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Evidentiality and Trust: The Effect of Informational Goals

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Abstract

Children's ability to exercise selective trust is crucial for the development of their knowledge and successful socialization. For speakers of some languages, evidentials, which are grammatical source-of-knowledge markers, could provide valuable support of these processes. Focusing on Bulgarian, this chapter situates children's use of evidentials in reliability judgments within the broader context of research on decision making and foregrounds the role of informational goals in children's decisions. © Wiley Periodicals, Inc.



For children, communication is the only way to acquire knowledge about object labels, historical events, the family's plans for the weekend, and the Tooth Fairy. Yet informants may be mistaken, deceptive, inattentive, or simply not well informed. Thus, children have to rely on others as sources of information, but their trust can have unwanted, if not dangerous, consequences. How do children solve this problem? How do they balance between their need to rely on others and the risk of being misled? Historically, children have been seen both as unquestioningly trusting and open to the testimony of others and as intransigently focused on their own experience. They were found to be easily misled by patently wrong statements (for a review see Ceci & Bruck, 1993) as well as to be paying little attention to others' statements and intentional instruction (Piaget, 1970). Recent research discredits both of these extreme views of the child's stance toward others' testimony. Rather than being gullible believers or intransigent skeptics, children appear to rely on a variety of cues that help them separate reliable from unreliable information: the speaker's certainty, source of knowledge, history of reliability, the presence of mental and modal verbs in statements, and evidentials. In other words, to the problem of trust in communication, children respond with selective trust informed by a large set of information. These recent findings reframe the problem into what cues, when in development, and how influence children's learning from others' testimony.

The dominant paradigm for studying children's use of various reliability cues involves a choice between two options. Children are presented with sentences said by people with different characteristics, such as age, or containing different linguistic reliability cues, such as evidentials, and are asked to decide which sentence is more likely to be true. Children's ability to discriminate between the options and the demonstration of a significant preference for one option over another is taken as evidence that the manipulated cue supports children's decision making and selective trust.

In this chapter, I focus on the role of evidentials in judging the relative reliability of sentences. I focus specifically on Bulgarian and draw on decision-making research to clarify the pragmatic value of evidentials, that is, their value in assessing the reliability of information. The determinants of human decision making have been extensively investigated, but the connection to developmental psychology has been limited to issues relevant to the origins of the heuristics and biases observed in adult decision making (Byrnes, 1998; Jacobs & Klaczynski, 2002; Schlottman, 2000). Here, I draw on the idea that decision making is a motivated cognitive process. There are several senses in which decision making is motivated, the most basic and pertinent of which for this chapter is that it is a goal-driven process. I suggest that just like actors' goals play a role in behavioral decisions, information seekers' goals play a role in assessing the reliability of evidential-bearing statements.

Goals, Options, and Decisions

In a recent review of decision-making research, Markman and Medin (2002) indicate that decisions imply that the decision maker has an unsatisfied goal and a set of options that might satisfy that goal. Decision making involves evaluating the available options and choosing to pursue one of them. Thus, options can be compared along multiple dimensions, and the comparison of two or more options may lead to different outcomes, depending on the relative importance of different goals.

As an illustration, consider a shopper who faces a choice between regular broccoli at \$3.00 and organic broccoli at \$4.50. The shopper's options can be compared on at least two dimensions: nutrition and price. Health concerns would likely foreground the items' nutritional value and lead to the purchase of organic broccoli. Budgetary concerns would likely foreground the items' price and lead to the purchase of regular broccoli. As another illustration of the role of goals in decision making, in the classic study of Tversky and Gati (1978), adults were asked which two countries are more similar: West and East Germany or Nepal and Sri Lanka. Most responded West and East Germany. However, most also selected West and East Germany as more *dissimilar* than Nepal and Sri Lanka. In other words, whether the similarities or the differences between West and East Germany loomed larger depended on the goals the participants were given.

Goals are critical determinants of human action, emotion, and cognitive processes (Carver & Scheier, 1998; Higgins, 1987; Schank & Abelson, 1977). In contrast to research on decision making, which spans the domains of consumer behavior, categorization, and action, research on children's assessment of the reliability of utterances has been largely oblivious to the role of goals. In communicating with and learning from others, we clearly have informational goals, for example, trying to find out who did what, why, and how. Yet whether and how they exert an effect on children's learning has received little attention. Can the source information carried by evidentials in particular be weighed on multiple dimensions analogous to the way food is along the dimensions of nutrition and price? Independent of that is the ultimate decision about what to trust dependent on the listener's informational goal. I will argue below that the answer to both of these questions is yes.

Comparing Statements with Evidentials

When children compare sentences containing evidentials, experimental controls are usually in place to ensure that the results represent children's evidential-based evaluations. Several studies have shown that evidentials affect children's trust, and two main approaches have emerged to answer the question of how children decide which source, denoted by an evidential,

is more reliable (Fitneva, 2008; Matsui, Yamamoto, & McCagg, 2006; Papafragou, Li, Choi, & Han, 2007).

The first approach builds on the idea that evidentials can be organized on a single scale representing the degree to which the source involves the speaker's own experience (Willett, 1988). For example, Papafragou et al. (2007) presented four-year-old Korean-speaking children with a task in which the children had to compare statements with the particle *-e*, which indicates that the speaker has direct evidence for the reported information and that the information is already assimilated by the speaker, and statements ending with the particle *-tay*, which indicates that the speaker has learned the reported information through hearsay. They predicted that children would prefer reports of direct to reports of indirect experience. Similarly, Matsui et al. (2006) examined the ability of three- to six-year-old Japanese-speaking children to compare the reliability of statements with the sentence-ending particles *yo*, which marks direct evidence, and *tte*, which marks indirect evidence for the report. Arguing also from the point of view of directness of experiences, these researchers predicted that children would prefer sentences marked with *yo*.

The second approach draws on the extensive literature on source memory and source monitoring, where *source* is defined as a multidimensional construct specifying when and where information originated, how it originated (for example, perceptually or through imagination), as well as whether the information originated with the speaker or was obtained from someone else (Johnson, Hashtroudi, & Lindsay, 1993). This framework has been essential in understanding the developmental changes in memory source monitoring (Lindsay, Johnson, & Kwon, 1991). For example, it motivated studies contrasting children's memory for actions that they had performed and imagined performing, distinguishable in the medium of the action, and their memories for actions that they and others performed, distinguishable mainly in whether self or other was involved in the action. One key finding of these studies is that children are more likely to confuse memories from similar sources.

Although this multidimensional concept of source was developed as part of an account of memory phenomena, it also applies to linguistic source expressions. For example, common source expressions in English are the phrases "I saw [that]" and "He thinks [that]." Statements introduced with these phrases can be compared along the I–he dimension, indicating with whom the focal information in the sentence (the information after that) originated: the speaker or someone else. These statements can also be compared along the see–think dimension, indicating how the information originated—through vision or thinking. As discussed below, Bulgarian evidentials can be organized along the same two dimensions (Fitneva, 2001, 2008).

A one-dimensional scale based on directness of experience may suffice for languages such as Japanese, and a two-dimensional model of source

applies fairly well to Bulgarian. However, other languages may require further elaboration. For example, in Tuyuca, the modality dimension is more differentiated than in Bulgarian (Barnes, 1984). Tuyuca evidentials allow the speaker to distinguish seeing and hearing as sources of knowledge. Both sources involve the speaker's own perceptual faculties.

The critical difference between the two approaches centers on whether reliability is seen as an inherent feature of evidentials. Matsui, Yamamoto, and McCagg (2006) and Papafragou et al. (2007) unequivocally predicted that direct experience would be judged as a more reliable source than indirect experience. In reflecting the experience scale he formulated, however, Willett (1988) was more circumspect and pointed out that the scale may have a probabilistic relationship with the reliability of the reported information. This relationship can be affected by context, the specific cultural interpretation of the sources, and may vary from one language community to another. Similarly, others have pointed out that what distinguishes evidential from modal reliability cues, which refer to the expression of speaker certainty, is specifically that the latter inherently mark the reliability of information (according to the speaker) while the former do not (Aikhenvald, 2004; Comrie, 2000; Fitneva, 2001).

If source information has an inherent reliability value, then informational goals have no role to play in source-based reliability assessments. No matter what the goal is, judgments would be the same. From this perspective, judgments with evidentials will proceed similar to those with modals, which express different degrees of speaker's certainty. Rooted in nonevaluative memory research, the more finely grained multidimensional analysis of source information is not committed to an inherent reliability value of the source dimensions and their levels. Thus, on this account, reliability assessments are computationally underdetermined on the basis of source information alone. Other information, such as informational goals, needs to be considered to determine the significance of this information and make a judgment.

Evidentiality in Bulgarian

Bulgarian is an Indo-European language in the Slavic family. The evidential information is carried by obligatory verb morphemes that, as in Turkish, are related to different tense-aspect paradigms. The evidential distinctions are mainly associated with statements in the third person and past tense. A Bulgarian speaker can say the sentence, "Ivan went to the park," in four ways depending on whether the information source is direct perception, inference, hearsay, or report of inference. The sentence, "*Ivane otide v parka*," is in simple past tense and conveys that the source is direct perception: the speaker has observed the reported event. "*Ivan e otishal v parka*" is in present perfect and is composed of the third-person form of the auxiliary *sum* (be) (*e* 'is') and the past (*-l*) participle of the main verb. It conveys that the

source is an inference: the speaker has inferred the occurrence of the reported event. “*Ivan e otishal v parka*” conveys that the source is hearsay: the speaker reports what other have observed. The difference between the last two forms is the omission of the auxiliary. Finally, “*Ivan bil otishal v parka*” is a form of the past perfect and composed of the past participles of the auxiliary *sum* (be) and the main verb. It conveys a report of inference: that the speaker reports what someone else thinks.

Two types of source information appear to be conveyed by Bulgarian evidentials: modality, or how the information was acquired, and authorship, or who acquired the information. Along the first dimension, analogous to the contrast between *I* and *he*, Bulgarian distinguishes between information acquired perceptually and information acquired cognitively (for example, direct perception versus inference). Perceptual acquisition involves the senses and cognitive acquisition reasoning processes. Along the second dimension, analogous to the contrast between *saw* and *think*, Bulgarian makes a distinction between firsthand and secondhand information (for example, direct perception versus hearsay). Firsthand information originates with the speaker, and secondhand information is acquired by the speaker from someone else (who may have acquired it from someone else). These two dimensions are easy to discern in the direct perception evidential: it introduces sensory information directly acquired by the speaker. Similarly, the inferential evidential introduces a product of the speaker’s reasoning. The other two evidentials introduce forms of hearsay: information acquired by the speaker indirectly, from someone else. The modality information here is less transparent; indeed, hearsay is treated as a single category in most accounts of evidentiality (Willett, 1988). However, a Bulgarian speaker cannot say, “*Ivan otishal v parka*,” and then deny that the person who has learned that first has *seen* Ivan going to the park. He also cannot say, “*Ivan bil otishal v parka*,” and then deny that the person who has come up with that information thinks that Ivan went to the park. These tests indicate that the use of hearsay and report-of-inference evidentials is felicitous under different assumptions about how the reported information was obtained at its origin.

Evidence for Effect of Goals on Trust

Do goals exert an influence in communication, specifically when decision makers evaluate the reliability of utterances on the basis of source information? The results of two studies with Bulgarian six- and nine-year-old children suggest that informational goals may in fact influence children’s trust in evidential-bearing statements (Fitneva, 2008). In these studies, children were presented with short stories in which the protagonists had to find out something, for example, where Ivan went to look for his dog. The protagonists heard contradictory statements from two informants: that Ivan went to the park and that he went to the beach. Children were asked whom they thought the protagonist believed. Across stories, children had to make a

decision for all six possible pairs of evidential expressions (direct perception versus hearsay, hearsay versus inference, direct perception versus inference, and so on). To determine the role of authorship and modality, the experiments assessed children's discrimination between perceptually and cognitively acquired information and between firsthand and secondhand information. To assess children's use of authorship information, the analyses included the data from the pairs that contrast firsthand and secondhand information (for example, direct perception versus hearsay) and evaluated if the number of times children selected the statement marked as being firsthand information above chance. A similar procedure was followed in assessing children's use of modality information. Here, the analyses evaluated if the number of times children selected the statement marked as being acquired perceptually was above chance.

In the first study, nine year olds showed use of the modality dimension, preferring perceptually to cognitively acquired information 59 percent of the time. The second study tested the generalizability of these results. Because the finding could potentially be related to the informational goal children faced through the protagonists, the question the protagonists were looking for an answer to was changed. In the first study, the protagonists' questions related to location, for example, where someone went. In the second study, their goal was to discover what a friend did while being on an adventure trip. In this study, nine year olds showed use of the authorship dimension, preferring firsthand to secondhand information 69 percent of the time. As the principal difference between the studies was the informational goal of the protagonists, these findings suggest that informational goal plays a crucial role in nine year olds' selection of a dimension along which to compare source information.

Six year olds performed differently. In the first study, like the nine year olds, they appeared to rely on modality information to assess the reliability of the sentences, but they preferred cognitively over perceptually acquired information. In the second study, there was no clear trend in their responses. These results are consistent with other research observing that children's reliability judgments begin to reflect evidentials around age six (Matsui et al., 2006). They also invite further research into the changes in children's reliability judgments involving evidentials in middle childhood. I will outline some hypotheses about the sources of these changes in the following sections.

It is important to note that an effect of the informational goal has been also observed in studies of children's use of nonverbal source information in deciding whether to believe or reject a statement. For example, Robinson and Whitcombe (2003) presented preschoolers with pairs of objects that were different in only one way: color (for example, a red and a blue ladybird) or feel (a hard and a soft snowman). One of the objects was hidden in a tunnel, and the children's task was to find out which one. In one condition of the study, children were asked to look inside the tunnel, and the experimenter reached inside and touched the object. In the other condition,

children were asked to touch the object, and the experimenter looked at it. To find out which object is in the tunnel, one of course has to look at it when only its color distinguishes it from the object it is paired with. Conversely, one has to touch the object in the tunnel when hardness is the critical property that distinguishes it from the other object. At age four, children's assessment of whether looking or touching is more trustworthy corresponded to whether the critical information they had to identify was the color or how the object felt.

In sum, informational goals appear to affect the evaluation of statements carrying either verbal (grammatical) or nonverbal source information. The relatively late age at which Bulgarian children's judgments are influenced by evidentials is unlikely to be due to general insensitivity to informational goals in evaluating assertions because research suggests that performance on nonverbal source tasks is culture invariant (Papafragou et al., 2007). We can understand the developmental trends better considering the mechanism through which the effect of informational goals obtain.

Explanation of the Effect of Goal

In decision-making research, it is usually assumed that choices can be explained by the compatibility between options and goals (Tversky, Sattath, & Slovic, 1988). For example, health concerns direct attention to nutrition labels, while budget concerns call attention to price. A question about differences directs attention to dissimilarities between options and a question about similarities to their common attributes.

The notion of compatibility may extend to explain how information seekers' goals affect reliability judgments, and trust in communication. Specifically, compatibility relates to Perner's (1991) theory of children's representation of knowledge. Perner argued that as part of having a theory of mind, children have to represent and understand the sources of knowledge. A major point of his theory is that children have to develop understanding of the "aspectuality of knowledge," which refers to the assumption that different sources, in particular sensory experiences, lead to different kinds of knowledge. For example, vision allows the apprehension of color information and touch allows the apprehension of weight information. If children understand these relations, then they can deduce the source of the information they need from the informational goal they have. For example, if they need to find out whether a blue or a red bird is in the tunnel (color information), the source of the information they need is vision. Then, when comparing the two statements—"The red bird is in the tunnel, I saw it" and "The blue bird is in the tunnel, I felt it."—we can expect them to trust the one for which the reported source matches the source they have deduced must be involved in gathering the information they seek. In the present example, the phrase "I saw it" matches the expected visual source. This match should lead children to prefer the first report.

Analogously, when children need to decide which of two statements marked with evidentials to trust, they could evaluate the match between the source expressed with the evidentials and the source their goal suggests must be involved in the acquisition of the information they are after. The situation is more complicated, however. One issue is that evidentials rarely map onto different sensory channels. Rather, they usually denote more abstract source information. In Bulgarian, for example, the modality distinction is between perceptual and cognitive channels, not between vision, audition, olfaction, and touch or between induction, deduction, and other inferential processes. Another issue is that in many cases, a given piece of information can be acquired in a variety of ways. We can estimate the weight, temperature, and surface texture of an object from looking at it, not just from touching it. This creates a problem for unambiguously identifying the source of the information the child seeks, and consequently in estimating the relative reliability of sources. Nevertheless, there may be broad regularities in information-gathering experience that establish probabilistic links between the kinds of source information tapped by evidentials and different kinds of information. Although probabilistic, these regularities could still support judgments about the reliability of sources.

The discussion so far has focused on particular sources rather than source dimensions. However, the extension could be easily illustrated, especially when multiple sources can lead to the acquisition of a given piece of information. Gathering information from different sources may lead to the discovery of a source dimension, or attribute, that is relevant across sources. This dimension would then be used to evaluate the reliability of source information associated with utterances.

On Development: From Use to Awareness to Skepticism?

Children show selective trust and an ability to use some cues to the reliability of statements, such as informants' past accuracy, as early as three years of age (Koenig & Harris, 2005). Yet a growing number of results suggest that a sophisticated discriminating ability and responsiveness to reliability cues, such as source information, take time to develop. For example, Robinson and Whitcombe (2003) constructed a task that used the same pairs of objects as in the tunnel task, but children did not perform an action themselves. Instead, they watched two people perform the looking and touching actions and had to decide who knew which of the two objects in a pair was in the tunnel. Five year olds but not four year olds succeeded in this task.

Responsiveness to source information in evidentials appears to develop even later. Korean four year olds succeed on tasks similar to Robinson and Whitcombe's where they have to judge the reliability of information based on nonverbal source information but fail on tasks where they have to judge

the reliability of information based on evidentials (Papafragou et al., 2007). Japanese children begin to prefer statements marked with *yo* over statements marked with *tte* only at around age six (Matsui et al., 2006). Bulgarian six year olds showed some ability to discriminate statements on the basis of modality information, but their performance was not as differentiated as that of nine year olds.

The explanation of these developmental findings is likely multifaceted, integrating a multitude of factors related to cognitive and linguistic development. To highlight a couple that could be particularly relevant to understanding the findings in Bulgarian, six year olds may not yet understand that the mind may distort information (Carpendale & Chandler, 1996). In their experience, thinking may be a quite prominent and reliable source as adults may appear to know and be able to guess things without perceptual access, for example, that a mischief has been done or the child is sick. It is also possible that the informational goals used in the studies did not set clear-cut evidential criteria for six year olds. For example, six year olds may have developed a stable sense of the source characteristics of good explanations.

One other factor is foregrounded by conceiving of trust in testimony as a decision problem: that decisions are affected by multiple factors or cues. That multiple cues affect decisions about what to believe is perhaps self-evident. However, the implications of this aspect of decisions have not received much consideration. In everyday conversation, evidentials typically co-occur with other reliability cues. For example, we often have some knowledge in the area of our questions, and that knowledge may influence what answers we decide to trust. In addition, we are more likely to ask questions of people we know than of complete strangers. Therefore, the speakers' reputation from past interactions may also color the perception of the reliability of their statements. But if other cues are available, what motivation do children have to use evidentials to resolve whom to trust? The routine availability of other, partially redundant reliability cues may affect both semantic development and children's reliance on evidentials.

One hypothesis is that the development of the use of evidentials in reliability judgments is related to formal school instruction (Fitneva, 2008). Many cues present in everyday interactions are less available in the school context. This may direct children's attention to intralinguistic cues, such as evidentials, and increase their sensitivity to and reliance on such cues.

To clarify, the suggestion is not that instruction on evidentiality is necessary for children to begin using evidentials. Indeed, the nine year olds in the Bulgarian studies were in third grade, and neither they nor the six-year-old kindergartners had received such instruction. Rather, the proposal is that the process of learning in school may create different needs, for example, to evaluate the adequacy of utterances outside the context of an ongoing interaction thus alerting children to cues they may have previously disregarded. Formal

school instruction also may just serve as a catalyst in this process. To test this possibility, research could compare same-age literate and illiterate children acquiring a language with evidentials. In addition, it should be clarified that any influence that formal school instruction has on children's use of evidential cues is unlikely to be through its support of the development of metalinguistic awareness of evidentials, that is, explicit awareness of the meaning of these morphemes (Fitneva, 2007). Systematic probing of Bulgarian children's intuitions about the source associated with different evidential-bearing statements revealed that both six and nine year olds fail this task. Thus, schooling likely does not affect children's evidential-based reliability judgments through the development of metalinguistic awareness.

It is reasonable to assume that early in development, children exercise selective trust without awareness of the cues that affect their decisions (Fitneva & Dunfield, 2008; Robinson & Whitcombe, 2003). With the development of awareness of evidentials and more deliberate decisions about what to trust, we may observe more consistent use of evidentials in reliability judgments. Indeed, in a follow-up study, nine year olds (but not six year olds) showed systematic beliefs that reported information is usually first-hand and perceptually acquired. This understanding may be a first step in the development of children's thinking about the origin of information communicated by others, or their theory of evidentiality. Furthermore, Papafragou et al. (2007) and Matsui et al. (2006) presented adults with a paper-and-pencil version of the tasks given to the children. Adults performed as expected, overwhelmingly preferring direct to indirect information.

However, the development of metalinguistic awareness may also undermine the use of evidentials when adult Bulgarian speakers were presented with the same reliability judgment task given to children, they appeared not to rely on evidentials (Fitneva, 2008). The participants, who were all university students or graduates, identified the manipulation of evidentials (thereby demonstrating metalinguistic awareness of evidentials) but overall responded randomly. They spontaneously presented rationalizations for their choices that suggested that they recognized that evidentials are relevant for decisions about whom to trust. However, they were concerned about the deliberateness of the speaker's choice of an evidential—for example, "This guy seems to say that he saw [repeats sentence with emphasis on the verb], but perhaps he's saying it this way so that Ivan's mom trusts him." Thus, there may be developmental erosion rather than strengthening of the effectiveness of evidentials as a reliability cue.

These adult data raise the issue of how and when in development Bulgarian speakers begin to develop questions about the possible intentional manipulation of evidentials and skepticism about their usefulness. Is the development of metalinguistic awareness of evidentials sufficient for raising such questions, or is some other experience also necessary? Clearly the motivation to rely on various reliability cues is tied to the decision maker's

perception of their unadulterated use by the speaker. That is, the cues have to honestly characterize the information the speaker presents for consideration by the listener in order for the listener to attend to them. Any experience with intentionally manipulating evidentials to further one's goals then may undermine their value for the language user. No studies to date examine if evidentials are subject to conscious selection by speakers in the course of a conversation, but there is no question that they can be manipulated intentionally at least off-line.

Conclusion

We compare what different people say about a situation and make decisions about whom to believe all the time. In this chapter, I presented evidence in support of the thesis that children's selective trust in evidential-bearing statements is a motivated cognitive process. The process is motivated in the sense that children's goals affect their perception of source reliability. In addition, I suggested that the process may be motivated in the sense that the discovery and use of evidentials may depend on children's encountering of contexts where other cues are not available and on their treatment of evidentials as honest signals about the speaker's knowledge.

A question that needs to be addressed explicitly is: How are informational goals established? Intuitively, questions reveal most directly a person's informational goal. However, goals are hierarchical mental structures, where more general, event-related goals (for example, start a soccer game) are instantiated in more specific plans (find Ivan), and related to overarching life themes (be popular among peers; Schank & Abelson, 1977). Moreover, sometimes informational goals are not stated overtly, and sometimes true goals are misrepresented. It is also possible that informational goals at one level contradict those at another. Thus, establishing the listener's informational goal is not always straightforward.

Full understanding of the role of informational goals in children's reliability judgments requires much further research. For instance, to further characterize the relationship between informational goals and source reliability, it is important to examine children's reliability judgments under a variety of informational goals and go beyond the rather circumscribed set used in existing studies. In addition, to generalize the current findings, it is necessary to extend investigations to examining languages other than Bulgarian in particular languages with different evidential systems. Finally, to better understand the process through which goals mediate the effect of source information on trust, it will be useful to examine children's assessment of statements containing lexical source information, which relies on more deliberate and effortful processing than evidentials (Matsui et al., 2006). The answers to these questions will help us further clarify the determinants and chart the development of children's selective trust.

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