What does one learn when one acquires the grammar of a language? Most child language researchers would probably say that one learns systems of grammatical morphology and syntactic constructions, as described in terms of the researcher’s preferred grammatical model. It would be noted that grammatical forms relate to semantic entities and pragmatic functions, and, depending on the theory, various roles would be allotted to semantics and pragmatics in the learner’s construction of the grammar.

Here I wish to propose that the child acquires more than a system of grammatical forms and semantic/communicative functions. In acquiring the grammar of a particular language, the child comes to adopt a particular framework for schematizing experience. That is to say, the grammatical system also expresses meanings. These meanings are of a general sort, in contrast with the specific contents of lexical items. Grammatical meanings apply across all possible lexical contents, putting the specific content of any particular sentence into a framework of temporal and spatial relations, modality, voice, illocutionary force, and so forth.

Much recent work in the emerging field of cognitive linguistics is concerned with the conceptual side of grammar. In an important paper on the semantics of grammar, under the title of "The relation of grammar to cognition," Leonard Talmy proposes that:

The grammatical specifications in a sentence ... provide a conceptual framework, or, imagistically, a skeletal structure or scaffolding, for the conceptual material that is lexically specified.

Comparing a number of languages, Talmy concludes that, universally, grammar expresses a restricted set of general notions that make up what he calls "the basic schematic framework for conceptual organization within the cognitive domain of language." This is a framework for locating objects and events in space and time, from given perspective points, and with given force-dynamic contours of events.

Although languages exhibit great diversity within these broad outlines, Talmy has succeeded in drawing out the cognitive unity that underlies crosslinguistic diversity. His work points to a universal set of conceptual systems that are basic to human cognition, and specialized for verbal expression by means of grammatical devices. Here, however, I wish to focus on the diversity within that unity, rather than on the cognitive universals. Briefly, I want to propose that a special kind of thinking is called into play, on-line, in the process of speaking in a particular language.

For almost two centuries—going back to the work of Wilhelm von Humboldt in the 1820s—anthropologically-oriented linguists have asked whether linguistic diversity implies
cognitive diversity. Von Humboldt, like Benjamin Lee Whorf in our century, looked
upon language as the formative instrument of thought. Both von Humboldt and Whorf
were concerned with the relation of language to world-view. In a characteristic
passage from von Humboldt, he states (1836/1988, p. 60):

There resides in every language a characteristic world-view. As the individual
sound stands between man and the object, so the entire language steps in
between him and the nature that operates, both inwardly and outwardly, upon
him. ... Man lives primarily with objects, [but] ... he actually does so
exclusively as language presents them to him.

And as Whorf put it in 1940 (1956, p. 221), in the strongest terms:

Users of markedly different grammars are pointed by their grammars towards
different types of observations and different evaluations of externally similar
acts of observation, and hence are not equivalent as observers but must arrive
at somewhat different view of the world.

Such a doctrine of linguistic determinism, along with the facts of linguistic relativity,
implies that children who learn different languages end up with different conceptual struc-
tures.

Another tradition in anthropological linguistics takes a less deterministic approach
in the face of linguistic diversity. Franz Boas, in his 1911 introduction to the Handbook
of American Indian Languages, catalogued a great diversity of obligatory grammatical
categories across languages. For example, he discussed the English sentence, The man is
sick, and noted that in Siouan one would have to indicate, grammatically, whether the
man is moving or at rest; in Kwakiutl one would have to indicate whether the man in
question is visible or non-visible to the speaker, and near to speaker, hearer, or a third
person; whereas in Eskimo one would simply say 'man sick', with no indication of
definiteness, tense, visibility, or location. To remove Boas's examples from the realm of
the exotic, note that in Spanish one has to indicate whether the man is temporarily or
chronically sick; that in many European languages one cannot indicate definiteness apart
from gender; and so on. What Boas made of such diversity, however, is different from
the suggestions of von Humboldt and Whorf (1911/1966, pp. 38-39):

The few examples that I have given here illustrate that many of the
categories which we are inclined to consider as essential may be absent in
foreign languages, and that other categories may occur as substitutes.

When we consider for a moment what this implies, it will be recognized
that in each language only a part of the complete concept that we have in
mind is expressed, and that each language has a peculiar tendency to select
this or that aspect of the mental image which is conveyed by the expression of
the thought.

While von Humboldt and Whorf held that concepts have no existence independent
of language, Boas suggests that there is a "complete concept," existing in the mind in the
form of a "mental image." The obligatory grammatical categories of each language
apparently sample from a universal form of mental representation, independent of any
particular language. On this view, the child's task is to determine which "aspects of the
mental image" are realized in the form of grammatical marking in the native language.
Was Boas right? What would a "complete concept" or "mental image" be like? Consider the two pictures below. These come from the middle of a picture storybook without words.¹ We have given this book to children and adults in a number of languages, and I will be reviewing some of our results in detail. For now, just look at the two pictures. They present a pair of events that you can understand immediately, probably without talking to yourself at all: something happens to the boy and something happens to the dog; an owl and some bees are involved; the location is among trees.

¹ From *Frog, where are you?* by Mercer Mayer. Copyright © 1969 by Mercer Mayer. Reproduced by permission of the publisher, Dial Books for Young Readers.
Examine the events of the second picture. What grammatical categories are implicit? Consider two languages of the crosslinguistic study that I will be reporting here, English and Spanish. If you speak English, it will be evident to you that the activity of the dog is *durative*, or extended in time, in comparison with the activity of the boy. In narrative mode, you might say: "The boy fell from the tree and the dog was running away from the bees." English marks *progressive aspect* on the verb, and it seems that this aspect corresponds to an obvious temporal component of the "complete concept" or "mental image." If you speak Spanish, you, too, will recognize the durativity of running, because Spanish also has progressive aspect, as well as imperfective aspect. But you might also note that the falling of the boy is *punctual* or *completed*, since your language contrasts perfective with imperfective aspect. However, what if you speak a language that has no grammatical marking of perfective/imperfective or of progressive, such as German, or Hebrew—to pick two more languages from our crosslinguistic study based on these pictures. Boas would presumably have suggested that you are aware of the differences in temporal contour between falling and running, but simply have no need to mark them grammatically in your language.

So far so good—but let us probe the second picture a bit further. Consider the owl as an observer. In an English narrative we might say: "The owl saw that the boy fell." Or: "The owl saw that the dog was running." The distinction between fell and was running, I have suggested, is clearly "in" the picture. But what about the owl's seeing? Note that, in both cases, in English we say "The owl saw." But seeing must have different temporal contours too. And indeed, in Spanish the seeing is perfective in the first instance, imperfective in the second:

(1a) *El buho vio que el niño se cayó.* the owl saw-PFV that the boy REFL fell-PFV [5 yrs.]

(1b) *El buho veía que el perro corria.* the owl saw-IPFV that the dog ran-IPFV [5 yrs.]

This will be evident to Spanish-speaking readers, as it is to Spanish-speaking preschoolers in our study—in fact, these two sentences come from a story told by a 5-year-old. But do English speakers sense that seeing can be perfective or imperfective? Is this part of our "mental image" or "complete concept"? I rather doubt it.

Let me take you once step further, this time into a less familiar linguistic terrain. Suppose you have seen only the second picture, and have been asked to describe it as a past event. Descriptions in English and Spanish would probably be the same as in the situation in which both pictures are presented. However, this is not the case in Turkish—another language in our sample—because in that language you are obliged to choose between two past-tense inflections, one for *witnessed* and one for *non-witnessed* events. If the second picture were to be presented alone, we would witness the dog running, but we could only infer that the boy fell at an earlier point in time. As a consequence, different past tenses would appear on the two verbs:

(2a) *Kopek kaç-iyor-du.* dog was-running-WITNESSED.PAST

(2b) *Çocuk düş-müş.* boy fell-NONWITNESSED.PAST

Turkish preschoolers are careful to make such distinctions. In English one could say, of course, something like: "It seems that the boy fell" or "Apparently the boy fell." We do have available *optional* lexical means for expressing notions that lie outside of the set of obligatory grammatical distinctions in a language. But I think we would be hard-pressed
to claim that everything about this picture that could be grammatically encoded in all of the languages of the world is implicitly present when we look at the picture.

The Turkish evidential inflections also demonstrate that much of grammar does not deal with mental images or perceivable reality at all. Rather, much of grammar marks distinctions that are relevant to discourse. When I speak Turkish, I must qualify my past-tense statements by telling you something about the source of my evidence. Furthermore, when I present a situation to you in any language, I take a grammaticized point of view. For example, in English I might say, "The bees are chasing the dog" or "The dog is being chased by the bees." Neither of these viewpoints—active or passive—is in the percept. Active and passive constructions serve to organize the flow of information in connected discourse. Thus, even within a single language, grammar provides a set of options for schematizing experience for the purposes of verbal expression. Any utterance is multiply determined by what I have seen or experienced, my communicative purpose in telling you about it, and the distinctions that are embodied in my grammar.

How, then, does the child know what all of these grammatical forms are about? Melissa Bowerman (1989) has suggested that the grammar of the native language guides the child in discovering the notions that are relevant for speaking. Leonard Talmy (1987) has suggested that these notions are drawn from a limited set of cognitive schematizations of experience, presumably innate. Steven Pinker (1989) has suggested that children know in advance what aspects of experience are likely to be grammaticized (the "Grammatically Relevant Subsystem"), and that they use such knowledge to "bootstrap" themselves into syntax. I think that all of these suggestions are in the right direction, yet we are very far from understanding how English-speaking children come to notice that events are in progress, how Turkish-speaking children come to notice that speakers communicate the source of their evidence, and so forth.

I do not propose to solve this problem here. Having raised it, I wish to put it in the background, and simply assert that each language trains the child to attend to a particular set of distinctions in the course of the acquisition of grammar. The purpose of the research I will present to you here is to demonstrate that, by age 3 or 4, children who have learned different native languages provide critically different descriptions of the pictures in our storybook.

In making this claim, I wish to present a new version of the von Humboldt-Whorf position on linguistic relativity and determinism. Recall that those theorists were concerned to relate language to world-view. The classic position thus seeks to relate two static entities: language and thought. Language is the totality of structures described by linguists. But what is "thought" or "world-view"? The hypothesis has always run into trouble in attempts to determine the mental structures that underlie perception, reasoning, and habitual behavior—as measured outside of the contexts of verbal behavior. I have a more cautious, but more manageable formulation—one that seeks to relate two dynamic entities: "thinking" and "speaking." We will probably never succeed in demonstrating the effects of grammar on world-view or nonlinguistic behavior. But there is a special kind of thinking that is intimately tied to language—namely, the thinking that is carried out, on-line, in the process of speaking. I believe that this is the sort of relation that Boas had in mind when he wrote about selecting aspects of mental images that are "conveyed by the expression of the thought."
You may have noticed that I have not yet mentioned the name of Edward Sapir, which usually appears in references to the "Whorf-Sapir hypothesis." Sapir sometimes took the strong view associated with Whorf, but sometimes he suggested the more cautious version that guides my own research. For example, in an early formulation, in 1924, Sapir, like Boas, pointed to the role of language in the expression of thought (1958, p. 152):

[The forms of each language] establish a definite relational feeling or attitude towards all possible contents of expression and, through them, towards all possible contents of experience, in so far, of course, as experience is capable of expression in linguistic terms. [emphasis added—DIS]

In my own formulation: The expression of experience in linguistic terms constitutes "thinking for speaking"—a special form of thought that is mobilized for communication. Whatever effects grammar may or may not have outside of the act of speaking, the sort of mental activity that goes on while formulating utterances is not trivial or obvious, and deserves our attention. We encounter the contents of the mind in a special way when they are being accessed for use. That is, the activity of thinking takes on a particular quality when it is employed in the activity of speaking. In the evanescent time frame of constructing utterances in discourse one fits one's thoughts into available linguistic frames. "Thinking for speaking" involves picking those characteristics of objects and events that (a) fit some conceptualization of the event, and (b) are readily encodable in the language. I propose that, in acquiring a native language, the child learns particular ways of thinking for speaking.

How can this proposal be investigated? One way is to compare the ways in which speakers of different languages depict the same events in words. This approach is well known to students of translation, and there is a large and fascinating literature showing that translations of the same text cannot help but add or remove nuances in accord with the characteristics of the given language. Informally, we have already encountered these issues in considering various descriptions of the two pictures in several languages, and in Boas's American Indian translations of The man is sick. We cannot ask monolingual children to carry out translations of a text, but we can ask children in different countries to tell stories to the same pictures, and see if their stories differ consistently, depending on the language that they are speaking. This is the method we have been using in Berkeley, in collaboration with researchers in a number of countries, using the picture storybook, Frog, where are you? (Mayer, 1969). For the purposes of my present argument, I will compare children's descriptions of several scenes in several languages, focusing on expressions of temporal and spatial relations. Our findings suggest that preschoolers do, indeed, give evidence of language-specific patterns of thinking for speaking, and that such patterns have implications for the development of rhetorical style in each of the languages.

The study was planned together with Dr. Ruth Berman of Tel-Aviv University in Israel. Table 1 lists the various researchers and languages involved. Here I will make only a few comparisons of four of these languages, in several episodes from stories told by preschoolers and 9-year-olds. I will be reporting on findings from English, German, Hebrew, and Spanish.
Table I
CROSSLINGUISTIC STUDY OF NARRATIVE DEVELOPMENT
(10-12 subjects/sample)

English: ages 3, 4, 5, 9, adult (Lisa Dasinger, Virginia Marchman, Tanya Renner, Cecile Toupin: University of California, Berkeley)

German: ages 3, 5, 9, adult (Michael Bamberg: Clark University; Christiane von Stutterheim, Universität Heidelberg)

Hebrew: ages 3, 4, 5, 7, 9, 11, adult (Ruth Berman: Tel-Aviv University)

Icelandic: ages 3, 4, 5, 9, adult (Hrafnhildur Ragnarsdottir, Reykjavik)

Japanese: ages 3, 4, 5, 7, 9, adult (Keiko Nakamura: University of California, Berkeley)

Mandarin: ages 3, 4, 5, 7, 9, adult (Guo Jiansheng: University of California, Berkeley)

Russian: ages 4, 5, 6, 7, 8, 9, 10, adult (Yana Anilovich: University of California, Berkeley)

Spanish: ages 3, 4, 5, 6, 7, 9, adult (Eugenia Sebastián: Universidad Autónoma, Madrid; Aura Bocaz (Chile, Argentina): Universidad de Chile, Santiago)

Turkish: ages 3, 4, 5, 7, 9, adult (Ayhan Aksu-Koc: Boğaziçi Üniversitesi, Istanbul; Aylin Künay, University of California, Berkeley)

First let me raise the issue of rhetorical style. When you have read many of these stories in various languages, you begin to get a feeling for typical characteristics of style in each language. This can be made clear even by comparing translations into English. I will focus on the two pictures that we have already examined, along with the seven following pictures in the Appendix. After the boy falls from the tree, he accidentally gets entangled in the antlers of a deer, with the result that the boy and dog fall into some water. The two following segments are representative of 5-year-old narratives. One is in English, and the other is an English translation of a Spanish story, where I have used the progressive to indicate the imperfective, which has no English equivalent, in order to render the version suitable in English:

(3a) First Version: The boy looked in a hole in the tree. An owl came out that threw the boy. And the dog, the bees were chasing him. The boy hid behind a rock and the owl flew away. A deer that was behind the boy when he climbed... And he slipped on top of the deer, while the deer was running. The dog went first. He threw them down where there was a river. Then he fell seated.

(3b) Second version: And the boy looked in the tree. And then the boy fell out, and the owl was flying, and the dog was being chased by the bees. And then the boy got up on some rocks, and the owl flew away. And the boy was calling for his frog on the rocks. And a deer... the boy got caught on the deer's antlers. And then the deer carried him over a cliff and threw him over the cliff into a pond. And the boy and the dog fell, and they splashed in some water.

We can be reasonably sure that the mental images, and understanding of the events, are roughly the same for these two children. Yet, to the practiced eye, it is evident that the
first version is Spanish and the second English. What are some of the salient characteristics of these two languages, as reflected in our narratives?

The two versions are similar in their treatments of movement through time. Both narratives mark some events as being in progress. In the first, compare: threw vs. were running; in the second, fell vs. was flying. (Recall that these past progressives in the translations were really past imperfectives in the Spanish original.) English and Spanish both have aspectual marking of durativity, and 5-year-olds note this distinction. As we will see later, this feature is lacking in German and Hebrew narratives.

The two versions differ, however, in their treatment of location and movement through space. In the first version, trajectories are not highly elaborated: threw the boy, slipped on top of the deer, threw down. The second version depicts more detailed trajectories: fell out, carried over a cliff, threw over the cliff into a pond, splashed in some water. By contrast, the first version has relative clauses that depict static locative configurations, which are lacking in the second: a deer that was behind the boy, where there was a river. There is also an encoding of the static end point of the fall: fell seated.

Note also that while the second version has no relative clauses, it has passive constructions, was being chased, got caught.

These cues are sufficient to identify the first version as Spanish and the second as English. The linguistic characteristics of these two narrative segments are typical of our preschool narratives in the two languages. In brief, where English allows for elaborated trajectories of motion, Spanish has simple verbs of change of location, supplemented by more elaborated descriptions of static locations of objects. And with regard to the syntax of non-canonical clauses, Spanish preschoolers make frequent use of relative clauses, and English-speaking preschoolers make frequent use of passives—but for different purposes, of course. Spanish relative clauses fill in locative and circumstantial detail in cases where English may not have need for such detail, as I will discuss later with some additional examples. English passives perform the same narrative function as Spanish word-order variation. I have given a left dislocation in the Spanish version: The dog, the bees were chasing him. This was really a standard object-fronting word order in Spanish:

(4) Le perseguían al perro las avispas. CLITIC.PRO chased OBJECT+the dog the bees [5 yrs.]

This corresponds in function to the English passive, The dog was being chased by the bees. Preschoolers in both languages can manipulate word order to topicalize a patient, although the construction types differ.

I want to argue that these systematic contrasts between Spanish and English reflect different patterns of thinking for speaking—different on-line organization of the flow of information and attention to the particular details that receive linguistic expression. These patterns hold up in quantitative analysis of our narratives, and show striking

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2 The original Spanish of the first version is as follows: El niño miró por un agujero del árbol. Saltó un loro que le tiró al niño. Y le perseguían al perro las avispas. El niño se escondió detrás de una piedra y se voló el buho. Un ciervo que estaba detrás al niño como se subió... Y se tropezó encima de la del ciervo, mientras el ciervo corría. Primero iba el perro. Le tiraron abajo en donde un río. Luego se cayó sentado.
contrasts with languages of different types.

Consider, again, the scene in which the boy falls from the tree and the bees chase the dog. Here we have two simultaneous events, one PUNCTUAL, COMPLETED and the other NON-PUNCTUAL, DURATIVE. As we have seen, English allows for an opposition between an aspectually neutral verb form and a progressive, with the neutral form taking on a default punctual value, given the lexical meaning of the verb fall. The description in our 5-year-old example is typical:

(5) *The boy fell out ... and the dog was being chased by the bees.* [5 yrs.]

The earliest aspectual contrast in our data for this scene is given by a child of 3;8:

(6) *He’s [dog] running through there, and he [boy] fell off.* [3;8 yrs.]

In Spanish, the preferred version is to mark the punctuality of falling by use of a perfective verb form, contrasting it either with an imperfective or a gerundive expression, as in the following 5-year-old examples:

(7a) *Se cayó el niño y le perseguían al perro las avispas.* ‘The boy fell-PFV and the bees chased-IPFV the dog.’ [5 yrs.]

(7b) *Se cayó ... y el perro salió corriendo.* ‘He fell-PFV ... and the dog came-out-PFV running.’ [5 yrs.]

As in English, this aspectual contrast is marked by the youngest children in our sample. Our earliest Spanish example comes from a child of 3;4:

(8) *Se cayó. ... El perro está corriendo.* ‘He fell-PFV. ... The dog is running.’ [3;4 yrs.]

Spanish, by providing a perfective, in addition to imperfective and progressive, thus makes it possible to grammatically mark both poles of the durative-nondurative distinction, whereas the English progressive provides explicit marking only of the durative pole.

German and Hebrew lack distinctive marking of either pole of the aspectual contrast. Hebrew has no grammaticized aspect at all. Verbs are simply inflected for past, present, or future tense. German has a simple past and a perfect. Neither language has grammatical marking of either progressive or imperfective. Although German- and Hebrew-speakers must be aware, in some nonlinguistic sense, that the temporal contours of the two events differ, they generally do not distinguish them grammatically, using the same tense for both verbs. The following examples from 5-year-olds are typical:

(9) *German: Der Junge fällt vom Baum runter ... und die Bienen gehen hinter dem Hund her.* ‘The boy falls down from the tree ... and the bees go after the dog.’ [5 yrs.]

(10) *Hebrew: Hu nafal ve hakeleu barax.* ‘He fell and the dog ran-away.’ [5 yrs.]

I have given examples from 5-year-olds, but it is important to note that the language-specific patterns hold across all ages, from 3 to 9, and adults. In German and Hebrew the tendency is to maintain the same tense-aspect form for both clauses, while in Spanish and English the tendency is to differentiate the two. This trend is summarized numerically in Table 2.
Table 2

PERCENTAGE OF NARRATORS USING SAME TENSE/ASPECT FORM FOR ‘FALL’ AND ‘RUN’ CLAUSES IN SCENE 1

<table>
<thead>
<tr>
<th>Language</th>
<th>Preschool (3-5)</th>
<th>School (9)</th>
<th>Adult</th>
<th>OVERALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hebrew</td>
<td>71</td>
<td>100</td>
<td>63</td>
<td>78</td>
</tr>
<tr>
<td>German</td>
<td>54</td>
<td>80</td>
<td>78</td>
<td>71</td>
</tr>
<tr>
<td>English</td>
<td>26</td>
<td>22</td>
<td>33</td>
<td>27</td>
</tr>
<tr>
<td>Spanish</td>
<td>23</td>
<td>18</td>
<td>0</td>
<td>21</td>
</tr>
</tbody>
</table>

Consider these figures in the light of thinking for speaking. If the figures for Hebrew and German were uniformly 100%, and for English and Spanish 0%, we could only conclude that speakers strictly adhere to the formal contrasts provided by their language, and it would not be possible to separate thinking from speaking. But the deviations from these extremes indicate that other options are possible.

Some Hebrew speakers try to contrast the two events by presenting the first in the past tense and the second in the present, thereby recruiting a tense difference to mark the aspectual contrast COMPLETED-ONGOING. For example:

(11) **Hebrew:**Hayeled nafal ... ve hakelev borex. ‘The boy fell ... and the dog runs-away.’ [5 yrs.]

Note that this option is used about 70% of the time by preschoolers and adults, while school-age children (9-year-olds) follow the language most tenaciously in not attempting any aspectual distinction. (I might mention, in passing, that 9-year-old stories, across languages, tend to be the most stereotyped and consistent with native language patterns. This may well be an effect of schooling.)

German presents a similar picture to Hebrew. There are some attempts to mark the two verbs differently, especially in preschool narratives. The first event is sometimes put in the perfect, thereby closing it off as a resultant state with regard to the second event in the present tense. For example:

(12) **German:** Der ist vom Baum runtergefallen und der Hund läuft schnell weg. ‘He has fallen down from the tree and the dog runs away quickly.’ [5 yrs.]

It is interesting that the tendency in German is to mark the first event as completed, rather than to elaborate the second as ongoing. Only two narrators in our total sample of 48 made any attempt to mark the second event as protracted in time:

(13a) **German:** Er rannte schneller und immer schneller. ‘He ran faster and ever faster.’ [9 yrs.]

(13b) **German:** Der Hund rennt rennt rennt. ‘The dog runs runs runs.’ [adult]

In fact, throughout the narratives, it is generally the case that when German speakers choose to take an aspectual perspective, they tend to orient to some marking of *boundedness*. It is intriguing that, in the history of German, there have been various attempts to grammaticize notions of boundedness or terminative aspect. English, by contrast, has gone in a different historical direction among the Germanic languages,
grammaticizing the progressive. And we find that our English-speaking narratives tend to mark durativity more than termination in their descriptions. The relations between diachrony and child language would require a separate paper. But I would like to point out, in passing, that persistence of a grammaticized notion over time in the history of a language provides another sort of critical evidence that grammatical distinctions may train children to attend to particular "contents of expression," to use Sapir's term. That is to say, speakers—and hence languages—become accustomed to maintain grammatical marking of particular semantic features.

To return to the fates of the boy and the dog: it is important for my argument that the figures in Table 2 are not all 100s and 0s. The deviations from the overall tendencies of each language type show that it is, indeed, possible to try to mark aspectual notions like TERMINATIVE and DURATIVE if they are not part of the regular system of verb morphology in one's language. And, on the other hand, the occasional lack of aspectual distinctions between the two clauses in Spanish and English shows that one is not compelled to make use of the full array of distinctions available in verbal morphology. But what is most striking in Table 2 is the finding that speakers so rarely make use of options that differ from the norm. Overall, Hebrew and German speakers attempt to elaborate aspectual distinctions about one-fourth of the time, while Spanish and English speakers fail to mark aspectual distinctions about one-fourth of the time. Such tendencies appear repeatedly, throughout our crosslinguistic study of narrative, clearly pointing to different types of thinking for speaking. Speakers of all ages, across languages, certainly know, in some nonlinguistic sense, that the boy's falling is punctual and completed with regard to the simultaneous, ongoing chasing and running of bees and dog. But they generally do not seem to be inclined to express any more of this knowledge linguistically than fits the available distinctions in the language. It is striking that children as young as 3 already show a sensitivity to the "rhetorical slant" of their particular native language.

In comparing languages in terms of aspect we find differences in terms of the number and kinds of distinctions that are marked. The four languages we have considered can be put on a continuum with regard to richness of aspectual inflection:

GRAMMATICAL ASPECT

Hebrew: none
German: perfect
English: perfect, progressive
Spanish: perfect, progressive, imperfective/perfective

When dealing with a continuum of this sort, we ask whether there is any sort of "compensation" for missing grammatical categories in a language, or whether they are generally ignored in thinking for speaking. Our data—across a number of story episodes and languages—suggest that categories that are not grammaticized in the native language are generally ignored, whereas those that are grammaticized are all expressed by children as young as 3.

However, languages do not only differ from one another in the presence or absence of a grammatical category. They also differ in the ways in which they allocate grammatical resources to common semantic domains. Again, it will be most useful to begin with
a comparison between English and Spanish. These two languages represent opposite poles of a typological distinction with regard to the verbal expression of change of location. That is, they differ critically in lexicalization patterns for verbs of motion. Consider one of the sentences we encountered earlier, in an English 5-year-old story:

(14) *And then the deer carried him over a cliff and threw him over the cliff into a pond.* [5 yrs.]

As Leonard Talmy (1985) has shown in detailed analyses of lexicalization patterns, the verb in English encodes some change of location in a particular manner—"throw," "carry," "run," etc.—leaving it to "satellites" of the verb to encode directionality—in English, verb particles and prepositions. English allows for quite elaborated use of satellites to specify path with a single verb root. The following sentence sounds perfectly normal to native speakers:

(15) *The bird flew down from out of the hole in the tree.*

The verb simply specifies motion in a particular manner, and the satellites specify the trajectory: *down-from-out-of.*

Spanish verbs of motion encode either directionality—*entrar* 'enter', *salir* 'exit', *subir* 'ascend', *bajar* 'descend', etc.—or manner—*volar* 'fly', *correr* 'run'. But one cannot compactly express manner and directionality in compound expressions as in English, because a collection of path satellites cannot be accumulated. The closest Spanish approximation to (14) would be something like:

(16) *El pájaro salió del agujero del árbol volando hacia abajo.* 'The bird exited of the hole of the tree flying towards below.'

Note that Spanish prepositions, by contrast to English, provide minimal locative specification: *de* occurs twice in example (16). In *del agujero* 'of the hole' it receives the meaning 'out-of' from the associated verb *salir* 'exit', while in *del árbol* 'of the tree' it receives the meaning 'in' from general world knowledge about relations between holes and trees. When world knowledge is not sufficient, the Spanish-speaker is often required to provide a static "sketch" of the relevant components of scene, so that the appropriate trajectory can be inferred. As we will see, this accounts, in part, for the flowering of relative clauses in Spanish. For example, in English one might say:

(17) *The boy put the frog down into a jar.*

A Spanish-speaker might say:

(18) *El niño metió la rana en el frasco que había abajo.* 'The boy inserted the frog *en [=in/on] the jar that was below.*'

The verb *meter* 'insert' implies that the proposition *en* is to be interpreted as 'in'; and the relative clause, *que había abajo* 'that was below', implies the directionality of insertion. Thus in Spanish the trajectory 'down-into' must be inferred from a combination of path-verb and a static description of the location of the goal—the jar, while in English the static location of the goal—located in the jar—must be inferred from the path-description, *down into.*

This is a systematic difference between the two languages. English tends to assert trajectories, leaving resultant locative states to be inferred; Spanish tends to assert locations and directions, leaving trajectories to be inferred. This systematic difference has effects on the grammar of discourse. I have already mentioned the Spanish use of
locative relative clauses. Another effect is in the use of Spanish participles, which are frequent at the youngest ages. We have already encountered one typical example in the first narrative fragment, where the 5-year-old narrator said that the boy 'fell seated':

(19) *Se cayó sentado.* 'He fell seated.' [5 yrs.]

This child is trying to take a perspective that includes both motion and endstate. More typically, we find clauses in which the only lexical verb is a participle. For example, where English-speakers tend to say *The boy climbed the tree*, leaving the boy's end-state implicit, Spanish speakers often say the untranslatable *El niño está subido en el árbol* 'The boy is climbed-PART in the tree'.

(20a) **English:** Assert trajectory, imply end-state. The boy climbed the tree.

(20b) **Spanish:** Assert end-state, imply trajectory. El niño está subido en el árbol.

'The boy is climb-PART en [=in/on] the tree.' [=the boy is in a state of having climbed the tree]

The languages incline towards different patterns in what is asserted and what is implied. Thus, at many points in our narratives, English-speakers assert actions, implying results, whereas Spanish-speakers assert results, implying actions. These differences come to have an effect on overall rhetorical style. English narrators devote somewhat more narrative attention to descriptions of processes, while Spanish narrators tend to provide more descriptions of states. In making this proposal, however, let me remind you that I am talking about thinking for speaking only. I am making no claims about how millions of Spanish- and English-speakers conceive of life or act in the world.

In our small sample of narratives to the *Frog, where are you?* picture-book, there are some suggestive differences by age and language with respect to the issues of location and motion that I have been briefly reviewing. First let us consider the issue of verbs of motion and their satellites. The analysis can be enriched by adding German and Hebrew, since German patterns itself like English—with undirected verbs of motion and a rich and differentiated collection of locative particles and prepositions; and Hebrew patterns itself like Spanish—with directional verbs and a small collection of polysemous prepositions.

There are three episodes in the story in which someone falls or is thrown downward. We have seen two of them—the fall from the tree and the fall from the cliff; and in my calculations I have added a third, in which the dog falls from a window. I have listed all of the verbs used to describe these scenes (mainly versions of 'fall' and 'throw') in English, German, Spanish, and Hebrew. For each verb, I noted whether it occurred alone, or with some kind of locative addition—a particle or prepositional phrase indicating downward direction, source, or goal of motion. In Table 3 you see the figures for 3-, 5-, and 9-year-olds, giving the percentages of such descriptions that had a bare verb with no locative elaboration.
First consider the 3-year-olds. It is already evident that English and German form one group, and Spanish and Hebrew another. Recall that, in comparing languages according to aspect, it was English and Spanish that formed one group, and German and Hebrew another. It is clear that, for psycholinguistic purposes, typological differences between languages must be considered separately for each semantic domain. The ways in which a language deals with issues of time may be quite different from its treatment of space, which casts some doubt on Whorf's grand overall conception of language and world-view.

Table 3 shows that English and German 3-year-olds hardly ever use a verb of motion without some locative elaboration, whereas Spanish and Hebrew 3-year-olds use bare verbs of motion about two-thirds of the time. This clear difference in narrative strategy holds up across age as well. Although there are different developmental patterns, at each of the three ages the difference between the two types of languages is maintained.

The most interesting developmental pattern is seen in Spanish. Here there is a U-shaped curve, with 5-year-olds providing relatively more locative elaboration than either 3- or 9-year-olds. Some children of this age seem to be groping for more detailed description of trajectories, using English/German construction types that are redundant in Spanish. For example:

(21a) *Se cayó dentro de un agujero.* '(He) fell inside of a hole.' [5 yrs.] [=*Se cayó en un agujero.* '(He) fell in a hole. ']

(21b) *Se cayó encima del agua.* '(He) fell on top of the water.' [5 yrs.] [=*Se cayó al agua.* '(He) fell a the water. ']

And some children add a locative adverb, *abajo* 'down' or 'downward', as in:

(21c) *Le tiró abajo.* '(He) threw him down(ward).' [5 yrs.]

These can be looked upon as attempts to compensate for an apparent gap in Spanish grammar. But they are different from the attempts at compensation that we encountered with regard to verbal aspect. There we found a few, rare instances of German and Hebrew attempts to add distinctions of punctuality or durativity that are not marked grammatically in the language. But here we have attempts to be more explicit, using tools that are part of the grammar.

Interestingly, these attempts disappear after age 5 in Spanish. They seem to be replaced by the use of extended static locative descriptions, which make it possible to infer trajectories from the combination of a motion verb and the description of a scene. The following 9-year-old example is typical:
(22) El ciervo le llevó hasta un sitio, donde debajo había un río. Entonces el ciervo tiró al perro y al niño al río. Y después, cayeron. 'The deer took him until a place, where below there was a river. Then the deer threw the dog and the boy to the river. And then, they fell.' [9 yrs.]

Table 4 summarizes the use of elaborated locative descriptions in narrating the fall from the cliff.

<table>
<thead>
<tr>
<th>Language</th>
<th>Age 5</th>
<th>Age 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>German</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Spanish</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>Hebrew</td>
<td>0</td>
<td>42</td>
</tr>
</tbody>
</table>

First compare English and Spanish: It is evident that this pattern of extended locative elaboration develops between ages 5 and 9 in Spanish, but not in English. Comparable narrations by English 9-year-olds present compact phrases with verbs of motion and locative satellites, but with no scene-setting descriptions, such as:

(23a) So the deer ran away with him and dropped him off a cliff in the water. And they fell in the water. [9 yrs.]

(23b) And the deer ran with the boy on his antlers. So the dog was chasing the deer, and the deer just stopped, and the boy and the dog fell off of a cliff into a swamp. [9 yrs.]

German 9-year-olds are strikingly similar to Americans, with little static scene-setting and compact verbal constructions that sketch out a trajectory. For example:

(24) Der Hirsch nahm den Jungen auf sein Geweih und schmiß ihn den Abhang hinunter genau ins Wasser. 'The deer took the boy on his antlers and hurled him down from the cliff right into the water.' [9 yrs.]

Finally, to complete the picture, 9-year-old Israelis are strikingly similar to Spaniards, as can be seen from the following Hebrew example:

(25) Ve ha'ayil nivhal, ve hu hitzil laruts. Ve hakelev rats azarav, ve hu higia lemacok she mitazat haya bitsa, ve hu atsar, ve hayeled ve hakelev naflu labitsa beyazad. 'And the deer was startled, and he began to run. And the dog ran after him, and he reached a cliff that had a swamp underneath, and he stopped, and the boy and the dog fell to the swamp together. [9 yrs.]

To return to my overall theme once again, these two types of languages seem to have important consequences with regard to thinking for speaking. In this instance, the unavailability of a particular grammatical device—a system of locative particles related to verbs—has rather large potential consequences for narrative organization. Spanish- and Hebrew-speaking children develop procedures of scene-setting, in which a vaguely
specified change of location becomes interpretable in context. One grammatical device which serves this function is relative clauses, and we find that Spanish- and Hebrew-speakers use relative clauses far more frequently than English- and German-speakers. This is already evident at age 3, indicating early development of a narrative style in which description and qualification are important.

Of course, I must be cautious in making large generalizations from a rather small sample of stories told to a single picture-book in several countries. I would like to comment, though, that the patterns we have found in Spain seem to hold up in comparable data gathered by Aura Bocaz in Chile and Argentina, and that the English patterns are repeated in several different American samples. Much more needs to be done even with the *Frog, where are you?* picture book in the remaining languages in our sample, let alone necessary additions of other speech genres and languages.

I am convinced, however, that the events of this little picture book are experienced differently by speakers of different languages--in the process of making a verbalized story out of them. For example, there is nothing in the pictures themselves that leads English speakers to verbally express whether an event is in progress or Spanish speakers to note whether it has been completed; to encourage Germanic speakers to formulate elaborate descriptions of trajectories; to make Hebrew speakers indifferent to conceiving of events as durative or bounded in time. (And, if we went on to examine our Russian and Turkish stories, we would find an indifference to indicating the definiteness of story participants—a category readily marked by our English, German, and Spanish narrators.) I suggest that, in acquiring each of these languages, children are guided by the set of grammaticized distinctions in the language to attend to such features of events while speaking.

There is, however, something dissatisfying in limiting ourselves to evidence that is so bound up with the acquisition and use of native languages. In conclusion, I would like to point to another type of evidence that seems to support my proposal that the ways in which learning a language as a child constrains one's sensitivity to what Sapir called "the possible contents of experience as expressed in linguistic terms."

Consider the small collection of linguistically encoded perspectives that we have been examining: temporal contours of events marked by aspectual forms, movement and trajectories in space, indication of definiteness of participants mentioned in connected discourse. These are precisely the sorts of things that make it so hard to master the grammar of a second language. For example, it is very hard for English-speakers to grasp the Spanish perfective/imperfective distinction that is lacking in our native language. In fact, we seem never to fully master this system in Spanish. By contrast, we have little difficulty in figuring out how to use the Spanish progressive and perfect, or the Spanish definite and indefinite articles—since we have already learned how to make decisions about the linguistic expression of these notions in English. But there is nothing inherently easy or hard about any of these Spanish distinctions. For example, native French speakers have no trouble with the Spanish imperfective, since they have a similar category in French; but the progressive and perfect pose problems to them, since these are not French ways of looking at events. Turkish speakers have difficulty with definite and indefinite articles in learning to speak Spanish, English, and German, since there are no definite articles in Turkish. German speakers of English use the progressive where they should use simple present, although Turks do not make this error in English, since
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Turkish uses progressive aspect and German does not. Spanish learners of English object that we make too many obscure distinctions with our large collection of locative prepositions and particles. And so on. In brief, each native language has trained its speakers to pay different kinds of attention to events and experiences when talking about them. This training is carried out in childhood and is exceptionally resistant to restructuring in adult second-language acquisition.

Much of value could be learned from a systematic study of those systems in particular second languages that speakers of particular first languages find especially difficult to master. I think that these systems—including the ones we have considered here—have something important in common: they cannot be experienced directly in our perceptual, sensorimotor, and practical dealings with the world. I would guess, for example, that if your language lacked a plural marker, you would not have unsurmountable difficulty in learning to mark the category of plurality in a second language, since this concept is evident to the nonlinguistic mind and eye. Or if your language lacked an instrumental marker it should not be difficult to learn to add a grammatical inflection to nouns that name objects manipulated as instruments. Plurality and manipulation are notions that are obvious to the senses. But there is nothing in everyday sensorimotor interactions with the world that changes when you describe an event as "She went to work," or "She has gone to work," or when you refer to the same object in successive utterances as "a car" and "the car." Distinction of aspect, definiteness, voice, and the like, are par excellence, distinctions that can only be learned through language, and have no other use except to be expressed in language. And, further, once our minds have been trained in taking particular points of view for the purposes of speaking, it is exceptionally difficult to be retrained.

It is interesting that Wilhelm von Humboldt anticipated these questions as well. He wrote (1836/1988, p. 60):

To learn a foreign language should therefore be to acquire a new standpoint in the world-view hitherto possessed, and in fact to a certain extent this is so, since every language contains the whole conceptual fabric and mode of presentation of a portion of mankind. But because we always carry over, more or less, our own world-view, and even our own language-view, this outcome is not purely and completely experienced.

If we substitute Humboldt’s term, "world-view," with my proposed term, "thinking for speaking," we have here a powerful statement about the role of language in what Sapir called those "contents of experience [that are] capable of expression in linguistic terms."

Conclusion

In sum, we can only talk and understand one another in terms of a particular language. The language or languages that we learn in childhood are not neutral coding systems of an objective reality. Rather, each one is a subjective orientation to the world of human experience, and this orientation affects the ways in which we think while we are speaking.
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REFERENCES


