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Keeping Verb Acquisition in Motion: A Comparison of English and Spanish

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A: If Gertrudis had only known! The poor thing *climbed up and down* ten times, carrying buckets of water.

B: Si Gertrudis hubiera sabido! La pobre *subió y bajó (ascended and descended)* como diez veces cargando las cubetas. (Esquivel 1989/1995)

As this example illustrates, English and Spanish speakers talk differently about the same motion events. English typically describes motion events using a verb that encodes the manner of motion (e.g., *climb*) with directional information encoded in a prepositional phrase or satellite (e.g., *up and down*). In contrast, Spanish typically encodes the path (or direction) in the verb (e.g., *ascended and descended*), infrequently attaching prepositional phrases. Not surprisingly, English-learning children grow up to talk—and write—like A above, whereas Spanish-learning children grow up to talk—and write—like B above. Given that this book focuses on word learning, our focus, too, will be on how children learn these language-specific lexical-semantic patterns of motion-verb knowledge and use. However, because our argument will be that this acquisition of verb meaning is strongly tied to the syntactic system of each language, we will also discuss the language-specific syntax of motion events and its development in children.

In particular, we first provide evidence from adults that the difference between English and Spanish modes of talking about motion events is both syntactic and lexical-semantic in nature. Our subsequent review of the developmental pattern concerning when

children acquire these differences highlights three relevant findings. First, the syntactic distinction is learned prior to the lexical-semantic one. Second, the first language-specific differences in motion-verb use are a result of the language-specific differences in syntax. And third, these early differences in motion-verb use by English and Spanish speakers do not yet indicate an appreciation of the deeper lexical-semantic distinctions. In other words, differences in motion-verb use in children do not yet imply different lexical-semantic generalizations about motion-verb meanings. Appreciation of these latter generalizations emerges between 4 and 7 years of age.

18.1 What Do Children Have to Learn?

The crosslinguistic difference illustrated in the example above has intrigued linguists and psychologists alike for more than 20 years, and it has figured prominently in major theories of linguistics, language acquisition, and linguistic relativity. Talmy (1975, 1985, 1991) made it the conceptual prototype of his theory of the relation between linguistic form and linguistic meaning. Gentner (1982; Gentner and Boroditsky 2001) cited it as a partial explanation for the ubiquitous finding that, in language after language, nouns are apparently learned before verbs. And Slobin's (1996) findings concerning the ways speakers of different languages narrate motion events led to his proposal of "thinking for speaking"—that is, the idea that speakers of different languages think differently as they cast their thoughts into speech. Our research questions draw on all of this previous work, but target specifically the questions of when and how the crosslinguistic difference in motion-verb use and comprehension is acquired. But first, we must capture what this difference—which has captivated so many areas of psycholinguistics—*is*.

Motion events are typically conceptualized as a figure moving in relation to some ground (Talmy 1975, 1985; Marr and Vaina 1982). The linguistic expression or description of a motion event can include any or all of the following components: figure (the object in motion); ground (the source, goal, or location of the motion); path (the course followed by the figure); manner (the way the figure moves); and cause (whether the motion is agentive or not). To illus-

trate, the sentence "The girl rolled the ball across the floor" contains all of these elements: the cause is *girl*, the manner is *rolled*, the figure is *ball*, *across* corresponds to path, and *floor* is the ground. For brevity's sake and because the different event types may correspond to specific learning patterns, we confine ourselves to discussion of internally rather than externally caused motion events—that is, those where the figure is moving more or less under its own power or volition.

These components are manifested in descriptions of motion events in several patterns across languages. We will focus on two of these, in which either the manner or the path component is conflated with, or woven into the meaning of, the main (motion) verb. Both patterns exist in some form in both English and Spanish. Manner-conflating motion verbs include *run/correr*, *walk/andar*, *jump/brincar*, *fly/volar*, and *crawl/gatear*; path-conflating motion verbs include *come/venir*, *go/ir*, *fall/caerse*, *enter/entrar*, and *descend/bajarse*. The patterns become differentiated because the choice of verb has syntactic consequences for the rest of the utterance (Talmy 1985, 1991). If the verb is manner-conflating, the path component is typically encoded in a content-rich preposition or *satellite*, and the ground component surfaces as the object of that preposition or satellite.

(1) She's walking through the forest.

(2) Está caminando por el bosque.

In contrast, if the verb is path-conflating, the ground component surfaces as the direct object (or object of a content-poor or "dummy" preposition; Tremblay 1996), and the manner component can be omitted entirely.

(3) She's entering the house (running).

(4) Está entrando a la casa (corriendo).

Thus, manner-conflating verbs are typically intransitive, whereas path-conflating verbs are typically transitive. There are two exceptions to this generalization. First, the most common path-conflating verbs, which describe general rather than specific directions, appear to follow manner-verb syntax.[1]

(5) She went through the forest.

(6) Pasó por el bosque.

Second, both manner and path verbs can appear without any ground information at all:

(7) What's she doing?
She's walking.
She's leaving.

(8) ¿Qué está pasando?
Está caminando.
Está saliendo.

(9) Let's go.

(10) Vámanos.

There have been several characterizations of how English and Spanish differ in their expression of motion events. Levin and Rappaport Hovav (1995) proposed a syntactically oriented analysis in which path verbs in the two languages are treated similarly but manner verbs are treated differently. In brief, path verbs in the two languages describe "inherently directed motion" (p. 56) and can appear with directional and ground-specifying phrases (e.g., (3) to (6) above). English manner verbs do not include directed motion as part of their core semantics but can acquire this additional meaning by rule, so that they can appear with a wide variety of directional phrases:

(11a) The children ran.

(11b) The children ran into the room.

The issue with Spanish is that it lacks the requisite rule, so that Spanish manner verbs cannot always appear with the same directional phrases:

(12a) Las niñas corrieron.

(12b) *Las niñas corrieron hacia adentro del cuarto.

Jackendoff's (1990) analysis is similar, albeit more semantically construed. He characterized path verbs as incorporating the major event GO, and manner verbs as incorporating the major event MOVE. Manner verbs become directional via a correspondence rule that incorporates a GO function into the verb; thus, when GO becomes incorporated into a manner verb such as *run*, the verb can appear with directional PPs. This correspondence rule is present in languages like English and absent in languages like Spanish.

These characterizations seem at once too narrow and too broad. They are too broad because the restrictions on Spanish manner verbs seem more subtle than simply being prohibited from appearing with directional phrases. In fact, as shown in (2), they can appear with some directional phrases; however, they certainly cannot appear as freely with them as can English manner verbs (e.g., (12b)). Aske (1989) and Slobin and Hoiting (1994) have suggested that Spanish manner verbs are only prohibited from descriptions of *telic* events (i.e., events with a definite source or end point) and/or events that include a boundary crossing (e.g., entering, exiting, crossing). Thus, (2) is permitted because the event is atelic; a direction is specified (*through*), but the ground is not the end point of the walking and no boundaries are crossed. In contrast, (12b) is not permitted because the event is telic; the end point of the running is the room, and a boundary is crossed between the outside and the inside of the room (see also Naigles et al. 1998).

Levin and Rappaport Hovav's and Jackendoff's characterizations are also too narrow because they seem to omit a larger point that Talmy (1985, 1991) and others (Gentner 1982; Slobin 1996; Berman and Slobin 1994; Naigles et al. 1998) make quite strongly—that whereas both patterns (with some restrictions) are *possible* in both languages, the manner-conflating verb pattern is more *typical* of English and the path-conflating pattern is more *typical* of Spanish. English manner verbs tend to be much more frequent than most English path verbs (Francis and Kucera 1982), whereas the opposite tends to be true of Spanish (Juilland and Chang-Rodriguez 1964). Talmy (1991) captured this as a contrast between *verb-framed* languages (e.g., Spanish) and *satellite-framed* languages (e.g., English): the frame for motion events is the path, and Spanish encodes the

path in the verb whereas English encodes the path in the satellite. The importance of the satellite as a frame for English but not Spanish is shown in another syntactic contrast between the two languages. Even in the case of atelic events, there is a manner-verb construction that is permitted in English but not in Spanish:

(13) She's walking through.

(14) *Está caminando por.

That is, when the ground itself is not mentioned, English manner verbs still permit the expression of a path in the satellite or string of satellites (e.g., *She flew* back up out *of the hole*) whereas Spanish manner verbs do not. The content-rich prepositions in Spanish do not function as satellites.

In sum, the relevant contrasts for the linguistic expression of motion events are both intralanguage and interlanguage and both lexical-semantic and syntactic, as summarized in table 18.1. We will not be able to address every nuance in this chapter, but will focus on the major lexical difference, that English typically encodes manner in the verb whereas Spanish typically encodes path, and the major syntactic difference, that English allows for an elaborate system of

Table 18.1
A partial list of permitted syntactic frames by language and verb type

	Language			
	English		Spanish	
Frame	Manner	Path	Manner	Path
Intransitive				
No ground NP				
Bare V	Always	Always	Always	Always
V satellite	Always	Sometimes	Never	Never
Ground NP in PP				
V + content-rich preposition	Always	Sometimes	Sometimes	Never
V + content-poor preposition	Always	Sometimes	Sometimes	Sometimes
Transitive				
Ground NP as direct object	Rarely	Sometimes	Rarely	Sometimes

postverbal satellites and prepositional phrases (PPs) whereas Spanish PPs within the predicate are much more restricted. Before we can address children's acquisition of these motion-verb patterns, though, we must consider an issue with the adult representations. In particular, we need to know whether these two differences are distinct, or whether they are two sides of the same coin. That is, are the syntactic differences between English and Spanish descriptions of motion events an inevitable consequence of the languages' different selection of verbs, or would they appear regardless of verb type? Specifically, if a manner verb is used, the path component must be expressed in other parts of the predicate, whereas if a path verb is used, little else about the motion event need necessarily be expressed. Put another way, are the verb-lexicalization differences between English and Spanish simply a by-product of the different syntactic patterns of the two languages, or do they exist as generalizations over and above the syntactic differences? Specifically, the expression of the path component in satellites and/or PPs leaves the verb "free" to encode manner without necessarily forcing the generalization that English motion verbs typically *do* encode manner. Thus, our first discussions of the empirical literature will be summaries of findings from adult elicited-production and novel-verb interpretation studies that indicate that both the lexical-semantic and the syntactic distinctions are present in adults' linguistic knowledge.

18.2 Adult Knowledge of the Linguistic Expression of Motion Events

How do English- and Spanish-speaking adults talk about motion events? Do they differ in the types of verbs they use? Do they differ in the types of sentence structures they use? Furthermore, what can we tell about the language-specific generalizations they have made about motion verbs? In this section, we summarize the findings of Slobin and his colleagues (Berman and Slobin 1994; Sebastian and Slobin 1994; Slobin 1996) as well as those from our lab (Naigles et al. 1998; Naigles and Terrazas 1998) that address these questions.

Slobin and his colleagues asked adults (and children, as described later) to narrate a story based on a children's wordless picture book,

Frog, Where Are You? (Mayer 1969). Native speakers of English and Spanish (as well as German, Hebrew, and Turkish speakers, whose data will not be discussed) retold the story of a boy's search, including much travel through forest, meadow, and swamp, for his lost frog. Overall, the English speakers produced almost three times as many manner-conflating verb types as path-conflating verb types, whereas the Spanish speakers produced almost three times as many path verb types as manner verb types. Clearly, speakers of these different languages have different preferences in terms of motion-verb selection. Moreover, Slobin and colleagues found that English speakers used the verbs with satellites (e.g., *The dog jumps down*) and with satellites and PPs (*The owl flew out of here*), whereas Spanish speakers tended to produce their motion verbs with little or no additional information in the same clause (e.g., *Salió/He left*). To illustrate, they report that for episodes of downward motion (such as going over a cliff into some water), fully 36 percent of the descriptions in Spanish were composed of such "bare" verbs, whereas only 15 percent of the English descriptions were. Across all episodes, 82 percent of English descriptions included source or goal-of-motion specification in PPs around the verb, whereas only 60 percent of Spanish descriptions did.[2] In sum, these elicited narratives supported the earlier linguistic analyses that clear differences can be seen in both the verb types that English and Spanish speakers used, and in the types of sentences they produced.

Naigles et al. (1998, Study 2) replicated and extended these crosslinguistic differences with a task involving a different discourse context, namely, video description. We asked monolingual English-speaking high school graduates in Texas and monolingual Spanish-speaking high school graduates in Guatemala to describe in writing short videos (6 seconds long) of motion events. Overall, the English speakers produced more manner-conflating main-verb tokens (87%) than path-conflating main-verb tokens (6.4%), and the Spanish speakers produced more path-conflating main-verb tokens (65%) than manner-conflating main-verb tokens (32%). Moreover, considering only those events depicting horizontal motion (such as crossing a bridge),[3] 91 percent of the English descriptions included a PP describing the source, goal, and/or location of motion, whereas only

56 percent of the Spanish descriptions included such a PP. Another 6 percent of the Spanish descriptions included only an NP source or goal, as compared with 1.7 percent of the English descriptions. And fully 38 percent of the Spanish descriptions included no locative information at all (meaning they used a subject and a verb but no further information about the source, goal, or ground), compared with only 4 percent of the English descriptions. Finally, the Spanish speakers used a total of nine prepositions (*en*, *a*, *hasta*, *de*, *por*, *hacia*, *para*, *entre, sobre*), of which *a/to* and *de/from* were the most common and accounted for 45 percent of all preposition use. In contrast, the English speakers used a total of seventeen prepositions and satellites (*to*, *through*, *into*, *up*, *(away) from*, *across*, *onto*, *in*, *down*, *out of*, *over*, *around*, *back*, *left*, *toward(s)*); *to* and *(away) from* accounted for only 1.7 percent of all preposition/satellite use. Interestingly, none of the English descriptions included a satellite without an accompanying ground NP.

The findings of these two elicited-production studies are consistent with our claim that both lexical-semantic and syntactic distinctions are involved in the difference between English and Spanish expressions of motion events. That is, both the verb meanings and the sentence frames are different in corpora of English and Spanish descriptions of motion events. If these same types of utterances are produced in speech to children, as is likely, the children's input differs on both dimensions: English learners hear mostly manner verbs with directional PPs, whereas Spanish learners hear more path verbs with fewer instances of directional PPs. However, it is still possible that the two distinctions are partially if not totally interdependent. For example, perhaps English speakers use more directional PPs because they use so many manner verbs, and perhaps Spanish speakers use fewer directional PPs because of their heavy reliance on path verbs. Naigles and Terrazas (1998) attempted to disentangle the lexical-semantic and syntactic distinctions by asking English and Spanish speakers to interpret novel (i.e., nonsense) motion verbs in different sentence frames. The questions were twofold: Would speakers be sensitive to the semantic implications of the sentence frames in interpreting the novel verbs? Would speakers differ by language in their preferred interpretations of the novel verbs?

Table 18.2
Videotape layout from Naigles and Terrazas 1998

Trial	Video 1	Audio	Video 2
1	Woman skips toward tree	E: *Look, she's kradding the tree.* S: *¡Mira, ella está mecando al árbol!*	Blank
2	Blank	E: *See, she's kradding the tree!* S: *¡Ves, ella está mecando al árbol!*	Woman skips toward tree
3	Woman skips toward tree	E: *Hey, she's kradding the tree!* S: *¡Oye, ella está mecando al árbol!*	Woman skips toward tree
4	Woman marches toward tree	E: *Look, they're different now!* S: *¡Mira, ahora están diferentes!*	Woman skips away from tree
5	Woman marches toward tree	E: *Where's she kradding?* S: *¿Dónde está mecando ella?*	Woman skips away from tree
6	Woman marches toward tree	E: *Where she's kradding?* S: *¿Dónde está mecando ella?*	Woman skips away from tree

Note: E: English audio; S: Spanish audio

The participants included monolingual college-educated English speakers and college-educated native Spanish speakers whose exposure to English began at or after puberty.[4] The stimuli were triads of videos of motion events, displayed on side-by-side monitors. As shown in table 18.2, the first three presentations of the video events introduced the novel verb, which was presented in either path-verb syntax (e.g., "She's kradding the tree"/"Está mecando al árbol") or manner-verb syntax (e.g., "She's kradding toward the tree"/"Está mecando hacia el árbol"). Recall that in English and Spanish, the path frame is typically a transitive frame with the ground as the direct object or (Spanish only) an intransitive frame with a content-poor preposition (see table 18.1). The manner frame in both languages is intransitive with a content-rich preposition; because the preposition encodes the path, the verb is free to encode the manner.[5] The fourth presentation changed the video events, so that one monitor presented the old manner of motion with a new path (the manner match) and the other monitor presented the old path of motion with a new manner (the path match). The fifth and sixth presentations showed the same videos, and asked the participants to designate, by

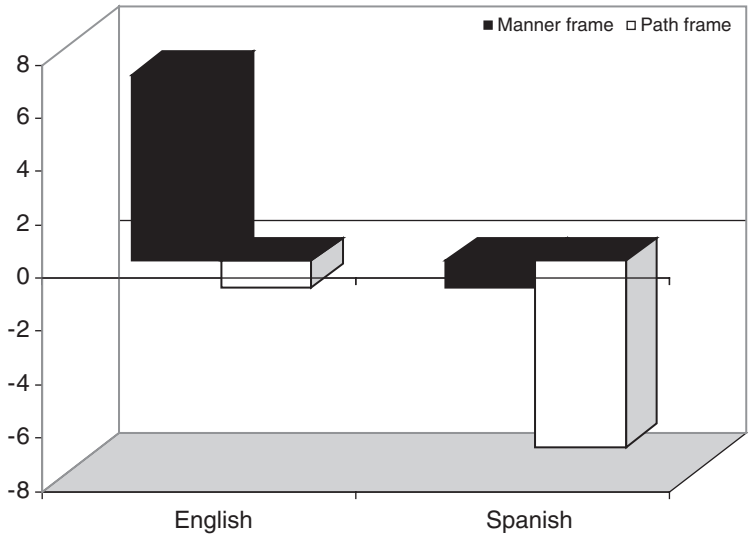

Figure 18.1
Mean manner preference (number of points to the manner screen minus number of points to the path screen) for each language group and frame condition. Adapted from Naigles and Terrazas 1998.

pointing, which of the new video events depicted the novel verb, presented in the most minimal of frames ("Where's she kradding?"/ "¿Dónde está mecando?").

There were three main findings. First, both English and Spanish speakers chose the manner match more frequently when the verb was presented in manner-verb syntax and the path match more frequently when the verb was presented in path-verb syntax. Thus, members of both language groups were sensitive to the semantic implications of the different frames and altered their interpretations accordingly. Second, across frames, the English speakers chose the manner match more frequently and the Spanish speakers chose the path match more frequently. Thus, the two groups had different overall preferences for their interpretations of the novel verb; each followed the motion-verb lexicalization pattern of their native language. Third, there was a significant interaction of language group and syntax, as shown in figure 18.1. Specifically, the speakers chose

consistently when their language-specific patterns coincided with the implications of the syntax (i.e., English speakers chose the manner match in the manner-verb syntax condition and Spanish speakers chose the path match in the path-verb syntax condition) and inconsistently when the lexicalization patterns and the syntax were in conflict (i.e., English speakers in the path-verb syntax condition and Spanish speakers in the manner-verb syntax condition). These findings confirm that adult English and Spanish speakers have gone beyond the use of individual lexical items to make *generalizations* about the types of meaning that motion verbs in their respective languages encode and about the types of frames they can appear in. Moreover, the generalizations are both lexical-semantic and syntactic in nature.

In sum, research with adults implicates both a syntactic and a lexical-semantic dimension to the crosslinguistic difference between English and Spanish expressions of motion events. Specifically, the syntactic dimension involves the ubiquitous presence of path PPs and satellites in English as compared with the primarily unelaborated verb phrase in Spanish. The lexical dimension involves the strong tendency for verbs to encode the path of motion in Spanish but the manner of motion in English.

18.3 Child Acquisition of the Linguistic Expression of Motion Events

Our main questions are twofold: First, how do children acquire their lexical-semantic generalizations, that English motion verbs encode manner and Spanish motion verbs encode path? Second, what is the direction of dependence between this lexical generalization and the syntactic one? In this regard, two possibilities suggest themselves. Either the lexical-semantic distinction emerges early and perhaps facilitates the syntactic distinction, or the syntactic distinction might precede and perhaps facilitate the lexical-semantic distinction. Thus, the dependence in acquisition of the lexical-semantic and syntactic dimensions can have consequences for theories concerning the interaction of grammar and lexicon in acquisition. Below, we review the theoretical background for both possibilities. We then present three sets of studies, two involving language production and one

involving novel-verb learning—studies that begin to distinguish the two possibilities just mentioned.

18.3.1 Two Views of the Interdependence of Lexicon and Grammar in Acquisition

In this section we briefly review two theoretical perspectives on how lexicon and syntax are acquired. One suggests that it is the lexicon that stimulates grammatical acquisition. The other supports the opposite view: that an understanding of syntax can drive lexical acquisitions.

Lexicon First

Current "emergentist" and "lexicalist" accounts of language acquisition (MacWhinney 1999; Bates and Goodman 1999; Tomasello 2000) have theorized that grammatical knowledge emerges from lexical knowledge. That is, children have been hypothesized to require a certain threshold number of words in their vocabularies in order to formulate grammatical categories and rules (see also Marchman and Bates 1994) and a certain threshold of verbs heard in combination with nouns in order to begin to construct sentence frames (Tomasello 1992; Goldberg 1999). Following this account, we might predict that the lexical distinction under consideration would be acquired before the grammatical one. For example, English learners would acquire many manner-conflating verbs whereas Spanish learners would acquire many path-conflating verbs, but the syntax with which these verbs were used would initially be similar across languages. These theories would predict, as well, that English and Spanish learners would show their language-specific lexical-semantic biases in a novel-verb learning task developmentally before they demonstrated an appreciation of the different distinctions conveyed by the syntactic frames. Finally, emergentist theorists might also predict that the syntactic distinctions would later be acquired via these lexical distinctions. Perhaps English learners would begin to use the path PPs so they could describe motion events more fully, whereas Spanish learners might observe that their motion verbs already adequately describe the core schema of motion events (Talmy 1991), and so

receive little impetus to incorporate locative PPs into Spanish motion-verb syntax.

Syntax First

In contrast, current grammatically oriented accounts of verb acquisition per se have proposed that children take advantage of the syntactic frames in which verbs are heard in order to narrow down or constrain the meanings of those verbs (so-called *syntactic bootstrapping*: Gleitman 1990; Landau and Gleitman 1985; Naigles 1990, 1998; Naigles and Hoff-Ginsberg 1995, 1998). Because verb syntax reflects aspects of verb meaning (i.e., causative verbs usually appear in transitive frames, motion verbs with PPs, mental-state verbs with sentence complements), the syntactic frame that co-occurs with unknown verbs can focus children's attention on specific aspects of meaning in the surrounding context (Kako 1998; Fisher et al. 1994; Naigles 1990, 1996). For example, children as young as 25 months of age have been shown to use sentence frames to distinguish novel causative verbs from novel noncausative ones (Naigles 1990; Naigles and Kako 1993). In this account, we might predict that the grammatical distinction under consideration would be acquired before the lexical one: English learners would use the V PP frame to describe motion events whereas Spanish learners would use the "bare" V frame, but the verbs used in these frames would initially be semantically similar across languages. Syntactic bootstrapping theorists might also predict that the lexical distinctions would later be acquired via these syntactic distinctions. Because the V PP frame already encodes the path of motion, English verbs acquired via this frame would typically be manner-of-motion verbs; after learning disproportionately many of these, English learners might then come to make the generalization that their motion verbs typically encode manner. In contrast, following Talmy's (1975) suggestion that the path information is most crucial to the communicative content, the "bare" V frame would facilitate the acquisition of path-of-motion verbs because the frame does not allow for path to be incorporated elsewhere. Spanish learners would thus be able to acquire disproportionately many path verbs, and the generalization that Spanish motion verbs encode path would prevail.

In sum, the theoretical debate between those who claim that grammar develops out of the lexicon and those who claim that grammar develops at least somewhat independently of the lexicon can be recast in miniature in the microcosm of children's motion-verb acquisition. We now turn to a consideration of the data on children's developing use and understanding of motion verbs in English and Spanish.

18.3.2 Elicited Production of Motion Verbs in Narratives

Sebastian and Slobin (1994; see also Berman and Slobin 1994; Slobin and Bocaz 1988; Slobin 1996) also asked English- and Spanish-learning children to narrate the frog story described earlier. The participants were 3, 4, 5, and 9 years of age. Their acquisition of the lexical distinction cannot be addressed directly, because Slobin and his colleagues did not report the number of manner-verb and path-verb types in the children's narratives. However, their analyses of the children's syntax suggest that, by the age of 3, English and Spanish learners talk differently about motion events. For example, when narrating the episodes concerning downward motion, Spanish-speaking preschoolers produced motion verbs "bare" of locative detail 56 percent of the time, whereas English-speaking preschoolers did so only 15 percent of the time.

Interestingly, the youngest English learners used the V + Satellite construction the most frequently, and then added the V + PP and V + Satellite + PP constructions at later ages. Moreover, the early satellites were mainly used with general path-of-motion verbs (i.e., *come*, *go*, and *fall*), and only later extended to use with specific manner verbs. With the Spanish learners, Sebastian and Slobin (1994) noticed an *increase* in the use of directional phrases from age 3 to ages 4 and 5 and then a decrease at age 9. The increase was due to the use of directional adverbs, such as *arriba/above* and *abajo/below*, with path verbs (e.g., *sube por arriba por el tronco/he ascends upward along the trunk*; p. 264). The presence of the path verb in Spanish renders the adverb redundant; Sebastian and Slobin suggested that these children had learned their language's prohibition of directional prepositions, but were still trying to find a way to include path

information elsewhere in the predicate. Even with these adverbs, though, the Spanish learners still included less directional information than did the English learners. In summary, children aged 3 and older already use language-specific syntax in their talk about motion events. The next analyses, using spontaneous speech databases, investigate whether this language specificity exists earlier in combinatorial speech and whether it is accompanied by differences in motion-verb types.[6]

18.3.3 Spontaneous Production of Motion Verbs

How do children talk about motion events, before the age of 3? Do they seem to talk differently almost from the onset of combinatorial speech? Choi and Bowerman (1991) uncovered some very early language specificity in English- and Korean-learners' talk about motion events. Specifically, in their study, 1-year-old English learners used the same terms (the same path satellites) in reference to both caused and spontaneous motion, as is typical in English, whereas 1-year-old Korean learners used different terms (different verbs) in reference to caused-versus-spontaneous motion, as is typical in Korean. Choi and Bowerman did not report how these terms were used in combinatorial speech, however, nor did they include data from Spanish learners. In other words, there was no information about the syntactic structure of the Korean- and English-speaking children's utterances once they were forming protosentences.

We present here some analyses of 2-year-olds' spontaneous speech, drawn from a variety of English and Spanish databases. Transcripts from three Spanish learners were examined. Data from Nancy and Marisa come from Eisenberg's (1982) corpus of transcriptions. Nancy and Marisa were living in Northern California with family members who were all recent immigrants from Mexico. Spanish was spoken exclusively in their homes, so at age 2–3 years they were monolingual learners of Spanish. Our analyses come from Nancy's database at 2;1 and 2;4–2;5 and Marisa's database at 2;11 and 3;0, the points at which motion verbs first appeared in their utterances. Data on Emilio come from the Vila corpus. Emilio was a monolingual Spanish learner raised in Spain; his transcripts at 2;4 and 2;8 were

downloaded from the CHILDES database (MacWhinney 2000). Transcripts from two English learners were also examined. Adam and Sarah are from the Brown 1973 corpus, also downloaded from the CHILDES database. Their transcripts were examined at 2;3 and 2;8. Adam and Nancy were the most prolific producers of motion verbs; hence, their data contributed most heavily to the analyses that follow.

In each transcript, we extracted the utterances that included internally caused verbs of motion (to be consistent across adult and child analyses) produced by the child, categorized each main verb as manner-conflating or path-conflating (see Naigles et al. 1998 for more information about our criteria), and parsed each utterance according to the grammatical categories included (e.g., NP, V, PP, Satellite, Adverb). Moreover, we noted whether each PP encoded directional (e.g., *through the hole*) or nondirectional information (e.g., *with Mommy*), and which NPs in the predicate encoded locative (e.g., *go someplace*) information. Table 18.3 presents the number of utterances that included motion verbs that were produced by each child at each age.

Table 18.3
Percent of utterances including locative/directional information (number of total motion-verb utterances)

	Age			
Child	2;1	2;3–2;5	2;8	2;11–3;0
Spanish				
Nancy	35%	31%		
N	153	100		
Marisa				18%
N				102
Emilio		6%	29%	
		16	14	
English				
Adam		34%	73%	
N		90	56	
Sarah		16%	55%	
N		6	11	

At 25 months, Nancy was our youngest and most prolific motion-verb user. She produced both specific path-conflating verbs (*salir/exit*) and manner-conflating verbs (*correr/run*, *bailar/dance*). However, by far her most frequent motion verbs were the general path-conflating ones *ir/go* and *venir/come*, comprising more than two-thirds of her motion-verb utterances. Approximately 35 percent of these utterances included some kind of directional or locative information, mostly in the form of PPs (*va al circo/(he) goes to the circus*) and locative adverbs (*vamos afuera/let's go outside*). She used motion verbs in single-word utterances (i.e., "bare") 59 percent of the time. At 2;4–2;5, she had added both manner verbs (e.g., *brincar/jump*) and path verbs (e.g., *llegar/arrive*); however, she still used *ir* and *venir* most frequently. She added locative and directional information only 31 percent of the time; fully 61 percent of her motion verbs were used "bare." Nancy's motion-verb utterances before 2;6 sound remarkably Spanishlike already, especially in their brevity with respect to locative and directional information. However, she was still very young, and it is possible that her brevity was due to overall grammatical/production limitations, rather than more specific knowledge about how to use motion verbs. Hence, we next turn to Adam.

Adam at 2;3 sounded very similar to Nancy at the same age. He produced both manner-conflating (*hop*, *walk*, *jump*) and path-conflating (*come*, *go*, *fall*) verbs; however, all of his path-conflating verbs encoded fairly general rather than specific directions. *Come* and *go* were also Adam's most frequently used motion verbs. Approximately 34 percent of Adam's motion-verb utterances included some kind of directional or locative information, mostly in the form of PPs (*go to the store*) and satellites (*go back*, *fall over*, *move away*). Only 33 percent of his motion verbs were used "bare," though; this included all of his utterances with manner verbs. Thus, at 2;3, Adam followed the Spanish pattern more than he did the English pattern. At 2;8, Adam had added only three new motion verbs (*jump*, *ride*, *cross*). However, his utterances containing motion verbs had expanded considerably; now, fully 73 percent included some kind of directional or locative information. Satellites provided the directional information for 63 percent of these utterances; the rest included PPs

and NPs. Only 16 percent of his motion verbs were produced "bare." Thus, at 2;8, Adam already sounded like an English speaker.

We do not have transcripts for Nancy past 2;5; however, our analyses of the transcripts of Marisa and Emilio suggest that Spanish learners do not elaborate on their motion-verb utterances as they gain grammatical knowledge and produce (in general) longer utterances. Emilio at 2;4 used *ir* and *venir* most frequently, but also produced instances of *volver/turn* and *pasear/stroll*. Only one of his utterances included any directional information (*ven aquí/come here*); 75 percent were produced "bare." At 2;8, Emilio had added one more motion verb (*levantarse/rise*), and produced "bare" verbs only 43 percent of the time; however, he still included locative or directional information less than 30 percent of the time. Marisa's motion verbs included *caerse/fall*, *correr/run*, *brincar/jump*, *volver/turn*, and *apurarse/hurry*; however, she, like Nancy and Emilio, used *ir* and *venir* most frequently. Only 18 percent of her motion-verb utterances included directional or locative information; the majority of these were PPs (*Vamos a la banca/Let's go to the bench*). Fully 73 percent of her motion verbs were produced "bare."

The possibility exists that the brevity of motion-verb use in the Spanish learners can be attributed to the scarcity of these verbs in the transcripts we examined. Perhaps the context was inappropriate for much motion-verb use, especially in an elaborated fashion. We wondered, therefore, whether the English pattern of development that we had observed with Adam could be seen with a much smaller sample of motion verbs. Sarah provided us with the opportunity to test this, because her overall frequency of motion-verb use was closer to Emilio's than to Adam's (see table 18.3). At 2;3, Sarah produced only *go*, and only one of her utterances included any directional information (*go here*). At 2;8, her motion-verb use had expanded to include *dance*, *hop*, *come*, *run*, *fall*, and *sit*, and more than half of her motion-oriented utterances ($n = 6$) included locative or directional information. For four of these, the directional information took the form of a satellite or preposition (*fall up*, *sit back*, *come from*). In sum, Sarah's few motion-verb utterances were still sufficient to reveal the same developmental pattern as seen with Adam. Near the beginning of the third year, English learners use motion verbs with little locative

elaboration; thus, these children sound more similar to the Spanish pattern than to the English one. In contrast, by the end of the third year, English learners sound like English speakers, adding directional or locative information to their motion verbs upwards of 60 to 70 percent of the time (see Slobin 1996; Naigles et al. 1998). Throughout the period we have sampled, and indeed into the later periods of development (Sebastian and Slobin 1994), Spanish learners sound like Spanish speakers, using motion verbs with brevity with regard to path-related information.[7]

The data from spontaneous speech suggests that the syntactic distinction between English and Spanish expressions of motion events emerges during the latter part of the third year. The data are less clear, though, about when the lexical distinction emerges. As mentioned above, both manner-conflating and path-conflating verbs were produced by children from both language groups (*go*, *come*, *sit*, *fall*, *stand*, *run*, *climb*, *lie*, *jump*, *dance*, *fly*). Moreover, individual children typically produced both types of verbs as well. A hint of emerging language specificity can be seen, though, in the set of verbs observed only in one of the two languages. Four of the six verbs used only by English speakers (*march*, *move*, *hop*, *walk*, *ride*, *cross*) were manner-conflating, whereas four of the six verbs that were only used by Spanish learners (*llegar/arrive*, *volver/turn*, *pasear/stroll*, *salir/exit*, *pasar/pass*, *bajarse/descend*) were path-conflating. In other words, these young English and Spanish learners may be showing the beginnings of their language-specific propensity to use manner (English) or path (Spanish) verbs.

18.3.4 The Role of Syntax in Children's Motion-Verb Acquisition

One question remains, though, concerning the developmental facts. Have the children yet made the *generalization* that motion verbs in English tend to encode manner whereas motion verbs in Spanish tend to encode path (see Naigles and Terrazas 1998)? If they have, then 3-year-old Spanish and English learners should attribute different meanings to novel motion verbs, as predicted by the lexicalist theories. However, it is also possible that the children's nascent crosslinguistic lexical-semantic differences are, at this point, simply a

result of their demonstrated syntactic differences. That is, they may be producing different verb types because they are producing different sentence types; the verbs may be being learned via the syntax. If this were the case, then 3-year-olds' understanding of novel verbs would be primarily dependent on the frames these verbs appear in. That is, intransitive frames with content-rich prepositions imply manner verbs but transitive frames, or intransitive ones with content-poor prepositions, imply path verbs. Because so many of the children's verb uses included *go* and *come*, which are general path verbs that behave syntactically like manner verbs (see table 18.1), data from early spontaneous speech are indeterminate. Thus, we address this question in the novel-verb learning study that follows.

18.3.5 The Roles of Language and Syntax in Children's Novel Motion-Verb Learning

Recall that Naigles and Terrazas (1998) demonstrated that English- and Spanish-speaking adults were alike in understanding the relations between motion-verb syntax and meaning because members of both language groups interpreted novel verbs of motion differently depending on the frames they appeared in. Verbs that appeared in "manner frames," which included prepositional phrases with content-rich prepositions, were interpreted as encoding *manners* of motion, whereas verbs that appeared in "path frames," which were either transitive, or intransitive with content-poor prepositions, were interpreted as encoding *paths* of motion. However, the adults also differed by language group in that the English speakers were more likely to interpret the verbs as referring to manners of motion, and the Spanish speakers were more likely to interpret them as referring to paths of motion, over and above the effects of syntactic frame. Thus, the adult speakers had made a syntactic generalization that held across both languages and a lexical one that distinguished between language groups. Our question in the current study was, when do children make these generalizations?

This study was part of a larger research investigation into the relation between English and Spanish speakers' understanding of motion verbs and their nonlinguistic categorization of motion events

(see Hohenstein 2001; Hohenstein and Naigles 1999, 2000). The participants in the study included children aged 3.5 years and 7 years, who were either monolingual speakers of English or of Spanish. The English speakers lived in Los Angeles, and the Spanish speakers lived in Mexico City. All came from middle-class families and all groups tested above average (and did not differ within ages) on both verbal and nonverbal standardized tests.

The materials in this study were almost identical to those in Naigles and Terrazas 1998; see table 18.2. Each child was presented with motion events that incorporated both a manner and a path. The events were paired with novel verbs that were presented either in manner frames (e.g., "She's kradding toward the tree") or path frames ("She's kradding the tree"). After three training trials, the events were changed so that one screen presented the same manner following a different path while the other screen presented the same path with a different manner. During these test trials, the children were asked to choose the screen that depicted the novel verb. Video sets were presented either entirely in the manner frame or entirely in the path frame. The children participating in this study viewed both sets of videos, counterbalanced for order; however, only the data from the first presentations are reported here (see Hohenstein 2001 for the within-subjects analyses).

The children viewed the stimuli in the setup of the intermodal preferential-looking paradigm (Hirsh-Pasek and Golinkoff 1996; Naigles 1998). They watched two television monitors placed side by side with a speaker in the center emitting the audio stimulus. Also in the center was a red rope light that served as a centering device. Additionally, a video camcorder placed between the monitors recorded the children's eye movements while they were watching the video stimuli. The children sat approximately 3 feet away from the video apparatus. Older children sat by themselves with their parent in the room, facing away from the videos. Younger children sat on their parent's lap while the parent was blindfolded. Children viewed the first video series and were asked to point to the monitor that showed the person engaged in the activity depicted by the novel verb. After a short break, they then watched the second video series (with the other sentence-frame audio) and were asked to perform the same task.

Table 18.4
Screen preferences in seconds (mean (SD)) by frame condition across ages*

	Frame condition	
Group	Manner	Path
Spanish	0.43 (0.90)	−0.86 (1.78)
English	0.17 (0.95)	−0.82 (1.54)

*Positive scores indicate preferences for the manner match; negative scores indicate preferences for the path match.

Table 18.5
Screen preferences in seconds (mean (SD)) by language, age, and frame*

Language	Age	
Frame	Younger	Older
Spanish		
Manner	0.72 (0.40)	−0.17 (1.05)
Path	−0.72 (1.11)	−0.98 (2.59)
English		
Manner	0.47 (0.93)	0.38 (1.04)
Path	−0.31 (0.90)	−1.59 (0.79)

*Positive scores indicate preferences for the manner match; negative scores indicate preferences for the path match.

The eye movements of all of the children were initially coded from the videotapes by the first author (JMH). Approximately two-thirds of the children were coded for reliability purposes by raters unfamiliar with the study; there was an average of 86 percent agreement between JMH and the other coders.

The results are displayed in tables 18.4 and 18.5, and in figure 18.2. The data are presented as difference scores between the children's visual fixation on the manner-match screen during the test trials, and their fixation on the path-match screen. Thus, positive numbers indicate a preference for the manner-match screen and negative numbers indicate a preference for the path match. As table 18.4 shows, across languages and ages, children robustly preferred the manner match in the manner-frame condition and the path

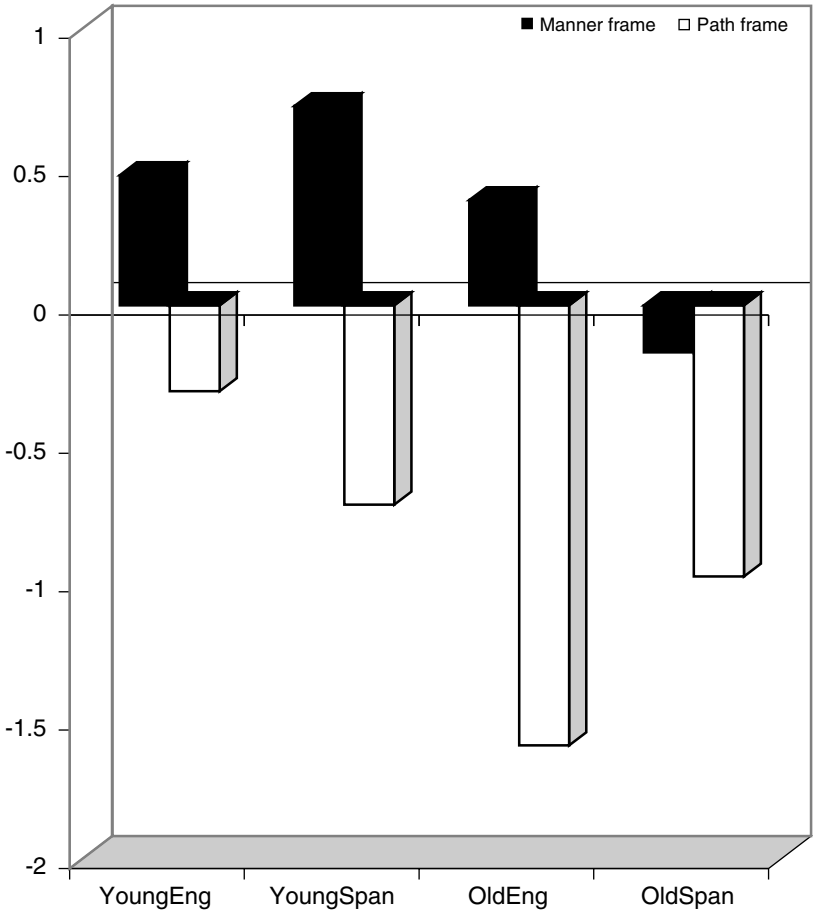

Figure 18.2
Mean manner preference (fixation on the manner screen minus fixation on the path screen) for each language and age group, by frame condition. Adapted from Hohenstein 2001.

match in the path-frame condition. Moreover, this effect held very strongly, even for the younger children in both language groups (see figure 18.2). Thus, these children show the same effect of sentence frame that had been demonstrated by the adult speakers in Naigles and Terrazas 1998. By the time they are 3.5 years of age, children have acquired the link between motion-verb syntax and meaning, such that they are able to make different conjectures about the meanings of novel motion verbs (manner-conflating or path-conflating) depending on the type of sentence frame the verbs appear in (i.e., syntactic bootstrapping). They have acquired the link between motion-verb syntax and meaning.

Table 18.5 shows the children's preferences for each language and age group for each frame condition. No difference between language groups is evident for the 3.5-year-olds, because both groups followed the interpretations suggested by the frames. In contrast, the 7-year-olds did show a significant difference between languages: the Spanish speakers preferred the path match overall, even in the manner-frame condition, while the English speakers still followed the interpretations suggested by both frames. Thus, the 7-year-old Spanish learners seemed to have made the *lexical* generalization that motion verbs in their language should encode the path of motion; they showed this path preference even when the syntactic frame in which the verbs were presented implicated a manner-verb interpretation.

In sum, when English and Spanish learners are asked to make conjectures about the meanings of novel motion verbs, they will eventually—by the time they are 7 years of age—show that they are influenced by both the frame in which the verb appears and the language they are learning. However, only the syntax effect is evident in the 3.5-year-olds; to them novel verbs in manner frames refer to manners of motion and novel verbs in path frames refer to paths of motion. These younger children do not yet show any language-specific lexical-semantic generalizations, though; the two language groups show identical effects. The 7-year-olds display this frame effect as well; however, at least one of the groups, the Spanish speakers, has also apparently acquired the lexicalization pattern of Spanish, such that they preferred the path interpretation for the novel verbs

overall. Thus, the developmental pattern suggested here is that children acquire their syntactic distinctions first, exploit the syntax to acquire many of their early motion verbs, and only later realize the lexical-semantic generalization that these motion verbs manifest. Because adult English speakers showed a preference for manner interpretations, it is likely that English learners will also show this difference at some point. Without further data we cannot determine whether the 7-year-olds in this study did not perform in accordance with the adult pattern because of the small sample size or because of their young age.

18.4 Summary and Discussion

The findings from the three adult studies reviewed above implicated multiple ways in which English and Spanish speakers differ in their linguistic representations of motion events. Specifically, the production studies revealed that Spanish and English speakers typically use different verbs when they talk about motion events. Spanish speakers use verbs that encode the paths of motion, whereas English speakers use verbs that encode the manners of motion. Furthermore, speakers of these two languages also use different syntactic patterns. English speakers include directionally informative PPs almost all the time, whereas Spanish speakers do so only about half the time. English speakers also use a much wider array of directional prepositions/satellites than Spanish speakers do. The comprehension study found that, when adults are asked to interpret novel motion verbs, they show both language-general, syntactic influences and language-specific, lexical influences. That is, the English- and Spanish-speaking adults were alike in using the syntactic frame in which the verbs were placed to guide their interpretation of that verb. As predicted, the presence of a content-rich preposition in the PP facilitated a manner-verb interpretation, whereas its absence facilitated a path-verb interpretation. The adults' interpretations were not completely swayed by the syntax, though. The English speakers demonstrated an overall preference for the verbs to encode the manner of motion, while the Spanish speakers demonstrated an overall preference for the verbs to encode the path of motion. Thus, both

language groups displayed a lexicalization bias that was independent of the effect of syntax.

For the purpose of our focus on motion-verb acquisition, these adult findings confirmed that children acquiring motion verbs in English and Spanish have at least two things to learn, namely, their language-specific syntax and their language-specific verb-lexicalization pattern. Learning the verb or syntactic distinctions by themselves would not be enough to manifest fully the adult patterns of speaking or understanding. Overall, the findings presented above suggest that children acquire the syntactic distinctions developmentally prior to the lexical-semantic generalizations. Moreover, they provided some suggestion that the generalization might emerge because of the syntax, because as the different syntactic patterns across languages promote the learning of different motion-verb types, the frequent use of a set of motion-verb types (e.g., *run*, *walk*, *skip*, *jump* versus *ascend*, *descend*, *enter*, *exit*) might lead to the lexical-semantic generalization. In particular, the production studies revealed that 2-year-old English and Spanish learners initially use similar verbs (*come*, *go*, *fall*) and similar frames ("bare" verbs) to talk about motion events. With development, English learners add more locative elaboration with PPs and satellites within the same clause as the motion verb; moreover, they use more specific, manner-conflating verbs such as *hop* and *march*. In contrast, Spanish learners maintain their terse descriptions of motion events and use more specific, path-conflating verbs such as *bajarse/descend* and *salir/exit*.

The findings of our small-scale, spontaneous-production study suggested that the syntactic differences in motion-verb use emerged earlier in development than the lexical-semantic differences did, and this developmental pattern was corroborated in our comprehension study. Specifically, the comprehension study found that, when asked to interpret novel motion verbs, 3.5-year-olds from both language groups were guided predominantly by the syntax in which the verb was placed. This study thus provides the first evidence for syntactic bootstrapping in children that is outside the domain of causative/transitive verbs (e.g., Naigles 1998). Moreover, these data from Spanish learners provide the first evidence for the use of syntax in novel-verb learning in a language other than English. Clearly, by the age of

3.5 years, both English and Spanish learners understand at least one aspect of the relation between motion-verb syntax and meaning and can use the former to make conjectures about the latter. The 7-year-olds in both language groups also showed that they were influenced by the syntax of the sentence; moreover, the 7-year-old Spanish speakers (but possibly not yet the English speakers) had achieved their language-specific preference for a path interpretation for the motion verbs.

Based on these data, we can sketch the developmental pattern of motion-verb acquisition in English and Spanish as follows. Children's early uses of motion verbs are similar across the two languages, and are composed primarily of general path-conflating verbs produced in "bare" intransitive sentences. By the end of the third year, though, the crucial differences in the syntactic patterns of motion verbs across the two languages are evident, even while the verbs themselves remain remarkably similar. By the middle of the fourth year (or perhaps earlier), children in both language groups understand the links between motion-verb syntax and meaning and can use the one to infer the other. Perhaps it is at this point, and because of this syntax-semantics link, that the lexicons of the two language groups will dramatically diverge; it is even possible that the hints of divergence seen late in the third year can be attributed to a beginning use of syntax in the learning of motion verbs. It apparently takes much longer, however, for children's use of predominantly manner or path verbs to lead to their language-specific motion-verb lexicalization patterns; only the 7-year-old Spanish learners showed that they had made this generalization and expected their motion verbs to encode path.

We do not yet know whether the absence of the analogous manner-verb generalization in the 7-year-old English speakers can be attributed to the relatively low power of this study or to some more extended time period needed for the manner-verb lexicalization pattern to be acquired. It is curious, though, that the Spanish learners should have acquired their verb-lexicalization pattern before the English learners because the most plausible account of how the generalizations are acquired relies on the frequency of use of categories of motion verbs (i.e., using many path verbs and few manner verbs leads to the path-verb generalization), and the adult

studies discussed earlier have suggested than the manner-verb tendency in English is more pervasive that the path-verb tendency in Spanish. Because adults in Naigles and Terrazas 1998 did show a manner bias, it might be assumed that English learners will at some time in their language development also acquire this bias. Further research is clearly needed to illuminate the developmental pattern of the English learners.

This developmental pattern is more supportive of the syntactic bootstrapping account of verb acquisition than the emergentist or lexicalist accounts. That is, it was not the case that English and Spanish learners acquired their verb-lexicalization patterns first and so could have developed their language-specific syntactic patterns from these lexicalization patterns. Instead, these children acquired their language-specific syntax first and only arrived at their language-specific lexicalization patterns much later in development. It is of course possible that the children used other lexical means to learn their language-specific motion-verb syntax; however, such a proposal has yet to be advanced. The emergentist and lexicalist accounts also have little to say about how children might acquire their later-developing, verb-lexicalization patterns; in contrast, the syntactic bootstrapping account is quite straightforward. The idea would be that children's use of their language-specific syntax, from the age of 3 or so on, would lead to increasingly frequent use of manner verbs in English and path verbs in Spanish. Our data from children's spontaneous speech shows this cross-language dichotomy at its very beginnings. The prevalence of these different verb types in the two languages could then lead children, over a period of years, to the generalization that most of the motion verbs in their respective languages encoded manner (English) or path (Spanish) (see Naigles, Fowler, and Helm 1992 and Brooks et al. 1999 for discussion of the role of frequency in other generalizations made during verb acquisition). In sum, the developmental pattern suggests that the acquisition of language-specific *syntax* (at least as it pertains to motion-verb syntax) is fairly rapid in that it occurs before the age of 3, whereas the acquisition of language-specific *lexicalization patterns* (again, at least pertaining to motion verbs) takes much longer in that these may not be learned for another 4 years or so.

We end this chapter on a more speculative note. The developmental pattern highlighted here could lead to the suggestion that children across languages first map their motion terms onto the path component of motion events. Recall that the three motion verbs used most frequently by our young 2-year-olds were those that encoded general paths, *come*, *go*, and *fall*. Choi and Bowerman (1991), too, reported that the first expressions of motion used by their 1-year-old participants referred to paths; these were satellites for the English learners (e.g., *up* and *out*) and verbs for the Korean learners (e.g., *kata/go* and *ota/come*). We conjecture that this early path-oriented usage indicates a possibly universal initial preference on the part of children to talk about the path aspects of motion events. Whether this preference, if real, is social-pragmatic or lexical in nature remains to be investigated. That is, children may like to talk about paths of motion more than manners of motion, or they may find paths of motion easier to map onto lexical items than manners of motion. Casasola and Cohen (2000) have shown that barely verbal children can distinguish visual displays of paths of motion; however, no comparison has yet been made on the ease of distinguishing paths versus manners. Thus, further research is still needed to explore the developmental origins of children's talk—and thinking—about motion events.

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Notes

1. Notice that the construal of (5) is a bit different from that of (1). The motion event in (1) can have either a locative interpretation (she is walking within the forest)

or a directional one (she is walking from one end of the forest to the other). In contrast, the motion event in (5) is most felicitous with the directional interpretation.

2. The Spanish speakers did provide spatial information in their narratives; however, as detailed by Sebastian and Slobin (1994; see also Slobin 1996; Slobin and Bocaz 1988), this information came in the form of elaborate static locative descriptions that appeared in separate clauses from the verbs of motion. That is, their narratives set up the physical aspects of the scene first, and then only provided minimal information about the actual motion.

3. The vertical-motion events were excluded from these analyses because they generated some surprising and unconventional responses (see Naigles et al. 1998 for details).

4. It was assumed that because Spanish speakers did not start to learn English until after puberty, they would rely on their base of Spanish for linguistic knowledge more than would Spanish speakers who had learned English (or another language) at an earlier age. Moreover, any differences discovered between these Spanish speakers and speakers of English could be considered conservative because of the Spanish speakers' exposure to English.

5. Notice that the manner frames give clues to the manner meaning of the verb *both* because of the intransitive frame itself *and* because of the content-rich path prepositions. In contrast, the path-frame clues are solely syntactic because no prepositions are present at all, as in English, or because the preposition present carries little semantic content related to motion (e.g., *a*, *de* in Spanish).

6. We investigated combinatorial speech in particular because motion-verb use is especially rare at the one-word stage (Tomasello 1992; Vear 2001), and because we wanted to see whether the onset of combinations—with children's newfound ability to add PPs—yielded an immediate difference in motion-verb types across languages.

7. We do not, on the basis of these data, make the claim that the English and Spanish learners use the same levels of locative elaboration at the same point in grammatical development; we do not have a means of independently assessing each child's level of grammatical development. However, we can and do make the claim that, over the course of the third year, a developmental shift in grammatical elaboration of motion-event expressions is seen within one language group (English) but not within the other (Spanish). To verify that the Spanish learners do not make this shift at a later point in development—and to corroborate Sebastian and Slobin's (1994) findings with spontaneous speech data—we examined the transcripts of several Spanish learners, including Emilio, at 3;6 to 3;8. None of them used PPs with their motion verbs more than 40 percent of the time.

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