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ON THE ACQUISITION OF MOTION IN ENGLISH

Abstract. This paper discusses the acquisition of motion of native English speakers within Talmy's (1985, 2000) typological classification of languages, the lexical elements involved in the expression of motion and the syntactic patterns emerging from their combination. Talmy introduces a two-class typology based on how a language encodes Path of motion; he distinguishes between Satellite-framed languages (Path conveyed by a satellite: a preposition, a particle, a prefix, a directional adverb), and Verb-framed languages (the verb itself encodes Path). In this typology, English is a Sattellite-framed language. A CHILDES corpus (Berman & Slobin (1994)) of narratives was analyzed. Participants had to describe images from a frog-story picture book. Five syntactic patterns used to express motion in English were systematically investigated in terms of frequency of occurence: bare directed motion, directed motion with a manner component, Path-Manner verbs (Drăgan (2012, 2022)), Goal of Motion constructions and located motion. Talmy claims that English speakers prefer Goal of Motion construction (manner-of-motion verb with a PP), however the preferred option seems to be the bare directed motion pattern. This paper provides a comprehensive view of language acquisition and development regarding the expression of motion, exploring the intricate relations between lexical items, syntactic structures and age-related changes.

Keywords: motion, Path, Manner, verbs, Talmy, Goal of Motion

1. Introduction

This study explores the acquisition of syntactic and semantic structures for expressing motion events in English, based on Talmy's (1985, 2000) typology of lexicalization patterns. Talmy distinguishes between Satellite-framed (S-framed) languages, where Path is encoded by a satellite

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(e.g., preposition, particle), and Verb-framed (V-framed) languages, where Path is expressed by the verb itself. In S-framed languages like English, Manner is typically conveyed by the verb, while in V-framed languages, it appears as an adjunct. The study analyzes motion-denoting patterns in English, focusing on how motion is expressed through various linguistic constructions.

Using a corpus of narratives from the CHILDES database (Berman & Slobin, 1994), the research investigates the acquisition of motion-related lexical items and syntactic patterns across different age groups. The findings reveal a developmental trajectory in motion event expression among English speakers, supporting Talmy's claims to a certain extent.

2. Building up Motion in English

This section explores the elements involved in the expression of motion in English focusing on verbs and prepositions and examining the types of motion verbs, their syntactic and semantic properties, the semantic and syntactic properties of prepositions, and how these elements combine to convey motion events.

2.1. Motion verbs

Motion events in English are expressed using two classes of verbs – inherently directed motion (Path) verbs (*come, go, descend, ascend*) and manner-of-motion verbs (*run, walk, dance*) – combined with spatial PPs. These verbs are normally intransitive, both unnacusatives and unergatives, but they can be used transitively as well (*enter/exit the house, ascend/descend the stairs, roll the ball, walk the dog*, etc.).

English features a rich variety of manner-of-motion verbs, including those for slow (*amble, crawl*), fast (*race, dash*), aimless (*wander, roam*), and sudden motion (*dart, bolt*). In contrast, Path verbs are fewer and primarily distinguish horizontal or vertical movement (*ascend, retreat*). This imbalance likely explains English speakers' preference for the Goal of Motion strategy in describing motion events.

2.1.1. Verbs of inherently directed motion

The class of inherently directed motion verbs includes *advance, arrive, ascend, come, cross, depart, descend, emerge, enter, escape, exit, fall, flee, go, leave, plummet, retreat, return, sink, tumble,* etc. (Levin, 1993). They are classified as unnacusatives due to their sole argument, a Theme. Their unnacusative status is further supported by the inability to appear in resultative constructions because their meaning entails an endpoint, thus preventing the addition of a second delimiter, under Tenny's (1987) Single Delimiter Constraint. Inherently directed motion verbs also occur in *there-sentences*, as they denote changes of location, exemplified in (1) below. These constructions typically involve verbs indicating the arrival or movement of entities to specific locations.

(1) a. *There rose a balloon in the sky.*
    b. *There came the faintest noise, the tiny grinding of a boot sole against the rock...* (Drăgan, 2012, p. 37)

As Drăgan (2012) suggests, inherently directed motion verbs can be divided into two classes: Source verbs and Goal verbs. Source verbs semantically express the "beginning of motion", as seen in examples like *depart, emanate, emerge, erupt, escape, exit, flee,* and *leave.* Typically, these verbs do not require additional elements to express Source (see (2)), though some can optionally select a Source PP (see (3)). In certain cases, omitting the PP (particularly the preposition *from*) results in ungrammaticality (see (4)).

(2) a. *He shook hands and then departed.*
    b. *New business opportunities will emerge with advances in technology.*

(3) a. *The bus for Dallas departs [from the Greyhound-Trailways Terminal]Source.*
    b. *A lion has escaped [from its cage]Source.*

(4) *Angry voices emanated *([from the room]Source).* [2]

Goal verbs, such as *advance, cross, plunge, retreat, ascend, rise, collapse, fall, arrive,* and *return,* focus on the endpoint of motion. Like Source verbs, they vary in behavior: some can occur with or without a directional phrase, while others specify both Path and Goal. For example, *collapse* and *arrive* can stand alone (5), *return* and *collapse* may include a Goal phrase (6), and *descend* can combine with two PPs for Path and Goal (7). The examples below illustrate the behavior of Goal verbs, which emphasize the endpoint of a motion event.

(5) a. *He thought his whole world had collapsed when his wife died.*
     b. *After a long day's travel, we finally arrived.*

(6) a. *Odysseus returned [to his home]Goal after many years of travelling.*
     b. *A piece of the wall collapsed [on top of him]Goal-denoting Locative PP.*

(7) *She descended [the sweeping staircase]Path [into the crowd]Goal of photographers and journalists.*[3]

Goal verbs typically indicate Goal through directional PPs or Direct Object NPs. However, verbs like *come* and *go* form a distinct class. These light verbs denote movement relative to a reference point and can combine with various directional phrases. While they specify Direction, they do not indicate a particular direction but rather a broad range of possible directions in relation to their reference point.

(8) a. *We came by car. (incorporated Goal)*
     b. *We went [up]Direction [to London]Goal last weekend.*[4]

There are cases of inherently directed motion verbs (*forge, lunge, plummet, slump,* and *swoop)* that integrate both Goal and Manner components into their lexical specifications, labeled Path-Manner verbs (see Drăgan, 2012; 2022). For example, *plummet* describes rapid downward movement, while *lunge* denotes sudden and threatening forward motion. Despite their

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[3] Cambridge Dictionary – https://dictionary.cambridge.org/
[4] Oxford Advanced Learner's Dictionary – https://www.oxfordlearnersdictionaries.com/

inclusion of Manner, these verbs are categorized as inherently directed motion rather than manner-of-motion due to their inherent unidirectionality.

2.1.2. Verbs of Manner of Motion

Unlike inherently directed motion verbs, manner-of-motion verbs (*amble, bounce, crawl, creep, float, fly, glide, gallop, hop, leap, march, roll, slide,* etc.) express the manner in which a motion event is carried out.

The class of manner-of-motion verbs is much richer than that of inherently directed motion verbs, with plenty of synonyms, fine-grained semantic distinctions in terms of manner of motion. There are 6 basic manner-of-motion verbs and a large number of verbs that are semantically related to them:

- Move verbs: *barge, creep, dance, dart, flit, float, gallivant, glide, hurtle, jolt, jump,* etc.
- Walk verbs: *amble, limp, mosey, pace, parade, plod, prowl, roam, shuffle, trudge,* etc.
- Rush verbs: *careen, charge, dash, hasten, hurry, nip, race, scram, scramble, speed,* etc.
- Run verbs: *bolt, gallop, jog, lope, romp, scamper, scoot, scutter, scuttle, skitter, swing,* etc.
- Jump verbs: *bounce, bound, cavort, leap, lope, prance, romp, skip, spring, vault,* etc.
- Turn verbs: *coil, roll, rotate, squirm, swing, twist, twirl, wheel, whirl, wind, writhe,* etc

These basic verbs and their correlatives illustrate the richness and variety within the class of manner-of-motion verbs, allowing for precise and nuanced descriptions of different types of movement. Examples are given in (9) below.

(9) a. *She turned off the light and crept [through the door]*_{Threshold/Path}*.*
    b. *The spider crept [up the wall]*_{Unbounded Path}*.*
    c. *She stood up and walked [toward him]*_{Unreached Goal}*.*

    d.   She ran [away]Direction [from home]Source.

    e.   Everyone rushed [to the door]Reached Goal when the alarm went off.

    f.   A group of teenagers were cavorting [in the park]Locative. [5]

Manner-of-motion verbs exhibit interesting behavior in locative inversion constructions ([Locative PP – V – DP Subject]), a non-canonical focus structure where the sentence-initial PP sets the scene (background information) and the post-verbal DP introduces a new referent (new information). Typically, unaccusative verbs of existence and appearance permit locative inversion, as they align with presenting a new referent within an established location.

    (10) *a. On the horizon appeared a large ship.*
            b. In the corner stood a tall lamp.

In locative inversion structures, all intransitive verbs are treated as unaccusatives, as these sentences convey an existence or appearance interpretation. They require two arguments: a Theme describing the entity that exists or appears, and a location indicating where the entity exists or appears.

    Manner-of-motion verbs are usually felicitous in such constructions and they usually combine with a directional PP, entailing change-of-location. Even when the verb is unergative, there is a behavior similar to the one appearance unaccusatives display, the argument being reinterpreted as a Theme that undergoes change of location.

    (11) *Into the room walked Sylvia Tucker, with Zahid walking behind her like a puppet.* (Levin & Rappaport Hovav, 1995, p. 243)

Resultative constructions can occur with transitive and intransitive verbs, both unnacusatives and unergatives. A resultative phrase is "an XP that denotes the state achieved by the referent of the NP it is predicated of as a result of the action denoted by the verb in the resultative construction" (Levin & Rappaport Hovav, 1995, 34). A resultative consists of two subevents, generally being in a relation of causation. In syntax, there is a Result Phrase

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[5]   Cambridge Dictionary – https://dictionary.cambridge.org/

RP that denotes the resulting state/location, which combines with the verb, which expresses the causing subevent.

(12)   John hammered the metal flat.

Resultatives require their RP to predicate an affected entity, typically the direct object, as captured by the Direct Object Restriction (Levin & Rappaport Hovav, 1995, p. 35). When the verb is unergative, an unselected or non-subcategorized object must be added the sentence to be grammatical. This object often appears as a fake reflexive or a DP denoting inalienable body parts (Simpson, 1983 in Levin & Rappaport Hovav, 1995, p. 35).

(13)   a. *Dora shouted hoarse.
       b. Dora shouted herself hoarse. (Levin & Rappaport Hovav, 1995, p. 35)

In (13b), the reflexive pronoun *herself* functions as the direct object, satisfying the requirement and making the sentence grammatical.

Manner-of-motion verbs can be unaccusative as well. Unaccusative manner-of-motion verbs take a Theme as argument, which is also the Subject of the sentence. However, they still observe the DOR[6] in resultatives because the single argument of unaccusatives starts out as an internal argument, so the DOR stands if rephrased as RP needs to be predicated of an internal argument (instead of direct object).

(14)   a. The gate rolled open.
       b. The door swung shut. [7]

To sum up, both unaccusative and unergative verbs can be used in resultative constructions, but they follow different patterns that comply with the DOR. Unergative verbs need to add a non-subcategorized or fake reflexive direct object for the Result Phrase to be added. In contrast, unaccusative verbs can combine directly with a Result Phrase because

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[6]   *i.e.*, Direct Object Restriction
[7]   Oxford Advanced Learner's Dictionary – https://www.oxfordlearnersdictionaries.com/

their single argument is already an internal argument that the Result Phrase can be predicated of.

2.1.3. Prepositions

According to Folli and Ramchand (2005), prepositions can be classified based on whether they indicate just Path or both Path and a final location (Place). Thus, there are three subclasses of prepositions: purely dynamic prepositions (*to, into, onto, across,* etc.), which specify both path and final location. They cannot be used with stative verbs (*I walked to the park.* vs. **I was to the park*). Secondly, there is a subclass of prepositions considered ambiguous (*under, behind, over,* etc.) since they can be interpreted as either dynamic or stative, making their use context-dependent. Lastly, stative prepositions (*in, on, underneath, beneath*) only indicate location and, when used with motion verbs, do not derive Goal of Motion, denoting only the location where the action occurs.

The examples in (15) to (18) below illustrate their distinct behaviour.

(15) a. *Sarah walked to the park.*
      b. *The cat jumped onto the roof.*

The prepositions in examples (15a) and (15b), which are an integral part of the Goal of Motion constructions, are obligatorily dynamic and cannot appear in simple stative constructions, as shown by the ungrammaticality of:

(16) a. **Sarah was to the park.*
      b. **The cat was onto the roof.*

A small group of prepositions typically used in stative contexts do not combine with Goal of Motion constructions. For instance, using *in* in a sentence like (17a) does not convey a result or endpoint of the motion, unlike *to* in (17b).

(17) a. *John ran in the store.*
      b. *John ran to the store.*

Prepositions like *under* or *behind* are ambiguous, i.e., they may acquire both locative and dynamic interpretations depending on their use. They may denote only Location/Place, deriving only a purely locative reading, or they may express the Goal of motion in a GM construction.

(18) a. *The boy ran behind the fence.*
      b. *The boat floated under the bridge.* (Folli & Ramchand, 2005)

In contrast, prepositions like *in*, *underneath*, and *beneath* are strictly locative, participating only in the expression of located motion, irrespective of the dynamic/stative verb they may combine with:

(19) a. *John is in the store.*
      b. *The cat slept beneath the table.*

Prepositions influence the depiction of motion in English and they are essential for the expression of different types of motion events in English (located vs directed motion).

3. The Syntactic Expression Of Motion

This section discusses the syntactic patterns potentially used to express motion events in English, patterns built on the lexical items (verbs and prepositions) examined in the previous section.

3.1. Motion events and Talmy's (1985; 2000) lexicalization patterns

According to Beavers, Levin and Tham (2009), the resources a language uses to express Manner and Path: lexical elements (manner and result verb roots, stems, affixes, spatial adpositions, particles, and boundary markers); morphological elements (case markers, applicative affixes, aspectual affixes, and compounding); and syntactic elements (adjunction, verb serialization, and subordination). These resources are not specifically dedicated to encoding motion events, but are semantically compatible with the components of such events and can be used for this purpose if they exist in a language.

With respect to expressing motion, Talmy (1985; 2000) identified two types of languages: Verb-framed languages (like Romance languages), which integrate Path directly into the verb, and Satellite-framed languages (like Germanic and Slavic languages), where Path is expressed through a satellite (such as a preposition, particle, or prefix with directional meaning).

(20) *John ran into the house*.

(21) *The boat floated under the bridge.* (Folli & Ramchand, 2005, p. 82)

(22) *a. La barca galleggiò sotto   il ponte.*
          the boat   floated   under   the bridge
                                          (Folli & Ramchand, 2005, p. 82)
       b. La barca passò   sotto   il   ponte galleggiando.
          the boat passed under   the bridge floating
                                          (Folli & Ramchand, 2005, p. 82)

(23) *a. Barca   a   plutit sub   pod.*
          Boat.DEF has floated under bridge
          'The boat floated under the bridge'.
       b. Barca   a   intrat sub   pod   plutind.
          Boat.DEF has entered under bridge floating.
          'The boat floated under the bridge.'

In Satellite-framed languages like English, Path is expressed through satellites (e.g., prepositions or particles), while the main verb conveys Manner, as in *run into the house* (20). This structure allows flexibility, as seen in (21), where *the boat floated under the bridge* can imply motion or location. In contrast, Verb-framed languages like Italian and Romanian encode Path directly in the verb, with Manner as an adjunct, e.g., *La barca passò sotto il ponte galleggiando* ('The boat passed under the bridge floating') (22) or Romanian *Barca a intrat/sub pod plutind* ('The boat entered/went under the bridge floating') (23a, 23b). These examples illustrate the distinct lexicalization patterns of Satellite- and Verb-framed languages.

3.2. The expression of motion in English

Drăgan (2012) explains how English exhibits various patterns for expressing motion, which differ based on the types of motion verbs used. Generally, English uses either inherently directed motion verbs (such as *ascend, descend, go, come, flee, escape, fall, arrive, depart*, etc.), which can be used with or without PPs, or manner-of-motion verbs combined with directional phrases to express directed motion (Goal of Motion[8]).

Inherently directed motion verbs mostly express Goal, and can occur alone or accompanied by PPs to provide additional details about the Direction or Source[9].

Manner-of-motion verbs (*run, lope, stride, sashay, fly, gallop, walk, jump*, etc.), on the other hand, primarily describe the way in which motion occurs and require additional directional phrases to express directed motion. They indicate a specific Manner of motion and combine with directional PPs to describe motion along a Path toward a specific Goal.

3.2.1. Located motion

Located motion events describe how an entity moves within a specific area. These events use atelic (not goal-oriented) unergative or unaccusative manner-of-motion verbs that can be paired with optional locative prepositional phrases acting as adjuncts. For example:

> (24) *a. We spent the afternoon wandering around the old part of the city.*
> *b. Skaters leapt and twirled on the ice.* [10]

There is a special subclass of manner-of-motion verbs, specifically, *run* verbs, that generally resist combining with directional prepositional phrases. These verbs, including *cavort, frolic, gambol, gallivant, mill, prowl, ramble,*

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[8]   Combinations like *run to the door, lope into the yard, stride across the plain, sashay out of the room*, etc.

[9]   *e.g., Ascend (through the woods)* and *descend (into the valley)* naturally include a sense of direction even without the PPs

[10]   Cambridge Dictionary – https://dictionary.cambridge.org/

roam, rove, etc., do not usually express a goal-oriented motion. They describe random or aimless movement within a certain area, and thus, they typically pair with locative prepositional phrases, either ambiguous (in their stative uses) or purely stative (locative).

(25) a. *Several wolves prowled around/*to the camp, but were kept at bay by the fire.*
      b. *They watched the children frolicking at/*to the beach.*
      c. *Young ladies did not cavort around/*across the estate with male friends...*
      d. *Samuel roamed around/*into the chamber, looking for a wall safe.* (Drăgan, 2012, p. 114)

In these examples, the verbs *prowl, frolic, cavort,* and *roam* describe motion that is unrestricted and not directed toward a specific goal, making directional prepositional phrases like *to the camp, to the beach, across the estate,* and *into the chamber* ungrammatical. Instead, these verbs pair more naturally with locative phrases such as *around the camp, at the beach, around the estate,* and *around the chamber*, which focus on the area where the movement occurs rather than on denoting a specific destination.

3.2.2. Directed motion

Directed motion events describe an entity moving toward a Goal and can be expressed in several ways. Pure inherently directed motion verbs (*depart* or *emerge*) may or may not include directional phrases, as in (26). Path-Manner verbs, shown in (27), combine inherent direction with a Manner component. Manner-of-motion verbs, illustrated in (28), always require a PP, encoding both Direction and Manner, but unlike Path-Manner verbs, they are not unidirectional and can pair with various directional PPs (*e.g., creep into/out of the room, up a hill, down the stairs*). Additionally, transitive verbs of inherently directed motion, as in (29), express directed motion with objects indicating Source, Path, or Goal.

(26)   *a.* *Needless to say, I departed quickly.*
       b. *Gladys emerged from the dressing room.* (Drăgan, 2012, p. 37)

(27)   *a.* *Shivering, she forged up the hill toward that boulder.*
       b. *Pieces of rock plummeted down the mountainside to the ground below.* (Drăgan, 2012, p. 41)

(28)   *a.* *Sara crept carefully down the stairs in the middle of the night and left the house.*
       b. *She flounced out of the room, swearing loudly.* (Drăgan, 2012, p. 70)

(29)   *a.* *They exited the building.*
       b. *The ducks crossed the river.*

All these different types of motion verbs and their associated PPs result in a series of directed motion subpatterns, to be discussed in what follows.

The **bare directed motion pattern** is based on inherently directed motion verbs which can optionally combine with a directional or locative PP. Since the meaning of direction is inherent, verbs of inherently directed motion can occur in isolation, as in (30).

(30)   *Finally, they came.*

They can be further classified into two classes: Source verbs and Goal verbs (see subsection *2.1.1.*). Source verbs denote the onset of motion and their expression of the actual Source can vary depending on the context. Typically, Source verbs do not require an additional element to express Source, as shown in (31).

(31)   *a.* *An FBI spokesman said Stewart fled before police arrived.*
       b. *Two prisoners have escaped.* [11]

However, some Source Verbs can take a Source PP to further specify the Source overtly.

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[11]   Cambridge Dictionary – https://dictionary.cambridge.org/

(32) *a. She emerged from the sea, blue with cold.*
      b. The train for Cambridge will depart from platform 9. [12]

On the other hand, there are certain Source verbs, such as *emanate*, which need an overt SourceDP to form a grammatically correct sentence (see (33)).

(33) *The sound of loud music emanated *(from the building).*

Another pattern for expressing directed motion, with a specification of Manner as well, is **the directed motion with a manner component** construction, which Talmy (1985; 2000) associates with Romance languages. This pattern combines inherently directed motion verbs with a directional or locative PP and a Manner adjunct. For example, in Romanian, structures like (34) illustrate this construction.

(34) *A   intrat   în cameră dansând.*
      has entered in room   dancing
      'He/she entered the room dancing.'

Although this pattern is considered typical of Romance languages (Talmy 1985; 2000), English can also express directed motion with a manner component similarly (*He entered/came into the room dancing*). However, due to the greater efficiency of the Goal of Motion construction, this pattern is rarely used in English.

What is more, English can lexicalize both Path and Manner into a single idiomatic construction – the **GO/COME-V-ING-OBL construction**, illustrated in (35a-d) below:

(35) *a. He went running into the room.*
      b. She came screaming out of the woods.
      c. I went looking for mushrooms.
      d. She went skiing in the Alps.

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[12] Cambridge Dictionary – https://dictionary.cambridge.org/

The GO/COME-V-ING-OBL construction, as outlined by Broccias and Torre (2018; 2020), is built on the inherently directed motion verbs *come* or *go* combined with a Manner-denoting ING verb, and they are semantically classified into three subtypes: manner, conflation and purpose/activity.

The category of inherently directed motion verbs includes a subset of verbs that inherently combine both Path and Manner – the subclass of **Path-Manner verbs** (Drăgan 2012; 2022). These verbs express movement toward a Goal, while simultaneously describing how that movement occurs. Examples of such verbs include *forge, lunge, plummet, slump, swoop*, etc.

(36) a. *He forged through the crowds to the front of the stage.*
      b. *She lunged forward and snatched the letter from me.*
      c. *The stock prices plummeted to an all-time low*.[13]

Last but not least, **Goal of Motion** refers to a construction that describes a complex event made up of two subevents: the process of motion, typically expressed by a manner-of-motion verb or a verb of sound emission, and the endpoint of that particular motion, expressed by means of a directional PP. Below, there are some examples of Goal of Motion constructions:

(37) a. *The athlete sprinted [toward the finish line]*Unreached Goal*.*
      b. *The child tiptoed [to the window]*Reached Goal*.*
      c. *He strode [past her]*Path *and mounted the stairs.*
      d. *He used to run [along the beach]*Unbounded Path *every morning.*
      e. *The queue shuffled [forward]*Direction *slowly.* [14]

In these sentences, the manner-of-motion verbs (*sprint, tiptoe, stride, run, shuffle*) depict how the motion occurs, while the PP describe different Path segments. Notice that the view of Goal of Motion adopted here aligns with Zubizarreta and Oh (2007), who argue that Goal of Motion constructions need not always be telic but can involve atelic PPs denoting unreached Goals (*e.g., toward, along*). The key requirement is that the Goal be reachable, not necessarily reached.

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[13] Oxford Advanced Learner's Dictionary – https://www.oxfordlearnersdictionaries.com/
[14] Oxford Advanced Learner's Dictionary – https://www.oxfordlearnersdictionaries.com/

According to Zubizarreta and Oh (2007), there are two main requirements for verbs to participate in the derivation of the Goal of Motion construction: they must denote Manner and be atelic. Verbs that denote Manner and are atelic include manner-of-motion verbs (*amble, bolt, hustle, climb, dance, run, jump,* etc.) and verbs of sound emission (*clash, clatter, creak, roar, rumble,* etc.).

Goal of Motion constructions often reflect a creative use of language, allowing for lexical items that might not typically function as verbs or that have different meanings as verbs in other contexts to express the manner of motion. This creativity is evident in sentences like those in (38):

(38) a. *Arakasi wormed out of the ditch.*
      b. *Blood fountained out of the gash in his neck.*
      c. *But before he could speak, the sitting-room door was flung open and Regal boiled into the room.* (Drăgan, 2012, p. 122)

Goal of Motion constructions can be elaborated using complex Paths, where a sequence of directional PPs denotes segments of the overall trajectory. In these structures, manner-of-motion verbs describe how the movement occurs, while the directional PPs outline the Path, as shown in (39) below:

(39) *He walked [out of the room]Source, [down the stairs]Bounded Path, [into the garden]Reached Goal, and [across the yard]Bounded Path.*

Goal of Motion constructions are highly productive and preferred in English due to the rich and varied class of manner-of-motion verbs in this language. Additionally, English benefits from access to both dynamic and ambiguous prepositions like *into, onto, across,* and *under,* which can clearly express direction, allowing manner verbs to occupy the verb position effectively.

4. The Acquisition of Motion in English

Built on the ideas discussed in the previous sections, this section explores how English speakers acquire the lexical tools and syntactic patterns necessary for the expression of motion. Specifically, it investigates the

lexicalization of the Path and Manner components with respect to Talmy's language typology, assessing the lexical tools and syntactic structures used by native English speakers. A corpus containing narratives provided by various age groups will be analyzed to draw out a clear picture of how the initial patterns of motion expression emerge and how they develop over time.

4.1. Database and methodology

The present corpus is selected from the Child Language Data Exchange System (CHILDES) and it consists of oral and written narratives collected by Marchman (adults) and Renner (children) and further used by Berman and Slobin (1994) in their publications. The corpus comprises stories from fifty-nine subjects across five age groups: three-, four-, and five-year-old preschoolers, nine-year-old schoolers, and twenty-year-old adults. Each group, except the five-year-olds (with eleven narratives), contributed twelve narratives, ensuring a balanced and comparable dataset for analysis across age groups.

The participants had to create stories based on a picture book, *Frog, Where Are You?* (Mayer, 1969). The book's 24 images depict a boy and his dog searching for his escaped pet frog in the woods, encountering various animals and experiencing many mishaps.

The analysis focuses on various syntactic structures denoting directed and located motion events, including Path and Manner verbs, simple and complex prepositions, and additional items used in later stages of expressing directed motion, such as Path-Manner verbs and idiomatic patterns denoting Manner (GO/COME/RUN-V-ING-OBL constructions). This broad selection aims to identify a developmental trajectory assessing both lexical and syntactic progression, and determining its alignment with Talmy's lexicalization pattern for S-framed languages.

Although the CHILDES database includes several corpora focusing on frog stories, we have chosen to investigate only Slobin's corpus because it is the only corpus that provides a wide-range coverage of the relevant age groups (young children, preschoolers, schoolers and adults).

In our analysis of the corpus, we focus on examining how native English speakers express motion events by categorizing their motion-

denoting syntactic patterns into five distinct categories: Path verbs with or without PP (bare directed motion), Path verbs with or without PP and a Manner component (directed motion with a manner component), Path-Manner verbs, Goal of Motion constructions and located motion (manner-of motion verb +/- locative PP). By looking at these categories, we aim to determine the preferences and patterns of motion expression across different age groups.

Based on our investigation of the lexical tools and syntactic structures involved in the expression of motion events discussed in the previous two chapters, as well as on Talmy's (1985; 2000) theory of lexicalization patterns, we make the following predictions:

(1) the youngest children will produce simple structures, built on Path verbs with optional PPs, though mainly without the PP (bare directed motion);

(2) young children will also incorporate Manner into their descriptions of motion events rather early in life, *i.e.*, they will produce simple Goal of Motion constructions, given that Manner is a relevant semantic component in the description of motion events produced by speakers of Germanic languages (Talmy 1985; 2000);

(3) as their age increases, children's lexical and grammatical competence with respect to the expression of motion will increase in the sense that their descriptions of motion events will become more elaborate and they will gain access to more marginal lexical items and syntactic patterns;

(4) adults will have access to the entire range of syntactic patterns to describe motion, but will display a marked preference for the lexicalization pattern Talmy (1985, 2000) claims is favoured by speakers of Germanic languages, *i.e.*, the Goal of Motion construction.

4.1.1. Three-year-olds

Analyzing the structures three-year-olds produce reveals several notable patterns. They frequently use basic Path verbs such as *go, get, climb, fall*, and *come*, often with PPs indicating direction and location, demonstrating an

understanding of spatial relations. Contrary to the first prediction, their narratives show more complex structures, with Path verbs frequently accompanied by PPs, rather than bare Path verbs alone. This suggests early comprehension of prepositions and the emerging development of the Goal of Motion pattern, where PPs indicate direction and Path verbs may later be replaced by Manner verbs. Examples in (40) illustrate these combinations in their narratives:

(40) a. *He fell [out the window]*_{Source PP}. [3:03a]
      b. *He falled [into the water]*_{Goal}. [3:03b]
      c. *The owl come.* [3:03d]
      d. *The boy tried to climb [up it]*_{bounded Path}. [3:03d]
      e. *He fell [over]*_{Path} *with the dog [into the pond]*_{Goal}. [3:03d]
      f. *The dog is going [away]*_{Direction}. [3:03d]

On the other hand, even at this young age, English-speaking children can and do derive basic Goal of Motion constructions built on basic manner-of-motion verbs, what Slobin (2006; 2014) calls "low manner verbs". In (41), below, some examples are listed:

(41) a. *A owl flew [out of here]*_{Source}. [3:03a]
      b. *He's running [away]*_{Direction}. [3:03a]
      c. *They chased [after the dog]*_{Path}. [3:03f]
      d. *What if he steps [in the glass]*_{Goal}. [3:03g]

Predictably, at this age, three-year-olds do not have access to more complex patterns built on special lexical items like Path-Manner verbs. However, they do show the ability to combine basic Path verbs with Manner adjuncts to provide a more refined, detailed description of the event.

(42) *You're going so fast.* [3:03b]

At this stage, the dominant pattern is the bare directed motion structure, built on Path verbs (70 occurrences). Goal of Motion constructions, on the other hand, are just beginning to emerge (there are only 21 occurences, generally built on garden-variety manner-of-motion verbs *like run*, *fly*, *jump*, *swim*, *step*, *chase*, and *follow*).

4.1.2. Four-year-olds

The analysis of the motion descriptions four-year-olds produce indicates that these children maintain patterns similar to those employed by three-year-olds.

Firstly, the number of examples of directed motion and Goal of Motion structures has visibly increased. The use of Path verbs remains prominent, with verbs like *go, get, climb, fall*, and *come* still in frequent use with or without accompanying PPs to indicate direction. Similarly to three-year-olds, four-year-olds use more Path verbs accompanied by PPs, thus confirming the assumption previously made concerning the pattern, which is prior to the Goal of Motion constructions.

(43) a. *He got [on a deer]*Goal-denoting locative PP. [4:04a]
      b. *They landed [in some water]*Goal-denoting locative PP. [4:04b]
      c. *They both fell straight [down]*Direction *[into the water]*Goal. [4:04e]
      d. *The little boy getting [up]*Direction *[from the rock]*Source. [4:04j]
      e. *He climbed [a tree]*Bounded Path. [4:04g]
      f. *They dropped.* [4:04f]
      g. *They fell [backwards]*Directional Adverb. [4:04g]

Although children mostly choose Path verbs in combination with different types of PPs to describe motion events, they also turn to Goal of Motion constructions to detail certain situations, as indicated in (44) below. What is more, four-year-olds appear to have gained access to the transitive causative variant of a Goal of Motion/change-of-location structure, built on verbs of surface contact through motion, which also indicates the expansion of their knowledge of motion verbs to include transitive causative verbs like *push* (44a), *throw* (44b) and *knock* (44c).

(44) a. *Pushed him [out the window]*Source. [4:04a]
      b. *He's gonna throw the deer [down there]*Direction. [4:04f]
      c. *He knocked him [down there]*Direction. [4:04i]
      d. *He slipped [onto (...) a deer]*Goal. [4:04b]
      e. *Hop [over the water]*Path. [4:04d]
      f. *Sneaked [over there]*bounded Path. [4:04i]
      g. *He jumped [out a window]*Source. [4:04c]

Like the three-year-olds, they rarely use Path verbs with Manner adjuncts (a pattern typical of Romance speakers when they need the specification of Manner, not just Path); instead, their motion descriptions rely on either bare directed motion or some form of Goal of Motion structures, with the latter increasing in frequency. However, the corpus does include an example of a Path verb with a Manner adjunct, illustrated in in (45) below:

> (45) *The frog quietly got out of his jar.* [4:04b]

Last but not least, four-year-olds' growing linguistic skills are reflected in the slightly increasing use of Goal of Motion constructions and the acquisition of new Path and Manner verbs. The numbers of Path verb constructions stays the same (70 occurrences), while the number of Goal of Motion constructions has increaseed (25 occurrences).

4.1.3. Five-year-olds

The structures expressing motion events produced by five-year-olds represent patterns similar to those observed in younger children, but they are characterized by increased frequency and increased complexity. Path verbs continue to dominate their descriptions of motion events, most of them being basic verbs of inherently directed motion like *go, get, climb,* or *fall*.

> (46) a. *...bumblebees coming [out of the honey hive]Source.* [5:05a]
>   b. *They go [in the water]Goal.* [5:05d]
>   c. *...[down]Direction he went.* [5:05h]

The five-year-olds also produce novel Goal of Motion constructions, using both low and high manner verbs, in Slobin's (2006; 2014) terms, to describe movement toward a Goal (*walk, crawl, rush* or *race*), as well as new causative/transitive motion verbs like *carry* in (47f) below. Their motion descriptions become more elaborate, reflecting the ability to convey more complex motion constructions.

(47)   a. *Frog crawled [out]*Source*. [5:05c]*
       b. *They walked [down the hall]*Direction*. [5:05e]*
       c. *He rushes [out the window]*Source*. [5:05f]*
       d. *The bees race [after him]*Path*. [5:05f]*
       e. *His frog creeped [out of its jar]*Source*. [5:05h]*
       f. *The moose carried him [over]*Path* [to a cliff]*Goal*. [5:05k]*

What is more, one subject in this age group is responsible for the production of another interesting example of Goal of Motion, a novel combination built on an onomatopoeic element turned verb only in this particular construction:

(48)   *A owl (…) bammed him on the ground. [5:05e]*

The structure in (48) qualifies as a case of spontaneous creation where *bam*, typically an interjection, is transformed into an ad hoc manner of motion verb.

Overall, five-year-olds still constantly select one of the two main patterns used by the previous age groups – the bare directed motion and the Goal of Motion patterns, built on mainly the same basic verbs with some notable additions. The number of occurrences for both patterns has increased: the former amounts to 80 occurrences, while the latter to 30.

4.1.4. Nine-year-olds

As children reach nine years of age, their expression of motion events becomes noticeably more complex. This age group exhibits greater progress in their linguistic abilities, using more elaborate constructions and introducing new patterns into their descriptions of motion events. The number of Path verbs is clearly higher and so is the number of complex Path structures they combine with:

(49)   a. *...to go [up]*Direction* [in a tree]*Location*. [9:09j]*
       b. *The boy and the dog fell [off a cliff]*Source* [into a swamp]*Goal*. [9:09i]*
       c. *He came [down]*Direction* [from the house]*Source*. [9:09d]*

An intriguing example produced by a nine-year-old is illustrated in (50) below:

(50)   *The dog came whimpering over.* [9:09i]

This idiomatic pattern, discussed in the previous chapter and known as the GO/COME-V-ING-OBL construction (Broccias & Torre 2018, 2020), combines the light verb *come*, denoting Path, with the present participle *whimpering*, a verb of sound emission describing Manner in the context of a PrtP (*over*) denoting Path.

While the dominant pattern for nine-year-olds remains the bare directed motion construction built on Path verbs, Goal of Motion constructions also become more pervasive and more complex in the sense that they also incorporate more complex Paths:

(51)   a. *An owl poked him [out of the tree]Source.* [9:09e]
       b. *He pushed him [off the side of the cliff]Source [into water]Goal.* [9:09e]
       c. *The owl popped [out]Source.* [9:09i]
       d. *The deer bucked him [off]Source.* [9:09j]
       e. *He tips him [off]Source [over a cliff]Path [into the water]Goal.* [9:09k]

It is interesting to notice that nine-year-olds also produce a significant number of located motion structures with or without locative PPs, which contribute to creating a background for the main scenes. This tendency demonstrates an increase in the narrative skills of nine-year-olds, as a corollary of their ability to describe complex motion events.

(52)   a. *An owl started flying around.* [9:09f]
       b. *He started stumbling.* [9:09f]
       c. *The owl started to chase the boy.* [9:09g]

Overall, this age group has displayed more progress and access to new patterns in expressing motion. The numbers of motion descriptions has grown to 99 instances of Path verb constructions and 37 instances of Goal of Motion constructions.

4.1.5. Twenty-year-olds

As expected, the twenty-year-old group, *i.e.*, the adult group, display the most elaborate constructions in their description of motion events. Their bare directed motion constructions are far more numerous than those produced by the previous groups, but they are also more diverse and intricate. There are numerous new verbs that adults use, some of them of Latin/French origin:

(53) a. *The boy left.* [20:20d]
      b. *The frog is escaping [from his jar]Source.* [20:20c]
      c. *They're headed [to the edge of a cliff]Goal.* [20:20c]
      d. *The stag (…) deposits the boy [off the side of the ravine]Source [into the creek]Goal.* [20:20k]

Not only do the twenty-year-olds use Latin-origin verbs, but they also employ prepositional collocations of Latin origin, as seen in (54).

(54) *He goes in the direction of a thicket.* [20:20k]

Additionally, the adults exhibit an ability to express complex Paths in a manner similar to speakers of Romance languages:

(55) *The boy fell off the tree and landed on his back.* [20:20c]

This age group not only uses more varied Path verbs, but also employs more complex constructions such as the COME/GO/RUN-V-ING-OBL construction and the *go+infinitive* pattern, as illustrated in (56) below:

(56) a. *They go wandering out in the woods.* [20:20c]
      b. *The boy and the dog go running.* [20:20e]
      c. *The dog runs howling.* [20:20f]
      d. *The bees come swarming out.* [20:20k]
      e. *The deer went running off with the little boy.* [20:20i]
      f. *They go call in the woods.* [20:20a]

Turning to the Goal of Motion constructions, we notice a significant change in number and complexity. The adults' narratives include 56 instances of the Goal of Motion construction, a large number compared to the number of similar structures produced by the other age groups. The constructions are also more intricate and display more enriched descriptions of the motion events.

(57) a. *An owl pops [out of the hole]*Source. [20:20b]
      b. *The dog has knocked their hive [out of the tree]*Source. [20:20b]
      c. *The boy is running [away]*Direction *[from the owl]*Source. [20:20b]
      d. *...while the dog is limping [into the picture]*Goal. [20:20c]
      e. *They walk [along]*Unbounded Path. [20:20f]
      f. *The frog tiptoes [out of the jar]*Source. [20:20k]

Another pattern that undergoes an increase in frequency of occurrence is that represented by Path-Manner verbs. As they have full access to the lexicon, it is expected that adults should provide descriptions using verbs that can capture both Path and Manner within the same lexical item.

(58) a. *The dog was plummeting [to his fate]*Goal. [20:20d]
      b. *...dog tumbles [out of the window]*Source. [20:20f]
      c. *The boy tumbles [down]*Direction *[from the branch]*Source. [20:20f]

As for the expression of located motion, adults also expectedly display more variation and the use of new manner-of-motion verbs, compared to the previous age groups.

(59) a. *They chase him [in a long stream]*locative PP. [20:20k]
      b. *...who is flapping about him.* [20:20f]

The numbers of identified motion-denoting structures reflect a significant presence of both bare directed motion and Goal of Motion constructions, though the former are more frequent with a number of 113 instances, compared to only 56 occurences for the latter, an issue we will take up in the next section.

4.1.5. The overall picture

The analysis of the corpus of children's motion event descriptions has revealed a clear developmental progression in the complexity and variety of patterns used across different age groups. As children grow older, their descriptions become increasingly more elaborate and varied, demonstrating a more refined understanding of motion events.

The table below encapsulates the progression in children's use of different types of motion constructions from ages 3 to 20 and generally confirms the predictions made at the beginning of this chapter, as discussed in what follows.

The first prediction was that the youngest children would favor simple structures, primarily using bare Path verbs (*come, go, get, fall*, and *climb*), optional PPs, but mostly without them. Table 1 shows that bare directed motion is the most frequent, but the expected preference for the structures without PPs is not confirmed. This may be due to the nature of the Path verbs used: *come*, *go*, and *get* are light verbs that inherently require directional PPs to convey specific meanings.

The table also supports the prediction that young children incorporate Manner into motion descriptions early, as Talmy (1985; 2000) suggests Manner is essential in the motion expression in Germanic languages and is encoded in the verb. The data show that even three-year-olds produce basic Goal of Motion structures, using simple Manner verbs (*run*, *jump*, or *fly*,) in combination with directional PPs.

The table also verifies our third prediction, that, as their age increases, children's lexical and grammatical competence with respect to the expression of motion would also increase. As the table partially shows and as our detailed corpus analysis reveals, by the time they are nine, children have access to the more marginal patterns and lexical items used to express motion events.

Finally, the table partially confirms our fourth prediction: adults use the full range of syntactic patterns to describe motion. However, it does not support the expected preference for Talmy's (1985, 2000) Germanic lexicalization pattern, *i.e.*, the Goal of Motion construction. Instead, bare directed motion dominates across age groups, possibly due to the nature of the experiment. The static images may not encourage more elaborate or creative descriptions, as storytelling, an art form, is only partially embraced by some older children and adults.

Table 1

Motion-denoting patterns

Age – number of subjects – number of tokens	Path verb +/- PP	Path verb +/- PP + Manner adjunct	Path-manner verb	Goal of motion	Located motion (manner-of-motion verb +/- PP)
Age 3; 12 subjects; 95 tokens	70 73.68%	1 1.05%	0	21 22.10%	3 3.15%
Age 4; 12 subjects; 105 tokens	70 66.66%	1 0.95%	0	25 23.80%	9 8.57%
Age 5; 11 subjects; 120 tokens	82 68.33%	0	0	30 25%	8 6.66%
Age 9; 12 subjects; 159 tokens	99 62.26%	1 0.62%	3 1.88%	37 23.27%	21 13.20%
Age 20; 12 subjects; 201 tokens	113 56.21%	5 2.48%	3 1.49%	56 27.86%	24 11.94%

5. Conclusions

This study provides a comprehensive analysis of how motion is expressed in English, focusing on lexical items and syntactic structures. Using Talmy's (1985; 2000) typological framework – which contrasts Satellite-framed languages (Path in satellites, Manner in verbs) with Verb-framed languages (Path in verbs, Manner as adjuncts) – the study explores various constructions for expressing located and directed motion. These range from basic Path verbs with optional PPs (bare directed motion) and Manner verbs with locative PPs (located motion) to Path-Manner verbs and Goal of Motion structures. Complementing the theoretical analysis, a corpus of English narratives was examined to investigate the acquisition and use of motion verbs and constructions across age groups, from early childhood to adulthood. The findings reveal consistent developmental patterns, with increasing complexity in lexical and syntactic choices as narrators grow older.

The findings have shown that the youngest children mainly use bare directed motion structures, though Goal of Motion constructions also appear in their simplest form. As children grow older, they produce more elaborate structures, acquire more specialized Manner- and Path-denoting lexical items, and use more complex structures to express motion events. Goal of Motion constructions become more frequent, although the corpus does not confirm Talmy's suggestion that it is the preferred lexicalization pattern for English speakers. We propose that the results may be influenced by the experiment's design, as static pictures might encourage simpler descriptions rather than more creative responses.

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