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► **To cite this version:**

Annie-Claude Demagny. Interrelationships between Time and Space in English and French discourse: implications for second language acquisition. *Langage, Interaction et Acquisition / Language, Interaction and Acquisition*, 2015, 6 (2), pp.202-236. <10.1075/lia.6.2.02dem>. <halshs-01285306>

HAL Id: halshs-01285306

<https://shs.hal.science/halshs-01285306v1>

Submitted on 4 Nov 2019

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Interrelationships between Time and Space in English and French discourse

Implications for second language acquisition

Annie-Claude Demagny

CNRS – Université Paris 8

This paper explores the expression of temporal boundaries in narrative discourse drawing on cartoon-elicited productions which narrate caused and/or voluntary motion events involving four types of paths. We hypothesise that the way speakers express temporal boundaries depends on the “framing” of their first language (Talmy 2000). We therefore examine productions by speakers of L1 French (V-framed language), L1 English (S-framed) and English learners of L2 French at three levels of proficiency. Productions may include a *Setting section* and a *Main event*. Findings show that each speaker group has its own mode of expressing temporal and spatial boundaries. The choice in L1 French depends on Path type, but not in L1 English. English learners of L2 French pattern more like L1 French speakers for verbal morphology, but their expression of space is nearly similar to their L1 English. The discussion highlights implications of this linguistic framing type for L2 acquisition.

Keywords: Linguistics typology, SLA, psycholinguistics, Space, verbal morphology, Time, English, French.

1. Introduction

Space and Time are two fundamental referential domains for human cognition. These domains have been extensively studied from different linguistic perspectives. Topics addressed include the expression of space and time in the study of linguistic universals, typology, as well as in the study of child language and second language acquisition (SLA). Within this thematic range, the study of bilingualism offers the possibility “to identify the processes taking place in the bilingual mind and the predictors and manifestations of conceptual restructuring” (Pavlenko 2011:245). Although the underlying conceptual structuring of Space and Time

appears to be universal, there is a great deal of cross-linguistic variability in the encoding of spatial and temporal event characteristics. Depending on the language to be learnt, L2 learners may be faced with a system that is different from the one in their mother tongue. This article aims to define the constraints facing the second language learner due to typological variability, focusing in particular on the English speaker learning French. This article has two principal goals: 1) to identify the role of typological differences in framing at the utterance and discourse levels, taking into consideration expressions of both time and space together, and 2) to understand the effect of these differences on the acquisition of French by English native speakers.

English and French are considered typologically distant in their expression of space (Talmy 2000/2003). Another distinguishing typological feature between these languages is aspectual marking on the verb, as shown in Smith (1991). Space and Time have been extensively studied separately, but very few experimental acquisition studies examine both together and consider their potential interaction. This interaction in English and French is one of the foci of this article, as is the impact of this interaction on the acquisition of L2 French by adult English-speakers.

The relations between spatiality and temporality in language

The relations between the domains of Space and Time have generated many studies. Two main approaches dominate the debate regarding the possible relations between the two domains: in the first one, spatiality underlies the expression of temporality; and in the other, the two domains are independent despite the existence of some shared linguistic features. Some studies show that the expression of temporality is conceptually dependent on spatial terms or metaphorically based on the expression of spatiality (Clark 1973; Lakoff & Johnson 1980, 1999; Lakoff 1993; Langacker 1987, 1991; Talmy 2006). The proposal that the expression of Time is based on the spatial domain remains a common hypothesis to this day (see Haspelmath 1997 and Chalozin-Dovrat 2015 for overviews). The tenets of this hypothesis rely on the cognitive ease of establishing temporal orientation thanks to concrete spatial elements. Clark (1973), among others, suggests that temporal expressions such as *before* and *after* derive from the spatial expressions *in front of* and *behind*. Lakoff (1993:218) assumes that our metaphorical comprehension of time in spatial terms is biologically determined: our visual system is geared towards the detection of motion and the localisation of objects. As the detection of time is more complex, it is a likely possibility that it is understood in terms of spatial localisation and motion. Indeed, motion takes place in space and has a temporal duration. Hence, the link between space and time is particularly obvious

in these types of events and the expression of path can entail temporal boundaries irrespective of the language-specific expression of the information.

The question of the relation between spatial and temporal domains has been recently addressed in a more experimental way. Casasanto and Boroditsky (2008) present six psychophysical experiments involving non-verbal tasks and stimuli. Their results show that their subjects cannot ignore irrelevant spatial information when determining the duration of an event. This finding suggests that the metaphorical relations between the two language domains, such as distance and duration, also exist in more basic mental representations and may be partly established on the basis of physical experience, such as sight and action. Casasanto, Fotakopoulou and Boroditsky (2010: 403) also conclude that “Space and Time are related asymmetrically in children’s minds. Kindergarten and elementary school-aged children can ignore irrelevant temporal information when making judgments about space, but they have difficulty ignoring spatial information when making judgments about time”.

In contrast, Habel and Eschenbach (1997) consider the two domains as independent in their conceptual representation, although they share a range of systematically related, representative linguistic structures. Studies by Tenbrink (2007) show that while the two domains share many basic traits, depending on the type of discourse, this does not indicate an underlying relation of dependence.

Although we will not explore this debate further in this paper, we take an active interest in the fact that in many languages Space and Time share similar linguistic means of expression. Specifically, we examine how this leads to their potential joint role in the expression of temporal boundaries, and how distinct lexicalisation patterns lead to different patterns of expression across languages within a typological perspective.

The following section addresses the expression of Time and Space with particular reference to English and French, within the context of our hypothesis that the typological framing of languages (Talmy 2000/2003) has an impact on the expression of temporally bounded and unbounded events in L2 narrative discourse.

2. Temporality and Spatiality in languages

Lexical aspect

Many researchers have shown that verbs together with the rest of the predicates to which they belong inherently express some temporal information, often called *lexical aspect*. One of the earliest researchers to classify predicates according to *lexical aspect* is Vendler (1957) who grouped them into four types: *States*

(unbounded); *Activities* (unbounded); *Accomplishments* (bounded durative events); *Achievements* (instantaneous bounded events). Many researchers have adopted this classification, sometimes adding further dimensions when needed (e.g. Smith's (1991) addition of semelfactives, i.e. instantaneous and iterative events, such as *to cough*). Studies assuming the notion of compositionality show that it is necessary to consider whole predicates rather than merely verb roots. For example, *dessiner* 'to draw' is an *Activity* verb, while *dessiner un cercle* 'draw a circle' is an *Accomplishment* predicate. Thus, it is the predicate — the verb and its arguments — that should be taken into consideration for this classification (e.g. *Activity* vs. *Accomplishment* predicate). This view is adopted here, i.e. unless otherwise indicated, we analyse predicates rather than verbs in isolation.

Lexical aspect is an intrinsic semantic property of verb predicates which is independent of other markers of temporality, e.g. as might be provided by verbal morphology, temporal adverbs, and discourse structure. In particular, it contributes to the marking of temporal boundaries. Specifically, the criterion of telicity distinguishes two types of events: those which include an intrinsic natural endpoint, a goal, a result or a change of state (*Accomplishments*, such as *to play a sonata* as exemplified in (1), *Achievements*, such as *to lose* (2)) and those that do not (*States*, such as *to have* (3), *Activities*, such as *to play* (4)). Combining telic and atelic events, or combining them with grammatical aspect and tense markings (see next section), can lead to different readings as exemplified below. Example (5) illustrates a case where a (punctual) event (marked here by the simple past *rang*) has occurred within the interval of another (durative) event (marked here by the past progressive *was playing the piano*), leading to a potential inference that the durative event is interrupted. In example (6), a temporal boundary is imposed on an otherwise unbounded predicate (*play the piano*) by means of the temporal adjunct *until*, this in contrast with (4), where the temporal adverb *yesterday* and the verbal morphology (simple past) contribute to mark a past event. Example (7) is an *Activity* predicate because there is no inherent endpoint to climbing. Example (8), however, introduces a spatio-temporal boundary by *jusqu'au sommet* ('until the top'). When considering temporal boundaries, a distinction must be made between the inherent temporal features of predicates that can lead to inferred readings and understandings of boundaries, and those that are explicitly added by means of temporal adjuncts and inflectional morphology.

- (1) Yesterday June played a Mozart sonata on the piano.
- (2) Yesterday June lost her keys.
- (3) June has a piano in her room.
- (4) Yesterday June played the piano.

- (5) June was playing the piano when the fire alarm rang.
- (6) June played the piano until 4 pm.
- (7) *Elle monte à l'arbre.*
Lit. She ascends the tree.
- (8) *Elle est montée jusqu'au sommet de l'arbre.*
Lit. She ascended until the top of the tree.

Grammatical aspect

While lexical aspect is a universal feature, languages differ in the way they express temporal boundaries through verbal morphology. In English, verbal morphology distinguishes the progressive (be + V-*ing*) from the non-progressive in both the present and the past. Examples (9) and (10) illustrate this contrast in the present.

- (9) She's cycling along the river.
- (10) She cycles (to school) every day.

The sentence in (9) answers the question 'what is she doing right now?'; that is, at the speech time, while (10) responds to a generic question 'how does she go to school?' Thus, the progressive in (9) represents an ongoing process. The same distinction is equally available for the past *was cycling/cycled*. In the analyses below, we will consider the simple past as potentially adding a temporal boundary, although this is not marked as such and may merely correspond to an inference. The simple past refers to an event which happened prior to speech time and, depending on lexical aspect, events marked with the simple past can be interpreted as indicating a) that a boundary has been reached (with inherently bounded events) or b) that the event has stopped (especially with inherently unbounded predicates) although speakers frequently assume by inference that some boundary has been reached even in the latter case.

The verbal morphology of French does not present the same temporal-aspectual features. In the present, there is no morphological aspectual marking, and ambiguity can only be resolved through temporal adverbials or context. Example (11) can therefore be interpreted as the speaker referring to either Caroline's general habits or to what Caroline is doing at speech time. In order to express the progressivity of a situation, speakers can use the periphrastic construction *en train de* ('in the course of') (Leclercq 2007).¹

1. The use of this periphrastic expression is mostly restricted to spoken language and to the description of particular situation types (Leclercq 2007).

- (11) *Caroline court dans la forêt.*
 ('Caroline is running/runs in the forest')

Grammatical aspectual alternation is possible only in the past, notably through the opposition of the *passé composé* and the *imparfait*. These two past tenses do not have the same aspectual features. The *passé composé* results in a perfective reading (12) and the *imparfait* can have two readings: habitual (13), or progressive in the past (14).

- (12) *Lundi, j'ai déjeuné avec des amis.*
 ('On Monday, I had lunch with some friends')
- (13) *Le lundi, je déjeunais avec des amis.*
 ('On Mondays, I used to have lunch with some friends')
- (14) *Lundi, tu travaillais pendant que je déjeunais avec des amis.*
 ('On Monday, you were working while I was eating with some friends.')

Tense, aspect and discourse

Kamp (1981) and Smith (1991) argue that the meaning of an utterance contributes to the meaning of discourse and to its temporal interpretation. Temporal reference in a given discourse is based on reference to intervals that correspond to situations (events, actions, reports). These situations are sequenced, located, and oriented with respect to temporal anchoring. Smith (2004) argues that events and states in a narrative are temporally connected to each other: "after the first sentence of a narrative the times are sequential or simultaneous with previous times in the text" (Smith 2004: 168). The events are ordered with regard to the others in a story. Thus, discourse coherence and cohesion partly depend on temporal coherence and cohesion.

In other words, the aspectual distinction plays an important role in such discourse organisation, as it is used to signal "foreground" vs. "background" information. The foreground corresponds to "situations that move the main line of the plot forward", whereas the background "corresponds to situations that surround the foreground" (Hickmann & Hendriks in press). Thus, in example (15), the event 'arrive' takes place within the time interval of the event 'sing' and represents foreground information. The overlap of the two events is expressed by the juxtaposition of the past progressive (*was singing*) and the simple past (*arrived*) in combination with lexical aspect (*sing* = activity, unbounded, *arrived* = achievement, bounded). By contrast, the use of the simple past for both events (16) triggers an interpretation of temporal succession. In example (17), the utterance expresses the

simultaneity of two sub-events, where one is marked by a gerund (*en courant* ‘by running’), following a main clause with the *passé composé* (*est partie* ‘left’).

- (15) Jude was singing when Claire arrived.
- (16) Jude sang. Claire arrived.
- (17) *Claire est partie de l'école en courant.*
Lit. Claire left the school by running
(‘Claire ran away from school’)

The French past tenses (*passé composé* and *imparfait*) have similar discourse functions to the English past non-progressive and past progressive, as exemplified in (18) and (19). In example (18), the activity performed by Amélie constitutes the background (*reading*), whereas the arrival of Florence constitutes the new foregrounded information in the discourse. Amélie’s activity has started before Florence’s arrival and may well continue after it, but this is not specified in the utterance. In (19), the interpretation of temporal succession is again triggered.

- (18) *Amélie lisait un livre. Florence est arrivée.*
(‘Amélie was reading a book. Florence arrived.’)
- (19) *Amélie a lu un livre. Florence est arrivée.*
(‘Amélie read a book. Florence arrived.’)

Space

In the case of the expression of Space, we follow Talmy’s (2000/2003, 2008, 2013) typology of languages with regard to the expression of Path in motion events. Talmy breaks down motion events into several components: an entity in motion (Figure) follows a trajectory (Path), or is located with respect to another entity, which constitutes a frame of reference (Ground). Talmy distinguishes Path from Location: Path indicates a trajectory, the direction in which a moving Figure progresses, while Location indicates a place where the Figure is or where an event takes place. Talmy argues that the distribution of Path information in the utterance defines two types of languages, *Satellite-framed* languages (e.g. English, other Germanic languages) and *Verb-framed* languages (e.g. French, other Romance languages). In the first case, Path information is marked outside the verb, in the *satellite* of the verb (20), while in the second, Path information is lexicalized in the verb (21).

- (20) The girl ran **across** the street.
- (21) *La petite fille a traversé la rue en courant.*
Lit. The girl crossed the street by running.

In a later paper, Talmy (2013:2) defines the term *satellite* as “a constituent in construction with the main verb (root) and syntactically subordinate to it as dependent from a head”. He distinguishes satellites from prepositions which he defines as “a constituent in construction with an NP that could consist of a preposition and/or a postposition and/or an affix on the noun of the NP.” In our analysis below, however, we will use a wider notion of satellites. The fact that Talmy excludes prepositional constructions from his definition of satellites is a problem previously raised by numerous authors (Beavers 2010; Croft, Barddal, Hollmann, Sotirova & Taoka 2010; Demagny 2013; Fortis 2010; Harr 2012; Hickmann & Hendriks in press, 2015; Matsumoto 2003), either because of definitional reasons (Beaver 2010), or because it excludes potentially valuable spatial information expressed in other parts of speech (Demagny 2013; Hickmann & Hendriks in press, 2015; Harr 2012).

Another criticism of Talmy’s typology rests on its binary frame (S-framed vs. V-framed languages). Some languages were found not to fit easily into one language type or the other. For example, *serial/equipollent* languages, in which it is difficult to define different elements as verbs, or satellites. Equipollent languages have “a kind of framing in which both path and manner have roughly equal morphosyntactic status” (Slobin 2006: 64). This new frame type includes serial verb languages, such as Niger-Congo, Hmong-Mien and Sino-Tibetan, bipartite verb languages, such as Algonquian or Hokan, and Jamijungan. Thus, Slobin (2006) and others (Beavers 2010; Pourcel & Kopecka 2005; Schultze-Berndt 2000; Zlatev & Yangklang 2004) propose additional frames to Talmy’s typology. However, Talmy (2013) questions the need for this addition in most of the cases proposed by his critics. He notes that “[...] the concept of equipollent framing should only be applied to cases where a constituent expressing Path and a constituent expressing the coevent together serve most or all of a main-verb like function in a sentence” (Talmy 2013: 26).

Slobin (2006) also proposes that the salience of the Manner of motion, which is expressed either in the verb or in satellites depending on the language, could provide a more relevant criterion for distinguishing languages than Path information. Thus, English and other Germanic languages exhibit a higher degree of Manner salience (22) than French and other Romance languages, characterised as exhibiting low salience of Manner, particularly in the expression of a change of location (23). The following two examples clearly demonstrate the difference between English and French. In the English example (22), Manner is lexicalized in the verb *pop* whereas Path is expressed in the particle *out*. In French, (23), the verb *sortir* (‘exit’) gives part of the Path and expresses a change of state, and the preposition *de* (‘from’) provides the source of the trajectory. No manner is expressed in this French utterance.

(22) An owl **popped** out.

- (23) *D'un trou de l'arbre sort un hibou.*²
 ('From a hole of the tree, exits an owl.')

Furthermore, Slobin (2006) and others (Croft et al. 2010; Hendriks & Hickmann 2015; Nikitina 2008) suggest that thinking in scalar rather than dichotomous terms could be more useful.

Where space and time come together

We now turn to the possible relation between the expression of Time and Space in English and French. Given the framing differences between English and French, and in particular their encoding of Path in Satellite versus Verb, it follows that boundaries will be expressed in different parts of speech, and may therefore interact differently with the inflectional system as well.

Boundedness is a central feature in all classifications of predicates. For example, Activities and Accomplishments are both durative and the difference between them is based on the fact that the latter includes a boundary. It is in this respect that Space and Time are reunited in some languages, particularly in speech focusing on spatial events (but not only), since the boundary is often marked in Accomplishments by means of spatial particles or prepositions (even if by no means always). For example, the predicate in (24) is an unbounded durative (Activity), while the predicate in (25) is a bounded durative (Accomplishment).

- (24) The girl is running along the road.

- (25) The girl is running into the house.

Furthermore, Aske (1989) argues that the expression of Path in the verb in verb-framed languages is also associated with telicity: "It is true, as Talmy says, that basic Path predicates tend to be main verbs in Spanish and secondary non-verbal predicates in English. But the inability of Spanish to express Path outside the verb is limited to telic Path phrases, i.e. Path phrases which also predicate an end-of-path location of the moving object." (Aske 1989: 11). Example (26) demonstrates that English expresses Path and telicity outside the main verb, in the particle *across*, contrary to French (27), which expresses Path and change of state in the verb *traverser* ('cross').

- (26) She walked across the street.

- (27) *Elle a traversé la rue en marchant.*
 Lit. She crossed the street by walking
 ('She walked across the street.')

2. Examples (22) and (23) from Slobin (2006).

Building on Aske, Slobin argues “One of the most salient characteristics of verb-framed languages is the preference to mark a *change of state* with a verb, rather than by some other device. With regard to motion events, changes of state are boundary-crossing events, and therefore the main verb must encode the change of state; enter, exit, cross” (Slobin 2006: 67; italics in the source). Demagny (2013) combines these ideas for French, showing the existence of this constraint on the expression of temporal boundaries in the main verb. In fact, if the Path includes a boundary, French must use a main Path verb, and Manner can only be expressed elsewhere (for example in a gerund) as illustrated in (28), while (29), despite its grammaticality, is not a standard form.

(28) *Elle est sortie en courant.*

Lit. She exited by running
(‘She ran out.’)

(29) ?*Elle a couru en sortant.*

Lit. She ran by exiting

This “boundary-crossing constraint” has an impact on Talmy’s typology. It seems that Manner verbs are possible as main verbs in Verb-framed languages, if there are no boundary-crossing events expressed in the sentence. It could follow that the salience of Path, on which Talmy builds his typology, can be substituted by the salience of Manner as suggested by Slobin (2006).

Temporal boundaries may be marked in different ways. In all languages, lexical aspect is an intrinsic semantic feature that contributes to expressing temporal boundaries. In addition, depending on the language, temporal-aspectual morphology can provide different types of explicit external markings used by speakers to mark such boundaries. Lexical aspect is particularly important in languages, but much more so for the spatial domain in Verb-framed languages such as French, where Path is frequently lexicalized in motion verbs (Talmy 2000). In English, temporal boundaries may be expressed in the satellites of the main motion verb in addition to any morphological marking that may also be used.

Additional differences in the inflectional systems across the two languages, and discourse constraints influencing the use of inflections (+/- progressive; +/- perfective), contribute to what must be acquired by English learners of L2 French, as we will see in the following section.

3. Second language acquisition

From a functionalist perspective, the ability to communicate in a foreign language depends on several factors: language-specific parameters, the type of communicative task, and the type of learner, including age and level of proficiency (see von Stutterheim, Carroll & Klein 2009). The relevance or salience of some information may vary depending on the communicative task and the speakers, so some information may remain implicit.

Second language learners have already acquired underlying concepts during the acquisition of their first language, but must learn the relevant linguistic means of the second language and how these are used (see von Stutterheim & Klein 1987: 194), which may lead them to reorganise or reconceptualise their representations: “To achieve quasi-native competence, [the learner] must restructure the organisational maps on a conceptual level, as most learners continue to function under the influence of the information structure of their source language” (Carroll & von Stutterheim 1997: 112).

More recently, Pavlenko (2011) has identified seven processes of conceptual reorganisation “that take place in the bilingual mind, sometimes sequentially and at other times simultaneously, depending on the speakers’ language learning trajectory and the domain in question”. Pavlenko’s analysis relies on the results of studies on categorisation (Athanasopoulos 2006, 2007) and event conceptualisation (such as Hendriks, Hickmann & Demagny 2008; Hendriks & Hickmann 2015; Lambert, Carroll & von Stutterheim 2003; von Stutterheim & Carroll 2006). The identification of these processes shows that learners refer to their L1 as a frame of reference in order to understand the similarities and dissimilarities between the source and target languages. Slobin proposes that “in acquiring a native language, the child learns particular ways of thinking for speaking” (Slobin 1996: 75–76). It is well-known that the L1 patterns represent a lasting challenge to even advanced adult learners (e.g. Schmiedtová 2011). Crosslinguistic influence is thus at the heart of Pavlenko’s proposal. Learners grasp the distance between the L1 and L2, depending on their individual level of proficiency and individual progress. These studies have shown the impact of language variability on cognition, without rejecting more universal developmental factors. A large number of studies on L2 and L1 acquisition have shown the influence of typological factors on the acquisition process (Hendriks & Hickmann 2015; Hendriks et al. 2008; Hickmann & Hendriks in press) and the modifications needed to achieve control of discourse structure that is close to native, even if not complete (cf. Lambert, Carroll & von Stutterheim 2008). The importance of discourse functions for the use of morphology in L2 acquisition has also been shown in many studies (Bardovi-Harlig 2000; Demagny 2012, 2013; Hendriks 1998, 2005; Lambert et al. 2003; Lambert et al. 2008; Leclercq 2007).

In a study of advanced L2 English learners (French- and German-speakers), Lambert et al. (2008) show that grammatical categories impose constraints not only at the local level of the utterance but also globally at the discourse level: they intervene in the way information (temporal, spatial, referential, events and knowledge of the world) is anchored and elaborated in discourse. L2 speaker patterns of narrative structuring demonstrate that this skill is difficult to master, lending a “foreign flavour” to the narratives of L2 learners, as noted by Lambert et al. (2003). von Stutterheim and Carroll (2006) and Lambert et al. (2008) have shown that even at a very advanced level, learners fail to adopt the discursive perspective of the target language. The length of immersion in a target language environment also plays a role, as shown by Pavlenko (2011) and Malt and Sloman (2003) among others.

Taking into account such approaches to L2 acquisition, we examine two hypotheses concerning the acquisition of the relations between spatiality and temporality by English-speaking learners of L2 French at three levels of proficiency.

4. Hypotheses

This study examines both temporal and spatial means of expressing boundaries, as well as the relations between them. Given the properties of English and French, we tested the following main hypotheses:

1. the typological framing differences between the two languages should have an impact on the relationship between spatiality and temporality in each language. Indeed, temporal boundary markers can take different forms: verbal morphology at the utterance level and discourse level, and the expression of Path in the main verb or in ‘satellites.’ These different forms could play a role in the way native speakers express temporal boundaries with or without spatial means. Given the framing differences between these two languages, we can make the assumption that English will use more spatial means outside the main verb than French, while French should use more lexical aspect than English.
2. These typological framing differences should have an impact on the acquisition of French by English learners. We therefore hypothesise that English learners of French should have considerable problems acquiring the French way of expressing spatial information, in particular when boundary crossing is involved. Discourse factors may constitute an additional difficulty for learners, given their need to pay attention to form and function at both the sentence and discourse level when producing their texts.

5. Methodology

Participants

The participants in the study (n=84) were divided into five groups: two adult native speaker groups, L1 English and L1 French (EngNS, FrNS, 24 per group, control group), and 36 adult English speaking university learners of L2 French, divided into three levels of proficiency (LearnLev1, Lev2, and Lev3), based on a university-internal test determining their proficiency depending on their grammatical and lexical knowledge. All the learners (21-24-years-old) had been in France for at least two months and at most six months at the time of recording. The amount of L2 French instruction they received in their home country varied: level 1 (at least three years); level 2 (at least five years); level 3 (at least six years). Level 1 learners have acquired the basic elements of spoken and written French and can give short, basic descriptions of events and activities. Level 2 learners can speak about brief descriptions, in order to convey routine factual information and state reasons for actions. Level 3 learners can describe situations and construct a chain of reasoned arguments. The learners were undergoing immersion in France in a semi-guided context at the time of the study, attending classes at the American University of Paris as part of their university curriculum.

The task

The controlled task consisted of 32 short cartoons (6–9 seconds) that show a human protagonist (*Popi*) manipulating objects (cf. Hendriks, Hickmann & Demagny 2008; Hickmann & Hendriks 2010). These cartoons varied along three crossed dimensions (see Tables in Appendix 1): Path, Manner of motion, and Manner of causing motion. Thus, with respect to Path, 16 cartoons show vertical motion (8 UP, 8 DOWN) with no boundary, i.e. a gradual change of location upward or downward, but no ultimate explicit goal location, and 16 show horizontal motion involving boundary crossing (8 ACROSS, 8 INTO). Among these 32 items, Popi is shown PUSHING objects in 16 cartoons and PULLING them in 16 other cartoons, causing them to either ROLL or SLIDE (equally divided, 16 of each) along four different paths (UP, DOWN, ACROSS and INTO). For example, the combination PUSH-ROLL-UP can be illustrated by a cartoon in which Popi rolled a rubber ring up a sand hill and the combination PULL-SLIDE-ACROSS in a cartoon where he pulled a toy horse that slid across the street to the other side.

The participants were presented with each individual cartoon, and asked to watch it all the way to the end. They were then asked to tell the story to a fictitious “naïve” interlocutor who would have to retell the story (“What happened?” for

English natives, “*Qu’est-ce qu’il s’est passé*” for French natives and L2 learners of French), resulting in multi-utterance narratives.

Coding

All utterances were coded for spatial and temporal features at the clause and discourse levels. Following a general definition of narrative parts (Labov & Waletzky 1967), each cartoon can be divided into three parts, two of which are analyzed below: scene setting and the main event itself which was always a motion event (a third part also involved departures or final states, not analyzed here). The coding of discourse therefore includes an indication of scene setting versus main event utterances. The setting presents the ‘scene’, including the frame in which the story progresses, and the introduction of the human and non-human entities. Subsequent productions focus on the actions of the human protagonist and the consequences for the object, as well as on the Manner of motion and the Path of motion followed by both the protagonist and the object. In this article, the Main event utterances are those referring to the main motion event elicited. Example (30) shows the discourse segmentation: part [1] contributes to the scene setting, part [2] are main motion events (description of a DOWN stimulus). Example (31) is a typical answer produced by an EngNS for the same stimulus without the scene setting expressed. Example (32) includes two utterances expressed by a Level 2 learner, only speaking about the Main event. In this latter example, the simultaneity of the two sub-events is not expressed (for the same DOWN stimulus).

- (30) [*Alors monsieur Popi se trouve encore à la montagne, mais cette fois-ci au sommet d’ une colline*] [1], [*et il descend cette colline, tout en poussant une balle multicolore*] [2]. (FrNS)

[‘So, Mr. Popi finds himself again in the mountains (Lit. at the mountain), but this time on the top of a hill] [1], [and he descends this hill, while pushing a coloured ball’] [2].

- (31) Popi rolled the beach-ball down the hill. (EngNS)

- (32) *Maintenant Popi # pousse une boule # vert, violette et # jaune. Il descend avec la boule # la colline.* (LearnLev2)³

(‘Now Popi pushes a green, violet and yellow ball. He goes down the hill with the ball’ (Lit. He descends with the ball the hill)).

3. The symbol # indicates a slight pause. Slashes, as in /word/, indicate a phonetic transcription in cases of ambiguities in verbal morphology.

The coding of predicates includes the four classes proposed by Vendler (1957), some of the semantic information encoded in the verbs (e.g. whether they are static or dynamic, express motion or not, provide Path or Manner information), verbal morphology, spatial prepositions and particles, the syntactic structures used, as well as the presence and location of temporal boundaries as a result of all of the above. The coding of these items allows us to compare their use across the two native speaker control groups, and how the specificity of their use in the learners' L1 may impact their use in the L2.

6. Results

As described above, all analysed utterances were categorised as referring to the Scene setting or to the Main motion event depending on the semantic content expressed in the utterances. In the following, we first discuss the findings for scene-setting utterances, then those for main events. For Main events, the following analyses were conducted: 1) general distribution of predicates, 2) verbal morphology as a function of predicates, 3) the expression of temporal boundaries. For each analysis, the results are given for EngNS first, then for FrNS and lastly for the three groups of French Learners.

6.1 Scene setting

The first series of findings concerns scene setting. Global measures indicate for each narrated cartoon if the speakers set the scene or launched directly into narrating the Main event.

The findings show that EngNS produce relatively few scene-setting utterances (21%), leaving the addressees to work out the background context of the stimuli on their own. FrNS produce scene-setting information more frequently (38%). These findings are in line with those reported by other researchers (Slobin 2004 on English; Harr 2012 on German), who also found that speakers of V-framed languages tend to provide scene settings more frequently than speakers of S-framed languages. Closer examination shows that the lack of scene settings in English tends to be most prominent with ACROSS items, whereas in French, this item type does not seem to influence the setting of the scene. When analyzing the predicates used in the setting, we found that both English and French native speakers tend to express mostly states to set their scenes (74%; 72%). Often, these are accompanied by spatial locations as in (33), or possessives with *have* ('avoir') (34).

(33) Popi is on the top of the snow pile. (EngNS)

(34) Popi has a beach ball. (EngNS)

Both groups also occasionally use motion verbs to describe static situations involving inanimate figures as if they were dynamic (a use termed *fictive motion* by Talmy 2000/2003; to *meet*, to *run*, *aller* 'to go', *monter* 'to ascend', *toucher* 'to touch', *traverser* 'to cross', *descendre* 'to descend' as in (35).

(35) *Le toit descend.* (FrNS)

Lit. The roof descends

('The roof slopes down.')

None of these types of utterances express a boundary-crossing event, but English native speakers do occasionally express the initiation of events, through verbs like *start* (40), before expressing the main event, a strategy not found in the French native speakers' production. As regards our main focus of interest, the expression of right boundaries (which mark the end of a situation), only the FrNS do this, using Achievements in this context (36), but only in relatively few cases (8% on average, 4–11% depending on item type). In these cases, temporal boundaries are expressed through lexical aspect, using the verbs *partir* ('to leave', 36), *arriver* ('to arrive', 37), rather than through verbal morphology or adjuncts, and the contexts of use of these predicates are very similar to those in which the English native speakers use predicates like *to start*. The *passé composé* is used in 33% of cases with these predicates intrinsically involving right boundaries (36).

(36) *Il est parti de la place.* (FrNS)

('He left the square.')

(37) *Il arrive avec sa valise.* (FrNS)

('He arrives with his suitcase.')

Overall use of inflections shows a predominant use of present tense markers: Native speakers of English mostly anchor the setting in the simple present and native speakers of French use the *présent* which is unmarked for aspect (Smith 1991). In the learner groups, the number of scene-setting productions fluctuates between 6% and 19%, never approaching the level of the FrNS. The L2 learners express mostly states (LearnLev1 68%; LearnLev2 85%; LearnLev3 95%), as do the EngNS, and also display the use of verbs like *start* in their French productions at all levels as in (39), similar to the EngNS (38). Activity predicates are rare in all five groups and Accomplishments are non-existent. The FrL2 learners also tend to use the unmarked *présent*, except for some Lev2 learners who use the *imparfait* (27%).

- (38) So, Hopi starts eh on the ground at the bottom right side of the screen.
(EngNS)
- (39) *Popi # commence # sur le terre.* (Lev1)
(‘Popi starts on the ground.’)

In sum, as expected, scene settings mostly express static situations, including locations and other types of background information, but do not include many situations in which boundaries are involved.

6.2 Main Events

6.2.1 General distribution of predicates

The “Main event” is the part of the narrative in which the speaker notes the actions that constitute the core of the cartoons. We first discuss the general distribution of predicate types by speaker groups (Activity predicates vs. Accomplishment and Achievement predicates), for all item types in the cartoons (Figure 1). The data show a clear difference in the choice of predicates between the two groups of native speakers: EngNS produce Activity predicates and Accomplishment predicates in similar proportions (50% of all predicates produced in relation to main events, no use of Achievements), whereas FrNS produce more Activities (73%) than Accomplishments and Achievements, and Accomplishment predicates are more frequent (21%) than Achievements (6%). This latter result was expected due to the nature of the task (i.e. durativity of the events). However, we expected similar proportions of Activities and Accomplishments as in English. The learners use a high percentage of Activity predicates (LearnLev1: 81%; LearnLev2: 71%; LearnLev3: 68%). The percentage of Accomplishments and Achievements increases with

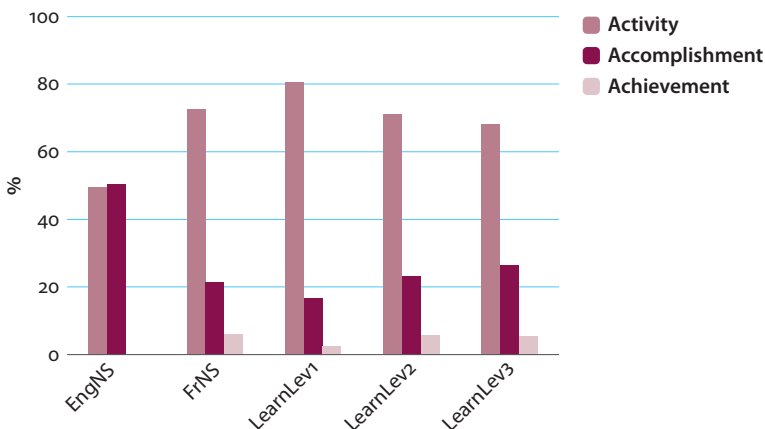


Figure 1. Types of predicates in “Main event” productions

proficiency, thereby approaching FrNS productions in the choice of predicate types. This result was expected, given the learners' increase in proficiency level and their lexical development. But the fact that the data looked relatively similar to the FrNS was not expected given the learners' L1.

6.2.2 *Verbal Morphology as a function of Predicate Types*

The verbal morphology used with Activity, Accomplishment and Achievement predicates highlights the typological differences and the gradual acquisitional development in L2 French. As shown in Section 2, the verbal morphology available is different for the two L1 groups. The following results show the proportions of verbal morphology for each type of predicate and for each group of speakers. The findings indicate that EngNS have a clear preference for the progressive with Activity predicates (67%), and slightly less so for Accomplishments (55%) (Achievements were not attested). EngNS also use the simple present (Activities: 16%; Accomplishments: 21%) and simple past (Activities: 16%; Accomplishments: 23%), but infinitives are rare (Activities: 1%; Accomplishments: 1%). FrNS use the aspectually unmarked *présent* (Smith 1991) in the majority of cases with all three types of predicates, and also employ gerunds (41%) with Activity predicates, as in (40) as well as with Accomplishments: 15% and Achievements 25%, whereas they prefer to use infinitives with Accomplishments (12%) and Achievements (25%), as in (41) (infinitives are used with Activities in only 5% of cases). The last two uses are noteworthy. Activity predicates attract the gerund, while Achievements attract more infinitives. In other words, when FrNS wish to express a simultaneous unbounded sub-event, they choose a gerund. But if one of the sub-events involves boundary crossing, particularly if it is expressed by an Achievement predicate, they tend to choose an infinitive proposition (41), in which case the simultaneity of the two sub-events is not explicitly expressed. In (41), the choice of the infinitive may be explained by the fact that the entry of the human figure and of the displaced object into the house took place at the end of the stimulus, making the simultaneity of the sub-events less evident, even if the sub-events are always presented as happening simultaneously in the stimuli. These two examples give us the opportunity to speak of the packaging of information. In (40), the FrNS uses a Path main verb, and a Manner verb as a gerund, whereas in (41), he expresses Manner in the main verb, giving the Path with an infinitive (expression of the goal). Example (40) represents the more typical way for FrNS to express simultaneity in our database.

(40) *Il descend une collin, en tirant une brouette derrière lui.* (FrNS)

Lit. He descends a hill pulling a wheelbarrow behind him.

- (41) *Alors Popi pousse la table pour la rentrer dans la maison.* (FrNS)
 ('So Popi pushes the table to put (Lit. enter_{transitive}) it in the house.')

In comparison to French natives, Lev1 learners seem to initially overuse the *passé composé* with all types of predicates, but most clearly with Accomplishment predicates (Activities: 36%; Accomplishments: 48%; Achievements 19%). Ambiguous verbal morphology is common with Activities (31%) and Achievements (38%). Example (42) presents such ambiguous verbal morphology, very common for L2 learners of French at low proficiency.⁴

- (42) *Popy /puse/ # une roue # dans une caverne # dans les bois.* (LearnLev1)
 Lit. 'Popi <pushed> a wheel, in the cave, in the woods.'

The use of the present tense is more frequent with Accomplishments (34%) than with Activities (25%) or Achievements (13%). It seems that for the main events, there is a tendency to use inflections related to the type of predicate in the Lev1 learner data. The gerund is practically nonexistent (0–2%). Given their level, it seems that this form of expression is too complex. The infinitive is used primarily with Achievements (31%) (vs. Activities: 6%; Accomplishments: 10%). Thus, given that learners encounter difficulties when expressing simultaneity because of the necessity to use the gerund, in many cases, they opt for another solution which is to express the goal (*pour+infinitif* 'to'+Infinitive (41)). At Lev2, ambiguous forms virtually disappear (4%) and the frequency of the *passé composé* diminishes as well (12% with Activities, 7% with Accomplishments, none with Achievements). Both are replaced by the *présent* used with all three predicate types (69% for Activities, 60–61% for Accomplishments and Achievements). The gerund is used primarily with Achievements (28%) (vs. Activities: 10%; Accomplishments: 6%). At Lev3, the *présent* is still the preferred form with Activities (67%), but the infinitive is preferred with Accomplishments (14%) and Achievements (11%). At Lev3, therefore, the learners start using verbal morphology as in the target language. The use of the gerund construction seems quite difficult for them to learn, particularly as regards acquiring the native patterns of use. While FrNS use the gerund to express the Manner of the character's action on the object in a single complex sentence (40), learners show a clear tendency to use the gerund to express Path (43).⁵

- (43) *Il roule le ballo # en descendant la colline.* (LearnLev3)
 Lit. He rolls the ball, while descending the hill.

4. The ambiguous forms were treated as a separate category, and therefore do not feature in the following analyses.

5. See Demagny (2013) with regard to the issue of locus of information in motion events.

Having analysed the verbal morphology of all the predicates used to describe Main events, we now move to the expression of boundaries used for these events, which is the primary focus of this article.

6.2.3 *Events with a temporal boundary and their expression through lexical aspect, verbal morphology and spatial expressions*

In the following, we will discuss the expression of temporal boundaries organised around the lexical aspect of the predicate. Starting with Activity predicates, remember that these can be bounded by simple past or *passé composé* markings, or through additional temporal adjuncts such as *until 4 pm* (cf. section on lexical aspect). Section 6.2.2. has already reported the cases in which Activities were combined with simple past or *passé composé* markings (EngNS: 16%; FrNS: 4%; Lev1: 36%; Lev2: 12%; Lev3: 4%). No other temporal boundaries were expressed with Activities in our data.

We now turn to the findings for Accomplishment and Achievement predicates. Figures 2–6 show the way in which the speakers within each group mark temporal boundaries in Accomplishment and Achievement predicates. These figures show the relative proportions of the following three cases: 1) the use of the simple past only in English and of the *passé composé* only in French **without** a bounding spatial expression; 2) the use of bounding spatial expressions only (without simple past or *passé composé*). In the latter case, ‘bounding spatial expressions’ can be particles (only in English) and prepositional constructions (both in English and French); 3) lexical aspect through the use of inherently bounded verbs, without the other two options (simple past in English or *passé composé* in French and bounding spatial expressions). The use of the non-progressive (simple) past in English or of the *passé composé* in French, when it is accompanied by bounding spatial information, is marked in the figures as ‘Both.’ These different types of boundaries are illustrated in (44) to (53). Right-bounding in EngNS productions is marked using a single spatial expression (*across* in (44) or through a combination of a morphological marking (simple past) and a spatial expression (*into* in (45)). We did not find any bounded predicates with only simple past as a way to bound the predicates. This result questions the role of the English simple past when used alone in the marking of boundaries. The data therefore show the interrelations between the expression of Time and Space in that the speaker must use the simple past with another expression (e.g. spatial particle or preposition) in order to mark boundaries. Figure 2 shows that EngNS primarily use bounded spatial expressions, as in example (44), regardless of Path shown in the cartoons. Furthermore, we find a fairly constant proportion of use of the simple past with bounded spatial expressions (15–21%) as in (45), again regardless of Path. EngNS productions therefore reveal a high level of homogeneity that is not found in the productions of other speakers.

- (44) He's pulling a pram **across** the road from left to right. (EngNS)
 (45) (...) and rolled this tyre **into** the cave. (EngNS)

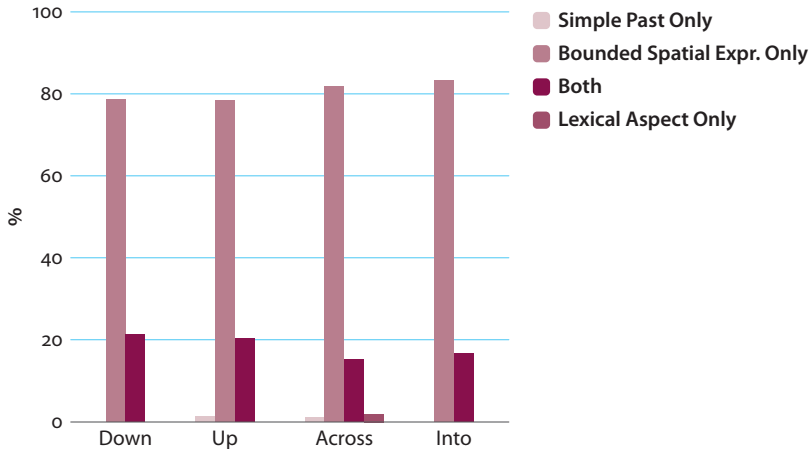


Figure 2. Accomplishment and Achievement predicates in Main events (EngNS)

FrNS use a larger variety of constructions (Figure 3) than EngNS to bound events. Example (46) shows the bounding of an event through the use of lexical aspect and verbal morphology, while (47) shows bounding through the spatial expression *jusqu'à* 'until' and the *passé composé*.

- (46) [...] *et a rentré le caddie dans la grange à gauche* [...]. (FrNS)
 ('...and put (Lit. entered_{transitive}) the shopping cart in the barn to the left')
- (47) *Popi a tiré une malle du haut d'une colline de neige, à la montagne, jusqu'en bas de la colline.* (FrNS)
 ('Popi pulled a suitcase from the top of a hill of snow, in the mountains (Lit. at the mountain), to (Lit. until) the bottom of the hill.')

Both types of bounding constructions coexist in French. Note also that FrNS prefer to rely on lexical aspect to express bounded Path in horizontal contexts (*traverser* 'cross', *entrer* 'enter'). In contrast, the predicates used for vertical motion (*monter* 'go up', *descendre* 'go down') do not have intrinsic boundaries, leading FrNS to express boundaries occasionally through a spatial expression such as *jusqu'à* 'until', very common in French to express a temporal or spatial boundary. Although a relationship between verbal morphology and bounding spatial expressions exists with upward motion (Figure 3), it is much less common than in EngNS productions. A possible explanation for this result can be found in ontology. In fact, in embodied cognition (Gallagher & Meltzoff 1996; Maouene, Hidaka & Smith 2008; Pfeifer et al. 2007; Zlatev 2007), concept formation is related to

our physical experience of the world. Thus, upward motion includes no intrinsic ontological boundary, whereas for downward motion, the Ground (i.e. the lower section of the location) serves as an inherent inferable endpoint, thus eliminating the need to express a temporal boundary. Although ontology is supposed to be universal, the results show that EngNS are not sensitive to the different Paths, whereas FrNS are. This could explain the difference we find between UP and DOWN Path in French.

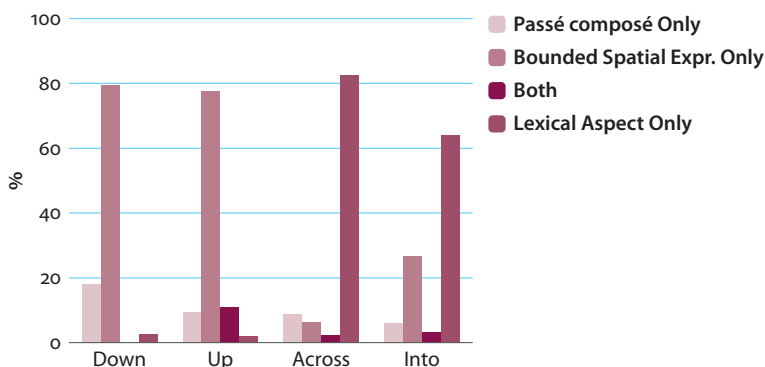


Figure 3. Accomplishment and Achievement predicates in Main events (FrNS)

Productions of Lev1 learners (Figure 4) are unique in this respect, since downward motion is never bounded (48) and upward motion is bounded only by the spatial expression *jusqu'à* 'until' (49).

- (48) *Il pousse la valise descendre # la # colline # de neige.* (LearnLev1)
Lit. He pushes the suitcase descend the snow hill.
- (49) *Il pousse le bouée jusqu'à # le parte de haut # de la colline.* (LearnLev1)
Lit. He pushes the wheelbarrow until the part of the top of the hill.

The two horizontal items are also treated differently. ACROSS is the only item type exhibiting interrelations between temporal and spatial boundaries: the *passé composé* is used with bounding spatial expressions in all cases. Speakers also rely on lexical aspect at Lev1 (Figure 4) (using the verbs *traverser* 'cross' and *entrer* 'enter'), although this may lead to idiosyncratic productions (e.g. a transitive use in (50), and in (51) the lack of a spatial preposition (localisation *dans*, Lit. 'in').

- (50) *Et, il a # le # truc avec # les pommes, il l'a traversé par # par l'autre côté de la # rue.* (LearnLev1)
Lit. And, he has the thing with the apples, he crossed it by the other side of the street.

- (51) *Il est entré le ferme et il /tire/ le chaise verte.* (LearnLev1)
 Lit. He entered the farm and he <pulls> the green chair.

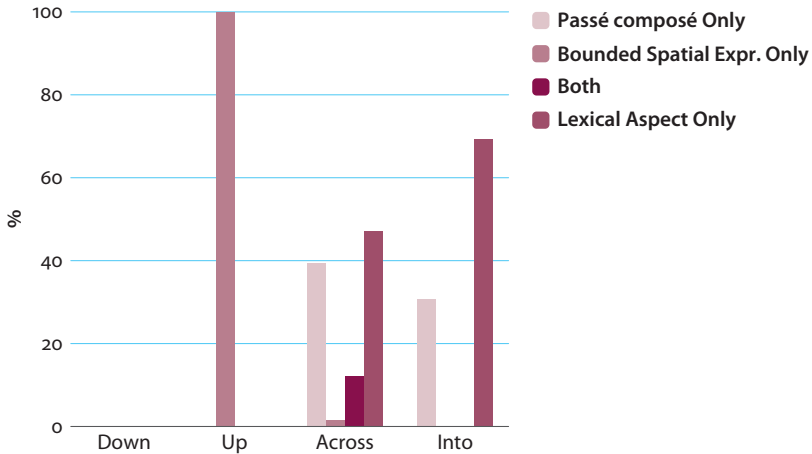


Figure 4. Accomplishment and Achievement predicates in Main events (Learners Level 1)

In other words, the learners use verbal morphology to mark a bounded event together with intrinsically bounded lexical aspect. This result confirms what Leclercq and Lenart (2015) found in narratives: the learners tend to be redundant, using verbal morphology and lexical aspect. Consequently, the expression of boundaries at Lev1 is very specific and highly constrained by item type. Lev2 productions (Figure 5) are much closer to the target language, using bounding spatial expressions for vertical motion and lexical aspect for horizontal motion. The differences are minimal, particularly with the use of bounding spatial expressions to describe entering motion. Perfective verbal morphology is rarely used. Idiosyncratic structures are produced (52), but these do not prevent the comprehension of the utterance. Lev3 productions (Figure 6) are also quite similar to the TL, except in the use of perfective past with bounding spatial expressions for vertical motion (53), a use typical of Lev3. Thus, learners at this level employ two modes to mark event boundaries.

- (52) *Popi # a traversé # par le route avec la roue.* (Lev2)
 ('Popi crossed by the road with the wheel.')

- (53) *Un ballon # qu'il a poussé # du haut de la colline # jusqu'en bas.* (Lev3)
 ('A ball which he pushed from the top of the hill to (Lit. until) the bottom.')

Overall, EngNS exhibit great regularity for all types of motion, always using the simple past with bounded spatial expressions, while FrNS employ distinct constructions depending on the type of motion, vertical or horizontal with cross-boundary. In the case of the learners, they only begin to approach the target language at Lev2.

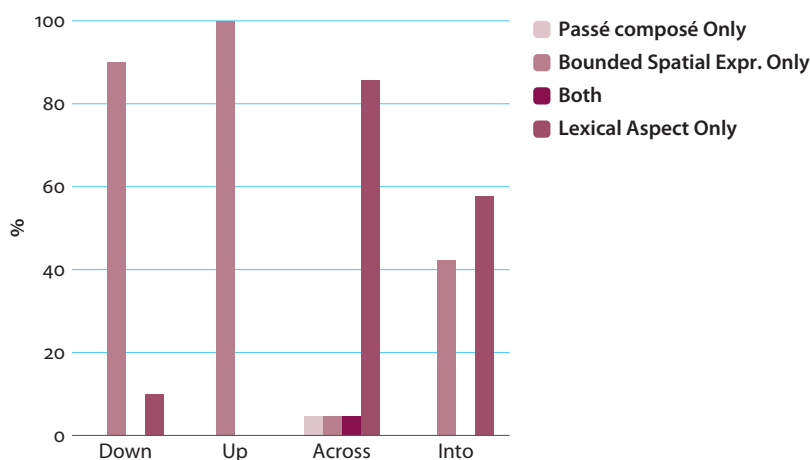


Figure 5. Accomplishment and Achievement predicates in Main events (Learners Level 2)

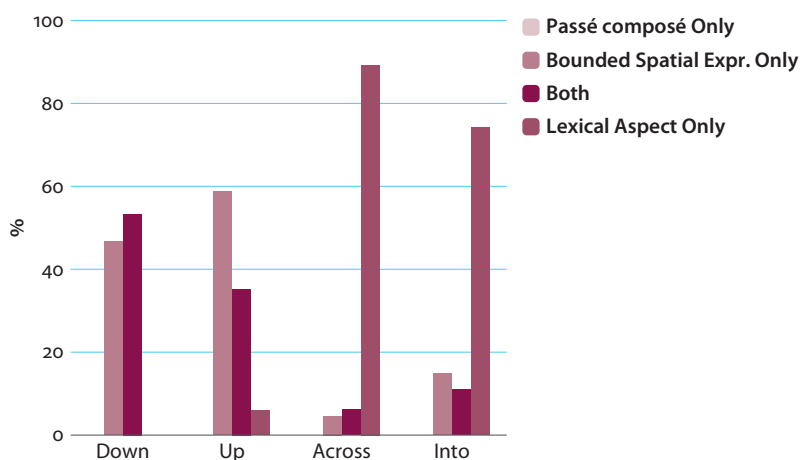


Figure 6. Accomplishment and Achievement predicates in Main events (Learners Level 3)

7. Summary and discussion

This article pursued two aims: 1) to account for the relations between Time and Space in the spatial discourse of speakers of two typologically distinct languages (S-framed *vs* V-framed) and 2) to consider the implications of these relations on the acquisition of English by learners of French as an L2 at three proficiency levels.

7.1 Relations between Time and Space in English and French discourse

The findings highlight significant differences between English and French. As shown above, various sections of the speakers' narratives are treated differently in these languages. In English, there is little scene setting, a finding which corroborates previous findings for English (Slobin 2004) and other S-languages such as L1 German (Harr 2012). We note here that EngNS do not produce bounded predicates (Accomplishment or Achievement) in the scene setting. In French, scene setting is more common than in English and involves varied types of predicates (excluding Accomplishments). Both English and French groups occasionally use fictive motion verbs such as *descendre* 'to go down' (54), *toucher* 'to touch' when only inanimate objects are involved in the sentence.

- (54) *Le toit touche le sol.* (FrNS)
 ('The roof touches the ground.')

In Main motion utterances, EngNS use Activity and Accomplishment predicates in similar proportions, while FrNS produce Activities, Accomplishments and some Achievements. This result seems to be a characteristic crosslinguistic difference in the encoding of events. Activity predicates involve more Path information than localisation for EngNS as in (55), while the opposite is true in French (56).

- (55) Mr Popi is pulling a car **over** the top of the roof of the house **from** the bottom **to** the roof of the house. (EngNS)

- (56) *Popi monte sur le toit de la maison, tirant derrière lui une voiture qui roule donc sur le toit.* (FrNS)
 Lit. Popi ascends on the roof of the house, pulling behind him a car which rolls therefore on the roof.

This result is due to the encoding of Path in the satellite in English and in the main verb in French, in accordance with Talmy (2000/2003). Furthermore, EngNS tend to indicate Path and Direction in the same utterance. Differences in verbal morphology between these languages are typical: EngNS primarily use the Present Progressive with Activity predicates when they use the present tense, while FrNS use the *présent* (aspectually unmarked, according to Smith 1991) and the gerund in equal measures to express the simultaneity of two sub-events. The gerund is needed due to the semantic packaging of information in French: the expression of caused motion by a human agent along a Path in French requires the use of two verbs (e.g. *monter* 'to climb' and *pousser* 'to push') (57). It seems obvious that French speakers have a tendency to mark simultaneous sub-events (Cause and/or Manner sub-events) with a gerund in Activity predicates (*en tirant la voiture* 'pulling the car') (57). But when they do not mark simultaneity with a gerund,

they express the goal of the situation through an infinitive (58). The latter result is found with Achievements in the case of INTO stimuli. English expresses caused motion in the verb (*push*) and the Path in a satellite (*down the hill*) (59).

- (57) *Alors Popi monte sur le toit en tirant la voiture.* (FrNS)
Lit. So, Popi ascends on the roof, pulling the car.
- (58) *Il le pousse pour arriver en haut du toit.* (FrNS)
(‘He pushes it to arrive at the top of the roof.’)
- (59) So Popi pushed the suitcase down the hill. (EngNS)

As for bounded predicates, EngNS never produce Achievements. Also, no significant difference was noted among the types of predicates (bounded and unbounded) in terms of verbal morphology in this group. English exhibits homogeneity and convergence of spatial and temporal expressions (i.e. production of simple past only with bounded spatial expressions). English speakers express the temporal bounding of a predicate primarily through particles or other spatial expressions outside the verb (e.g. *to*, *across*, *into*). This is, therefore, the strongest link between the expression of Time and Space in English. The types of Path have little influence on the relations between Time and Space in English, as the marking of temporal boundaries is outside of the verb, while the use of the simple past is always associated with bounded particles or spatial prepositions. In French, the type of Path does have an effect, particularly in the case of horizontal motion involving boundary crossing (ACROSS, INTO). In such cases, speakers rely mostly on the lexical aspect of the verb which provides intrinsic temporal boundaries, given the constraint on the lexicalization of boundaries in the verb (i.e. the verbs *traverser*, *entrer*, *sortir*, etc. ‘to cross’, ‘to enter’, ‘to exit’, etc.) (60) for V-languages (Aske 1989; Slobin 2006). Our results thus confirm Aske’s statement that the expression of Path in these languages is linked to the expression of a temporal boundary. In (62), the Path verb *traverser* (‘to cross’) involves boundary crossing which is expressed in the main verb, and the Manner and the Cause are given in the gerund by the verb *tirer* (‘to pull’).

- (60) *Il traverse la rue en tirant heu, derrière lui un cheval de bois.* (FrNS)
Lit. He crosses the street by pulling behind him a wooden horse.

Following Aske, Slobin (2006) argues that a Manner verb is possible in these languages when the predicate does not imply the crossing of a boundary. Our controlled experiments are in line with Slobin’s results. When there are no boundary-crossing events in our experiments (i.e. for Paths like UP and DOWN), French native speakers do express Cause and/or Manner in main verbs (*tirer* ‘pull’) and Path (*vers la droite* ‘towards the right’) in a satellite-like expression linked to it (61).

- (61) *Alors Popi tire une voiture de course derrière lui en montant vers la droite.*(FrNS)
Lit. So Popi pulls a race car behind him by ascending toward the right.

Since there is no lexical verb in French that could express both a temporal boundary and a rising or descending trajectory, to express such paths, the FrNS employ the temporal and spatial preposition *jusqu'à* +Noun (62), or do not bound the event. *Jusqu'à* ('until') is the only marker in our data that expresses a temporal and a spatial boundary simultaneously.

- (62) *Popi a fait glisser le gros cadeau en le poussant jusqu'en haut du toit.* (FrNS)
Lit. Popi made slide the big present by pushing it until the top of the roof.
(‘Popi slid the big present by pushing it to the top of the roof.’)

As shown by our analyses, the means to express boundary-crossing events depend on the verbal morphological system of each language, but also on its type of framing as defined in Talmy's typology (that is, on the way they express Path and Manner) in each part of the narrative. We demonstrated that English is homogeneous in the way it always expresses both bounded spatial expressions (other than in the main verb) and simple past forms with bounded predicates. In contrast, French is not so homogeneous: the use of the *passé composé* is not always related to bounded spatial expressions. In French, the bounded spatial expression *jusqu'à* 'until' cannot be used when a telic verb is available to express the Path. This is the constraint of telicity in V-framed languages, as suggested by Aske (1989).

7.2 Implications for the acquisition of L2 French

These differences between languages are not without influence on English-speaking learners of French. Discourse analysis of our learner productions showed significant differences with the TL. Some of these clearly stem from the learners' interlanguage, others are attributable to transfer from the L1. Little scene-setting information is expressed by the learners, who produce primarily states and very few activity predicates, regardless of proficiency level. This result can be related to L1 transfer, but it is also possible that, as a result of low proficiency, learners are constrained by the linguistic means they have available, and therefore transfer results in "minimal contributions". As Watorek wrote, "The adult learner [...] is forced to simplify the contents of the message to be delivered due to his/her rudimentary linguistic means, which affects the communicative efficiency of his/her production" (2004: 149).⁶ As a result, they only narrate the Main event in our

6. 'L'apprenant adulte [...] est contraint à simplifier le contenu du message à transmettre par des moyens linguistiques rudimentaires dont il dispose, ce qui affecte l'efficacité communicative de sa production.' Watorek (2004: 149) [our translation]

study. Verbs of fictive motion, which have been found in EngNS and FrNS productions, are not found in learner productions, indicating that such non-dynamic verbs have yet to be acquired by the learners, which can again be attributed to their proficiency level.

Several observations are noteworthy in the production of Main events information. First, verbal morphology clearly evolves with increased proficiency. The number of ambiguous markers and the use of the *passé composé* decreases sharply between Lev1 and Lev2 and from Level2 the use of the *présent* is close to that of FrNS.

At that point, the only remaining obstacle is the use of the gerund with Manner and/or Cause verbs, which develops from Lev2 onwards, but remains infrequent with unbounded predicates. In addition, the preference shown by FrNS to employ this mode for the expression of two simultaneous sub-events with unbounded predicates expressing Cause and/or Manner is not found in the learners. This fundamental difference may be due to a conceptual transfer from the L1, where Cause and/or Manner of motion are expressed in the main verb, while Path is relegated to the satellite (63) (*traîner* 'to drag': expression of Cause and Manner; *traverser* 'to cross': expression of Path). It also shows that the constraint on the expression of telicity in the main verb (noted by Aske 1989) is not acquired by the learners, despite its strong impact in French (Demagny 2013), even after complex gerundive structures have been acquired.

- (63) *Il traîne la poussette en traversant la rue.* (LearnLev3)
(He drags the pram while crossing the street')

This transfer leads to significant consequences, particularly in the expression of vertical motion. Globally, the types of predicates used in target utterances are similar to those used by the FrNS. With respect to spatiality, a significant difficulty in the expression of Path is noted with Activity predicates at Lev1. Learners at this level exhibit other particular features. Thus, they distinguish ascending and descending stimuli; the former are bounded by spatial expressions while the latter are unbounded, as if Lev1 speakers were guided by ontology in bounding such events. The two other types of stimuli (INTO and ACROSS) are also uniquely dealt with: INTO stimuli are bounded either with verbal morphology (*passé composé*) or with lexical aspect, while ACROSS stimuli are the only ones showing a dense relation between the expression of spatiality and temporality. This level of proficiency is highly constrained in its expression by the type of stimuli. The other two levels are much closer to the TL, both in their use of verbal morphology as in the expression of Path information. The differences with the FrNS (64) lie primarily in the expression of Path in the satellite, as in (65), particularly with vertical motion.

- (64) *Alors Popi a monté la dune de sable en faisant tourner la bouée.* (FrNS)
 Lit. So Popi ascended the sand dune making roll the wheelbarrow.
 ('So Popi went up the sand dune rolling the wheelbarrow?')
- (65) *Donc il roule la bouée en montant le toit.* (LearnLev3)
 Lit. So he rolls the wheelbarrow ascending the roof.
 ('So he rolls the wheelbarrow while going up the roof?')

We conclude that learners at both levels 1 and 2 must first reconstruct their utterances, especially in order to express Path in the verb and Manner in gerunds. The gerund is used more frequently than in native French productions with Achievements in Lev2, but rarely with Activity predicates at both levels. More generally, our learner data indicate that the impact of the L1 on acquisition gradually diminishes with increasing proficiency in the target language, as also shown by other studies (Cadierno & Ruiz 2006; Cadierno 2008; Navarro & Nicoladis 2005; Dimitrova-Vulchanova, Eshuis, Martinez & Listhaug 2012). However, in order to reach a more native-like level in French, the distribution of semantic information in the utterance still requires conceptual reorganisation. In particular, second-language learners must develop new ways of conceptualising events, learn two types of expression, lexical and grammatical, and understand the form-function relations that are necessary to express boundary crossing in French, at both sentence and discourse levels.

8. Concluding remarks

This study has focused on interrelations observed in the expression of temporal and spatial boundaries in discourse from a dual perspective that is both typological and acquisitional. From a typological perspective, English (S-framed) exhibits spatio-temporal relations which are not found in French. This relation becomes evident in the combination of the simple past with the expression of bounded Paths in the satellite. English also exhibits particularly compact structures, whereas French often requires subordination (e.g. gerunds). In addition, French verbal morphology has an aspectually unmarked present, but no relation between the *passé composé* and the spatio-temporal boundaries for the expression of some Paths (those without crossing boundaries like *up* and *down*). The expression of two types of simultaneous motion (caused vs. voluntary) in the same utterance forces French speakers to rely on verbs that intrinsically imply bounded lexical aspect first, and then to express caused motion in the rest of the utterance. These differences allow us to confirm that Talmy's typology fits with the dichotomous categorisation of Satellite- vs. Verb-framed languages at least for English vs. French, even though

a scale from the first to the second type of framing could also be created as suggested by numerous authors (Croft 2010; Hendriks & Hickmann 2015; Nikitina 2008; Slobin 2006). Although Talmy's typology has been fruitful in highlighting tendencies across many languages, it does not specify how much variability is possible within any language. One conclusion from this study is that his typology of motion events could take into account more interesting features, particularly more information concerning temporal and aspectual properties of languages.

These language differences also make French particularly difficult for native English adults to learn. Since French is clearly more variable than English in this respect, it takes learners some time to learn the constraints on the expression of temporal boundaries in the verb (lexical aspect), e.g. they continue to distribute information relating to the two sub-events in accordance with their L1 even after they have acquired the temporal-aspectual morphology of the target language. In this sense, we can conclude that English learners of French, even at Level 3 in our study, have not yet reconceptualised the time-space relation as acquired in their mother tongue. This relation can be very difficult, and may be impossible to reconceptualise, as the learners need to reorganize the expression of space in their utterances and at the same time take into account the constraints on the expression of boundedness. Future research including different L1 and L2 combinations is necessary to enable us to generalise these results, i.e. different S-framed L1 and V-framed L2, as well as the reverse L1-L2 combination (such as French learners of English).

Acknowledgments

I would like to thank Pascale Leclercq and Martin Howard for their interest in and comments on my study. I would also like to thank the anonymous reviewers for their invaluable feedback and suggestions. I also acknowledge the people who stood by my side while writing this paper.

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Appendix

Tables explaining the four different Paths, the two different Cause and Manners of the Agent and the two different Manners of the object in the 32 stimuli. The numbers indicate the number of stimuli.

Cause and Manner of the Agent: *PUSH*

	UP	DOWN	ACROSS	INTO
<i>Roll</i>	2	2	2	2
<i>Slide</i>	2	2	2	2

Cause and Manner of the Agent: *PULL*

	UP	DOWN	ACROSS	INTO
<i>Roll</i>	2	2	2	2
<i>Slide</i>	2	2	2	2

Résumé

Cet article s'intéresse à l'expression des bornes temporelles dans un discours narratif. La tâche présentée aux sujets est constituée de dessins animés courts présentant des mouvements pro-voqués et/ou volontaires selon quatre types de trajectoires. Nous formulons l'hypothèse que

la façon dont les locuteurs expriment les bornes temporelles dépend du type de cadrage de leur langue (Talmy 2000). Nous avons étudié les productions de cinq groupes de sujets adultes: francophones L1 (« cadrage verbal »), anglophones L1 (cadrage « satellitaire ») et trois groupes d'anglophones apprenants du français à trois niveaux différents de compétence. Les productions peuvent comporter 1) une mise en scène, 2) l'événement principal. Les résultats montrent que chaque groupe de locuteur utilise des moyens propres pour exprimer les bornes temporelles et spatiales. En français L1, l'expression des bornes temporelles dépend des différents types de trajectoires, ce qui n'est pas le cas en anglais L1. Les productions des apprenants du français L2 sont plus semblables au français L1 quant à la morphologie verbale, alors que l'expression de l'espace est plus proche de l'anglais L1. La discussion met en évidence les implications du type de cadrage pour l'acquisition d'une L2 par des apprenants adultes.

Author's address

Annie-Claude Demagny
CNRS – Laboratoire SFL
59, rue Pouchet
75017 Paris
France
annie-claude.demagny@cnrs.fr