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Aurélie Barnabé¹

**Motion events assessed through the cognitive paradigm and the enactive pattern:
Two complementary approaches**

ABSTRACT:

This article reports the results of a corpus-based investigation, which evaluates the way French and English native speakers depict motion events. Space markers' distribution (prepositions, particles, *etc.*) is here assessed through the insertion of the selected items in French and English depictions. The inclusion of both languages' space markers is scrutinized within French and English reports – both languages' syntactic patterns illustrating the Talmian typology, which opposes English as a satellite-framed language to French as a verb-framed language.

According to the hypothesis of this work, when one individual is made to describe some other individual's motion experience, the linguistic structuring of her report is likely to be influenced by the physical activity she goes through before the descriptive task. This assumption implies that depicting identical phenomena can present language differences, if the speaker goes through a kinesthetic or a static physical performance before delivering her/his report. To test this hypothesis, two groups of speakers are interviewed and they are submitted to distinct sensorimotor constraints before describing the spatial progress of some other individual in the experimental scene. The individual's spatial navigation to be described is identical in both groups.

Through the non-linguistic variable of this investigation, the impact of speakers' kinesthetic and stationary processes on the linguistic data collected is evaluated, hence assessing the potential relationships between two kinds of phenomena – linguistic and kinesthetic ones. Language is here apprehended through the enactive paradigm, according to which the experiential and sensorimotor dimensions contribute to the structuring of linguistic meaning.

Key words: typology, space markers, motion, enactivism, embodiment

RÉSUMÉ:

Cette étude fait état de résultats provenant de corpus oraux recrutant des locuteurs français et anglais, chargés de décrire des phénomènes de mouvement dans des scènes données. Il s'agit ici d'évaluer la distribution de marqueurs d'espaces (prépositions, particules, *etc.*) insérés dans les descriptions attendues des locuteurs français et anglais. Les descriptions visent à appréhender l'inscription desdits items dans des rapports français (langue à cadrage verbal) et anglais (langue à satellites) ; langues dont les profils syntaxiques s'opposent selon la typologie talmienne.

L'hypothèse de ce travail est la suivante : lorsqu'un individu décrit le parcours spatial d'un autre individu dans une scène donnée, il est probable que l'activité physique qu'il entreprend à un stade pré-langagier ait un impact sur la structuration linguistique de sa description. Selon cette supposition, la description de mêmes phénomènes présente des différences en fonction du type d'activité qui précède la description du locuteur. On entend ici par « activité » une séquence physique dynamique ou une contrainte statique. Afin de tester cette hypothèse, deux groupes de locuteurs sont interrogés et soumis à différentes contraintes sensorimotrices avant de décrire la navigation spatiale d'un individu le long d'un même parcours dans les deux groupes.

Par la variable non-linguistique inscrite en cette expérience, il s'agit d'apprécier l'impact de processus kinesthésiques et de postures statiques des locuteurs interrogés sur les données linguistiques recueillies, questionnant alors la relation et l'influence potentielle de deux phénomènes : l'un étant linguistique, l'autre kinesthésique. La langue est ici appréhendée au prisme du paradigme éactif, selon lequel l'activité motrice représente un facteur contribuant à la construction du sens.

Mots clé : typologie, marqueurs d'espace, mouvement, enactivisme, corporéité

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Introduction

This article reports the results of a study aiming at assessing the patterns of frequency and distribution of linguistic space markers used by French and English native speakers when describing a path. This analysis targets the dichotomy that exists between English as a satellite-framed language and French as a verb-framed language (Talmy, 2000a; Matsumoto, 1996; Slobin, 2004), within what is known as the Talmian typology (Talmy, 2000a).

To further examine the discrepancy of both groups of languages in their distinct ways of structuring *motion events* (Talmy, 2000a, 2000b), this article reports the results of an *experienced-based* investigation, evaluating the way space markers are distributed in depictions delivered by French and English native speakers who are submitted to distinct bodily constraints before the descriptive task. The speakers' physical activity represents the core issue of this experimentation since we suspect sensorimotor perceptions to specifically influence the linguistic structuring of the speakers' descriptions.

In this research, a non-linguistic variable is inserted in the experiment in order to evaluate the impact of the speakers' bodily posture on the linguistic data collected. The combination of the participants' physical activity with the linguistic data gathered is used to assess the potential relationships between two kinds of phenomena – linguistic and kinaesthetic ones – assessing the possible influence of bodily postures on the linguistic data recorded.

The experimental task is submitted to 80 male and female students² from 18 to 25 years old, 40 of them being French, the other 40 students being English. Focusing on the effects sensorimotor processes can have on the speakers' descriptions, language is here apprehended through the enactive paradigm, according to which the experiential and sensorimotor dimensions contribute to the structuring and the elaboration of linguistic meaning. This hypothesis represents the thesis defended in this paper.

This work is divided into four parts: the first two sections are concerned with the experiment and data analysis, and the last two sections offer a twofold discussion of our findings. First, a description of the experiment and the concerns pertaining to the methodology of the investigation are developed. In a second part, the emphasis is laid on the data resulting from the French and the English descriptions collected, composed of path components solicited by speakers. Attention is paid to the linguistic distribution of the various units employed to characterize the paths.

² This experiment took place at the University Clermont Auvergne (UCA), soliciting students who volunteered to participate to this project. A first experiment was accomplished in 2014, and a second test was realized in 2015 to collect identical numbers of descriptions in English and French.

The third part of the study comments upon the results gathered in the previous section, specifically tackling the non-linguistic criterion inserted in the experimentation and foregrounding the factor related to bodily posture. The frequency of the items used to structure the paths is also reported.

In the fourth part, the assessment of French and English typological patterns is revised in the light of enactivism through the non-linguistic parameter here considered. Enactivism is defined through the concepts of *linguaging* and *embodiment*, highlighting the prominent role assigned to the kinaesthetic issue. This part suggests a novel outlook on language through the enactive paradigm, strengthening the assessment of linguistic facts, which are first evaluated with cognitive models and then envisaged with the enactive pattern.

1. The Talmian typology tested through *experience-based* experiments

1.1. Theoretical background

Over the past decades, cognitive linguists have highlighted the concept of “trajectory” or “path” (Talmy 2000a, 2000b; Slobin 1996, 1997, 2003, 2004; Jackendoff, 1983, 2002; Hickmann & Hendriks, 2006; Matsumoto, 1996). These analyses emphasized the typological dichotomy, which opposes satellite-framed languages (i.e. English, German, Dutch, Celtic, Mandarin, Slavic languages, Chinese, Finno-ugric languages, Ojibwa, Warlpiri) and verb-framed languages (i.e. Spanish, French, Italian, Turkish, Hebrew, Korean, Japanese, Greek, Tamil, Semitic, Turkic, Basque, Polynesian, Bantu, a few Mayan languages, Nez Perce language) in their distinct way of structuring *motion events* linguistically (Talmy, 2000a: 177-254; Talmy, 2000b). This typological contrast is revealed through the Talmian typology, which specifies the characteristics pertaining to satellite-framed languages (S-languages) compared to those related to verb-framed languages (V-languages).

The basic components of a motion event consist of the *figure*³ (the moving entity), the *ground* (the locational anchor relative to which the movement is conceptualized) (Talmy, 2000b: 311-344), the *path* and the *motion* itself (Talmy, 2000a: 340; Talmy, 2000b: 225-229, 240). Other less basic components such as *manner* (Talmy, 2000a: 120; Talmy, 2000b: 27-29, 129-133; Slobin, 2003: 9; 2004: 10-13) or *cause* (Talmy, 2000a: 415, 471-549) can also be integrated into the linguistic structure revealing motion. While S-languages (Talmy, 2000b: 222-233) tend to conflate certain components in a motion event, the same components will remain distinct if expressed by V-languages (*Ibid.*: 222, 224). The Talmian typology actually illustrates a dynamic approach of syntax in cognitive linguistics as it refers to two perception processes:

S-languages like English (Slobin, 2003, 2004) specify the manner of motion through the verb’s semantics (e.g. (a) *the bird flew into the room*), which then gives us access to a particular representation of space, considered through the embodied simulated act of motion: “S-language children have been guided by their native language to pay attention to manner of motion and to construct a set of systematic semantic categories in this domain” (Slobin, 2004: 10). Closed-class grammatical units (cf. *into* in (a)) refer to the path of motion.

V-languages like French (Slobin, 1996, 2004) highlight the path of motion through the verb (e.g. (b) *l’oiseau est entré dans la pièce*). One characteristic of V-languages is to specify manner of motion only when manner is at issue⁴ through “[means such as] subordinated manner verb

³ The terms *figure* and *ground* (Talmy, 2000a, 2000b) are here used to signal the moving entity and the locational anchor which correspond to elements designated by *trajector/landmark* by other authors (Langacker, 1991, 1999; Fauconnier & Turner, 2002).

⁴ Consequently, if ‘*the bird flew into the room*’ was translated as follows: « *l’oiseau est entré dans la pièce en volant* », a V-language speaker might suspect something wrong with the bird’s ability to fly and could think that

constructions (e.g., ‘enter/exit running’) and various adverbial forms (e.g., ‘dragging one’s feet’)” (Özçalışkan & Slobin, 2003: 259). Indeed, “for V-language speakers, manner is much less salient and attention is focused on changes of location and the settings in which motion occurs” (Slobin, 2004: 13). In the present paper, motion events are emphasized through the way space markers⁵ are used to refer to paths by the speakers taking part to the experiment developed below.

Before describing the experiment, the notions of embodiment and *linguaging* can be defined, as both of them play a major role in the interpretation of the data collected. Through the term embodiment, we are not pointing at the representation of a “universalistic” body, but we are promoting a language directly tied to the body or to the self. As for *linguaging*, this model is embodied in that experiencing the sensorimotor coupling of voicing and hearing is instrumental in the construction of thinking at every level of experience (Bottineau 2011: 18).

1.2. Methodology

The present study reports the results of a corpus-based analysis assessing the patterns of frequency and distribution of the items used by French and English speakers to structure path components. Oral corpora are examined in the experiment, in which the descriptive task is submitted to French and English students who are between 18 and 25 years old. Each experiment involves the presence of two students, one listening to audiotaped instructions meant to guide his/her way through the settings in the room, while the second is asked to describe the motion of the first student⁶. According to the protocol related to the instructions elaborated, each student listens to exactly the same commands. The latter are meant to make the first participant go through a couple of paths, which are located in the room where the experiment takes place. The paths are surrounded by various entities (ex: hoops, balls etc.) scattered on the floor.

The instructions are explicitly meant to make the participants follow various paths and hence change places recurrently. As indicated in Table 1A below (cf. “Paths¹”), participants have to go through fifteen paths if they properly execute the commands. The aim underlying the instructions is to make a first student (called *student 1*) describe a second student (called *student 2*) go through diverse paths; the student describing the other being expected to use as many space markers as possible, among which prepositions, particles, adpositions, adverbs, and *Internal Localisation Nouns* (ILN)⁷.

the bird is hurt; hence the mentioning of the manner of motion ‘*en volant*’. Animate and inanimate entities’ prototypical manner of motion (cf. *the bird* in (a)) is usually not mentioned with V-languages (Bottineau, 2012).

⁵ We are meaning closed-class grammatical units (prepositions, particles etc.) through the term “space markers”.

⁶ None of them are aware of the target of the experiment not to influence their speech. However, their willingness to cooperate to this linguistic project is then recorded through an official certificate explicitly disclosing the experiment’s process.

⁷ *Internal Localisation Nouns* are defined, detailed, and exemplified in section 2.4 below.

1.2.1. Instructions of the experiment

The issue related to bodily posture is directly associated to the linguistic concerns of this work, the linguistic data collected being assessed according to the potential impact sensorimotor experience may have on them. The present investigation hence allows for the creation of *experience-based* corpora, which may lead us beyond the firmly established Talmian typology, making kinesthetic elements the core issue of the experiment here developed.

At the beginning of the experiment, the first participant (i.e. student 1) is told to get inside a hoop, which marks the starting point of the experiment. Six commands then direct his/her movement (cf. Table 1A, “Order³”) in the room. While some instructions charge participants to follow one specific path, other directives are meant to make them go through two itineraries, as indicated by “Paths to follow²” (cf. Table 1A) below:

INSTRUCTIONS	Paths ¹	Paths to follow ²	Order ³
First, you will follow the blue path and pick up two different-coloured balls.	1	1	1
You’re going to set the balls down in the orange hoop that is next to the umbrella.	2	1	
Next, you will get back inside the purple hoop where you started and follow the white path. Once again, you will pick up 2 different-coloured balls.	3-4	2	2
And you’re going to set the balls down in the orange hoop that is next to the umbrella.	5	1	
Next, you will get back inside the hoop where you started and follow the yellow path. You’ll choose one of the 2 balls at the end of the path,	6-7	2	3
which you will set down in the orange hoop beside the umbrella.	8	1	
Next, you will get back inside the hoop where you started and you will walk beside the ropes and pick up 2 objects of your choice.	9-10	2	4
You will put them down in the hoop next to the umbrella.	11	1	
Then, from the hoop next to the umbrella, you will follow the orange path. You’ll choose one of the 2 Frisbees at the end of the path,	12	1	5
which you will set down in the hoop next to the umbrella.	13	1	
Finally, you will be back in the hoop that marks the starting point. You will pick it up and put it on the table of your choice.	14-15	2	6

Table 1A: Instructions of the experiment

¹ Total of the paths to follow in the experiment

² Number of paths to follow per instruction

English participants listen to the aforementioned instructions while French students get exactly the same commands in French (cf. Table 1B, Appendix). This experiment is divided into two different sub-experiments, namely Test n°1 and Test n°2, as developed in the following section; each student going either through Test n°1 or through Test n°2. Among the 40 French participants, twenty of them go through Test n°1 while the other twenty students experience Test n°2. The same is true in English.

1.2.2. “Dynamic” and “static” descriptions

- Test n°1: “dynamic transcription”

In the first test, student 1 and student 2 listen to the above mentioned audiotaped instructions. The instructions first recommend student 1 to walk along fifteen paths. Once he/she has achieved the spatial navigation along the various paths, and has come back to the starting point in the room, he/she is asked to describe the course followed by student 2, who is then charged to perform a similar itinerary, after listening again to the aforementioned instructions⁸.

Consequently, student 1, asked to walk along the fifteen-path itinerary, is then made to describe the motion of student 2 along the same paths he/she went through before. Student 1 thus goes through a dynamic bodily experience *before* describing another student’s progress along similar itineraries. Therefore, the description given by student 1 is referred to as *dynamic* since his/her description of the other student’s performance is introduced by a dynamic bodily experience.

- Test n°2: “static transcription”

In the second sub-experiment, French and English students perform a similar experiment with slightly different criteria, which precisely distinguish the first from the second experiment. In the second sub-experiment, “student 1” listens to the aforementioned audiotaped directives and he/she is made to perform his/her spatial locomotion along the fifteen itineraries.

Before student 1 starts progressing through the room, student 2, unaware of the particular motion student 1 has to perform, enters the room where the experiment takes place and is asked to

⁸ In the dynamic test (Test n°1), student 1 first performs his spatial progress after listening to the directives. When listening to them, student 2 is present in the room, hence also listening to the instructions given by the experimenter. Student 1 is then asked to depict the spatial navigation performed by student 2. But once student 1 is done with his spatial progress, student 2 is made to perform the identical navigation in the room and sometimes needs listening to the instructions again to make sure (s)he does not forget any step in the whole process. It can be noticed that the experimenter cannot speak during the experiment and hence cannot give any detail pertaining to the instructions to be followed in the course of the participants’ spatial progress. During the experiment, Test n°1 is first carried out with French and English participants of the first group, and the second group of participants then goes through Test n°2.

depict the spatial progress of student 1⁹ by describing his/her spatial navigation. As a result, student 2 has to describe the fifteen-stepped trajectory *without* going through a dynamic bodily experience beforehand. In addition, attention is paid for students 2 to be maintained in a stationary bodily position before delivering his/her description, which is why the description is characterized as static.

At the end of each experiment, the descriptions collected display the data resulting from the students having gone through a dynamic bodily experience before depicting the other participants' progress through the fifteen itineraries, hence representing *dynamic* descriptions. Correlatively, the other reports gathered exhibit the data of the students who experienced a stationary bodily posture before describing the other students' motion along identical itineraries, hence corresponding to *static* delineations. The aim of describing a student going along fifteen trajectories – whether delivering static or dynamic descriptions – consists in depicting paths, which implies that speakers will use as many space markers as possible.

1.3. Hypotheses

So far, linguistic assessments of motion events have given rise to several studies (Talmy 1983, 2005; Slobin, 2004, 2005, 2012), some of them highlighting the different syntactic and lexical patterns adopted by V-languages and S-languages to structure trajectories linguistically. These studies assess the individuals' reports when people are interviewed, which implies that the participants' speech is evaluated, taking into account linguistic data exclusively.

Previous analyses actually report the way S-languages (e.g. English) tend to accumulate closed-class grammatical items to reveal a path of motion (Slobin, 1997, 2003, 2004), as opposed to V-languages (e.g. French) which express a path through a single verb, preferentially using several verbs to describe distinct paths of motion. In the present investigation, attention is paid to the way space markers are inserted in speakers' reports; static and dynamic experience representing the core issue of the experimentation. Indeed, we seek to demonstrate whether this non-linguistic variable entails effects on the structuring of motion and location events in English and French.

The instructions exhibited in Table 1A (cf. 1.2.1) indicate the way participants move in the experiment: they walk back and forth with specific tasks to perform, which imposes to adopt particular bodily postures. If participants are likely to structure the paths they are expected to depict through various space markers, we may wonder whether the bodily exercise preceding the depictions required is liable to have an impact on the distribution and the frequency of the path components in the languages examined. In the following section, the distribution of the space markers selected by

⁹ Similarly to the first test, the student made to describe the motion of the other individual is unaware of the target of the experiment, and once the investigation is done, his/her willingness to cooperate to the linguistic project is guaranteed through an official certificate.

speakers is worked through, concurrently considering the sensorimotor experience participants are submitted to before delivering their depiction.

2. Speakers' selection of space markers to refer to paths

2.1. English closed-class grammatical items

As a satellite-framed language, English satellites are defined by Talmy as “the grammatical category of any constituent other than a noun-phrase or prepositional-phrase complement that is in sister relation to the verb root. It relates to the verb root as a dependent to a head” (2000b: 102). This particular class has to be differentiated from prepositions, defined as follows: “Satellites should be well distinguished from prepositions [...] the two forms have quite distinct positional and grammatical characteristics. However, a problem arises in English, which, perhaps alone among Indo-European languages, has come to regularly position satellite and preposition next to each other in a sentence” (Ibid.: 106).

The putative confusion that may result from both closed-class grammatical items is accentuated by a third group of units, i.e. *adpositions*, gathering *prepositions* and *postpositions*:

Adpositions (Adps) may be defined as grammatical tools, which mark the relationship between two parts of a sentence: one is the element which an adposition governs. [...] English adpositions are prepositions, but other languages have postpositions. [...] Adps are the most frequent type of function marker. [...] Adps constitute, from the semantic and cognitive point of view, a complex set of interrelated meanings. (Hagège, 2010: 6)

Adpositions are mainly followed by linguistic items (Grinevald *et al.*, 2011: 4) and they are derived from what Bolinger (1971) defines as “adprep”, “adprep patterning in some ways like a preposition and in some ways like an adverbial particle” (O’Dowd, 1998: 23)¹⁰. This shows that “adpreps” can sometimes behave as particles and sometimes as prepositions, which O’Dowd summed up in the following passage: “Both Bolinger’s and Talmy’s interpretation seem to hold to the principle that, at some underlying level of syntax, the preposition and the particle are categorially distinct, even though they may be semantically identical” (1998: 23-24).

If the distinction between particles and prepositions does not appear to be clear-cut in the English language, the class represented by satellites increases the difficulty to clearly distinguish particles from prepositions, since the linguistic status of satellites often results from a process of “satellization”: “[Satellites] are the result of a process of satellization of elements already existing in the language” (Grinevald *et al.*, 2011: 4).

Consequently, “satellites may be verbs, adverbs, preverbs, i.e. grammatical categories that have already been identified in languages” (*Ibid.*: 2). These remarks evidence that identifying the

¹⁰ Bolinger’s quote (1971) is extracted from O’Dowd’s work. Bolinger’s work hence does not appear in the references; O’Dowd’s study (1998) being the only one mentioned.

particular status of English closed-class grammatical units is not necessarily easy. For this reason, and throughout the analysis here commented upon, attention is paid to the minute identification of the items considered (i.e. adpositions, particles, adverbs, *etc.*) in the descriptions delivered by English speakers.

Closed-class grammatical items are not the only units contributing to structuring paths' descriptions. Verbs play a major role in the linguistic structuring of itineraries as well. If most verbs are assorted with prepositions or particles, some of them differ from the others through the semantic roles assigned to *figures* and *grounds*:

[The pair of concepts Figure and Ground] shows up in relation to a semantic event of motion or location, [...] that is, an event conceptualized as involving one physical object moving or located with respect to another (Talmy, 2000a: 311).

Instances of figure/ground alignment might be regarded as special cases of the more general and pervasive process of comparison. For physical motion, [...] we therefore expect relatively few lexical exceptions to the selection of the mover as subject. (Langacker, 1987: 121, 234)¹¹

Indeed, in most cases, the subject corresponds to the moving entity, as in (1):

(1)	¹⁵ Paul is walking towards the red balls. [BrE , 09]
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Paul represents the figure while *the red balls* stands for the ground.

In the descriptions, it can be noted that a minority of clauses are involved with equivalent status of figures and grounds, as in (2):

(2)	²¹ Then the yellow path reaches the orange path ²² And Victoria stops. [BrE, 32]
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In (2), the figure corresponds to *the yellow path* and *the orange path* refers to the ground. Both elements hence provide similar information and display an equivalent semantic status, which accounts for Langacker's comment: "It is in fact quite difficult to find convincing examples, where all aspects of the designed entity participate equally in a relationship" (Langacker, 2000: 191). Such examples represent a tiny minority in the clauses examined, when there is no closed-class grammatical unit after the verb, as in (2) with *reach*. If verbs, figures and grounds do contribute to structuring linguistic paths, the present article only focuses on English and French space markers, analysed and compared to each other in the 80 descriptions recorded.

¹¹ Langacker specifies that the syntactic and semantic arrangement as in (1) tends to prevail but this disposition is not exclusive: "Because salience is a matter of degree, and since factors other than figure/ground alignment enter into it, a certain amount of language-specific variation is to be expected; the grammatical properties in question should be associated with subjects only 'preferentially' instead of 'exclusively'." (Langacker, 1987: 235).

2.2. Linguistic analysis

The clauses displayed in the aforementioned examples and those commented in the article correspond to units constituting sentences: “A sentence comprises one or more clauses, each of which in turn comprises elements.” (Greenbaum & Quirk, 1990: 15). The clauses examined in the descriptions can be single independent clauses, which may be of seven types; the types differing according to whether one or more clause elements are obligatorily present in addition to the subject and verb (*Ibid.*: 204)¹². The other clauses included in our analyses correspond to the clauses inserted in complex sentences, which have “one or more subordinate clauses functioning as an element of the sentence.” (*Ibid.*: 283).

Among the three main structural classes of clauses established by Greenbaum & Quirk (*Ibid.*: 285) – “the FINITE CLAUSE: a clause whose verb element is finite [...], the NONFINITE CLAUSE: a clause whose verb element is nonfinite [...], and the VERBLESS CLAUSE: a clause that does not have a verb element” – verbless clauses are excluded from the analysis. First, they represent a tiny minority of the data registered, secondly they mostly point at considerations that are not related to the linguistic depictions of paths. The methodology of our study consists in separating every single clause structuring English and French descriptions. The clauses analysed represent those precisely contributing to delineating the paths linguistically, while those displaying details that are not significant for our analysis (e.g. *He has forgotten something/Je crois qu’il s’est trompé*) are not taken into account.

In both languages examined, each description’s clause has been singled out to precisely focus on the space markers used by French and English speakers. The clauses extracted from speakers’ descriptions are preceded by a figure as in (1) – “¹⁵ Paul is walking towards the red balls [BrE, 09]”; number ¹⁵ corresponding to the fifteenth clause uttered by the speaker, as all spoken clauses¹³ have been separated and numbered in the depictions. At the end of each clause, the type of language used is specified, namely “Fr” for French, “BrE” for British English as in (1), and “AmE” for American English. Finally, the last number between brackets (cf. [BrE, 09]) refers to the speaker’s I.D, i.e. rank of speaker interviewed out of the forty French speakers and the forty English participants.

2.3. French closed-class grammatical units

French descriptions articulated by participants are composed of several space markers whose grammatical statuses differentiate from the English path components mentioned above. S-languages like English solicit numerous particles and prepositions to refer to trajectories. V-languages like

¹² (1) SV, (2) SVO, (3) SVC, (4) SVA, (5) SVOO, (6) SVOC, (7) SVOA – ‘S’ corresponds to *Subject*, ‘V’ to *Verb*, ‘O’ is used for *Object*, ‘C’ for *Complement*, and ‘A’ for *Adverbial elements* (Greenbaum & Quirk, 1990 : 204).

¹³ All spoken clauses have been coded in the analysis of speakers’ depictions.

French, on the other hand, use fewer closed-class grammatical items: French linguistic delineations of paths more often rely on the use of separate verbs to identify distinct trajectories (Soroli *et al.* 2012; Hickmann & Hendriks, 2006).

“Simple prepositions” are concurrently used with complex prepositions, as enumerated by Le Pesant with a list displaying 186 items (2012: 923). Table 1C and Table 1C’ (cf. Appendix) illustrate the insertion of these units into different syntactic arrangements. Some prepositions’ binary use contributes to structuring path depictions, as in (3) with *depuis* and *jusqu’au*:

(3)	¹⁸ Il marche en zigzags <i>depuis</i> le cerceau orange <i>jusqu’au</i> chemin jaune. [Fr, 36]
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In (3), the binary use of *depuis* and *jusqu’au* explicitly depicts the delineation of the path followed by the subject, i.e. *Il*, just as the binary use of the prepositions *de* and *en* displayed in Table 1C’.

2.4. Internal Localization Nouns

Other space markers are classified with what Aurnague identifies as “Noms de Localisation Interne” [NLI]¹⁴ (2010: 5§) or “Internal Localization Nouns”, henceforth [ILN] (Aurnague, Vieu, 1993: 2), which are all lexical elements pointing out the different portions of an object” (Borillo, 1988)¹⁵:

Les noms de Localisation Interne (NLI : *haut, derrière, intérieur, bord, extrémité*) identifient, en effet, des parties/zones stables au sein d’une entité-tout (+fix) auxquelles des portions d’espace sont fréquemment associées (+esp). Par ailleurs, le contenu sémantique de ces marqueurs précise – au moyen d’informations orientationnelles, topologiques ou liées à la distance – la localisation des entités désignées (+spc) (Aurnague, 2010 : 5§).

[Internal Localization Nouns (ILN: *top, back, inside, edge, extremity*) actually identify stable parts/zones within a whole area (+fix) to which spatial parts are often associated (+esp). Besides, the semantic content of these units provides precision pertaining to the localisation of the entities referred to (+spc) through orientational, topological information or details related to distance]

Aurnague, Hickmann and Vieu signal that ILN (*ex : avant, dessus, fond*) [*ex : front extremity, top extremity, back*] indicate some « *specified location* » [+fix, + esp, + spc.]¹⁶ (2005: 222). Among the space markers used in French, the data collected mainly concern simple prepositions, prepositional phrases and ILN, as developed in the following sections.

If ILN are used in both languages, it seems that speakers do not to use them with the same ratio in static and in dynamic descriptions. Through these expressions related to space, one accesses to spatial relations that distinguish themselves from the spatial features pertaining to prepositions or prepositional phrases, as evidenced by the following example:

¹⁴ The acronym “NLI” – “ILN” in English – is used as such in the following sections to refer to *Internal Localization Nouns*.

¹⁵ Borillo’s definition is quoted by Aurnague & Vieu (1993: 2).

¹⁶ The abbreviations [+fix, + esp, + spc.] are related to the aforementioned quote by Aurnague (2010 : 5§).

(4)	<p>¹⁸ Elle circule à l'intérieur du chemin blanc</p> <p>¹⁹ puisqu'il est plus large que les autres. [Fr, 20]</p>
-----	--

In (4), *l'intérieur* represents the ILN and it gives us a specific delineation of the path (i.e. *chemin blanc*).

Les noms [...] (dits de localisation interne) ont pour fonction de préciser la référence spatiale des entités physiques. La portion d'espace qu'occupe une entité déterminée peut être découpée en zones différenciées, sur la base des relations spatiales qui les rattachent au tout (Aurnague, Vieu, Borillo, 1997: 70).

[Nouns [...] (reported as Internal Localization Nouns) are meant to provide the spatial reference of physical entities. A specific entity's spatial part can be fragmented into differentiated zones, on the basis of the spatial relations that tie them to the whole.]

(5)	<p>²³ Elle est dans la pièce et</p> <p>²⁴ marche vers la partie centrale. [Fr, 29]</p>
-----	--

As compared to occurrence (4), the ILN can be identified through the adjective unit in “*la partie centrale*”¹⁷. Referring to the room the student is walking through, the ILN provides some spatial precision while depicting the room.

2.5. Path markers in English and French depictions

As indicated by Table 1A (cf. 1.2.1), fifteen paths are to be followed by the students if they apply the instructions properly. Table 2 identifies the insertion of space markers in the clauses after speakers experienced a dynamic activity, compared to those solicited by the participants experiencing a static bodily posture. A distinction has been made between the clauses displaying space markers structuring path depictions and those with no space marker. As shown by Table 2, 51.5% of the French clauses display space markers (and hence 48.5% do not) while 72.5% of the English clauses include space markers (and 27.5% do not).

In French, 24.5% of the clauses are extracted from dynamic descriptions (and hence concern the oral production of 20 speakers) while 27% of them are associated with the other 20 speakers experiencing a static bodily posture before the descriptive task. Correlatively, 33.5% of the English clauses are taken from the descriptions delivered by 20 speakers going through a dynamic activity, while 39% of them correspond to the descriptions of the remaining 20 participants experiencing immobility.

¹⁷ Aurnague, Vieu, and Borillo actually point at the grammatical items used as ILN: “ces noms et adjectifs fondés sur des traits de nature diverse (dimensionnels, morphologiques, fonctionnels) permettent de donner une plus grande précision à la description spatiale des entités” [these nouns and adjectives founded on features of different types (dimensional, morphological, functional) make it possible to provide some more precision to the spatial description of the selected entities] (1997: 70).

51.5% of the FRENCH clauses WITH space markers		72.5% of the ENGLISH clauses WITH space markers	
Dynamic descriptions	Static descriptions	Dynamic descriptions	Static descriptions
24.5%	27%	33.5%	39%

Table 2: Space markers inserted in French and English clauses in static and dynamic reports

The results gathered are only significant if dynamic descriptions' data are compared static depictions' outcome. Besides, the relevance of this experimentation here matters since the data amassed with a V-language are compared to the details accumulated with a S-language, hence foregrounding the contrastive issue usually differentiating both language types in the typology initially examined.

2.6. Data collected in both types of experiments

2.6.1. Similarities and differences in the use of path markers in English and French

In both languages, the notion of trajectory is structured through different categories of space markers. Various types of closed-class grammatical items are used in French with “simple prepositions” (cf. 2.3), prepositional phrases, adverbs, ILN, and “other units” (cf. Tables 4’– Appendix). English speakers mainly structure paths through satellites and adpositions (cf. 2.1), they also use “other units” (cf. Table 5’ – Appendix), and items that are equivalent to French ILN, as in:

(6)	¹¹ He’s moving to the end of the room. [BrE, 34]
-----	---

In (6), *end* exemplifies an ILN, just as *fond* in example (7):

(7)	¹⁶ Il se dirige vers le fond de la salle. [Fr, 01]
-----	---

The items *to* in (cf. (6)) and *vers* in (cf. (7)) are related to the verbs *is moving* in (6) and *se dirige* in (7).

Some occurrences exemplify the semantic contiguity of some French and English prepositions (e.g. *across* / *à travers*) to reveal spatial relations but the examples examined in the depictions highlight their semantic non-reciprocity. For example, *à travers* often imposes the notion of obstacle (Stosic, 2009: 4; Stosic, 2008: 207), which is not always the case, as Stosic underlines it: “La notion d’obstacle ne suffit pas pour expliquer le sens spatial de ‘à travers’ [The notion of obstacle is not enough to account for the spatial meaning of ‘à travers’]” (Stosic, 2008: 208). Filipović signals that “‘à travers’ needs to be followed by an object which clearly signifies a barrier (or a boundary) that is crossed” (Filipović, 2007: 311). Indeed, speakers’ use of *à travers* very often points at impediments on the paths, which are represented by objects lying on the floor, as in (8):

(8)	⁸ Lucie passe <i>à travers</i> les cônes du chemin blanc, ⁹ et évite de marcher sur les lattes posées au sol, ¹⁰ Elle ramasse deux balles. [Fr, 03]
-----	--

Identical visual stimuli foregrounding similar obstacles are described differently in English, as is the case with (9):

(9)	⁰⁹ Ella is going <i>across</i> the white path, ¹⁰ and picks up two yellow balls. [BrE, 12]
-----	---

If the semantic features revealed by *across* and *à travers* seem to be analogous, their semantic load often differs in the way they are used in both languages. The visual scene is identical in (8) and (9), but while the French speaker mentions the obstacles in the clause following that containing *à travers*, there is no mention of the impediments (i.e. ‘les lattes posées au sol’) [*the laths that are lying on the floor*] with *across*, whose complement is *the white path*, with no notification of obstacles in clause¹⁰. Stosic foregrounds the notion of finding out one’s way¹⁸ to actually move with the use of *à travers* (Stosic, 2008: 211), which does not correspond to the prevalent semantic load of *across*¹⁹. In both languages, the notion of boundary is often apprehended differently through the use of *across* and *à travers*, making it hence difficult to consider both units equivalent²⁰.

2.6.2. Space markers structuring paths in dynamic reports

Table 3 and Diagrams 1 and 2 illustrate the main space markers through which French and English speakers refer to paths after experiencing a dynamic activity. Interestingly, comparable results can be observed:

	Closed-class grammatical items	ILN	Other units
French dynamic depictions	80%	13%	7%
English dynamic depictions	68.5%	22%	9.5%
French static depictions	59%	27%	14%
English static depictions	44%	41%	15%

Table 3: Distribution of space markers delineating paths in English and French

¹⁸ “La particularité des sites médians avec ‘à travers’ semble résider dans la nécessité pour la cible de s’aménager un chemin” [*The particularity of central lines with ‘à travers’ seems to reside in the necessity for the figure to “find one’s way”*] (Stosic, 2008 : 211).

¹⁹ See (Filipović, 2007) for details on *across*.

²⁰ For further details on the various meanings of *across* and *à travers*, see (Stosic, 2009, 2008; Filipović, 2007).

- DYNAMIC depictions:

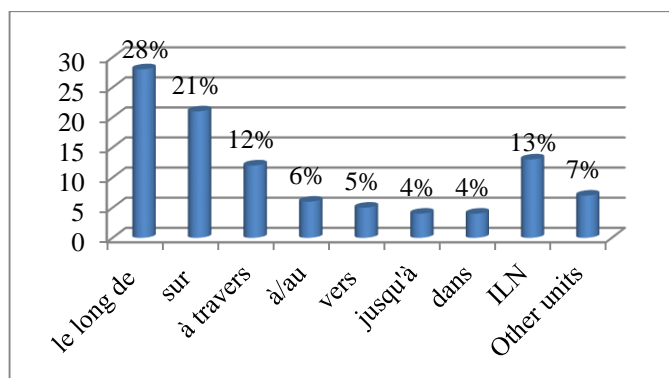


Diagram 1: French units revealing the paths: ‘closed-class grammatical items’ – ILN – ‘other units’

Among the space markers used to articulate the paths, both languages seem to display preferences for some units seemingly better delineating the notion of trajectory. Such units belong to the category “units revealing the paths” (cf. Diagram 1), which include ‘closed-class grammatical items’, ‘ILN’ and ‘other units’ (cf. Tables 4’ and 5’ – Appendix). Diagrams 1 and 2 display the mostly used prepositional items and phrases to refer to paths in both languages, the ratio of ILN, and the ‘other units’, made up of prepositional items and phrases, which do structure paths even if they are rarely used.

The selected items appearing in percentages in Table 3 exclusively correspond to the units structuring the paths. In other words, *pendant* in the clause ¹⁵*pendant qu’il réfléchit* [Fr, 38] is not taken into account in the percentages in Table 3, as *pendant* does not contribute to structuring any path. However, when *pendant* or *dès* are taken into account in the analysis, it reveals their actual participation to delineate a path as in the clause ⁴*dès les premiers plots qui dessinent le chemin bleu* [Fr, 35]. It seems that adpositions, particles, adverbs and prepositions mainly tend to structure paths in English (cf. 68,5%). If French speakers appear to use a bit more of them (cf. 80%), English speakers correlatively apply more ILN to represent paths, with 22% of them against 13% of ILN in French.

- DYNAMIC depictions:

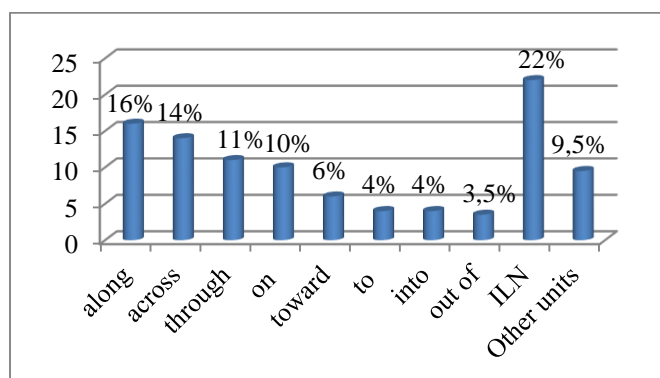


Diagram 2: English units revealing the paths: ‘closed-class grammatical items’ – ILN – ‘other units’

Diagram 2 displays the mostly used prepositional items and phrases used in English. Their ratio appears in Table 3 (68.5 %). A second group of items correspond to ILN in Diagram 2 (cf. 22%) and Table 3. Occurrence (10) exemplifies one of them:

(10)	¹⁷ Sinead is now tiptoeing along the front extremity of the room, along the yellow path. [BrE, 14]
------	---

In (10), *front extremity* represents the ILN through which the speaker provides spatial information. Prepositional items and phrases appearing in Table 5’ (cf. Appendix) are exposed in Diagram 2 (cf. 9.5%) and Table 3. These units exemplify the delineation of itineraries, as in (11):

(11)	¹⁷ She is walking between big yellow cones and small yellow cones. [BrE, 36]
------	---

Even if *between* is rarely used in the descriptions, this preposition here structures the delineation of the yellow path (cf. *yellow cones*).

2.6.3. Path markers patterning trajectory in static descriptions

These results are only relevant when compared to the same descriptive task performed with participants experiencing a sensorimotor stance with no movement beforehand, as demonstrated by Diagrams 3 and 4, which correspond to Table 3 in the previous section²¹. Interestingly, speakers seem to use more space markers to delineate paths when not going through a previous motion experience.

²¹ Even if space markers’ use in static and dynamic depictions (cf. 51.5% in French and 72.5% in English) only represents a part of the whole units solicited by speakers, the data presented in the diagrams and tables manifest the distribution of the various units out of 100% to make it easier to compare the data in both languages and after both types of sensorimotor experiments.

Diagrams 3 and 4 can be paralleled to Diagrams 1 and 2, exhibited above. The four diagrams and Table 3 highlight the divergence that can be observed between the data aforementioned and those communicated below, which seems to pertain to the type of sensorimotor activity experienced by speakers before the descriptive task.

- STATIC depictions

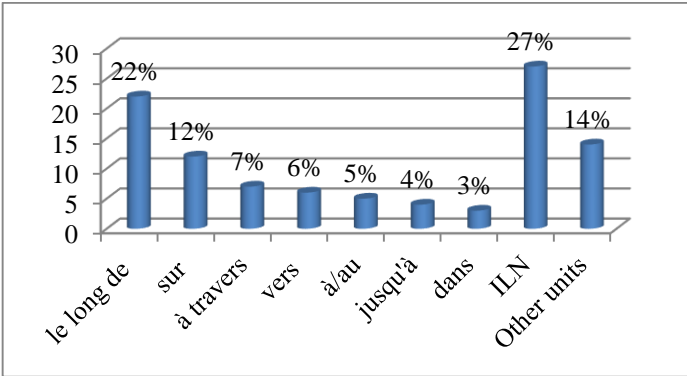


Diagram 3: French units revealing the paths: ‘closed-class grammatical items’ – ILN – ‘Other units’

The lexical and grammatical quality of path components does not vary between both types of experiments since the participants solicit similar space markers to structure paths in both languages. Nevertheless, the quantitative load of path components used by speakers reveals some disparity between both types of experiments and in the two languages examined, as demonstrated by Diagrams 1, 2, 3 and 4, which separate space markers into three groups: ‘Closed-class grammatical items’, ILN , and ‘Other units’, as represented by Table 3 presented above.

- STATIC depictions

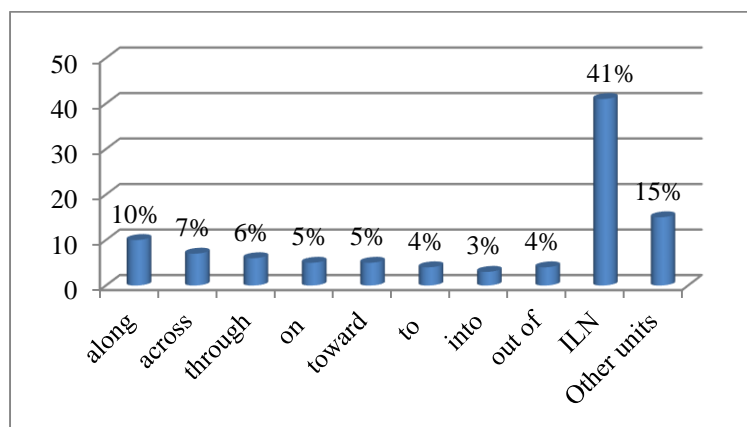


Diagram 4: English units revealing the paths: ‘closed-class grammatical units’ – ILN – ‘Other units’

The use of ILN appears to be much solicited when speakers do not go through a dynamic activity before the descriptive task (cf. 41%). Potential reasons accounting for speakers’ path markers’ selection are suggested in the following sections.

3. Cross-linguistic comparison between static vs. dynamic depictions in English and French

The space markers contributing to designating paths seem to reveal a certain syntactic reciprocity in English and French, as indicated by Table 3 above (cf. 2.6.2). English and French linguistic depictions manifest strikingly similar results when participants go through static or dynamic sensorimotor tests before delivering their report, as evidenced by analogous amounts of closed-class grammatical units, ILN, and other units to depict the paths.

3.1. Contrastive ratio of closed-class grammatical units in static and dynamic reports

Indeed, after a dynamic experimentation, English speakers solicit 68.5% of items while French participants use 80% of them. So it seems that speakers’ dynamic experiences lead them to use more units identifying paths when they go through a dynamic experience. In comparison, when participants experience a static bodily posture, 59% of path markers are inserted in French static reports, compared to 44% of them in English ones.

This state of fact tends to demonstrate that the grammatical units’ selection here corresponds to a real act, to an intentional, sensorimotor achievement through which the speaker gathers previously experienced interactional associations. This remark foregrounds the speech act as matching with the act of thought, which itself blends with the pre-linguistic bodily load of meaning. The data seem to demonstrate that the bodily functions present intentionality and a capacity of meaning (Bottineau, 2011).

Static and dynamic bodily postures seem to plot an experience of capturing representational and organizational forms, namely intuitive semantic and psychological events that are inserted into the path markers selected by speakers. We may presume that the spatial navigation performed by speakers leads them to depict motion through units marking the efficiency of movement, such as *through*, *toward*, *vers*, or *jusqu'à*, which specifically point at the directions they went through while experiencing motion. Those directions are kept in mind and seem to *need* phrasing through the linguistic items speakers select to structure the paths.

3.2. Quantitative load of ILN

It seems that static and dynamic bodily conditions do not lead speakers to express paths through “closed-class grammatical units” (cf. Table 3) exclusively, as evidenced by the quantitative load of ILN used in both languages (cf. *idem*). While French and English respectively use 13% and 22% of them in dynamic descriptions, 27% of them are used in French static reports and 41% of them structure English static depictions.

Twice as many ILN are used after speakers experienced a static bodily posture. Therefore, we may assume that speakers’ attention is more focused on the settings in which motion occurs after experiencing immobility, which tends to make them precisely depict the visual environment where the experiment takes place:

(12)	²⁹ She is putting the book down into the orange hoop, in the back extremity of the room, near the umbrella. [BrE, 28]
------	--

In (12), we may suppose that the topological precisions identified through *back extremity* aim at delineating the global visual array of the experiment’s framework discovered by the speaker after experiencing immobility. In comparison, in clauses included in dynamic reports, speakers seem to take the visual disposition in which the experiment takes place for granted, hence specifying topological details through terse sentences:

(13)	¹⁹ And David is putting the book in the orange hoop. [BrE, 18]
------	---

As in (13), speakers tend to only signal the necessary information when localizing entities through prepositions (cf. *in*), seemingly considering that the visual array is not to be depicted since they performed various tasks inside this local environment before describing the scene. The visual stimuli to be depicted were the same in (12) and (13), but the use of speakers’ different path markers leads us to presume that their previous bodily experience is likely to have influenced their linguistic structuring of the entity’s localisation (i.e. *the book*). If speakers going through a dynamic experience resort to ILN in their reports, these nouns appear to be far less used in dynamic descriptions than in

static ones, but this preliminary hypothesis is currently being more worked through on the basis of the analysis of additional experimentations to provide more details on this point.

3.3. Other units

“Other units” (cf. Tables 4’ and 5’ – Appendix) are more numerous in English and French after speakers experience a static bodily posture. The selected items are composed of English prepositions and particles seldom used in the reports, as well as prepositional items and phrases rarely displayed in French depictions. 15% and 14% “other units” appear in English and French static depictions, as compared to 9.5% and 7% of them occurring in dynamic reports.

(14)	¹² There’s a book <i>around</i> the umbrella. [BrE, 31]
(15)	¹⁷ Le cerceau orange est situé <i>derrière</i> la ligne de plots bleus. [Fr, 24]

In (14), the preposition *around* is meant to assess the distance separating the figure, i.e. *the book* from the ground, i.e. *the umbrella*. Occurrence (15) displays a similar local assignment of the figure, i.e. *le cerceau orange* with respect to the ground, i.e. *la ligne de plots bleus* through the preposition *derrière*.

To account for the peculiarity of these closed-class grammatical units, Talmy refers to the twofold concepts of Figure and Ground (2000a: 313):

When a Figure object and a Ground object in a linguistic representation are considered only with respect to their relation to each other, apart from any background, then the former object is indeed the psychological figure and the latter object is the psychological ground (*Ibid.*: 313).

Talmy explicates that the reference to the *psychological figure* with respect to the *psychological ground* defines the bipartite partitioning of a referent scene as in:

(16)	⁸ She is moving to the end of the path. [AmE, 08].
------	---

In this occurrence, *she* corresponds to the psychological figure and *the path* represents the psychological ground. The figure and the ground are connected through the preposition *to*, which establishes a bipartite partitioning of the scene.

Talmy identifies grammatical units inserted in clauses which structure what he designates as the *tripartite partitioning* of a spatial setting: “The tripartite partitioning of a spatial scene into a Figure object, a Ground object, and a reference frame as background affords a basis for relating the linguistic Figure/Ground concepts to the psychological figure/ground concepts. [...] Consideration of a background²² can be further included for a tripartite scene partitioning (*Ibid.*: 313)”. The

²² The *background* underlined in Talmy’s quotation refers to the identical *background* he points at in the quote aforementioned (Talmy, 2000a: 313).

conceptualization exemplifying the tripartite partitioning of spatial scenes is mostly illustrated with items included in the category “Other units” (cf. Tables 4’ an 5’), as in:

(17)	²² The Frisbee is lying <i>between</i> the blue cones and the white path. [AmE, 33]
------	--

French clauses also display reciprocal syntactic items revealing the tripartite partitioning of a scene:

(18)	⁷ Il est <i>entre</i> le chemin de cordes et le chemin blanc. [Fr, 15]
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The tripartite partitioning of clauses (17) and (18) can be illustrated through figure (b), as compared to figure (a) that exemplifies occurrence (16):

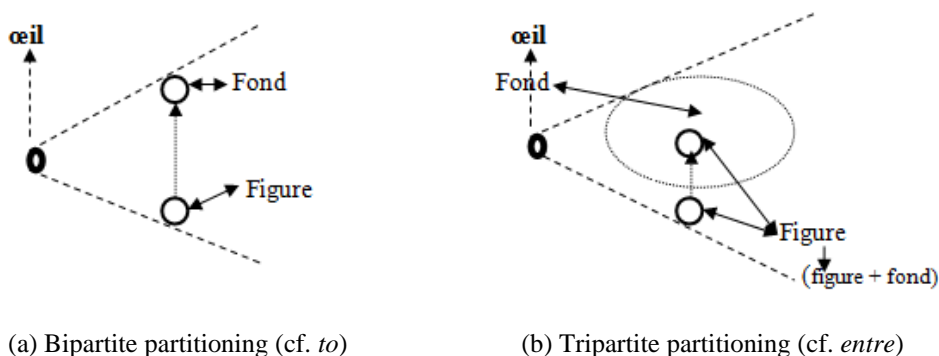


Figure 1 : Bipartite and tripartite partitioning of a scene (Talmy, 2000a : 312)

In occurrences (17) and (18), the figures and the grounds are to be combined to constitute the psychological figure (cf. *Figure*) whereas a contiguous area to the ground constitutes the psychological ground (cf. *Fond* (= *ground*)), hence enabling the observer to locate the psychological figure with respect to the psychological ground (cf. through the *œil* (= *eye*))²³ with the grammatical units *between* [cf. (17)] and *entre* [cf. (18)].

The quantity of grammatical items structuring the tripartite partitioning of spatial scenes is important in the category “Other units” after speakers experience a static posture and in both languages. Their considerable usage in static reports seems to reveal attentional interactions and mental events shared by speakers experiencing a static bodily posture before delivering their description. We may assume that static sensorimotor predispositions are at the stem of the depiction of spatial scenes identifying regions, which are considered differently when speakers experience motion beforehand.

²³ The terms used in ‘Figure 1’ are translated from French to English.

3.4. Global results

The statistics commented upon in the present section evidence that describing analogous visual stimuli after experiencing distinct sensorimotor bodily states can give rise to contrastive data pertaining to the way path markers are distributed to structure motion and location phenomena. This state of fact turns out to occur in two languages that are generally distinguished by their different syntactic pattern (Slobin, 1996b, 1997, 2003, 2004) to structure the phenomena here assessed. The present statistics tend to connect the French and the English language in this experiment, and we may assume that the non-linguistic variable of the present investigation can account for this connection.

So far, our analysis has focused on the spreading of the items used to structure the paths, specifically considering the non-linguistic parameter of the experiment when assessing the data. As the syntactic nature and the distribution of the particular items have been commented upon, examining the frequency of the units included in the clauses can be significant. Indeed, in both languages, the frequency of path markers may reveal similarities or divergences with respect to the languages' syntactic patterns illustrated by the Talmian typology (Hickmann and Hendricks, 2006; Ibarretxe-Antunano, 2002; Soroli *et al.* 2012).

On the basis of the outcome pertaining to the recurrent use of the items previously exposed, the following section demonstrates to which extent a non-linguistic variable can affect a firmly established typology concerning the diffusion of items examined in *experience-based* investigations and with languages belonging to different language families (i.e. V-language for French and S-language for English).

3.5. Path markers' frequency in English and French clauses

Slobin points at the accumulation of path components carried out in S-languages as opposed to the verb-related syntactic pattern displayed by V-languages:

Speakers of S-languages are more likely to break up the event into a larger number of components, based on 'narrative habits' of compacting several path components in a single clause. [...] Speakers of V-languages, by contrast, have developed a narrative style that makes more sparing use of individual motion verbs to encode path components. (1997: 448)

Slobin's remarks are exemplified by occurrences (18) and (19) which illustrate English and French depictions articulated by speakers attending perfectly identical visual data:

(19)	⁰⁴ Now, she's going <i>back towards</i> the purple hoop <i>along</i> the blue path. [AmE, 06]
(20)	⁰⁵ Elle <i>fait marche arrière</i> et ⁰⁶ <i>retourne</i> vers le cerceau violet, ⁰⁷ elle <i>longe</i> le chemin bleu et ⁰⁸ <i>regagne</i> le point de départ. [Fr, 02]

These occurrences correspond to instructions 1 and 3 (cf. [1] *First, you will follow the blue path*, [3] *Next, you will get back inside the purple hoop where you started*) in Table 1A (cf. 1.2.1), in which participants are expected to narrate two paths of motion.

The English speaker compacts several path components through the particle *back* and the prepositions *towards* and *along* associated with the verb *go* to refer to the paths. In comparison, the French speaker uses four verbs (cf. *fait marche arrière*, *retourne*, *longe* and *regagne*) to reveal analogous facts, hence structured through four clauses and making use of a single preposition: *vers* (cf. clause ⁰⁶). English and French occurrences exemplify the disparity separating V-languages and S-languages concerning the frequency of use of closed-class grammatical items.

Table 2 (cf. section 2.5) displays the way path markers are spread in French and English clauses. Table 4 exhibits the distribution of grammatical units in French and English clauses, including zero to six items to structure the paths²⁴:

FREQUENCY OF CLOSED-CLASS GRAMMATICAL ITEMS PER CLAUSE	ENGLISH		FRENCH	
	FIGURES	%	FIGURES	%
0 closed-class grammatical unit	217	27.5%	403	48.5%
1 closed-class grammatical unit	190	24%	412	49.5%
2 closed-class grammatical units	182	23%	17	2%
3 closed-class grammatical units	114	14.5%	-	-
4 closed-class grammatical units	31	4%	-	-
5 closed-class grammatical units	31	4%	-	-
6 closed-class grammatical units	24	3%	-	-
Total	789	100%	832	100%

Table 4: Frequency of closed-class grammatical items delineating paths in English and French clauses

²⁴ In Table 7, ILN are not taken into account; only grammatical items and « other units » are considered.

It seems example (20) is representative of the minor frequency of the grammatical units exhibited in French clauses. If half clauses contain units designing paths (i.e. 51.5% [49.5% + 2% = 51.5%]), very few of them display more than one preposition (cf. 2%). French space markers' frequency hence conforms to the data displayed by the Talmian typology (Berman & Slobin, 1995; Slobin, 1996; Ibarretxe-Antuñano, 2002).

In the same trend, as evidenced by example (19), an English clause can include several components structuring a single path. Table 4 reveals that English clauses can include up to six items patterning trajectories. Apart from the clauses including one, two, or three grammatical units, the clauses inserted with more than three items equal 11%²⁵ out of the whole clauses collected, hence demonstrating that the frequency of units contained in English clauses is in coherence with statistics related to the Talmian typology. French and English results confirm Berman & Slobin's opinion: "The native language directs one's attention, while speaking, to particular ways of filtering and packaging information" (1995: 612).

4. Linguistic data assessed through the enactive paradigm

4.1. Analogous English and French results

The data clustered in this investigation do not challenge the firmly established typology when examining the results related to the distribution and frequency of English and French space markers in the clauses collected. The issue tackled in the present article revolves around the way the distribution of the selected units can vary, taking into account the non-linguistic factor considered to assess static and dynamic reports.

On the one hand, a considerable amount of closed-class grammatical units are used to mark the motion performance in dynamic descriptions while the similar units appear to be less solicited in static depictions. This puzzling outcome raises questions since similar path markers are used in a parallel way after both types of experiments and in both languages, thus connecting English and French, i.e. languages that are usually distinguished from each other on account of their distinct syntactic patterns. Altogether, it seems that experiencing motion or not predisposes speakers to phrase analogous path components in both languages. This shared propensity to refer to motion and location may be due to the proprioceptive reminiscence of the bodily postures adopted by participants. By proprioception, we mean, "an immediate knowledge of limb presence and posture, caused by either cerebral events or postural sensations" (O'Shaughnessy, 1995: 175).

On the other hand, a second outcome unites the two languages since the data disclose a joint proclivity to use many ILN and "Other units" to characterize location events in static depictions. Speakers actually portray visual scenes through a tripartite partitioning of the regions considered,

²⁵ 11% result from the clauses including four (4%), five (4%) and six (3%) closed-class grammatical units.

soliciting some units that are very rarely used in dynamic depictions. The frequent use of ILN in static descriptions foregrounds a minute delineation of the visual array, which is differently apprehended in dynamic descriptions. Dynamic reports are actually more characterised by motion events, the information related to the location of some entities being backgrounded.

The aforementioned observations lead us to presume that experiencing motion or some other physical activity naturally makes speakers describe a scene in a more or less precise way; the bodily reminiscence of their postures seemingly echoing in their linguistic structuring of motion and/or location events. Despite the puzzling outcome of this investigation, we keep in mind that our analysis is only based on the way path markers are used to structure motion and location events, which only represents one part of the Talmian typology here examined. Besides, this typology is based on two models displaying distinct lexicalization processes.

To get a better idea of the influence of speakers' physical activity on their linguistic structuring of motion phenomena, a similar experiment could rely on the exclusive analysis of the use of verbs in English and French since the verbs' semantics and their syntactic uses are at the stem of the Talmian typology. This experiment is a preliminary approach to further research into the linguistic structuring of motion and location events and its potential variation.

4.2. The enactive outlook of a typology

Linguistic units are traditionally examined aside from the embodied conditions of their motor production. Yet, linguistic phenomena are first and foremost a vocal, embodied and interactive performance. The data collected demonstrate how physical activity can be intertwined with the elaboration of meaning – meaning that is not pre-given, as evidenced by this experiment. The present investigation demonstrates that the emergence of significance seems to be incorporated within the coordination of kinesthetic processes. The strategy to associate the participants' physical activity to the linguistic data collected clearly highlights the relationships between the two phenomena considered: one being linguistic, the other being kinaesthetic. This body-oriented point of view towards language is defined as the enactive paradigm, which offers novel views towards language.

The enactive paradigm comes from the notion of enaction, which was originally inspired by Husserl's and Merleau-Ponty's phenomenologies of the body²⁶. The term itself, from the English verbs 'to enact', 'to perform', introduced by Chilean biologists F. Varela and H. Maturana refers to cognition, not as the representation of a pre-given world by a pre-given mind, but it rather points to the "enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs" (Varela *et al.*, 1993: 9). This model destabilizes what Foucault (1966) called the epistemological basis of our knowledge, and challenges traditional scientific protocols.

²⁶ Considerations on Husserl's theory can be found in Depraz (2001) in the references.

According to Bottineau, modeling language in the light of the enactive paradigm entails methodological choices that highly constrain the heuristic approach adopted:

Describing language in the light of the enactive paradigm is a most challenging issue: language is to be reconsidered in terms of sensorimotor interactions with an environment in which both the individual and the environment are modified; [...] an experience which is, all in one, that of the speaker and hearer at the instant of uttering or thinking; [...] and that of the linguist interfering with his object of scrutiny by linguistic means (2010: 2).

The aforementioned proposals of the enactive paradigm bring about a range of novel views that upset firmly established theories or at least question them. In this respect, if the present experiment does not challenge the theoretical background of the Talmian typology, this study evidences that a pragmatic part of the exploration of the speech acts related to the typology has manifestly not been worked through. If English and French are usually distinguished from each other owing to their singular syntactic patterns, this study enables to connect both languages, here reconsidered in terms of the situational interactions speakers are embedded in at the instant of speaking, taking into account the impact of participants' proprioceptive load on the linguistic data collected.

The semantic patterns highlighted through the selection of the path components used in this experiment seem to be partly related to the kinesthetic issue, at the core of the questioning underlying this analysis. Foregrounding speakers' propensities mentioned in the previous sections only becomes possible when considering the speaker's linguistic production through a holistic grid of analysis, taking into account the communicative scheme individuals are embedded in at the instant of speaking, which includes cognitive experience, physical doings, and collections of selves experiencing proprioceptive sensations, emotions and judgments. As demonstrated by this experiment, such parameters turn out to be echoed in the participants' linguistic production.

The enactive "revision" of the Talmian typology has made it possible to foreground syntactic and semantic tendencies related to the insertion of path components in English and French, affecting in some way the firmly established typology. However, instead of challenging the typology *per se*, a minute exploration of the non-linguistic variable – seemingly loaded with pre-linguistic meaning – reveals potential sources to account for unexpected linguistic similarities connecting English and French.

As a result, the present experimentation demonstrates that the aim of the enactive revision of the Talmian typology is not to challenge its theoretical assumptions. Instead, the enactive standpoint, by not exclusively considering linguistic facts, makes it possible to differently apprehend linguistic patterns that are usually assessed through cognitive views. In other words, the enactive model provides a theoretical complement to cognitive assumptions by foregrounding linguistic observations that might have been left unexplored.

4.3. *Languaging* and *embodiment* defined through the enactive paradigm

Through a reading of the typology which considers personal, interactive, and proprioceptive conditions in which speakers are embedded at the instant of speaking, we are focusing on the way speakers are enacting the experience of speaking. This is what Maturana calls *languaging*²⁷ (1995). Languaging, as an interactional process, gathers all the experiences related to the act of speech. The experiment suggests that there might be a specific role of the body and spatial positioning in the languaging process, which highlights the importance of the kinesthetic issue in the elaboration of meaning. A divergence has actually been evidenced between children experiencing motion and the others: the former tend to narrate their partners as *actor-speakers*, while the latter depict their partners as *observer-speakers*. This experiential parameter has shown that languaging cannot be conceived out of the realm of bodily action. In this sense, we can say that languaging is embodied (Bottineau, 2010: 12).

The *embodiment* we are dealing with here does not refer to the binary, mental, symbolical copy of experience. Embodiment has given rise to many criticisms over the past few years because of the theoretical misunderstanding this notion tends to display. Hampe critically highlights the *mind-body* dualism, promoting a universalistic conception of the mind, which many cognitive studies are based on (2005: 5), and Mark Johnson warns us against the easy way to use the term *embodiment* to account for linguistic facts (2007: 146).

The embodiment we are dealing with in the present experiment concerns another model through which languaging is specifically embodied. The proprioceptive feeling – at the core of the kinesthetic issue here examined – allows us to consider the individual's speech act in a more complete design, taking into consideration the speaker's holistic bodily constitution. This is precisely what the enactive paradigm has to bring in beyond the traditional embodiment described by the symbolic cognitivist paradigm. The Talmian typology has hence been revised through *experience-based* corpora, involving another reading grid to assess linguistic data, questioning the proprioceptive dimension experienced by the speaking subject, who is also an *experiencing* and *living* subject.

Further experiments will contribute to identifying the linguistic impact related to the interactive process existing between the instructor and the speaking subjects. In the present investigation, speakers have a relationship with the experimenter that can be compared to the one they have with a teacher. But other kinds of relationships could be determined between the children speaking and the instructor or even between the children themselves, in the frame of experiments

²⁷ *Languaging*, as a manner of flowing in recursive consensual coordinations of behavior, is a manner of living in coordinations of doings, not a manner of symbolizing the features of an independent reality. Languaging is a manner of living in doing things together in the particular domain of consensual doings in which the languaging is taking place through the flow of the interactions of the participants. (Maturana, 1995)

defined as games including the notions of motivation and reward. Linguistic results also depend on this interactive parameter. Examining linguistic data pertaining to the collaborative interaction among children or to the one shared between children and the instructor could bring forth additional linguistic results. If some linguistic outcome has been collected through the kinesthetic issue, conceived as a non-linguistic factor, the data gathered could be completed through the consideration of collective verbal interactions, which cannot be neglected.

Conclusion

Relying on the firmly established Talmian typology, this experiment has emphasized the way space markers identifying path components are distributed in depictions delivered by speakers submitted to identical physical constraints before the descriptive task. The semantic and syntactic patterns foregrounded in this investigation have proved to be analogous in *static depictions* and *dynamic reports* in both languages examined.

The data collected hence evidence that the occurrence or absence of motion before the delineation tend to predispose speakers to describe motion or location events through path markers displaying analogous features, although both languages remain distinguished from each other owing to their different typological models. Indeed, English reports are regularly inserted with “multi-segment paths frequently occurring in English descriptions of physical motion” (Slobin, 2004: 17), while French depictions are characterized by “more sparing use of individual motion verbs to encode path components” (Slobin, 1997: 448).

In light of the results of the experiment, the speaker cannot be examined as an exclusive *speaking* subject, but as an *experiencing* individual. The speaker’s linguistic data have to be scrutinized from a holistic approach, taking into consideration the subject’s proprioceptive apprehension generated by his pre-linguistic kinesthetic experience (Bottineau, 2011, 2013). If sensorimotor conditions contribute to elaborating meaning, linguistic significance also seems to be loaded with sensorimotor reminiscences.

This study evidences the extent to which bodily involvement can contribute to structuring meaning through an assessment that does not elucidate linguistic facts in terms of input and output. The enactive issue here questions the influence of non-linguistic variables on linguistic data at a semantic, lexical and syntactic level. The enactive paradigm commented upon insists on a new definition of *embodiment*, promoting a view of language which is directly tied to the body. Sensorimotor considerations manifestly contribute to elaborating meaning, and linguistic significance seems to echo heterogeneous recollections that are linked to the self.

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Appendix

INSTRUCTIONS	TOTAL ¹	CHEMIN(S) ²	ORDRE ³
Premièrement, vous allez marcher le long du chemin bleu et ramasser deux balles de couleur différente.	1	1	1
Vous irez déposer ces balles dans le cerceau orange situé à côté du parapluie.	2	1	
Ensuite, vous reviendrez vous placer dans le cerceau qui marque le point de départ et marcherez le long du chemin blanc. Vous ramasserez de nouveau deux balles de couleur différente et	3-4	2	2
Vous irez déposer ces balles dans le cerceau orange situé à côté du parapluie.	5	1	
Ensuite, vous reviendrez vous placer dans le cerceau qui marque le point de départ, puis vous marcherez le long du chemin jaune. Vous choisirez un des deux ballons au bout du chemin.	6-7	2	3
Vous irez le déposer dans le cerceau situé à côté du parapluie.	8	1	
Vous reviendrez vous placer dans le cerceau qui marque le point de départ puis vous marcherez le long des cordes et ramasserez deux objets de votre choix qui se trouvent au sol.	9-10	2	4
Vous irez les déposer dans le cerceau à côté du parapluie.	11	1	
A partir du cerceau à côté du parapluie, vous marcherez ensuite le long du chemin orange, puis ramasserez un des deux frisbees au bout du chemin.	12	1	5
Vous irez le déposer dans le cerceau à côté du parapluie.	13	1	
Enfin, vous reviendrez au cerceau qui marque le point de départ. Vous ramasserez ce cerceau et vous irez le déposer sur la table de votre choix.	14-15	2	6

Table 1B: Instructions of the experiment, French version

¹: Nombre total de chemins à suivre au cours de l'expérience (15 au total)

²: Nombre de chemins à suivre par consigne (1 ou 2)

³: Ordre des instructions (de 1 à 6)

PREPOSITIONAL ITEMS AND PHRASES	DATA COLLECTED THROUGH THE EXPERIMENT
Simple Prepositions	à/au - contre - dans - de - derrière - entre - jusque - sous - sur - vers
complex prepositions	au bout de – à côté de – au-dessous de – au-dessus de – à droite de – au fond de – à gauche de – à hauteur de – à l’envers de – à l’extérieur de – à l’extrémité de – à portée de – auprès de – à travers – le long de
Discontinuous prepositions	de / en – depuis / jusqu’à
Prepositions + VP **	* Prepositions + present participle * Prepositions that accept the (direct) infinitive form: après, de, jusqu’à, par * Prepositions that accept the (indirect) infinitive form: avant
Prepositions used as nominal entities	devant
Prepositions + adverbs	jusque
Prepositions + 2 complements (1 nominal, 1 adjectival)	Après + (1 nominal complement) + (1 past participle used as adjective)
Adverbial use of prepositions	devant
Semi-auxiliaries managing the preposition à	continuer à
Semi-auxiliaries managing the preposition de	venir de
Preposition in the phrase être à + verb	être à V- infinitive form
Prepositions + clauses	vu
Prepositions + NP ***	malgré
Preposition + preposition	Par + preposition

Table 1C: Prepositions and prepositional phrases used by French speakers in static and dynamic reports *

*: Tables 1C and 1C' are based on the experiment's data, and also rely on the explanations related to some prepositional items' uses by Vaguer (2008) and Le Pesant (2006).

** VP : Verbal Phrase

*** NP : Noun Phrase

PREPOSITIONAL ITEMS AND PHRASES	EXAMPLES
Simple Prepositions	Paul se dirige <i>derrière</i> le cerceau.
Prepositional phrases	Émilie va <i>au fond de</i> la pièce.
Discontinuous prepositions	Il va <i>de</i> plot <i>en</i> plot pour parcourir le chemin blanc.
Prepositions + VP	* Il retourne vers le cerceau violet <i>en</i> zigzagant. * Elle a fini <i>par</i> prendre le chemin jaune. * <i>Avant de</i> contourner le dernier chemin, elle ramasse le ballon bleu.
Prepositions used as nominal entities	Elle revient sur le <i>devant</i> du parcours.
Prepositions + adverbs	elle est revenue <i>jusque là</i> .
Prepositions + 2 complements: (1 nominal, 1 adjectival)	Elle s'arrête <i>après</i> les cordes à sauter longées.
Adverbial use of prepositions	Il passe <i>devant</i> .
Semi-auxiliaries managing the preposition <i>à</i>	Valérie continue <i>à</i> parcourir le chemin bleu.
Semi-auxiliaries managing the preposition <i>de</i>	Cécile vient <i>de</i> marcher le long des plots du chemin blanc.
Preposition in the phrase <i>être à + verb</i>	Ce chemin est <i>à</i> suivre en faisant des zigzags.
Prepositions + clauses	<i>Vu</i> que le chemin est en zigzags, elle se déplace de manière un peu étrange.
Preposition + NP	Il atteint le bout du chemin rapidement <i>malgré</i> la longueur du trajet à suivre
Preposition + Preposition	Julie passe <i>par derrière</i> le parapluie au bout de la pièce.

Table 1c': Examples of the use of French prepositions and prepositional phrases in static and dynamic reports *

PREPOSITIONS AND PREPOSITIONAL PHRASES RARELY USED IN THE DEPICTIONS	PREPOSITIONS DERIVING FROM OLD PARTICIPLES	ENDANGERED PREPOSITIONS	ADJECTIVES USED AS PREPOSITIONS	ADVERBS
Avec Contre Dès Derrière Depuis Envers Hors de Pendant Pour Sans Selon	Excepté Hormis Vu	Delà	Sauf Plein	Loin Près

Table 4': "Other units" used by French speakers in static and dynamic reports

Above	During	Underneath
After	Except for	Versus
Against	Excluding	Via
Ahead of	For	Without
Among	Plus	
Around	Regarding	
Before		
Between		

Table 5': "Other units" used by English speakers in static and dynamic reports

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