The choreography of time : metaphor, gesture and construal

Jean-Rémi Lapaire

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Jean-Rémi Lapaire, EA CLIMAS, Université Bordeaux-Montaigne, France
jrlapaire@u-bordeaux-montaigne.fr

Jean-Rémi LAPAIRE is professor of cognitive linguistics, language education and gesture studies at Université Bordeaux Montaigne, France. His current research is focused on the *physicality of speech* in relation to *embodied social cognition*. He has designed and tested multimodal learning environments where students are invited to use their sensorimotor abilities to engage in dynamic acts of observation and reenactment as they analyze human communication systems. He has built multidisciplinary partnerships with professional choreographers and dance theory specialists to explore the *choreography of speech*, i.e. how speakers use *patterned moves* to shape and display meanings in space.

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Introduction

As speakers physically engage in communication, they move. As they move, they produce rich kinaesthetic imagery that opens a window onto thought (MCNEILL 1992, 2005; GOLDIN-MEADOW; ALIBALI 2013). Some of this imagery relates to **time**: it is remarkably patterned, intrinsically metaphoric, occasionally metonymic, and overwhelmingly spatial. The body parts that are characteristically involved—"hand, index finger, head or gaze" (CALBRIS 2011, p. 131)— can be identified with relative confidence, together with the general orientation system that governs kinetic action in the temporal domain.

Speakers unconsciously stage **bodily displays** of their experience and understanding of time. Their performance is based on a genuine "choreography of time" that determines the figures they trace and their occupation of conceptual space. The choreography may be observed, studied and eventually enhanced to create new embodied approaches to cognitive grammar (LAPAIRE 2011b). But the shift from spontaneous to controlled **conceptual action** is not so simple, as the present study reveals.

1. Gesture and the verbal-spatial expression of time

Gestural action routinely occurs along with verbal expressions of time. The highly patterned movements are not mere additions to lexical and grammatical constructions but essential **co-articulators** of time reference. Gestures are "purposeful constructive actions" (KENDON 2004, p. 359) which make a vital contribution to the **shaping** of temporal meanings. Their symbolic properties are fully integrated with the semiotics of temporality. The reference to time may be direct (1.1) or indirect (1.2.).

1.1. Movement and orientation in kinetic expressions of time

Temporal experience is commonly expressed in spatial terms. A significant number of verbs (*go, come*, *follow, continue, stretch…*), prepositions (*at, in, on, to, from*), adjectives (*short, long, continuous…*) or adverbs (*far away*, *back, forward*) are indifferently used to express spatial or temporal relations. Building on previous observations by WHORF (1956, p. 155) and LAKOFF & JOHNSON (1980, pp. 41-45), CALBRIS (1990, p. 85) remarks:

> The spatial expression of time is overwhelmingly evident on the verbal level. The notions of length or duration, path, interruption, localization, point of departure, point of arrival, limit, interval, distance, sequel or prolongation, posteriority or anteriority are expressed identically in space and time.

The spatial construal of time is also reflected in the kinetic activity manifested by speakers as they **locate** events or indicate **duration** in gesture space. In her landmark study of the role of gesture in the expression of time, CALBRIS (1990, p. 87) spells out the basic rules for **temporal localization** in European languages:

- "the future is placed in the direction of walking or writing, that is forward or to the right." The chin may be "lifted forward to designate a date in the future," or "a leap of the hand or forefinger" might occur, especially for predictions, developments or postponements.

- "the recent past" is "situated directly behind the speaker" and typically expressed with "the thumb or head turned over the shoulder." The movements are usually "small and quick" (p. 87). To locate the more distant past, the head may be "raised high and backwards," more slowly, suggesting that things are "far behind".

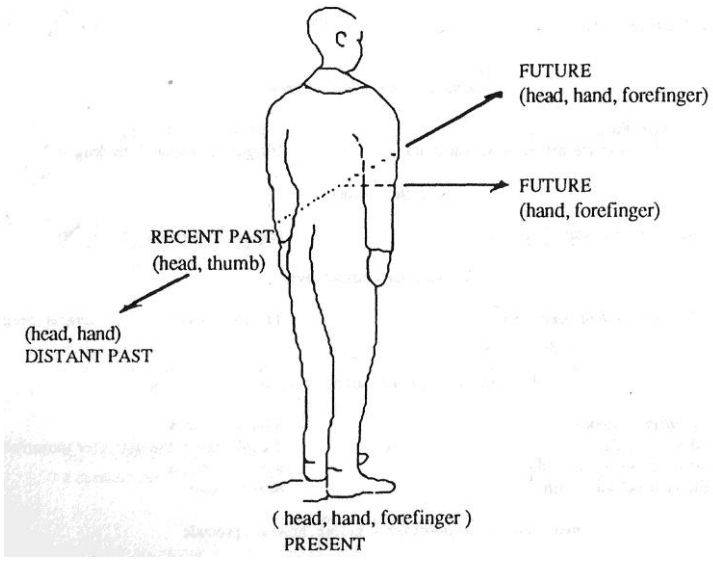

Figure 1 – Gestural localization of time
relative to the speaker's body (CALBRIS 1990, p. 88)

CALBRIS does not explore the "geometry of gaze direction" (TODOROVIĆ 2006, p. 3550) but her drawings and diagrams suggest that a change in both head and gaze orientation characteristically accompanies the shift from the present

moment to a past situation. This is especially true of narrative contexts, where speakers are seen redirecting their gaze away from the central or frontal axis, with eyes looking up to the left[1].

Figure 2 – Looking up and away (CALBRIS 2011, p. 129)

It is important to note that events are not systematically localized relative to speaker's here and now. Some other moment of reference may be chosen and established manually. Once the temporal landmark has been set up, hand movements indicate what occurred "beforehand" (anteriority) or what is "forthcoming" (posteriority). The head is sometimes involved too, especially when a contrast needs to be established between "before" and "after".

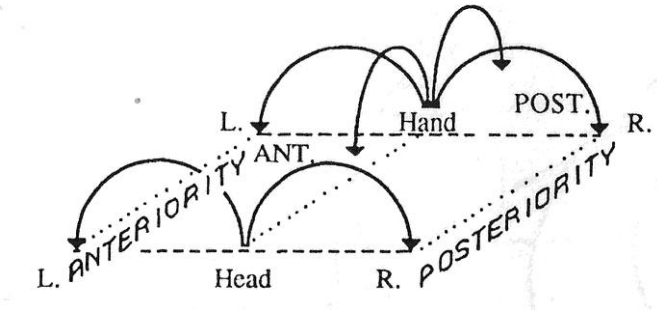

Figure 3 – Gestural localization of time respective to a given moment (CALBRIS 1990, p. 90)

Duration is the second major temporal dimension open to gestural expression. The spatial construal of **temporal distance** is visually explicit: a "span" or "stretch of time" is measured by allowing the dominant hand to travel from left to right (or in front of oneself) between invisible **time limits** (CALBRIS 1990, p. 90). Different hand configurations may be used to mark off boundaries whenever these need to be highlighted: "two palms held in the sagittal plane, facing each other"; "the thumb and the index finger held apart" (for brief time intervals); "a hand folded with the backs of the fingers forming a frontal panel that moves forwards" are common instances (CALBRIS 2011, p. 136).

The expression of duration is not confined to the simple and direct measurement of time intervals. Such notions as continuity, succession, repetition, progressive or regressive unfolding (CALBRIS 1990, p. 92) are commonly expressed by repeated curved movements (small vertical loops or circles). A sense of duration may be conveyed straightforwardly or indirectly, through an indication of origin, transformation or iteration.

[1] More research attention is needed here, using eye-tracking technology to monitor the eye activity that accompanies "visions of the past" in speech.

Figure 4 – Tracing curved lines to express the course of time (CALBRIS 2011, p. 138)

In summary, time location and time duration may be openly expressed or implied through a combination of audible vocal signals and visible gestural forms.

1.2. Indirect reference to time

Gestures typically function and signify at different levels. Their contribution to utterance meaning is **multi-layered**. The layers may be self-contained or interdependent. In Figure 5 below, reference to time is metonymically implied via some related element of meaning. Akram Khan[2] uses a combined eye, head, and thumb movement over his shoulder to point to the theater space where rehearsals have been taking place in the last two weeks. In so doing, he directly refers to a location placed behind him (spatial deixis), while indirectly referring to the stage work previously done there (temporal deixis). The form, orientation and dynamics of the gestural action are congruent with both meanings.

Figure 5 – Pointing back: spatiotemporal deixis
"We're behind, as usual. But IT'S GREAT TO HAVE THE THEATRE."

In Figure 6, another British choreographer, Wayne McGregor[3], is seen telling the audience about the loving support he got from his family when he decided to become a professional dancer: "My parents were very up for me going. They absolutely encouraged me to take risks, to go, to try, to try." The utterance of "encouraged", "go", "try" and "try" is matched with a succession of two-handed gestures: palms facing each other, with a swift forward projection. As the bilateral hand moves are repeated, slight variations in hand configuration occur. Remarkably, the speaker does slightly lean forward and down while stressing "encouraged," thus indicating that success lay ahead and ambition was a driving force egging him on. All three actions involve metaphoric motion towards a goal. The "purpose metaphor"(LAKOFF; JOHNSON 1999, p. 190), in

[2] Interview with Akram Khan, Vertical Road Rehearsals at Curve Theatre, Week 2, Leicester, Sept 2010.
[3] Wayne McGregor: A choreographer's creative process in real time, TEDGlobal 2012, Jun 2012.

which desired events are imaginatively placed in front of the speaker, combines with an "event-for-time metonymy" (p. 154) and a "space-time metaphor" (p. 159): success is construed as a craved-for state, out there, in front of the desiring subject.

Figure 6 – Leaning forward towards the promising times ahead
"They absolutely ENCOURAGED me to take risks

1.3. Further extensions to choreographic thinking

The co-speech movements examined so far may be regarded as spontaneous manifestations of construal operations. Speakers physically enact the spatialization of time—a complex cognitive mechanism. Scenes of "visual thinking" are choreographed in which "concepts take shape" (ARNHEIM 1969, p. 116). Visible kinetic form is given to invisible representational processes, perceptual imagery and mental imagery meet and merge.

What ordinary speakers unconsciously do—"thinking in the medium of gesture" and "manu-facturing" meanings (STREECK 2009, p. 151)—may be put to conscious use for teaching and learning purposes. Through language, we all acquire the ability to create homologies between bodily moves and conceptualizations. We learn to manually shape, locate and connect entities; we tirelessly practice "the poetry of motion" in "imaginary spaces" (WHORF 1956, p. 155). This remarkable **semiotic** and **aesthetic empowerment** means that teaching strategies can be developed that use movement to develop plastic analogies between sensorimotor activity and cognitive mechanisms (LINDGREN; JOHNSON-GLENBERG 2013). In the following section we discuss the use of kinesthesia and spatial consciousness to introduce the semiotics and cognitive semantics of time reference in English.

2. Moved by time : the *Grammar in motion* study

Grammar in Motion (LAPAIRE; MASSE 2006) was conceived to explain "how grammar works" by turning meanings, construals and pragmatic configurations into kinetic action. 4 professional dancers were filmed performing **metaphoric scenes of conceptualization** (LAPAIRE 2011a). As they engaged physically in a series of symbolic interactions and manipulations, images of abstract concepts and semantic

configurations were generated. The short scenes were designed to be physical enactments of metaphoric statements like "blocking (barring, obstructing, standing in) the way" for deontic *can't* constructions:

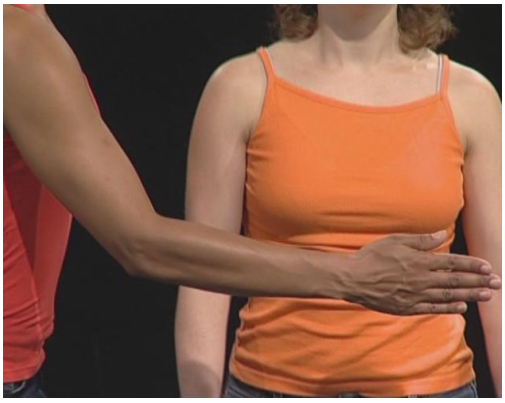

Figure 7 – Deontic *can't*
"Blocking the way" on an "action path"

Using metaphoric gestures to **give form to abstract content** may look special. Yet the "smart moves" (HANNAFORD 2005) designed by the French choreographer Jean Masse are based on the fundamental principles of "gesture imagery" that structure ordinary language.

- In narrative or argumentative situations, all speakers produce "gestures of the abstract" that create "homologies" between ideas and objects, mental activity and sensorimotor experience (MCNEILL 1992, p. 145). The homologies are congruent with those existing between meanings and substances, change and motion, purposes and destinations, knowing and seeing at the verbal level (LAKOFF; JOHNSON 1980, 1999).

  Metaphors, including metaphoric gestures, provide us with the power to think of the abstract in concrete terms – in images of space, form, and movement that are not just concrete images but that become abstract concepts." (MCNEILL 1992, p. 178)

- All speakers use "multimodal metaphors" in their speech. The metaphors are often "deployed" in gesture and speech at the same time (MÜLLER 2007, p. 113-14).

- Gesture forms are patterned. Lines, loops, curves, areas and boundaries all have conventional schematic structure.

Two *Grammar in Motion* episodes were used for the present study. The first, entitled "Time" (Appendix 1), featured a performer "standing in the "here and now" of current consciousness, then turning round to "look back" and (mentally) "travel back into the past." The performance was clearly an artistic creation, not an imitation of what speakers actually do in real life when referring to time. Yet, using head movements, gaze activity and hand gestures to localize past or future time with respect to the present moment was little more than an extrapolation of the authentic semiotic mechanisms operating in natural language (cf. 1.1.).

Figure 8 – The past

The presentation closed with the performer "looking ahead" into the future:

Figure 9 – The future.

The "Time" episode ends with verbal illustrations read out by the narrating voice: Present - *Here and now*. Past - *Looking back…. Back in 1920… 10 years back*. Future- *Looking ahead. Ahead of one's time.*

The second video used in the study was entitled "*Ago* and the past." *Ago* allows speakers to "travel back in time" while "counting their steps". The size of the steps and the distance covered may be short (e.g. *a moment ago*) or long (e.g. *ages ago*), definite (e.g. *ten days ago*) or indefinite (e.g. *some time ago*). As shown in Figure 10 below, metaphoric motion through symbolic space may involve:

- the entire bodily frame, with a strong engagement of the feet and legs as steps are visibly taken down the *alley of time*;

- the hands only, as the dancer faces back and produces a manual simulation of steps being taken down *memory lane*.

Figure 10 – "Travelling back in time with *ago*"

100 students aged 18-22 were shown 10 *Grammar in Motion* episodes during an introductory course to English grammar and linguistics[4]. The two pieces on "Time" and "Ago" were respectively presented in weeks 1 and 2. Students were advised to keep a written record of the content of the videos. The suggestion was made that they write down the metaphoric catchphrases summing up the scenes (e.g. *Standing in the present*; *Looking back*) while adding some short verbal illustrations (e.g. *Here and now*; *Back in 1920*). But few complied with the recommendations. The videos were obviously treated as peripheral recreational material. As a result, most students had trouble recalling what they had seen when the final test was given in week 12. A separate "assessment package" was handed out, containing questions on 6 of the videos shown in class[5]. Screen captures were printed that summed up the main points in each episode. The tasks were the following:

- **identify** the pictures ("What is this gestural performance about?");
- **explain** the scenes ("What do the moves stand for?");
- **evaluate** the approach ("Does this help? Please give your sincere opinion").

Our first hypothesis was that the video on "Time" would be easier to process because the gesture sequence rested on a simple **front-back orientational metaphor** (LAKOFF; JOHNSON 1980, p.14). This kind of metaphor is very much alive in everyday language[6] and continuously fed by the spontaneous kinetic activity that accompanies "temporal localization" in every day speech (CALBRIS 2011, p. 134). It was also conjectured that the aesthetics and phenomenological quality of the "Time" performance would make a more lasting impression on the students' minds than the leaps and bounds used to illustrate "ago." The results of the study confirmed our prediction.

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[4] *Introduction to English linguistics : grammar and lexicology, semester 1*. Department of anglo-american studies, Faculty of Modern Languages, Université Bordeaux Montaigne, France. Period of instruction : Autumn semester 2014. Total number of students : 100.

[5] The 6 videos that the students were tested on were (1) "Time" (2) "Ago" (3) "Verbal base + affix" (4) "Tag questions" (5) "Past participles" (6) "Countable vs. uncountable nouns."

[6] E.g. *Back in the 1920s*; *Ten years behind*; *Looking forward to meeting you*.

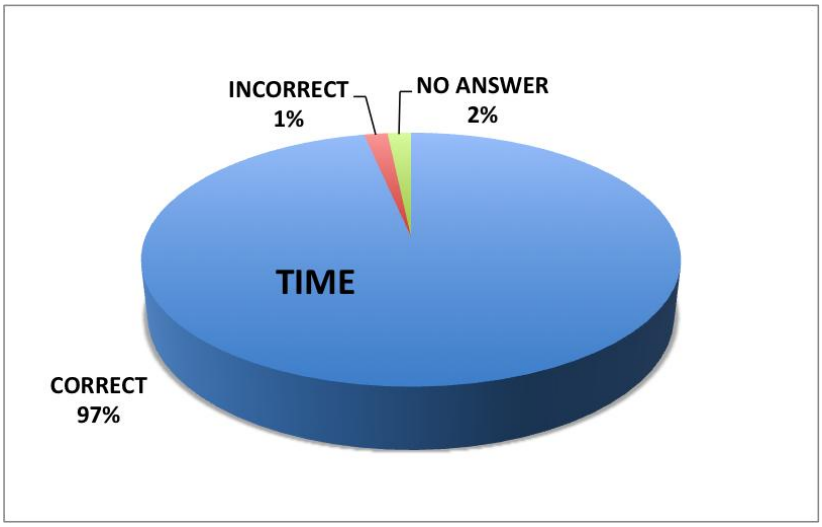

Figure 11 – TIME: PAST, PRESENT, FUTURE
Topic identification (97% success rate)

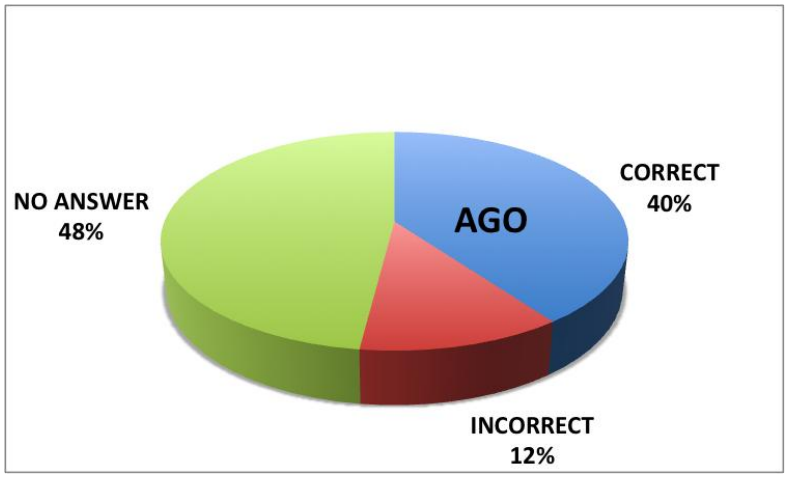

Figure 12 – AGO AND THE PAST
Topic identification (40 % success rate)

Our second hypothesis was that **embodiment**—or "the enactment of knowledge and concepts through the activity of our bodies" (LINDGREN; JOHNSON-GLENBERG 2013, p. 445)—would create "meaningful connections" between movements and concepts. The "smart moves" (HANNAFORD 2005) would stick in everyone's mind and act as cues to access essential information about the constructions and cognitive mechanisms. But a more complex picture emerged from the study. Although the process of retrieval was largely successful with the "Time" visuals (97%), only a third of the students (34 %) produced detailed descriptions of the scene. Unsurprisingly, the remarks were confined to "time orientation" and the "space-time metaphor": "the *future* is ahead of us" and "the *past* is behind us" (LAKOFF; JOHNSON 1999, pp. 152-159). Scant attention was paid to the **sensorimotor events** linked to the **cognitive acts** of **reminiscing** and **predicting**: "turning around" and "looking back" (for remembering); "reaching out" (for attempting); "bringing back" (for retrieving and displaying); "bending forwards" and "looking ahead" (for anticipating and foreseeing).

Figure 13 – Recapturing the past
"Turning around" - "Looking back"
"Reaching out" - "Bringing back"

Bodily action was given more prominence in accounts of "Ago and the past" because the jumps made by the performers were conspicuous enough and could hardly go unnoticed. But students scored relatively low on basic identification tasks (40%) and no reference was ever made to gaze activity, head and hand movements, when measuring the distance between the present moment and a past situation:

Figure 14 – Retrospective measurement of temporal distance
between past and present (e.g. *10 years ago*)

Only a fraction (6 %) of the students discussed the interconnection between motion, sensation and understanding. The role of the body as a **medium**—a "living form" through which meaning is simultaneously "conveyed" and allowed to "emerge" by itself (SIMPSON STERN; HENDERSON 2010, p. 136)—was not even hinted at. A likely explanation is that the students never engaged physically in the kinaesthetic experience they were asked to report on. As one of them insightfully remarked, "it would have made much more sense to *do* the moves, not just watch them[7]". In ordinary spoken interaction, the listeners are **exposed** to forms of gesture symbolism—concrete or abstract, iconic or metaphoric—that they themselves **perform** when speaking. Production and reception alternate, so everyone has some practical knowledge of the semiotic system used and communicative strategies applied. But the expressive style of *Grammar in Motion* (LAPAIRE; MASSE 2006) was not resonant with anyone's gestural

[7] See Appendix - Negative ratings.

style. The visual metaphors made sense but were too far removed from conventional ways of using movements as "material carriers" of meanings (MCNEILL 2005, p. 58). Because testing raw reception and basic understanding was deemed a priority, students were simply **presented** with the "smart moves". Favourable conditions for them to respond and engage physically were not created. Feedback was limited and participants could not build on their own kinaesthetic intelligence to explore "embodied, enactive forms" created "to organize and represent content" (STREECK 2009, p. 162). Their position was largely one of passive "spectatorship" (PUSTIANAZ 2016) in a non-participatory performance, with little or no access to **performativity**—"the making of signs and scenes" (SCHECHNER 2003, p. 327). This is why future studies should be careful to design movements that resemble natural co-speech gestures more. Also, greater viewer-involvement should be sought, probably by adopting an **immersive workshop format** (as successfully tried elsewhere):

Figure 15 – Multimodal linguistics seminar (2015)
Exploring exclamatory structures
Variations on *Laugh and laugh in the face of adversity!*

Our third and last hypothesis was that designing a kinetic system that "creates images of abstractions" (MCNEILL 1992, p. 145) would be a welcome innovation in the disembodied world of theoretical linguistics. Students, we believed, would find the phraseology poetic, the choreographed movements compelling, and the sensuous beauty of the moving bodies alluring. But once again, a more contrasted picture emerged from the study, although the expectation seemed to be confirmed at first. The videos were met with spontaneous manifestations of surprise and amusement. Occasional giggles or sneers soon gave way to cheers, and scattered pockets of resistance eventually dissolved. Within weeks, a fascination for "visual grammar" had developed—or so it seemed. Looks of disappointment would show on some faces when screenings of *Grammar in Motion* had to be postponed. However, the written reports produced for the study sent out a different signal (Appendix 2). The practical usefulness of the approach was challenged by over a quarter of the respondents. Adding to the disappointment, the expected learning gains were not considered as decisive as had been wishfully anticipated.

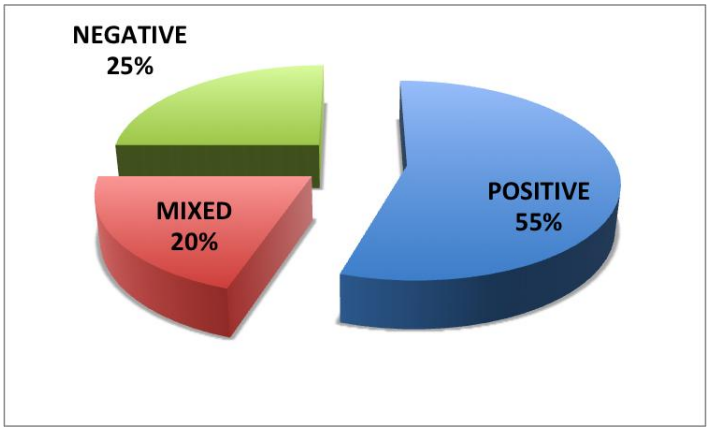

Figure 16 – Student rating of the visuo-kinetic method

By and large, the **form** and **aesthetics** of the movements were positively assessed. The gestures were praised for their "beauty", "fluidity" and "plasticity." Most importantly, the moves were seen as giving "visible shape to the invisible mechanisms of grammar" thus creating "a new form of grammatical imagery." Yet, some reservations were also expressed, although more marginally, by those unable to perform the recognition tasks: "weird," "confusing," "strange and disturbing."

The contribution of the method to the successful **comprehension** of language functioning was generally acknowledged: "clear", "concise", "accurate", "relevant." A clear majority of the respondents expressed support for an approach that facilitates understanding by giving visible shape and spatial location to abstract notions: "an instant connection [is established] between grammatical meaning and a visual concept, thus avoiding the need to translate or learn technical definitions." But what constituted a "motivating" or "stimulating way of learning" for many (55%), also "added a layer of complexity" and caused "unnecessary disturbance" in some (25%). A small but articulate group of respondents (20%) expressed mixed feelings. The system is "clever" but functions in a paradoxical way, they remarked: it makes things "look simpler" while "adding a layer of complexity." Adding to the ambivalence, the creations are of unequal worth and inspiration: "some topics are very nicely handled, others are made trickier to grasp."

Lastly, students were found investigating the limitations of the kinaesthetic approach. A harshly critical comment mentioned "complete aversion to this kind of stuff," while another judged the innovation "pointless" and "gimmicky." Both came from students with low scores on identification and description tasks. Elsewhere the criticism was more subdued: some practical-minded respondents found "no real benefit" in watching the videos since they "already knew the rules." Driven by similar utilitarian considerations, other respondents found the visuals positively enlightening but of questionable value to improve actual **language performance**: "Enjoyable but won't help you speak or write better"; "Makes you *see* things and understand things but remains very abstract. At the end of the day, what you will be judged by is whether you use the forms correctly or not, in real life situations." Some students showed deeper critical insight by challenging the durability of conceptual and perceptual **memory**. The imagery, they complained, "fades away too fast" and the concepts are hard to recollect. The visuo-kinetic arrangements, they pointed out, may strike viewers as beautiful and

meaningful "in the instant" but that does not necessarily mean that the mental imagery will last for long. Even if some suitable degree of entrenchment is achieved, "you (still) need to put words back onto the pictures if you want them to mean anything at all." So there is no doing away with words.

Concluding remarks

"Gestural meaning-making and understanding" (STREECK 2009, p. 3) play a central role in the expression of **time relations**. Sensory reality is given to **fundamental construal operations** and "basic cognitive abilities" (LANGACKER 2008, p. 34) are revealed in action. Thus, the ability to locate, connect, oppose, limit, measure, orient, establish reference points is **displayed** and **enacted** as speakers engage in the verbal-gestural evocation of time. As suggested in the second half of this research paper, "smart moves" (HANNAFORD 2005) may be designed and successfully used as "cognitive artifacts" (STREECK 2009, p. 173) in teaching-learning settings, if they tap into the existing semiotic resources of co-speech gesticulation. For this to happen, "conceptual acts" (STREECK 2009, p. 160) must be observed and studied, as they spontaneously occur in everyday communicative interaction. But above all, **symbolic actions**, **cognitive actions** and **bodily actions** must be integrated into a single framework for exploring and understanding, where learners are simultaneously cast in the roles of viewers, cognizers and movers, and all eventually find themselves "emboldened by embodiment" (LINDGREN; JOHNSON-GLENBERG 2013, p. 445).

Appendix 1: *Grammar in Motion* - "Time"
The French voiceover script and its English adaptation

"*Le temps, je ne le vois pas mais je le sens. Là, sous mes pieds, sous mes yeux, autour de moi, le present: here and now. Et là, dans mon dos, le passé. En anglais: back. Back in the past. J'y retourne, je le revois, parfois. Plus loin, là-bas, devant moi, le future! There, in front of me. J'y vais ou il vient vers moi. Quand je le devine, c'est comme si je le voyais déjà!*

"Time is invisible, yet I can feel it. I can sense the present under my feet and before my eyes, *here* and *now*, surrounding me. The past is behind. I can turn round and *travel back in time* to *see what happened.* The future lies ahead of me! I can travel forward in time, or wait for times yet to come. Anything I predict, I can see looming on the horizon, out there, somewhere."

Appendix 2: student assessment
Learning gains and practical usefulness of *Grammar in Motion*

Open-answer question n°3: "Does this kind of approach help? Please give your sincere opinion"
Sample of student responses

Positive ratings
FORM AND AESTHETICS: "Gives visible shape to the invisible mechanisms of grammar"; "A vivid illustration of abstraction"; "Creates a new form of grammatical imagery"; "Beautiful"; "Plastic and fluid"
UNDERSTANDING: "Clear and accurate"; "Short and to the point"; "Helps us understand better", "Enhances understanding"; "Understanding made easier"; "Stimulating"; "A fun way to learn"; "Uses powerful imagery to visualize abstract grammatical concepts"; "Sets up concepts in space"; "Helps understand a concept through a concrete analogue"; "Promotes a better understanding of grammar"; "Establishes an

instant connection between grammatical meaning and a visual concept, thus avoiding the need to translate or learn technical definitions."

Negative ratings

FORM AND AESTHETICS: "Weird"; "Personifying grammar rules in this way is somewhat strange and disturbing"

UNDERSTANDING: "I'm not sure I understood the video on AGO"; "Adds a layer of complexity"; "Causes unnecessary disturbance. I much prefer the usual way of explaining things."

RELEVANCE, PRACTICAL USEFULNESS: "Pointless"; "I have no problem making sense of the movements and comments but they don't add much to my understanding of grammatical issues. To be perfectly honest, I don't see the point and am rather averse to all this stuff"; "No real benefit: I already knew about time and tense. And using *ago* is not a problem for me."

LIMITATIONS: "It would have made much more sense to *do* the moves, not just watch them"; "Everything looks fine while you watch, but the imagery quickly fades away."

Mixed feelings

SIMPLE AND COMPLEX: "Makes things both simpler and more complex"; "Some topics are very nicely handled, others are made trickier to grasp"; "Facilitates understanding in some places, but may add complexity elsewhere"; "Clever and special but also confusing in its own way."

LIMITED GAINS: "Inspiring, but then you need to put words back onto the pictures if you want them to mean anything at all. So, at the end of the day, what's the gain? ; "Enjoyable but it won't help you speak or write better"; "Innovative and thought-provoking but you need to spell out rules again in order to bridge the gap between the smart moves and the grammatical rules"; "Makes you *see* things and understand things but remains very abstract. At the end of the day, what you will be judged by is whether you use the forms correctly or not, in real life situations."

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