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► **To cite this version:**

Brahim Azaoui. On pointing in first and foreign language classes. GESPIN, Sep 2020, Stockholm, Sweden. hal-02912833

HAL Id: hal-02912833

<https://hal.umontpellier.fr/hal-02912833>

Submitted on 22 Oct 2020

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Reference:

Azaoui, B. (2020). On pointing in first and second language classes. Paper presented at GESPIN conference, Stockholm, Sweden, 7-9 sept., 2020, 1-6.

On pointing in first and foreign language classes

Brahim Azaoui

LIRDEF, Université de Montpellier, France

brahim.azaoui@umontpellier.fr

Abstract

Gestures are ubiquitous in teacher actions. Among those, deictics in foreign language classes are the most produced types of gesture. And yet, to date, no study specifically dedicated to pointing gestures in educational setting seems to have been carried out.

Our case study aims to examine and discuss the production of a teacher's pointing while teaching French as a first and a foreign language. The analysis of almost 600 pointing gestures allows us to offer some particular insight on this specific topic. Fourteen different pointing gestures have been distinguished. It has been shown that the form of the hand may be motivated by an economy of movement, whereby the hand shapes may be influenced by the one of the preceding gesture. In parallel, there has been consistency between the forms and the teacher's intentions. Of particular interest for the understanding of the use of pointing gestures in this context was the analysis of the ones performed in two-handed gestures where the hands move in different patterns.

Index Terms: pointing, educational setting, two-handed gestures, first and foreign language classes

1. Introduction

As of toddlerhood, pointing plays a crucial role in the child's development by paving the way to language thanks to the creation of joint attention between the child and the interlocutor [1]. Progressively, the referencing process is becoming more complex, all the more so in some cultures [2, among others]. Besides, because the space around the interlocutor is potentially part of the exchange, the gesture space has a discursive meaning [3], and the deictic gestures has *in fine* both a discursive and a grounding function [4].

It has also been shown that various hand shapes may bear different meanings. According to Calbris [5], the forefinger "often designates someone or something in order to command or accuse"; the hand "presents and offers", is "polite and not imperative" (p. 129). The French author posited that one may alter the form of his hand according to the speaker's intention or to the context.

As for educational settings, recent research has shown that pointing gestures predominantly compose the gesture repertoire of (first and foreign) language teachers [6]. Still, to our knowledge, no research has specifically dedicated itself to the study of language teachers' hand shapes and functions of pointing gestures as, for example, Kendon & Versante [7] did for the Neapolitan deictics.

We however find some information in the scientific literature. Information gathered in various studies on gestures in educational settings ([8], [9], [10], [11]) indicates that pointing serves the same functions as in day-to-day

interactions; they "ground teachers' talk by linking the abstract, verbal utterance to the concrete, physical environment" ([8], pp.190). The authors hypothesised that "such grounding should facilitate students' comprehension and therefore their learning" (*ibid.*). Deictic gestures mediate the teachers' actions and intentions. They silently draw students' attention to the referent that may elicit answers from them without further verbal explanation. For example, Azaoui ([9], pp.42) examined how a French as a foreign language teacher resorts to pointing to the board, used as a silent scaffolding [10], to overcome the non-native students' temporary inability to conjugate a verb. He concluded that the gestural scaffolding facilitated students' empowerment and autonomy by urging them to observe and pick up the relevant information written on the board. For that matter, when asked about the relevance of gestures, students interviewed by Sime [11] confirmed the usefulness of pointing gestures for their understanding of the lesson, particularly when they pointed to teaching material (the board or books).

Despite the quantity and the relevance of deictics in foreign language classes, settings which have their own specificity ([10], [12]), to date no study dedicated to pointing gestures has been carried out in this context. Yet, many questions, which will serve as guidelines to this paper, remain unanswered: are there recurrent forms? are there consistencies between the use of certain forms and the intentions behind them? how do deictics interplay with other gestures during two-handed gestures? can we observe some kind of difference between the forms and functions of pointing between the two teaching contexts? This paper, which follows a data-driven approach, will examine this set of questions.

2. Methodology

2.1. The corpora

The data set consists in video recorded classroom interactions of a French secondary school teacher, in two different contexts. She teaches both French as a foreign language (FL2) to newly arrived migrants and French as a first language (FL1) to French speakers.

The 11-14 year old foreign students were then in France for less than a year. Their linguistic ability varied from basic to lower-intermediate and the class was composed of about 10 students. As for her French students, they were 11 years-old, and about 25 in the class.

2.2. Transcription and coding

We considered only the primary dimension of the gestures, the interpretation of this dimension being supported by the verbal utterances (mainly verbal deictic or spatial localization). Some gestures may however also bear a secondary dimension (see for example 3.3.1).

In total, out of 193 minutes of oral interactions and 1789 gestures (subdivided as follows: 855 in FL1 classes and 934 in the FL2 setting), 581 pointing gestures were transcribed and annotated with ELAN. All the figures have been brought down to a 100 minute duration basis to allow comparison.

Regarding the gestures, three types of information were categorised: form of deictics, referent and arm extension. Even though the main dimension “deictics” draws from McNeill’s [13] typology, the subdivision of pointing gestures is dependent on this teacher’s production of pointing in these contexts. Among these gestures, we included a head-chin deictic even though it occurred only twice. In the end, 14 sub-types of deictics were coded (see Table 1 for presentation). Among these types, the “showing document” category refers to situations where the teacher held a document (book, worksheet) up with one or two hands for her students to see it.

We also observed and coded the referents and the extension of the pointing gestures. We drew on McNeill’s [13] distinction between concrete and abstract pointing gestures, and added another referent: material, by which we meant all teaching material that may be designated by the teacher. It includes the whiteboard, the activity sheets, the textbook, or any realia used during the lesson (mostly maps in the French as a foreign language classroom). As for the arm extension, we considered three sub-categories according to the aperture of the inner elbow at the apex of the gesture: folded, half-extended, extended.

Classroom interactions are marked by their polylogal and polyfocal dimension. By polyfocal, we mean that the teacher may direct his attention to various foci of interest, and polylogal refers to the idea that more than three students may speak simultaneously. Due to this interactional reality, two-handed gestures are quite common in educational settings [12]. We thus coded in two different tiers the right hand and the left hand.

Finally, the teaching functions of the gestures were also coded following Tellier’s [14] typology. Gestures can be used during class management, oral assessment, and the delivery of information.

3. Results and discussion

Comparing settings ought not to be limited to looking for the differences between the contexts. Focusing on the invariant traits of a teacher’s gestural productions across contexts may inform about his gestural style.

3.1. Form and referent distribution

Pointing gesture sub-types are distributed differently according to the teaching context. The percentage of deictics in the total number of gestures in the FL2 setting is higher than the one in the FL1: 38% vs 26%. The types are distributed as shown in Table 1:

Table 1: *Pointing gesture sub-types.*

	FL2	FL1
chin	0	2
index finger curled up	4	8
index finger palm down	73	65
index finger palm lateral	101	62
index finger palm up	18	16
hand palm down	29	25
hand palm lateral	42	4

hand palm up	29	24
hand purse inverted	3	1
hand purse vertical	0	6
joined hands	0	1
material	4	23
other fingers	30	8
showing doc	10	2
Total	343	247

If we consider two main categories (hand pointing gestures and finger pointing gestures), in both contexts, the latter is numerically superior to the former. As for the referents, here is now how they are distributed (Table 2):

Table 2: *Referents.*

	FL2	FL1
abstract	94	70
person	125	145
material	124	32
Total	343	247

The high number of material as referents (mostly a map on a wall) in FL2 may be highly situated as it is related to the topic under discussion during a lesson. However, it is coherent with Alibali & Nathan’s [15] idea that “gestural grounding” facilitates students’ understanding of the teacher’s verbal information as it makes visible the utterances. This materialised scaffolding of the teaching discourse is coherent with the linguistic level of the students in this class which is composed of newly arrived migrants.

3.2. What is behind the form

3.2.1. The form: an economy of movement?

While the “form of the pointing adopted provides information about how the speaker wishes the object being indicated to be regarded” ([16], pp. 201), we believe the deictic shape may also be related to the previous (non-)gesture. Hence, we posit that the form may also be motivated by an economy of movement, not always by a semantic meaning.

In our corpora, the form of a hand pointing was often related to the manual gesture that preceded it, be it a non-gesture [13] (Figure 1a) or not (Figure 2a).

The first gesture (Figure 1a) shows the teacher waiting for an answer with her hand holding her chin. As soon as she hears the voice of a student, she starts pointing to him (Figures 1b and 1c) for him to repeat louder. The change between the two gesture forms is negligible: the forefinger is extended; the other fingers are still curled up and the hand almost in the same position. Only the extension of the arm differs.



Figure 1: *Form and economy of movement – 1.*

So is the change of form minimal in the second example taken from the FL2 setting. First, as student A has interrupted

student B, the teacher gesturally puts student A on hold with her hand palm down, a French emblem [17] that expresses the idea of halting the interlocutor (Fig.2a). The same form of gesture is however produced to invite B to resume his idea (Fig.2b).



Figure 2: *Form and economy of movement – 2.*
(Fig.2a: 14'42 - Fig.2b: 14'43)

The hand palm down now directed to student B no longer means negating or interrupting someone, but rather inviting one to speak, as would do a hand palm up. We could assume that the extension of the arm, along with the co-speech, allow the gesture to perform a different pragmatic function. The idea that this gesture is motivated by an economy of movement comes also from the fact that when she first gave the floor to student B she performed a hand palm up (see 3.2.3). Although she returned to student B and asked him to start again, she did not resume her first gesture – which would have been coherent with the idea of continuation – but maintained the one she had performed to halt student A.

However, as interesting as this may be, this economy of movement is not the rule in our material; more often than not, the pointing may inform about the speaker's intentions. Our analyses will now concentrate on the four quantitatively meaningful gestures: index finger down and lateral and hand palm up and down.

3.2.2. *Functions of index finger palm down and lateral*

These two sub-types are the most produced in the two contexts, and as counterintuitive as it may sound, they mostly serve the same functions. In coherence with the study by Kendon [16] or Calbris [5], when the teacher singles out a student to give him the floor, to reprimand or congratulate him, it is mostly likely that the forefinger pointing is used, be it with the palm down or lateral. Both index palm down and lateral are performed to invite a student to speak and validate an answer. The former is also used to count the students and stress on the information being transmitted. A beat gesture sometimes superimposes the pointing when produced to validate an answer or stress on a piece of information. Unlike the index palm down, the index palm lateral is used to warn or reprimand a student.

During these actions, the orientation of the torso or the gaze, or else the bending of the upper part of the body, need to be considered. Indeed, the number of students makes it sometimes difficult to know who is pointed to. The indication is made more precise by bending the upper part of her body towards the interlocutor, by accompanying the gesture with the orientation of the teacher's gaze and torso, and/or by the word she utters (for example, she names the student or urges him to speak).

Also worthy of interest is the index palm lateral pointing used as a "radar" to detect the student that will answer the question. For instance, as she is expecting her students to find the word "antonyms", she slowly moves her hand laterally

with her index pointing as a radarscope. When a voice is heard, she slows down the lateral movement and orientates her arm to the location of the voice. It is as if the finger were exploring the class, ready to stop and point to the student that has the correct answer or wants to have the floor. The same radar procedure is observed with the index palm down, except that the fingers are wiggling in a wavy way (note that this wiggling movement is not to be mistaken with a beat gesture). They are ready to freeze and, with an index finger palm down, single out someone potentially having the answer. To better understand this technique, let's bear in mind that most teachers' questions are rhetoric in the sense that the instructors usually know the answer to the question. However, they make as if the students' answers were essential and by using her index finger as a location device, this teacher somehow goes hunting for ideas that will help her move on in her lesson plan.

When either index pointing is produced to designate the whiteboard, the interplay with the gaze is different according to the object of attention. If the teacher is indicating the overall message on the board, she designates the board with her head facing the students. But if she wants to draw the students to a specific element, she first looks at where to place her finger, then turns to look at the class.

3.2.3. *Functions of hand palm up and down*

Although we observed hand palm up / down gestures pointing to teaching material we will here concentrate on abstract pointing and deictics that designate interlocutors.

Hand palm down gestures were performed either with one hand or with two hands in mirror images. Regardless of the context, when abstract pointings are produced with two hands in the space in front of her, they may be paraphrased by "what have we said *up to now*" – and thus bear some iconic dimension; they may aim to take stock of the various ideas proposed so far. In one-handed gestures, the hand palm down pointing – sometimes produced with a beat gesture – enabled the teacher to locate places or refer to absent persons when it was directed to the gesture space around her. A variant of this gesture with bended fingers (Figure 3) was observed when the teacher was explaining the meaning of the word "endroit" ('place'): "un endroit, c'est là où on est" ('a place is *where* we are'). As she did so above the sheet of paper she was holding in her right hand, she performed this specific hand palm down with bended fingers, which we believe served to isolate the key words "là où" (literally, 'the place where') and make the meaning even more explicit.



Figure 3: *Hand palm down with bended fingers.*

As for the hand palm prone, it occurred when the teacher was talking about the 2012 French presidency; she explained there were various candidates and referred to them by locating each one of them in the abstract gesture space. However, because she performed a *hand* palm down gesture where a *finger* palm down pointing could have been sufficient, we

assume she had a group in mind and that she was not pointing to each candidate for presidency, but to the whole campaign team along with this candidate.

Let's now turn to the hand palm up. Müller [18], Kendon [16] and Calbris [5] have often argued that it may convey the idea of receiving or giving. It is such a meaning that we observed in our material.

Abstract hand palm up pointing is used to enumerate ideas. They present "wide range of discursive objects" or "listing of ideas" ([18], cited in [19], pp.1593) that are elements the students are supposed to take in as pieces of information and explanation. Regarding pointing to the interlocutors, our teacher points to her students with her hand half-extended or fully extended when she intends to "receive" the information. These gestures occur when the student is thought – by the teacher – to be about to deliver (or indeed delivered) the information she was looking for.

In the following example from the FL2 context, the student's sentence starts with the key word "2e tour" ('2nd round') the teacher is focusing on. She pays attention to it because she assumes the rest of the sentence will contain the answer she is expecting. So, she produces a hand palm up as if to "collect" the intervention.

More, we observed in both contexts that this gesture was also performed not to offer or deliver, but to "acknowledge another as a source of something said" ([16], pp.272). In our two settings, the teacher shows readiness to acknowledge the origin of an idea. In an example taken from the French as a foreign class, she says: "et donc, effectivement, grâce à la télé" ('and so, indeed, thanks to television'). As she utters the word "indeed", she produces a hand palm open pointing, which allows her to almost literally hand back the idea to the person who "owns" the paternity? This is confirmed verbally with the use of the word "effectivement" ('indeed') used in each setting and occurrence of this gesture.

In each context, the intervention of the student occurred 30-45 seconds before the teacher repeats it. The pointing seems to function as a gestural reported speech, and could be translated by "as you previously said".

3.3. Pointing in two-handed gestures

Two-handed gestures in teaching contexts have rarely been the focus of attention despite their frequency [12]. Indeed, teachers are often busy dealing with a multi-agenda [20], i.e. organising simultaneous multiple tasks. It requires instructors to be able to "divide" themselves. Using their two hands is one way of doing so.

McNeill [13] distinguished two types of two-handed gestures: one where "the hands move in the same pattern but in mirror images" and another where the two hands "perform different movements but, jointly, create a scene in which there is a single event" (p.117). In educational settings, we propose to include two sub-types to the latter, ones where the two hands create a scene in which there are *two separate events*:

- the hands perform two different dimensions and pragmatic / teaching functions,
- the hands perform the same dimension but with two different functions and/or directions.

Azaoui [12] has demonstrated that only by resorting to multimodal resources – including two-handedness – could

teachers simultaneously manage two events or transmit two different pieces of information.

3.3.1. Pointing where the hands move in mirror images

There exist several occurrences of pointing where the hands move in the same pattern. In both contexts, often the two-handed pointing is observed in situations where the teacher wants to stress her point, or make her explanation clear. This is exemplified in the following example (Figures 4a and 4b) taken from the French as a foreign language class.

The teacher is explaining how to write a letter to Santa Klaus, and as she is writing "Dear Santa" on the board – she is right-handed – a student asks her where to put the date. She stops writing, brings her right hand at the level of her left hand, she produces a two-hand palm lateral gesture and progressively moves her hands up to designate "en haut" ('at the top', Figure 4a). She then produces a deictic: she withdraws her left hand, maintains her right hand up and performs a wiping movement to the right to indicate "à droite" ('on the right', Figure 4b). She resumes her writing right after this explanation.



Figure 4: Teacher performs a two-handed pointing with hands in mirror images (Fig.4a).

Interestingly enough, a few seconds earlier, she had told them they had to mention the place where they were sending the letter from "tout en haut" ('at the very top') of the letter, without accompanying her explanation gesturally. The linguistic competence of the students is enough for them to understand French prepositions of location. Consequently, she could easily have also mentioned orally "on the right". Yet, and even though she is turning her back to the class, and therefore does not know if her students are looking at her, she produces a gesture to make her explanation visible. But even so, why not with one hand? First, we assume it emphasises the fact that it is to be written above what is already on the board. Second, and as strange as it may sound, her two-handed pointing may account for the urge to compensate for her size. She has indeed already written "Cher Père Noël" (Dear Santa) and she is now too small to write the date above these greetings. Yet, because she needs to clarify this location on the board, she resorts to a multimodal explanation: she orally isolates the two prepositions: "en haut" / "à droite" (there is a 0.5 sec pause between the two), and produces a gestural explanation.

3.3.2. Pointing where the hands move in different patterns

Two-handed gestures where the hands perform different patterns occur in both educational contexts under scrutiny. As mentioned, we revised McNeill's distinction to consider also types where the two hands perform two separate events.

3.3.2.1 *Two hands, two different dimensions and functions*

We illustrate the first type with material from the FL1 context. As head-teacher of her class, she needs to explain the organisation of the “Conseil de classe”, i.e. the Board that gathers parent representatives, student reps, the Principal and the teachers to discuss about the students’ progress. While doing so, a student has taken the floor unauthorised. As shown in Figure 5, the teacher performs an emblem with her left hand extended to keep the student on her left (off-camera) at bay and stop her from speaking. She holds on this gesture while resuming her explanation: “et le professeur principal, c’est-à-dire moi, je note l’avis général” (‘and the head-teacher, in other words me, I write down the final recommendation’). With her right hand, she produces a self-oriented pointing gesture temporally synchronised with the word “principal” (*head*, in head-teacher). It seems that either the gesture anticipates the pronoun “moi” (‘me’), which makes “head-teacher” more explicit, or else, the reformulation – introduced by “in other words” – comes to disambiguate the pointing gesture as it may somehow have been ill-timed.



Figure 5: *Two-handed gesture with hands in different patterns.*

Note that this word needs further explanation because the students she is speaking to are in 6th grade, first year in Middle school. Among the differences with Elementary school in France is the fact that the students will now have several teachers each concerned with a subject. As head-teacher of this class, she supervises the work and progress of this class in particular.

3.3.2.2 *Two hands, same dimension but different directions and functions*

The second type of pointing in two-handed gestures is illustrated by an extract from the FL2 class. In this example (Figure 6), the teacher has asked a question about the meaning of the word ‘debate’. Two students, Antonio and Pedro (Nb.: names have been changed), take the floor one after the other to share their ideas. After Antonio (on the teacher’s right, off-camera) has proposed his idea, the teacher somehow positively evaluates his intervention by directing her right hand index finger palm down towards him – she produces beat gestures while performing this deictic – with her arm fully extended. She then briefly produces a French emblem – oscillatory rotation of her right hand palm down to evaluate as “approximate” the relevance of Antonio’s answer. While still holding her hand palm down pointed to Antonio (Figure 6), she gives the floor to Pedro by directing her left hand palm down towards him. She politely refutes Antonio’s idea by asking Pedro to make his classmate’s idea clearer: “mais plus précisément, vas-y” (‘but more precisely, go ahead’). The two hand shapes are now performing the same deictic dimension with the arms extended, but they point to two different directions and serve two different functions: the right hand

keeps Antonio’s intervention on hold – as if not to forget it – while the left one invites Pedro to speak.



Figure 6: *Same gesture dimension, different functions.*

By maintaining her right hand raised and directed to Antonio, she sort of reminds the observer that something he said was of interest. We believe the teacher weaves a mental thread between the two interventions. We could even contend that she becomes the thread itself as she symbolically relates the two interventions, the latter building upon the preceding one, making the two students part of a community of ideas.

4. Conclusions

This paper investigated the semantic and discursive meaning of pointing gestures in first and foreign language classes. The results may benefit from further studies with more speakers.

Despite this limitation, we found that, qualitatively speaking, the meaning of the deictic is not context-sensitive, i.e. the linguistic profile of the students has no impact on the signification of the pointing use and form. Besides, whatever the setting, the hand shape may be motivated by an economy of movement, whereby the form of the pointing may be influenced by that of the preceding gesture. In parallel, there has been consistency between the forms and the teacher’s intentions. Among the functions deictics may have, we found that index palm lateral pointing can be used as a “radar” in search of the student likely to come up with the expected answer. Beside, we also confirmed the use of hand palm up gestures to acknowledge the source of the idea. The results also show the use of the two-handed hand palm down to take stock of the ideas exchanges so far. Of particular interest was the analysis of deictics in two-handed gestures where the hands move in different patterns. We revised McNeill’s distinction of two-handed gesture types to adapt it to classroom contexts; we observed that they allow her to organise and manage different foci of interest.

This research emphasizes the semantic and discursive nature of pointing in foreign language classes. Because it focused on a teacher’s invariant gestural production in different settings, this case study also sheds some light on what could be called teachers’ gestural style, a notion which may have some interest in teacher training sessions.

Further analyses of this teacher’s deictics may reveal more about the relationship between the pointing form and its semantic / discursive meaning. It would be interesting to examine the arm extension related to the notion of closeness vs. far-offness. We think that deictics with the arm fully extended, in particular when combined with the bending of the upper part of the body contribute to reducing interpersonal distance and even individualise student-teacher interactions within overly large class sizes. This might then be observed more in French as L1 rather than in FL2 teaching context.

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