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Assessing Spoken English Performance and Self-Efficacy Beliefs in the Classroom: Some Considerations on the Value of an Interdisciplinary Embodied Methodology for French Learners of English

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The present paper was triggered by a twofold line of thought. The initial perspective draws on the authors' teaching experience, both at university and secondary levels, and therefore falls within the scope of applied and situated research. The second perspective stems from cognitive (embodied) theoretical traditions in linguistics and psychology. We first provide the theoretical context and goals of the study that motivated the research project. We then present the *PICL!* project (*Phonologie Incarnée de l'anglais au Collège Labitrie!*), an ongoing longitudinal investigation in a French secondary school, from its collaborative roots to its implementation (first and second years of our study, 2019-2021). We examine some salient interdisciplinary outcomes within *PICL!*, from the conception of educational modules to the measurement of the learners' production and perception in English phonology. Finally, we discuss some transitional results of this four-year longitudinal study, specifically in terms of the assessment of self-efficacy, motivation and phonetic performance of learners.[1]

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Theoretical Frameworks and Goals in the *PICL!* Research Project

The teaching of English as a foreign language as well as methods of language learning involving speech processes and concerns for norms and variation are long-standing and complex issues (*e.g.*, Collins and Mees 1999, Skela 2019, Durand and Lyche 2021), with more recent developments in situated research and embodied cognitive sciences, crucially at the interplay of Psychology and Linguistics, between embodiment, the physicality of speech, bodily activity, gesturing and performance and learners' perceptions of speech structure and musicality (see Ionescu and Vasc 2014, Skulmowski and Rey 2018 for a typology and, as illustrations in different domains of teaching and learning, Abercrombie 1965 on rhythm, Billière 2002 for a verbo-tonal method of phonetic correction, Glenberg 2011 on reading, Lapaire 2019 on grammar, as well as studies such as Delhoume and Ferragne 2018 on body posture and speech production).

Our stance is a situated one (Condamines and Narcy-Combes 2015), inasmuch as we consider authentic language phenomena in the non-native context of the French classroom, in connection with specific needs of the learners, namely the ability to i) learn an adequate phonological system of English, ii) gain confidence in the performance of English in a school setting and ultimately iii) address schoolmates and teachers in the classroom. Within this field of enquiry, an applied research project at the crossroads of phonology and psychology was elaborated on embodied grounds, which are sustained by concomitant embodied traditions of thought in the two disciplines.

According to the theory of embodied cognition, cognitive processes are grounded in sensory, motor and emotional systems (Barsalou 2008). Concepts are stored along with any other component of knowledge in long-term memory. During the retrieval process, the individual reactivates the memory trace on the basis of a reactivation of these same sensory-motor and emotional neuronal systems. From the point of view of pronunciation, a sensory experience reinforces the memory trace of the right pronunciation of a word. Recent research has shown that bodily actions (hand gesture, head nodding, labial gesture) promote the learning of a native or foreign language (e.g., Tellier 2008; Zheng, Hirata and Kelley 2018). Other studies such as Macedonia (2019) have shown that only gestures that are semantically-related to the word facilitate memorisation.

Our embodiment-based research takes into account the congruency of the gesture and performance of four speech components: phonemes, syllabic structure, words as well as rhythmic patterns towards the production/perception of post-lexical units (from feet to utterances) and phenomena (such as /r/-sandhi) typical of native-like standards of English.[2]

2 In the *PICL!* project, we rely on in-class body gesture sessions and videos, in which congruent hand gesture is used to accompany consonantal plosion (as in *pit*) or facial

Besides, our methodology promotes the awareness of the sensory experiences associated with the pronunciation of each word.

We start with the observation that French pupils dread speaking aloud in English in the classroom. They often share low self-efficacy beliefs regarding speech acts in English. Self-efficacy beliefs were defined by Bandura (1997) as people's beliefs in their abilities to succeed in a given task. Many authors (Mills, Pajares and Herron 2006, 2007; Wang, Spencer and Xing 2009; Hsieh and Kang 2010; Tilfarlioğlu and Ciftci 2011; Raoofi, Hoon Tan and Heng Chan 2012) reveal that foreign language learners' self-efficacy beliefs affect their performance in varied language skills as well as their level of anxiety whenever speaking in a foreign language (*e.g.*, Zheng 2008). Finally, authors such as Sardegna, Lee and Kusey (2018) show that the higher the self-efficacy beliefs towards pronunciation performance in a given foreign language, the higher the learner's engagement and performance.

With reference to the scientific literature mentioned above, and in line with the longitudinal perspective of our study, we hypothesise that

i) embodied tasks in English phonology designed in coherence with the teachers' undertakings may benefit pupils and
ii) self-efficacy beliefs positively affect the pupils' performance in spoken English, despite early adolescents' expected behaviour (Sawyer *et al.* 2018) towards more introspection and less public speaking.

We globally expected the following results:

i) our cohort of pupils' self-efficacy beliefs about their spoken performance and their English classes in general will be lower before experiencing embodied phonology sessions than after performing a series of tasks during those sessions;
ii) negative emotions (such as anxiety about pronunciation) after the sessions will be lower than those experienced before the sessions;
iii) self-efficacy beliefs regarding pronunciation will be higher in the 'Embodied Phonology' experimental group than in the control group;
iv) pupils who have followed the embodied phonology protocol are expected to experience an increase of their self-efficacy beliefs, while learners from the control group are expected to experience a decrease or stagnation of these.

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gesture used to illustrate degrees of mouth aperture and tongue position (as in the *c<u>a</u>t-k<u>i</u>t* minimal pair).

Phonologie Incarnée de l'anglais au Collège Labitrie: The *PICL!* Project

The *PICL!* project (*Phonologie Incarnée de l'anglais au Collège Labitrie*) is an applied research project which has been elaborated from 2018 onwards in the framework of the PAC Programme (The *Phonology of Contemporary English: usage, varieties, structure*; Przewozny, Viollain and Navarro 2020; Durand and Przewozny 2012). Therefore, it follows its theoretical and methodological frameworks in sociophonological and variationist studies, while also contributing to research in the domains of interphonology and Teaching/Learning within the PAC framework.

The *PICL!* project explicitly draws on the conceptual backgrounds and field methods of corpus phonology (Durand, Gut and Kristoffersen 2014; Durand 2017), embodied cognitive psychology and Teaching/Learning methods. The general purpose is to anticipate the impact of articulatory phonetics through embodied phonology exercises of production and perception on phonological deafness and, subsequently, on the potential improvement of spoken performance as well as self-confidence on the part of young learners (e.g., Borrell 1996, Llisterri and Schwab 2019). As detailed below, the four-year protocol is built on a high degree of bodily engagement and gestural task performance in the classroom (Skulmowski and Rey 2018). For the teachers and researchers involved in this study, the goals are to improve pupils' competence and performance in spoken English in the classroom and to determine interphonological as well as psychological hindrances in the process, while helping the pupils to improve their pronunciation skills and their levels of self-efficacy and personal motivation in and out of the classroom.

Setting and Implementation of the Project

Collège Labitrie (Tournefeuille, Greater Toulouse area, France) was selected on institutional and sociolinguistic grounds as a joint place for sociophonological investigation and testing in cognitive psychology in a four-year longitudinal perspective (from 'sixième' to 'troisième' class levels[3]). During the preparatory year of the project (2018-2019), the school had 802 pupils, 28 classes and 85 staff members. The sociological indicators of the pupils' family networks are 69.3% teachers or middle and senior managers, 17% employees, artisans, merchants or farmers, 8.4% workers or inactive persons, and 5.3% others.

In Year 1 (2019-20), 64 pupils from four classes of 'sixième' were selected in collaboration with some members of the English teaching team at Labitrie, Cécile

3 Corresponding to Years 7 to 10 in the British secondary school system.

Baron and Muriel Barou, dispatched into two experimental versus control classes. The pupils were aged 10 to 11 with a proportion of 46.4% of male learners and 53.6% female learners. They presented various sociolinguistic profiles. In terms of levels of English, the 64 informants were situated on a scale between A1 and A2 of the Common European Framework of Reference for Languages. A yearly institutional process of intermixing between pupils from several classes led us to reshuffle our cohorts from experimental and control groups at the beginning of each school year. Hence 25 informants from Year 1 ('sixième') could be kept in Year 2 (16 of them in the experimental group and 9 pupils in the control group), while new informants ('cinquième') were selected by the teachers so as to broaden the groups to 60 subjects of study. In both Years 1 and 2, the learners had English classes three hours a week on average.

A Scalable Protocol

From 2019 onwards (starting in Year 1 of the study with 'sixième' level cohorts), our informants have been recorded in pairs with digital recorders[4] within the Collège Labitrie buildings, either in available classrooms or in offices. The interviews were performed as ecologically as possible, although the quality of the recordings can be affected by external parameters such as background noise. The interviews have been carried out following a similar protocol each year. The *PICL!* protocol is adapted from the PAC Interphonology protocol for learners of English (Mairano and Bouzon 2020) and expanded to a psychological component. Anonymity was preserved by applying the procedure recommended by Audette, Hammond, and Rochester (2019) in longitudinal studies. Participants self-generated their identification code by answering a few simple questions (for example, *the month you were born in*; *the first initial of your mother's first name*). A parallel identification procedure was implemented for future PAC analyses in a corpus phonology framework.[5]

The protocol comprises the following components:

1. A questionnaire (see Appendix 1) about interest (3 items), perceived usefulness (3 items) of English (adapted from Eccles and Wigfield 1995), and general self-efficacy beliefs in English was adapted from Schwarzer and Jerusalem (1995). The learners have to rate a series of items ranging from "Not true at all for me" (1) to "Totally true for me" (6). Emotional states regarding English pronunciation (5 items adapted from Caci and Baylé, 2007) are assessed by requiring the learners to express their degree of agreement on a scale ranging from "I strongly disagree" (1) to "I totally

4 Digital recorders: Edirol R-09 and Zoom H4nPro-BK/IF.

5 The *PICL!* protocol was granted the University of Toulouse Research Ethics Board IRB approval n°2021-366.

agree" (6). Finally, self-efficacy beliefs related to confidence in succeeding English pronunciation are assessed by asking pupils to rate how confident they are in succeeding to pronounce English correctly, from "not at all sure of being confident" (1) to "totally sure of being confident" (6). The learners are asked to fill in the questionnaire twice, once in April and once in June so as to assess potential changes in their reactions.

2. A sociolinguistic semi-guided conversation (in French, see Appendix 2) in which the fieldworker asks questions about the speakers' background, the languages they speak, their parents' background, etc.
3. A reading task of two wordlists in English (Appendix 3): 38 lexical items in citation form with a focus on vocalic phenomena (such as the realisation of short front vowels and diphthongs in closed syllables) and 20 lexical items in citation form focusing on consonantal phenomena (such as the realisation of /r/ in postvocalic position, quality of the approximant, /h/-dropping). The reading task remains the same each year so as to get comparable data. Depending on their level of proficiency, the informants are asked to pronounce the numbers in front of each lexical item.
4. A Maptask to encourage the informants to interact using continuous speech. In Year 1, we chose a simplified version of the PAC Maptask (Przewozny and Huet 2020, Herment 2021), but it proved difficult for 'sixième' pupils although they had been prepared beforehand in the classroom. Consequently, a Year 2 Maptask was created to adapt to the cinquième's curriculum. Thanks to the teachers' help, the theme of a treasure hunt for the Holy Grail in a secondary school was developed in two teaching units "Discovering a British School" and "All Hail the King!" featuring King Arthur and his knights. The Maptask was designed so that the subjects were able to use the vocabulary they were familiar with (see below Appendix 4), which proved to be more efficient than in Year 1. For Year 3, the Maptask is to be adapted again to fit the pupils' new curriculum and classroom activities as designed by the teachers. Both teachers will prepare all the pupils (in experimental and control groups) beforehand with a training session, so that the learners are able to communicate more easily with their peers and to feel more comfortable during the recording session.

The *PICL!* corpus can be defined as a database of authentic spoken performances in the classroom (Van Lier, in Cots and Tusón 1994). Whatever the precision of the pupils' productions on a scale of native/non-native norms (Jenkins 2000, Mukherjee and Hundt 2011, Gilquin and De Cock 2013) in the varied stylistic targets within the *PICL!* protocol, the spontaneous quality of the data offers a basis for the measurement of each learner's phonetic performance from Year 1 onwards, provided that

i) spoken data express some naturalness of the learners' speech (non-modified speech; Warren 2006) and
ii) reasonable intelligibility (Derwing and Munro 1997, Jenkins 2000, Smith and Nelson 2008, Mairano, Bouzon *et al.* 2019).

Linguistic Data and Metadata Analysis: Typologies and Preliminary Outcomes

In this section, we present a provisional interphonological classification designed to observe what difficulties pupils are faced with in their pronunciation of English, given their sociolinguistic background (metadata), individual phonological system(s) and oral skills and self-efficacy beliefs, both in production and perception (data). This classification offers the basis of our phonological measurement scale throughout the four years of the *PICL!* longitudinal study. The sociolinguistic metadata compiled from Year-1 64 semi-guided interviews were structured in 39 descriptors (*e.g.*, age, gender, place of birth, spoken languages, proficiency, knowledge of a musical instrument, type of the neighbourhood, parents' geographical origins, *etc.*), plus the relevant CEFRL levels of proficiency for correlations with the linguistic data.

As far as the spoken linguistic data are concerned, a specific methodology was implemented so as to support the learners' increase in performing spoken English. Each recording of the *PICL!* corpus (four segmented audio files, medium length 50 minutes per anonymised learner) is analysed auditorily, providing a preliminary overview of a learner's phonological system. The audio files are gradually processed through Praat (Boersma and Weenink 2020) for acoustic (spectrographic) inspection of each learner's system and future processing of the data and metadata through Phonometrica (Eychenne and Courdès-Murphy 2019) for annotation and analysis of the corpus and hypothesis testing.

A list of phonological difficulties or errors among French L2 speakers of English can be drawn from Kenworthy (1987), Jenkins (2000), Capliez (2011, 2016): h-dropping (vs. hypercorrection), non-aspirated voiceless plosives /p, t, k/ in syllable onset, erroneous vocalic contrasts and consonant clusters, vocalic reduction and lexical stress patterns. Interphonological typologies usually account for the systems of young adults or adult L2 speakers (Tortel 2008, 2010, Herment, Loukina and Tortel 2012; see also De Cock and Tyne 2014, Ballier and Martin 2015, Capliez 2016). As expected from the *PICL!* corpus, the interphonological system developed by our L2 learners displays transient features (Detey, Durand and Nespoulous 2005). This provides an opportunity to describe the interphonological development of 10- to 14-year-old learners, allowing for a new interphonological typology from the end of Cycle 3 onwards.

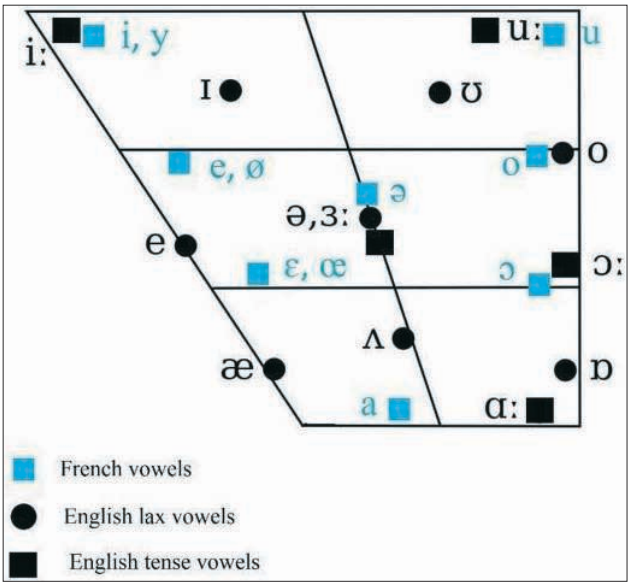


Figure 1: An English-French contrastive vocalic trapezium
(adapted from Deschamps et al. 2004, Roach 2009, Capliez 2011)

One criterion and a benefit of starting our longitudinal study with 'sixième' pupils is the "magic barrier" of children aged 10 to 12 which is emphasised by Guiora and Acton (1979) and Voise (2019). The <10-12> age range corresponds to the end of 'Cycle 3' when young learners express enjoyment in learning, while speaking up is not yet felt as taboo. Furthermore, in the French context, Cycle 3 pupils' exposure to a second language (let alone an L3, see Gut 2009, 2010) is still limited, except in rare cases of non-sequential bilingualism. And yet, although we do have an example of non-sequential bilingualism in the *PICL!* corpus (French/Arabic speaker 12FLL0, see Table 1 above), this does not prejudge the speaker's quality of production in L2 English. In such Cycle 3 classrooms, phonological consciousness of English is in progress (Chaplier 2010), and many segmental realisations towards native English targets can be the result of imitation of (variably rhotic) teachers or leisure activities (TV series for example).

Table 1[6] displays some salient segmental realisations (Wordlists reading task) which are retrievable from the *PICL!* corpus (Year 1, 'sixième' class). We choose to illustrate our point with partial data of three informants (07FEA0b, 09FLC0, 12FLL0).

6 Data processing is ongoing work, as the longitudinal quality of our study suggests (2019-2023).

Target	Lexical item	07FEA0b	09FLC0	12FLL0
Vocalic realisations, closed σ				
/æ/	*pat, van*	Fr. [a]	Fr. [a]	Fr. [a]
/ɪ/	*pit, witch, little*	Fr. [i]	Fr. [i]	Fr. [i]
/ʌ/	*duck, judge*	En. [ʌ]	En. [ʌ]	Fr. [y]
/ɜː/	*bird*	En. [ɜː]	En. [ɜː]	Fr. [i]
/aɪ/	*side*	En. [aɪ]	En. [aɪ]	Fr. [i]
/ɛ/	*wet, yet*	[ɪ]	En. [ɛ]	En. [ɛ]
/ʊ/	*put*	[juː]	[juː]	En. [ʊ]
/iː/	*feel*	[eɪ]	[eɪ]	En. [iː]
/ɜː/	*bird*	[ɪə]	En. [ɜː]	En. [ɜː]
/ɑː/	*heart*	[ɪə]	[ɜː]	[ɜː]
/eɪ/	*wait*	En. [eɪ]	En. [eɪ]	[aɪ]
Consonantal realisations				
/t/	*pit, pat, sport*	Fr. [t]	Fr. [t]	Fr. [Ø]
/ð/	*father, this*	Fr. [z]	Fr. [d]	Fr. [t]
/h/	*horse, heart*	En. [h]	En. [h]	Fr. [Ø]
/tʃ/	*church*	Fr. [ʃ]	Fr. [ʃ]	Fr. [ʃ]
/dʒ/	*judge*	En. [dʒ]	En. [dʒ]	Fr. [ʒ]
/n/	*knows*	Fr. [kn]	Fr. [kn]	En. [n]
/ɹ/ in σ onset	*rack, run, rubber*	En. [ɹ]	En. [ɹ]	Alveolar trill [r]
postvocalic /ɹ/	*far* *board, church*	Non-rhotic En. [ɻ]	En. [ɻ] En. [ɻ]	Fr. /ʁ/ Fr. /ʁ/
/Ø/	*earth*	/h/-insertion (hypercorrection)	En. [Ø]	En. [Ø]

Table 1: Phonemic targets and segmental realisations, PICL! Spoken data (Year 1; σ for syllable)

Three types of realisation can be observed from the data (Table 1): English-targeted realisations (in bold types, with variable quality as for [ɜː] in *bird*, /h/-insertion in *horse*), French realisations ([a] in *pat*, *van*) and other realisations (underlined in grey) which exemplify issues in L2 lexical knowledge and/or oral performance in a reading task.

Although our Year 1 and 2 cohorts' representation of a Teaching/Learning norm of English was limited, our data suggests that the learners' vocalic target is generally non-rhotic (RP-type, *bird* [ɪə] to En. [ɜː] realisations), with random variability of rhoticity depending on syllabic environments in the reading tasks (in open syllables such as *far*, we found rhotic and non-rhotic production; in closed syllables such as *board, church*, rhotic productions were observed, with qualities varying from En. [ɻ] to Fr. [ʁ] with 12FLL0). This variability can be explained by several factors, such as i) the influence of spelling when learners read an orthographic *r* and try to produce an anglicised target, ii) their individual levels of English, iii) the influence of their teachers' own targets of production. Informant 12FLL0 demonstrates the usefulness of sociolinguistic correlates: the

speaker almost systematically produces an alveolar trill [r] in onset position (*rack*, *run*, *rubber*). Following her sociolinguistic portrait, 12FLL0's parents are Syrian. She was born and spent several years in Spain, and she regularly speaks Arabic and Moroccan in her family network. Her Spanish background and her practice of Darija may be clues to this seemingly unexpected phonetic realisation in the context of our study.

It has to be underlined that our aim is not to reach any perfect matching between the performance of young French learners and a standard vocalic system of native English (see Figure 1 for a contrastive vocalic trapezium of standard French and RP English), which would obviously not be attainable and which raises the complex issue of desirable targets and norms for L2 learners of English in a French context. Table 1 provides a basis for a phonological measurement scale in order to measure i) segmental phonetic improvement towards a native English norm in the successive embodied phonology tasks and, ii) future correlation between phonetic improvement and self-efficacy beliefs. As far as suprasegmental production is concerned, the authors decided on a scoring system taking into account lexical stress placement in the reading tasks. Prosodic features are to be taken into account through the Maptask data. Once processing is completed, this classification will be scored so as to enable us to perform quantitative analyses together with qualitative ones that have already been carried out. The purpose is to verify potential correlations with self-efficacy beliefs. Meanwhile, each year some educational tools are elaborated in close collaboration with the school's teaching staff, so as to offer further support and remediation modules which compensate for some of the pupils' gaps or personal lack of performance. These modules focus on segmental knowledge, phonetic performance and rhythm and are based on the vocabulary which is covered during classroom work. The following section specifically deals with this procedure.

Educational Modules for Embodied Phonology

Knowing that the teaching team at Collège Labitrie were already engaged in a regular use of bodily resources in their elaboration of teaching modules and tools, a preparatory phase of observation in the classroom was set up for both the experimental and control classes in early 2020. On the part of the pupils, the corroborations we gained from the observation phase were i) strong influence of the written medium on the production and the behaviour of the pupils (as stated in Durand 2000, Capliez 2011 among others), as well as ii) few spoken performances in connected speech situations. This raises a number of questions in terms of access to phonological processes such as coalescence, rhythm and alternation patterns of strong and weak syllables that all foster intelligibility (Mennen 2006). On the part of the teachers, the observation phase confirmed

a sustained incentive to use spoken English in the classroom (with role playing situations and a choice of teaching material), as well as a set of teaching tools which explicitly rely on embodied T/L, with gestural support of the plosion phenomenon at the segmental level (in lexical tasks with words such as *pencil*), or of vowel reduction (*about*).

Due to the Covid-19 pandemic during Years 1 and 2 of the *PICL!* longitudinal study, access to French schools was restricted. The authors of the present paper and the teachers had to adapt to those new circumstances and turned to online tools so as to help pupils improve their skills in perception and production in English and increase their phonological awareness and performance in English. A series of educational modules for the experimental group were built in accordance with the teachers' needs regarding their curricula and the pupils' progress in pronunciation. A remediation process was devoted to the experimental group and was composed of three different modules in an embodied perspective[7]:

1. On a semi-autonomous basis, the team created distance learning explanatory videos focusing on the learners' articulatory and auditory knowledge of English phonemes. Each segment is explained in simple terms and the articulation is accounted for using bodily and vibratory gesture demonstrations. The segments are then illustrated with an example word (and an image) which is repeated several times. The learner is provided with specific visual and auditory hints for a more comprehensive learning experience. Each explanatory video is 15 minutes long.
2. Corresponding short videos offering segmental drills are then meant to carry out repetition loops (*e.g.*, *pit*, *pet*, *pat*, *pot*, *put*, *putt*). The learners are shown how to pronounce each lexical item within the loops with precise instructions and then, they practise by repeating the words. These exercises are provided as homework by the teachers, and the pupils must send their personal recording back through their personal digital work environment.

Once it became possible to go back into the classroom, in-class articulatory and auditory body gesture sessions ("ateliers gymnastiques") were organised in collaboration with the teachers during usual class hours. First, some contrastive (French-English) exercises focused on the awareness of the vocal apparatus as well as the usefulness of articulators and resonators. Then at the segmental level, learners were made aware of distinctive features such as voiced and voiceless consonants, oral and nasal vowels, *etc*. In order to be consistent with the teachers' curricula, specific exercises were carried out on the pronunciation of *-ed* and the plural, which gave the pupils the opportunity to apply the voiced/voiceless distinction. Bodily gestures and articulatory demonstrations were also used to help pupils pronounce consonant sounds that do not exist in the French

7 Videos are available on the *PICL!* YouTube channel at https://www.youtube.com/channel/UCENmPY8jPkvtgx8JHU-dbNw.

segmental system. At the suprasegmental level, the embodied approach allows us to emphasise some prosodic phenomena such as rhythm and syllabic prominence. During the in-class sessions, pupils became aware of how omnipresent rhythm is in their everyday lives and how it works in language thanks to breathing exercises. Other exercises on prosody were carried out with nursery rhymes and popular songs by the authors and the teachers. As an example, students would use their hands to mark rhythm and lexical stress whenever they would hear stress.

At the end of Year 2 (2020-2021), each online module was rated by the pupils. The latter were asked to indicate whether they had watched all the *PICL!* videos on YouTube or only some of them or none. In order to make sure they had actually watched the videos, they were asked to discuss their content. Then the pupils were invited to indicate whether they had done the pronunciation exercises from the drills: from "none" (1) to "all the exercises done" (4). The next items were about the perceived usefulness of each method (video, repetition loop and in-class body gesture sessions). Each pupil was asked to assess if he or she thought that the module was useful to improve their pronunciation of English and easy to use, ranging from "not true at all for me" (1) to "totally true for me" (6). The same response scale was applied to assess the amount of effort required to go through each module. Finally, pupils were asked to rank each module from the one they had liked the most (1) to the one they had liked the least (3), (2) being the one they had moderately liked. The following section displays some preliminary results about our psychological data for Year 2.

Assessing the Learner's Motivation and Emotions as Psychological Variables

Four sets of analysis were conducted in Year 2 of the protocol. The first set of analysis was a descriptive one. The second set examined, on the one hand, the relationships between motivational variables (interest, perceived usefulness of pronouncing English correctly, self-efficacy beliefs in English and in pronouncing English correctly) and, on the other hand, emotional variables related to English pronunciation. The third set was meant to test the effect of our embodied phonology method on the motivational and emotional variables from Time 1 (April) to Time 2 (June, the same year) by comparing the experimental and the control groups. Finally, the fourth set of analysis explored the pupils' perception of the embodied phonology method and of the videos which were used within the experimental group.[8]

8 A preliminary analysis was carried out in order to detect outliers. Outliers were dropped, thus resulting in slight variations between numbers of observations in the different analyses. As a consequence, the degrees of freedom slightly differ from one analysis to another.

Descriptive Analysis (Set 1)

Cronbach's alpha was calculated to assess homogeneity within questionnaire items about interest, usefulness, emotions and general self-efficacy beliefs. The scales demonstrated good reliability (all of the Cronbach's alpha being above 0.70 as recommended in Nunnally 1978). Our results reveal (see Table 2) that, whatever the measurement time was, both groups self-reported a moderately high interest in pronouncing English correctly, and a rather high perception of usefulness in pronouncing English correctly for their future education. Besides, the pupils self-reported a moderately high self-efficacy belief score in English in general and in English pronunciation more specifically. Finally, in both groups, learners tend to agree on the fact that pronouncing words in English generates rather negative emotions such as anxiety, nervousness or fear (see appendix 1).

	Control group		Experimental group	
Motivational variables	Time 1 M (SD)	Time 2 M (SD)	Time 1 M (SD)	Time 2 M (SD)
Interest	4.08 (1.09)	3.96 (1.10)	4.10 (0.98)	4.13 (0.96)
Utility	5.26 (0.66)	5.19 (0.83)	5.29 (0.73)	5.36 (0.79)
ESEB*	4.44 (0.94)	4.14 (1.05)	3.99 (1.04)	4.18 (0.98)
PSEB**	4.08 (1.27)	4.12 (1.05)	4.32 (1.16)	4.54 (1.07)
Emotion	3.14 (0.80)	2.83 (0.81)	3.17 (0.85)	3.11 (0.99)

Table 2: Mean (Standard Deviations) of the motivational variables and of emotion expressed on a scale from 1 to 6 as a function of group from Time 1 to Time 2.
*ESEB: English Self-Efficacy Beliefs; PSEB**: Pronunciation Self-Efficacy Beliefs

Relationships Between Motivational and Emotional Variables (Set 2)

Results in Table 3 reveal that the more learners showed an interest in pronouncing English correctly, the more they perceived the usefulness of correctly pronouncing English, the more they showed high general self-efficacy beliefs in English and specifically in English pronunciation. Besides, the more they felt negative emotions about pronouncing English, the less they showed interest in pronouncing English correctly and the less they expressed a high pronunciation self-efficacy belief.

N=60	1	2	3	4	5
1. Interest					
2. Perceived utility	.40**				
3. General self-efficacy beliefs	.69**	.44**			
4. Pronunciation self-efficacy beliefs	.42**	.40**	.57**		
5. Emotions	-.40**	-.24	-.11	-.54**	

Table 3: Pearson's correlations between motivational and emotional variables
Note. **correlation was significant at p < .01

Effect of the Embodied Phonology Method on Motivational and Emotional Variables (Set 3)

A two-way ANOVA was computed with the method (experimental *vs.* control group) as an independent variable, and measurement time as the repeated measure on the motivational variables. The results show no significant effect of the group ($F(1,56)=.753$, $p=39$) or time of measurement ($F(1,56)=.22$, $p=.64$), but they display a significant effect of the group*time interaction on the self-efficacy beliefs related to English ($F(1,56)=4.74$, $p=.033$, $\eta_p^2=.08$). In the experimental group, the learners did not change their English self-efficacy beliefs over time whereas in the control group, the self-efficacy beliefs decreased over time (see Table 2).

Unexpectedly, no significant effect of group was found on pronunciation self-efficacy beliefs ($F(1,55)=1.39$; $p=.24$), neither on time effect ($F(1,55)=.97$; $p=.33$) nor on the interaction group*time ($F(1,55)=.51$; $p=.48$).

Concerning the interest to pronounce English correctly, no group effect ($F(1,57)=.11$; $p=.75$; $\eta_p^2=.002$), no time effect ($F(1,57)=.23$; $p=.63$, $\eta_p^2=.004$), and no interaction group*time ($F(1,57)=.79$; $p=.38$; $\eta_p^2=.01$) were found.

Concerning the perception of usefulness, no group effect ($F(1,58)=.28$; $p=.60$, $\eta_p^2=.005$), no time effect ($F(1,58)=.002$; $p=.97$, $\eta_p^2=.00$), no interaction group*time ($F(1,58)=.98$; $p=.33$, $\eta_p^2=.02$) were found.

Finally, for the emotional variable, no group effect ($F(1,57)=.60$; $p=.44$; $\eta_p^2=.01$), no time effect ($F(1,57)=3.32$; $p=.07$, $\eta_p^2=.06$), no interaction group*time ($F(1,57)=1.49$; $p=.23$; $\eta_p^2=.03$) were found.

Learners' Perceptions of the Embodied Phonology Method and of the Videos Used within the Experimental Group (Set 4)

Our results show that 20 out of the 29 pupils within the experimental group self-reported that they watched the two videos per session, eight self-reported that

they saw only one video and one pupil self-reported no video. In order to assess the truth of these claims, the pupils were asked to write down the content of what they had watched. 25 out of 29 responded with some content which matched the videos. In addition, 13 out of 29 certified that they had done all of the exercises, 9 out of 29 said that they had done most of the exercises, and 7 out of 29 claimed that they had done some of the exercises. Finally, the results about the embodied method ranking from the most preferred to the least preferred exercises (see Table 4) show that 27.6% of the pupils preferred the repetition loops, then the in-class articulatory and auditory body gesture exercises and at last the longer videos; 24.1% of the learners ranked the in-class body gesture exercises first, the repetition loop exercise second, and the explanatory videos as last.

Ranking from the most preferred to the least preferred exercises			
Video	Repetition loop	In-class gestures	Percentages
1	2	3	6.9
1	3	2	13.8
3	1	2	27.6
2	1	3	17.2
3	2	1	24.1
2	3	1	10.4

Table 4: Percentages of pupils ranking from the most preferred to the least preferred exercises.
Note: "1" the most preferred; "3" the least preferred

Concerning the perceived usefulness of the three embodied types of exercises, a one-way repeated measures ANOVA was conducted. The results reveal a significant effect of the exercises on the perceived usefulness ($F(2,54)=4.91$, $p=.011$). The repetition loop exercise was perceived as significantly more useful ($M=5.06$; $SD=.12$) than the other two types of exercises, both for the video ($M=4.54$; $SD=.20$) and for the bodily gesture exercises in class ($M=4.5$; $SD=.22$).

Finally, as far as the perceived ease of use of the exercises is concerned, results from the t-test with repeated measures show no significant difference between the in-class bodily gesture exercises and the repetition loop exercises ($t(27)=.20$; $p=.85$). Similarly, the pupils did not find any difference in terms of perceived effort between the repetition loop exercise and the in-class bodily gesture exercises ($t(28)=.26$; $p=.80$).

Discussion and Conclusive Remarks

The *PICL!* project was elaborated on a longitudinal basis. It therefore awaits two more years of collecting, analysing and interpreting data and measurements so as to assess the values and limits of our embodied methodology for the benefit of the *PICL!* cohorts of pupils and the teaching staff at Labitrie Secondary School, as well as on-going research in the field of French learners' interphonology. The needs of our *PICL!* cohorts were defined in collaboration with their teachers with two highly interrelated perspectives in this applied research project: i) an academic perspective with the description of interphonological system of learners, the definition of Teaching/Learning targets in the French context of Cycle 3 and Cycle 4 classrooms, the increase of their performance in production and perception, and ii) the increase of confidence in the performance of spoken English in and (hopefully) outside the classroom.

After two years of implementation, we are able to confirm that our embodied methodology in language T/L confirms previous findings on the value of bodily actions in the promotion of the spoken component of EFL/ESL in the classroom. Our exploratory results support the initial hypothesis that embodied tasks in English phonology designed in coherence with the teachers' undertakings may benefit pupils. In terms of the congruency of the gesture and performance of speech components, in-class observation shows increased attention on the part of some pupils to proper phonemic and word production. An increase in the perception and production measurement of rhythmic patterns and towards post-lexical issues and phenomena will not be assessed before the conclusion of the *PICL!* project, since few comparable data have been available so far. Data and metadata collecting and processing have enabled us to describe the interphonological system of 64 pupils in Year 1 of the project. This description will serve for Years 3 and 4 as a basis for inter- and intra- speaker variability analysis and, crucially, as a phonological scale of measurement in terms of individual spoken performance (in production and perception) of English in correlation with the implementation of the *PICL!* embodied methodology.

One constant hindrance so far has been the gap between classwork (in terms of lexical learning and methodological rehearsals of repetition loops and map tasks, for example) and the spoken actuation of the pupils' linguistic knowledge in the various testing phases of the *PICL!* protocol. Two directions have already been elaborated to avoid such a hindrance: on the one hand, to further strengthen upstream work between teaching staff and researchers and, on the other hand, to increase in-class articulatory and auditory body gesture support as well as semi-autonomous distance learning sessions for pupils. In the COVID-19 context of both Years 1 and 2 of the *PICL!* project, the present authors cannot but stress the fact that more practice of the English lexicon in a spoken context is a clue

to performance and confidence in spoken English and adequate pronunciation (whatever the Teaching/Learning pronunciation norm).

Despite the COVID-19 situation, we can also conclude positively that from a general point of view, both experimental and control groups of learners from Years 1 and 2 have shown eagerness in participating in a collaborative project with their teachers and external researchers. These age groups may have played a positive role that we may not find in the third and fourth years of our project, for want of a renewed "magic" socio-psychological barrier.

We now turn to our initial goal of assessing the efficiency of our embodied phonological method to support learners' better production and perception in spoken English. Unexpectedly, our most important finding was that pupils who benefited from the embodied phonological method (experimental groups) did not change their English self-efficacy beliefs over time both for general English and for English pronunciation. But those who did not benefit from the embodied phonology method (control groups) expressed a lower English self-efficacy belief at the end of the year than at mid-year. This suggests that the embodied phonology method maintained the self-efficacy beliefs. In other words, it prevented the self-efficacy beliefs from decreasing. This is important because many authors have shown that a high self-efficacy belief is positively associated with high performance (*e.g.*, Hsieh and Kang 2010; Mills, Pajares and Herron 2007).

Furthermore, and contrary to expectations, the negative emotions associated with correct English pronunciation did not decrease after going through the embodied method. These remained stable regardless of the groups.

Another important result is that the embodied phonological method was perceived by the pupils as useful, user-friendly and as not too challenging in terms of effort-making. Finally, the repetition loop exercise was perceived as significantly more useful than the other two exercises.

The lack of effectiveness of our embodied method on pronunciation self-efficacy beliefs can be explained by several factors: firstly, the training duration of the embodied method was too short. More sessions are now necessary. The pursuit of the same method with the same pupils when they are in grades 8 and 9 will enable us to evaluate the duration necessary for the effectiveness of the method. Secondly, it is possible that, due to their lack of expertise, 12-year-old pupils may have difficulty assessing the correctness of their English pronunciation, which may lead to biases in the self-efficacy beliefs to pronounce English correctly.

Our future targets in the *PICL!* project include collaborative work on new educational in-class and online educational modules for Years 3 and 4 of the project, in coherence with the interphonological table which was set up and which serves as a basis of measurement for a spoken English production and perception scale. Meanwhile, further individual performance measurements will be produced on the basis of renewed linguistic data and psychological testing.

An ultimate internal criterion in the process will be the ability of pupils to decide on the quality of their segmental and suprasegmental production within the normative context of the classroom. At the level of psychological enquiry, we should be able to confirm correlation levels between self-efficacy beliefs and phonetic performance within learners on a four-year basis.

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Appendix

1: A questionnaire assessing motivational and emotional variables (Source: *PICL!* project)

Questionnaire

"*Ci-dessous, on va te demander de répondre à une série d'affirmations.*
Indique à quel point chaque affirmation proposée correspond à toi. Il n'y a pas de bonnes ou de mauvaises réponses, réponds le plus spontanément possible!!! Mets une croix dans la case qui correspond le plus à toi ! (Échelle de réponse de pas du tout vrai pour moi (1) à tout à fait vrai pour moi (6))

Interest

J'aime prononcer les mots en anglais
J'adore parler anglais en prononçant bien les mots
Les cours d'anglais sont très motivants

Perceived usefulness

Je pense que prononcer correctement l'anglais m'aidera plus tard dans ma vie
Je pense que prononcer correctement l'anglais me sera utile pour l'année prochaine
Je pense que prononcer correctement l'anglais me sera utile quand je serai au lycée et plus tard.

Emotional variable (échelle de réponse pas du tout d'accord (1) à tout à fait d'accord (6))
Quand tu dois prononcer des mots en anglais, indique comment tu te sens

Je suis anxieux(se)
Je suis tendu(e) quand je dois prononcer des mots en anglais
Je suis nerveux(e) quand je dois prononcer des mots en anglais
Je suis excité(e) quand je dois prononcer des mots en anglais
J'ai peur de mal prononcer les mots en anglais.

English Self-efficacy beliefs
Indique à quel point chaque affirmation proposée correspond à toi. Il n'y a pas de bonnes ou de mauvaises réponses, réponds le plus spontanément possible!!! Coche la case qui correspond le plus à toi ! (Échelle de pas du tout vrai pour moi (1) à tout à fait vrai pour moi (6))

Je crois que j'aurais une excellente note en anglais à l'oral
Je suis sûr(e) que je suis capable de prononcer correctement les mots les plus difficiles en anglais
Je sais que je peux apprendre à prononcer correctement les mots en anglais

Self-efficacy beliefs related to confidence in succeeding English pronunciation
Indique à quel point tu penses être certain de réussir à prononcer correctement l'anglais. Il n'y a pas de bonnes ou de mauvaises réponses, réponds le plus spontanément possible!!! Coche la case qui correspond le plus à ta certitude de réussir. (Échelle de réponse de pas du tout sûr (1) à tout à fait sûr (6))

2: A sociolinguistic semi-guided conversation in French (Source: *PICL!* project)

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Date de l'enregistrement : .....
Prénom de l'informateur : .....
Identifiant PAC : .....
Âge :.....
Genre : ☐ fille ☐ garçon
Lieu de naissance : .....
Lieu d'habitation (village, ville, quartier etc.): .....
Langue maternelle : .....
Pratique d'un instrument de musique (ou chant) oui/non
depuis quand.....

Autres langues pratiquées :

Langue 2	Lieu de pratique	Niveau de pratique	Fréquence de pratique
	☐ à la maison, noyau familial ☐ dans un centre linguistique ☐ autre :	☐ basique ☐ intermédiaire ☐ courant	☐ rarement ☐ souvent ☐ tous les jours
Langue 3	Lieu de pratique	Niveau de pratique	Fréquence de pratique
	☐ à la maison, noyau familial ☐ dans un centre linguistique ☐ autre :	☐ basique ☐ intermédiaire ☐ courant	☐ rarement ☐ souvent ☐ tous les jours
Langue 4	Lieu de pratique	Niveau de pratique	Fréquence de pratique
	☐ à la maison, noyau familial ☐ dans un centre linguistique ☐ autre :	☐ basique ☐ intermédiaire ☐ courant	☐ rarement ☐ souvent ☐ tous les jours

Père de l'informateur :
Origine géographique : .....
Métier ou autre activité : .....
Langue(s) parlée(s) : .....

Mère de l'informateur :
Origine géographique : .....
Métier ou autre activité : .....
Langue(s) parlée(s) : .....

Qui joue ou a joué un grand rôle dans l'apprentissage de la langue maternelle/le cas échéant d'une langue 2, 3, 4 (grand parents, nounou etc.) : .....

Métadonnées de l'enregistrement

Nom de l'enquêteur : .....
Longueur de l'enregistrement : .....
Contexte de l'enregistrement (lieu, salle, interruptions etc.) : .....
Informateurs du binôme de la maptask :
Informateur 1 : .....
Informateur 2 : .....

3: Reading task: two wordlists in English (Source: *PICL!* Project)

1. pic
2. pe1
3. pal
4. pot
5. put
6. far
7. more
8. feel
9. bird
10. board
11. plant
12. after
13. aune
14. dance
15. father
16. poor
17. pause
18. wait
19. side
20. four
21. for
22. nose
23. knows
24. start
25. horse
26. word
27. short
28. sport
29. next
30. here
31. there
32. merry
33. sorry
34. scory
35. hurry
36. earth
37. look
38. room

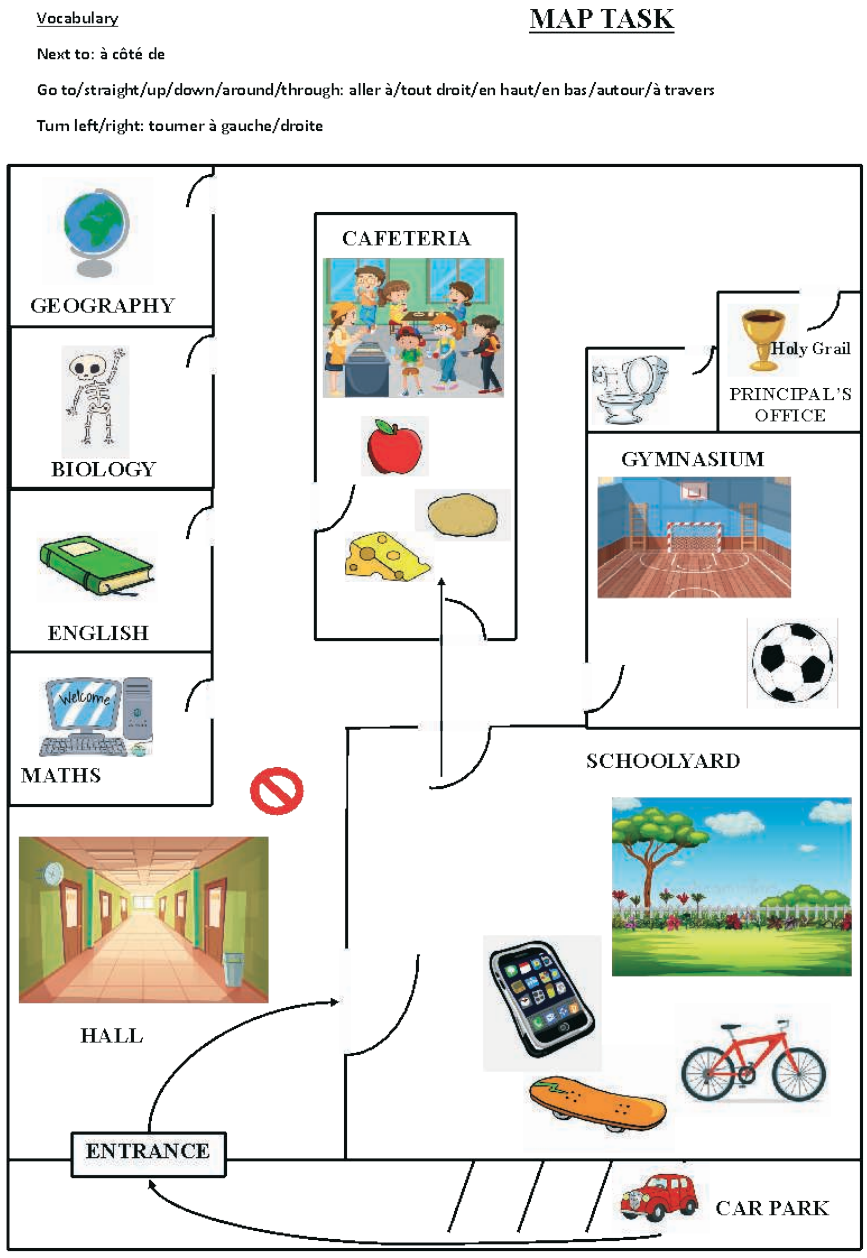
Wordlist l ©PAC-PICL 2021

1. bal
2. duck
3. fan
4. van
5. this
6. heart
7. badge
8. run
9. Jack
10. rack
11. wet
12. yet
13. witch
14. rubber
15. little
16. bigger
17. fat
18. bar
19. church
20. judge

Wordlist 2 ©PAC-PICL 2021

4: Conversation task: Maptasks (Source: *PICL!* Project)

Maptask 1: Leader (Source: *PICL!* Project)
Maptask 2: Follower (Source: *PICL!* Project)



Vocabulary

Take: prendre

Subject: matière

Skeleton: squelette bike: vélo

MAP TASK

