

Integrating Computer-Assisted Phonetic Transcription in Classroom Phonetics Teaching: does listening to English help French students transcribe?

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1. Abstract

This paper is a report on a new experiment carried out with French students of English as a second language. For several years now, in previous experiments, we have been successfully testing a program designed to teach phonetic transcription to University students [1]. After making this correcting program available for training sessions and testing it outside the classroom, we decided to integrate this system into instructional sessions. We were thus able to assess the full extent of its role in teaching/learning phonetics [2]. However, in our opinion, this tool remained unsatisfactory as a language learning tool, since it lacked sound. Our aim was to make sound available to the students in their transcription task, on the hypothesis that it would clearly be a positive improvement. We wanted to assess whether listening to English actually helped the French students transcribe.

2. Material and procedure

2.1 Sample of students in the test

The students were chosen according to the same criteria as in a previous experiment [2]; they were all students of English, in the first semester of their second year, with similar educational backgrounds, and had volunteered for this reinforcement course in a computer-assisted environment. They had had one semester of basic phonetics teaching in a classical pedagogical context with some experience of pen and paper transcription training from written texts (mainly individual words and short sentences) the previous year. The experiment was carried out following the same lines as before: a group of nine students took part in the same 9 tests, including a compulsory intermediate test and a final test in weeks 5 and 9.

2.2 Description of the phonetic transcription marker – with sound

The texts chosen for transcription were identical but, on this occasion, the software was modified. It remains an open system where the teachers choose their own texts for transcription, but, in its present form, it also allows the oral version of the texts to be incorporated into the program. The student interface still displays a text in ordinary written form for the students to read before they start transcribing, but they must also listen to the sound, which is started automatically. They are free to listen to the whole text as many times as they wish. By providing the oral version of the text together with its graphic representation, we aimed to help the students bridge the gap from a French classroom environment to an authentic English-speaking one. Such a set up was intended to have a warming-up effect that would help them anticipate their transcription task by circumscribing the lexical field concerned, together with its overall correct pronunciation [3].

2.3 Student interface and student correction sheet

On their computer screens, there now appear the intonation groups, into which the teacher has segmented the text, together with a button to the left of the written text, which can be clicked on to trigger the available corresponding sound. The number of hearings is unlimited. The student can transcribe one word at a time as it appears on the screen. Each word is submitted for correction immediately and automatically. As the corrector indicates three different types of errors (symbols are described as either wrong, missing or added), the students can listen again to help them in their correcting task. Although they transcribe word by word, the students hear a whole intonation group, segmented on grounds of semantic and syntactic coherence, and not individual words. Our purpose here is to provide the French learner with a connected speech version of spoken English, as opposed to the pronunciation of words taken in isolation. During the transcription task, the program keeps score of the trials and errors made by each student as well as the time each one of them has spent on the test. They are given individual sheets with these data so they can easily keep track of their progress and can become more conscious of their acquisition process over time. The teacher gets a detailed quantitative account of all the different transcriptions provided in each of the three attempts for each word. This is a helpful tool in preparing for the next class and addresses the students problems in a more adapted and, hopefully, efficient manner.

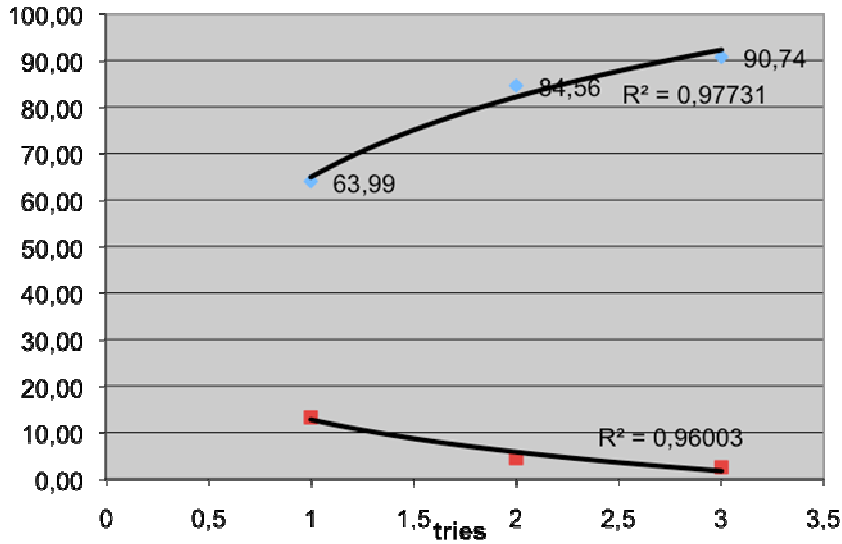
2.4 Teaching procedure

Each class is organized following the same protocol: the students transcribe a different extract each week on their computers. The following week, their individual sheets are handed back to them and an interactive procedure takes place, whereby they are encouraged to ask questions on their errors, trying to group them according to error type, either due to error on word-stress or on vowel and consonant pronunciation. The students work in pairs in a collaborative way, to try and provide the answers to the other students' questions, under the teacher's guidance. The whole procedure thus led to the gradual discovery of the phonological rules that could be applied in different contexts (emphasizing the role of strong vs. weak endings, studying stress assignment in words of two or more syllables, or in words of Greek and Latin origin, etc.). Each week, they were encouraged, to explore, both inductively and deductively, the regular patterns of oral English and the systematic character of rule-governed pronunciations in order to build up their own phonological competence. The students were prompted by the teacher to listen to the oral version of the texts under study as they were analysing their errors. A class always ended with a few students reading the original text to their peers to help them improve their pronunciation through practice, but also to enhance their awareness of the progress just made, thanks to the phonological knowledge acquired [4].

3. Test results

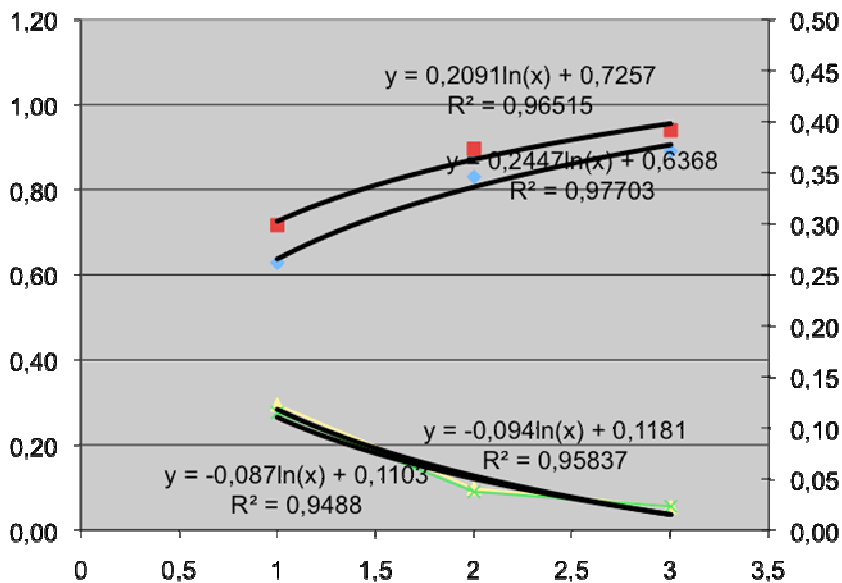
Our aim was to check whether the integration of the phonetic transcription marker, with its filling module, and its new sound implementation helped the students improve their performances. We therefore collected the average of correct answers and errors for all students in one test over three tries.

Figure 1 : Evolution of the percentage of correct words and errors over tries 1, 2, 3.



This figure shows that from try 1 to try 3, the students' progress (in terms of the percentage of correct words per try) is as high as 25 %. The number of errors is inversely proportional and as high as 10% over the same three tries. Both results are highly significant on a logarithmic scale. Progress is higher between try 1 and 2, since some students are capable of correcting their transcriptions when they get a second chance and do not need another try to access to the correct form. The overall degree of correction is very high. We compared these results with the students' previous performances, to address the question of the impact of sound on progress.

Figure 2 : Compared evolutions of the percentage of correct words and errors over tries 1, 2, 3, with sound and without sound.



The diamond series (representing the transcription with sound) is now compared to the square series (without sound) in the figure above, showing that the group with sound starts at a slightly lower level than the one without, but its progress is ten per cent higher than the performance of the group without. There are two possibilities here: either the first group had a lower initial performance level, but made more progress, which would imply either that the sound provided helped them improve in a more significant way or that the first attempts at transcribing were impeded by the multiple tasking that consisted in listening and reading the written form for transcription. Some of the students complained about being bothered by the sound and chose not to listen to the pronunciation provided. Whether listening to the intonation group is or is not the cause of the lower initial performance cannot lead to a clear-cut conclusion since the students' listening was not actually recorded as data by the system.

3.3 Did listening to the text help student progress over the nine tests?

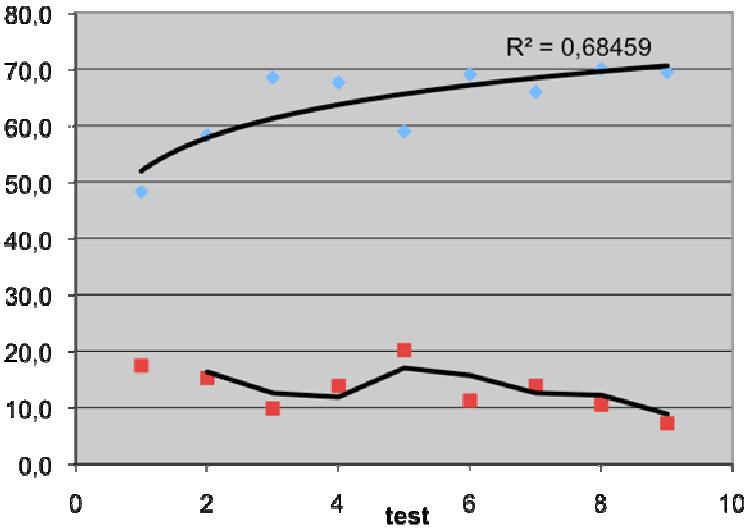


Figure 3 : Compared evolutions of the percentage of correct words and errors over 9 tests with sound.

The average number of correct words (diamonds) and errors (squares) in each first try over the nine tests has been collected for all students and compared. We wanted to address the question of the regularity of the evolution of the progress made by the students each week, as they were learning from their errors and acquiring more theoretical knowledge. What happens here corresponds quite strikingly to the students' own experience and comments on the experiment. The first three tests show rapid linear progress ($R^2 = 0,99$), which corresponds to the first steps before they fully master the new phonetic keyboard. It has been designed to allow the students to either click on the keyboard that is represented as a picture on their screen or type directly on the actual modified keyboard, so as to respect individual style and preferences. Test 4 was reckoned by the students to be more difficult as the number of words in the test increased (from 160 to 190 in the first three tests to 321 words in test 4), and yet the performance is just as good, proving that the students have acquired some stability in the new skills at that point, as well as mastering the correct use of the phonetic alphabet itself. However, test 5 proves to be a counter-performance. This is not due to the number of words in the transcription (now lowered to 238 words) but to the test conditions themselves, test 5 being part of the actual exam grading at mid-term. There are no particular lexical difficulties as this test deliberately

uses the same lexical field (Acoustic Shadows) as in the preceding transcriptions, in order to facilitate the task and reward the actual work the students have put into the course. Exam testing is inevitably a stressful situation and anxiety clearly plays its incapacitating role here in acquisition, pressure somewhat masking competence in this case. In the last four tests, the lexicon has been changed (the lexical theme now being British Citizenship) and if progress certainly picks up again, it is not regular enough to provide reliable statistic modelling. Yet, the figures show that it remains stable at a very high level of success. Between test 1 and test 9, progress is 20% higher for the correct words and 10% lower for the number of errors, both figures being considered as statistically significant. It is interesting to note the slight difference between the two types of data; it shows that words, as linguistic units, are now transcribed correctly and that the students are now making systematic use of the correct pronunciation at that linguistic level. However, the number of errors are now concentrated in some problematic words, at segment or stress level. That the French students should have integrated the correct pronunciation of whole words is indeed in itself a step towards of the progressive acquisition of a phonological competence, even though some finer segmental distinctions still remain to be acquired. The data collected each week also enable us to check on the evolution of progress in terms of the correlation between progress and transcription time, with and without sound.

3.4 Did listening to the text help students make progress in task duration and correctness over the nine tests?

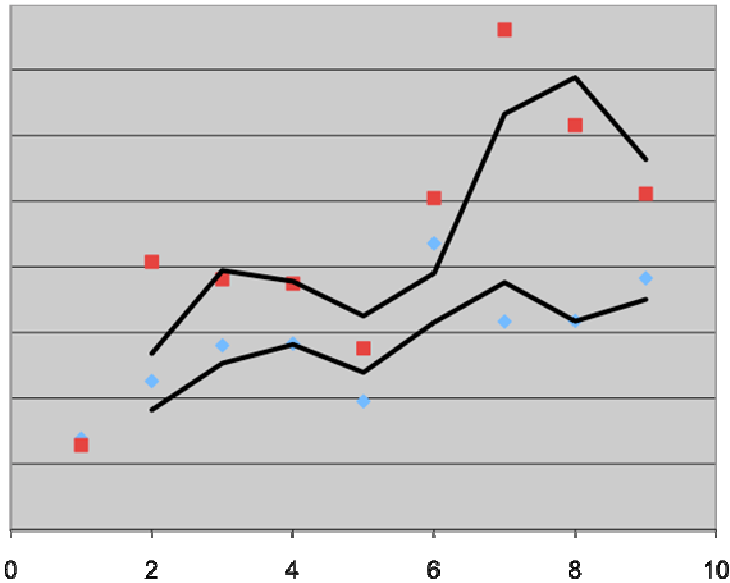


Figure 4: Compared evolutions of the ratio of the percentage of correct words and task duration over 9 tests with sound (diamonds) and without sound (squares).

Both groups of students start from the same level; however, the second test results are much better in the group without sound. Considering that we are dealing with a ratio of correctness over time, this does not necessarily mean that they are doing better, but that they have become much quicker at finishing the task in question. It is predictable that listening to sound takes more time since it requires more attention from the students, who could actually be seen silently mouthing the words as they were transcribing in class. Integrating sound into the task hence requires the development of another skill, notably linking sound to graphic form and being able to generate a more abstract, symbolic representation, as well as mastering the new keyboard and the handling of the phonetic symbols in an adequate manner. Transcoding is a two-step process in that case. Over the first 4 tests, progress is



more stable with sound than without; attention and concentration is higher, as the task is more demanding and the foundations of the new knowledge apparently strengthened. A similar drop in performance is to be seen at exam time in both groups, but only for test 5 in the group of students with sound. The results now show a striking difference between the two groups: the performance in test 9 also shows a drop for the students without sound whereas constant and stable progress is made by those provided with sound, even though they are exposed to the same anxiety-ridden, stressful exam situation. This would argue for the greater stability in phonetic knowledge acquisition when students are exposed to sound and when the transcription task is associated to listening.

4. Conclusion

The new experiment confirms that the transcription marker associated with its filing system when integrated within the classroom teaching of phonetics improves students' skills in phonetic transcription and helps build a phonological competence by linking theory to practice and by making learning explicit. Adding an auditory to a visual modality to the students' task has initially proved to hinder progress, probably because of its higher cognitive cost. Yet, it also proved to be a decisive factor in progress stability in a later phase of acquisition. We now intend to target the difficulty experienced by French students in linking sound to graphic form and vice versa, by increasing listening practice, linking it to abstract symbolization tasks and hopefully developing better pronunciation skills. By enhancing the role played by meta-cognition in the passage from perception to production, we intend to facilitate their potential oral performances. Another experiment including evaluation of the students' final oral skills in reading and fluency is to be designed in the near future.

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