TEACHING NUMBER WORDS WITH THE DOT-TO-DOT GAME

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ABSTRACT • Children learn number words early, as they learn how to count. While learning a foreign language, in this paper English as a Foreign Language (EFL), they also have to learn new number words. Unfortunately, exercises about numbers are often boring and little effective. Therefore, the application of recreational linguistics could be an ideal solution to this problem. In the described experiment, the dot-to-dot game is compared to a traditional exercise; it will be shown to be a more enjoyable and effective way to improve the revision of English numbers for Italian students.

KEYWORDS • EFL, recreational linguistics, dot-to-dot game, numbers

1. Introduction

Number words are a fundamental element in the vocabulary of every language spoken in the world. Therefore, they should be an important topic in foreign language teaching. Nevertheless, a quick analysis of textbooks used for EFL Teaching in Italy proves that numbers are relegated in the first chapters only, at all school levels. In addition, exercises about numbers lack variety and relevance to everyday life. They are often boring and repetitive. The consequence is that students learn number words all at once and they are seldom required to use them in subsequent chapters or activities. This may explain why children are rather inclined to making mistakes when using them.

An exercise set in a realistic context could be an effective solution to this problem. The purpose of this paper is to report the results of a trial aiming at developing an exercise which could be an effective tool in EFL numbers teaching: the dot-to-dot game. The game presented here is an adapted version of the classical dot-to-dot game, one of the richest resources for the development of language exercises, which was transformed into an amusing listening comprehension task. This dot-to-dot game was tested in an Italian middle school and compared to a more traditional listening comprehension exercise. The effectiveness of the test was assessed by comparing the performance of both trial groups using a third task, which was the same for all students. In spite of the need for improvements, the dot-to-dot game proved a useful tool for revising numbers as well as a playful way to train number words in a realistic context.

2. Number words in the native language

Numbers are used every day and for different purposes; they can be used to express a measure (in this case they are followed by a measurement unit) or as an arbitrary tag: a common example is the numbers given as a name to bus lines in many cities. Nevertheless, their most important use is as cardinal numbers. Cardinal numbers are employed for counting and to express a physical property of a group of objects, which is usually known as "quantity", as in

sentences like “There are three beds in the room upstairs”. Consequently, words expressing cardinal numbers set an interconnection between linguistic and arithmetical abilities in the human mind. In describing the concepts of number and number word, Gerschel (1993) observed that “the arithmetical concept of number, relying on a law of recurrence that allows creating n +1 from any number n, is a late conquest of the human mind”.[1]

The first consequence of this statement is that, since numbers are infinite, number words are also unlimited in quantity; each language has a different way of creating new number words, using a specific method. This also means that there are different arithmetical and counting systems in the world, and number words can be a useful method to approach and understand the basis of each of them. The difference between the English *eighty* and the French *quatre-vingts* (literally four times twenty) is a very common example of this statement.

2.1. Acquisition of numbers and counting principles

Children come in contact with numbers in their native language from the time they are a few months old, and they start dealing with them as soon as they start developing their linguistic abilities. Children start counting when they are about one year old, and can count up to twenty (or more) when they are 4 years old. At the beginning, children's use of numbers is quite arbitrary, but they learn quite quickly to give to each number the proper meaning. Most of the experiments in the last twenty years tried to explain how children learn the correct use of cardinal numbers, in other words, which number word refers to each arithmetical quantity.

The five counting principles, set by Gelman & Gallistel (1978), are the first step to explain the correct use of number words.[2]

1. One-to-one principle: while counting, the subject has to tag each object only once and with a single, specific number word.
2. Stable order principle: numbers are used in a specific, prearranged order.
3. Cardinal principle: the last number word used has a specific feature, as it carries the information about the total quantity of the objects being counted (cardinality).
4. Abstraction principle: numbers can be used both with homogenous and uneven groups of objects. For instance, a subject should be able to count all the chairs and the people in a room together.
5. Order irrelevance principle: the number of objects counted is independent of the order in which they are actually counted, as tags are arbitrarily assigned.

The third principle is usually the last to be learned and its acquisition marks the complete acquisition of the counting competence.

The first and the second principles are involved also while learning number words in a second language. The learner already has a number tag for each quantity, but the tags will become two, one in the first language and one in the foreign language.

[1] The original French version is«La conception arithmétique du nombre qui prend appui sur une loi de récurrence et qui permet ainsi, pour tout n, de construire n + 1, est une conquête tardive de l'esprit humain ».

[2] Gelman and Gallistel(1978) refer to number words as “numerlogs”: in this paper *number*will be used for ‘number words’.

2.2. Theories about number acquisition

The way children acquire numbers in their native language has not been understood yet. Wynn (1992) has developed tests confirming the most important theories about children's number acquisition, i.e. the counting-principles theory and the different context theory. The counting principle theory states that children acquire number words just by counting repeatedly, until they get the concept of cardinality. On the other hand, according to the different context theory, children start pronouncing the count as a whole (as *onetwothreefourfive*), and then they acquire the concepts of cardinality thanks to the different context in which they hear numbers being employed.

Both theories have arguments for and against them; in the last years, important studies are being set up using corpora of children speech. However, these studies do not offer an overall view of the acquisition process, as they often only analyse the utterances concerning specific number words. Nevertheless, many experiments have proven that children learn the number word *one* first, and often quite a long time before they start using the other numbers. That can be easily explained considering that children usually learn new words only when they can refer them to real objects. However, number words are special words, as they do not refer to an object or a group of objects, but to a property of a group of objects. Therefore, they are quite difficult for a child. The number word *one*, referring to a single object, is an exception as it allows children to approach numbers using a more familiar learning strategy.

Furthermore, as children learn numbers from *two* on (and their corresponding quantities), they also acquire the concept of singular and plural. Singular and plural are indeed grammatical categories, which require a basic arithmetical competence, that is, the discrimination between the quantity corresponding to the number *one* and all the others.

"Subitizing", as first described by Kaufman (1949; see also Benoit, Lehalle, Jouen, 2004, and Fisher, 1993) is another important element in native language number acquisition: it is the innate ability to recognize quantities from 0 up to 3. Looking at a group of one, two or three objects, the brain succeeds in recognizing these quantities automatically, and avoiding the counting process. It has been shown that children already have this ability at six months of age or even earlier. According to Benoit, Lehalle, Jouen (2004) "[s]ubitizing appears to be a more primitive and necessary skill for understanding what the counting process means".

Children learn number words up to three, as they understand their cardinality, and then acquire the others exponentially. Four is the quantity corresponding to the already known three with one more element added, and so on. Subitizing should therefore cooperate with counting in order to fulfil the acquisition of numbers.

When talking about the difficulties in learning numbers in a second language, it must be remembered that in L2 teaching, numbers are considered a part of vocabulary. Therefore, the difficulties encountered by students are similar to those they are having in other parts of the L2-vocabuary. The structure of English numbers does not pose particular complexities for Italian speakers, as the numbers follow the same pattern (both Italian and English belong to the so-called "non-inverted languages" group, i.e. number words for units come after number words for tens, in the same order in which they appear in digit).

3. Numbers in second language acquisition

Numbers are quite underestimated in foreign language courses offered in Italian schools, despite their importance and complexity. They are usually taught in the first year and they are not revised anymore, even though they may appear again in texts or exercises. This is true in all

school rankings of the Italian school system, from primary to secondary high school, because most course books start from a very elementary vocabulary.

According to the Italian ministerial learning program, children start learning English when they are about seven years old. They deal with L2 numbers (usually 1 to 20) for the first time at 8, and then English numbers are once more explained in the first year of middle school, when children are 11 or 12. More precisely, in middle school children learn (or revise, depending on their previous knowledge of EFL) numbers up to 1000 in the first weeks of school. The acquisition process is quite simple: the children are already aware of the cardinality principle; they just have to replace the native language tags with the new ones. Therefore, number words are often the subject of the first lessons; most of the time, they are explained in the 0-unit of textbooks. At this point of their L2 course children have neither fluency nor good lexical skills in English. Therefore, numbers are learned as "empty words", or used in a very small range of realistic sentences. This is particularly true for children in primary or middle school. This paper focuses on children attending middle school, because they exhibit greater competence of cardinal numbers in L1, implying that mistakes occurring during the experiment should not be connected with an incorrect use of numbers in L1.

3.1. Exercises about numbers

A very limited range of exercises usually supports lessons on numbers in the Italian middle school. Writing competence is developed through instructions such as "read the digits and write the same number in letters". However, number words are only rarely written, as in everyday life they are replaced by the easier and commoner digits. They are written in full only on cheques or in contractual documents, particularly when an amount is stated (e.g. 200 euros *two hundred*). Therefore, the most important competences about numbers use are listening comprehension and oral production. Nine textbooks[3] used in EFL teaching in the Italian middle school were analysed, concentrating on the activities they offer about numbers. Unfortunately, most of these books show a great scarcity of exercises in this domain. Children are asked to write down numbers as they are being read aloud in by a recorded voice on a CD or, in the best scenario, they have to write down a phone number.

All these exercises do not provide real-life situations. Students are not encouraged to use these new words; the only utterances required follow exercises with the traditional "listen and repeat" model. This leads to an incomplete acquisition of English number words, as also shown in Carrozzo (2012), where different Italian high-school students were tested about their skills in understanding English number words, with quite mediocre results. The participants in Carrozzo's test were 45 students between fifteen and seventeen years old. They showed great difficulties in recognizing English numbers as used in discourse; the distinction between number words such as *thirteen* and *thirty* caused the greatest problems during these experiments.

Teachers always want the students to think in the target language, but when it comes to numbers they often switch again to the mother language, especially when they have to read some digits. Some textbooks report many numbers (e.g. page numbers) also in letters, but this is not the only possible solution. Presenting students with a wider and more varied range of activities can be an effective incentive for them to use the foreign number words and to become more familiar with them.

Many of the Italian EFL textbooks analysed suggest entertaining activities such as completing a telephone book or, more frequently, the bingo. Not many books have more than

[3] See their titles in the Textbooks section of this paper's References.

one of two of these activities anyway. Nevertheless there are plenty of possibilities: Mollica (2001) suggests more than 200 games and activities concerning numbers, among which are games about birthdays of famous people, dates of inventions in history and crosswords. Most of the games are easy to set up and can be quickly understood by the students. Therefore, they could be seen as a helpful alternative to the traditional exercises in order to improve the time dedicated to the acquisition of number words in a foreign language.

4. Description of the experiment

Considering these premises, the aim of this research was to develop an exercise to allow the students to use English numbers in context, encouraging a more detailed analysis and including number words with a difficult pronunciation for Italian native speakers.

Anthony Mollica offered a useful suggestion (in English in 2008 and in Italian in 2010). The Canadian linguist describes the didactic application of a very common game, the so-called dot-to-dot game. In his traditional version, this game is very intuitive and does not require instructions: there is a pattern with dots, labelled with a number each. Children connect the dots following the chronological order to obtain a picture. This game can be easily modified in order to provide an entertaining activity at school. The easiest application of this game involves the numbers (as digits) in a random order on the pattern; the order to be followed is given in a list where the numbers are given as number words, in letters. This activity can be easily transformed in an exercise about the listening competence, as shown in the experiment below as well. The game can be also used for a wide range of school subjects, just by replacing the usual numbers with other elements. For instance, a history teacher can use years. The correct dot-connecting order will be given in a list, but the same years will be there disguised as historical events that the children need to situate in time. Mollica usually suggests complex dot-to-dot patterns (from 30 to 50 dots). The exercises are quite simple anyway. This game offers many advantages, as it is easily understood, can be used for homework as well, and puts children in a more comfortable learning situation.

The dot-to-dot game was chosen in this case as it could give a strong advantage in comparison with the common listening exercises found in EFL books. As already mentioned, these exercises do not reflect real-life situations nor do they allow students to practice the number vocabulary in a real context. The game can be a quick and practical solution. The children are actually playing the dot-to-dot game and they feel engaged in this activity: those who finish quickly and correctly are the winners. In this way, an ordinary task about recognizing numbers can be turned into a more interesting, and therefore effective activity. This does not mean, however, that this type of exercise is not useful in testing children's abilities.

4.1. The dot-to-dot pattern

For this experiment a dot-to-dot game was prepared using a pattern of twenty dots (Appendix 1). The pattern required fewer dots than the drawings suggested by Mollica. This choice can be justified considering that in Mollica's examples the children are given a list to read, whereas in this test they have to listen to the numbers. This requires a greater effort of concentration; more numbers might lead the listeners to distraction and cause them to make errors. Each of the twenty-dot illustration was given a tag with a natural number from 0 to 100, not in the chronological order. Although the chosen tags seem to have been given randomly at a first glance, they actually were arranged in order to produce some difficult turning points in the path, where the student's ability in recognizing number words could be better tested.

4.1.1. Hypothesis on critical points

The hypothesis concerns the difficulties in telling apart number words with similar phonemes, especially if these phonemes are not present in Italian. The supposed critical points are shown below.

Group 1 - Discrimination between tens and units:
Forty-nine /ˈfɔ:(r)ti-naɪn/ and *ninety-four* /ˈnaɪnti-fɔ:(r)/

Group 2 - Discrimination between numbers with the same unit but different tens:
Fifty-two /ˈfɪfti-tu:/ and *eighty-two* /ˈeɪti-tu:/

Group 3 - Discrimination between the voiceless dental fricative /θ/ and the voiceless labiodental /f/: (see Pulcini 2009: 80)
thirty /ˈθɜ:(r)ti/ and *forty* /ˈfɔ:(r)ti/

Group 4 - Discrimination between short and long vowels:
-ty /ti:n/ and *-teen* /ti/

If completed correctly, the chosen pattern shows the outline of the biggest British Isle (the United Kingdom), but the solution is very hard to find out without completing the task. Quite some time was spent in choosing the right drawing; many pictures were considered as alternatives, but no others seemed fit for the purpose. For instance, an easier picture might have led the children to errors because they could have completed the pattern instinctively, instead of actually understanding the numbers. The subject was also chosen as it could be used as a starting point for a lesson about British geography.

4.2. Structures of the recording and of the comparison exercise

The dot-to-dot pattern is supported by a recording of the twenty numbers read in the correct order by an English native speaker; once given the starting number (i.e. twenty-five), the students have to follow the voice, connecting one dot to another in order to complete the drawing. The numbers are read with an interval of four or five seconds, and then the sequence is repeated, so that the children can hear the stimulus twice. The children have therefore enough time to recognize the numbers, as the game is conceived about listening comprehension, and not about the speed of comprehension itself. An alternative exercise, which consisted of twenty groups of three numbers each, was created in order to provide a basis for comparison (Appendix 2). The children had to listen to the same recording prepared for the dot-to-dot game; this time, their task was to circle the number they heard in each line. The wrong alternatives in each line have been placed specifically in order to reproduce the difficulties of the dot-to-dot pattern. This means that each correct answer is placed side by side with the tags that flank the same number in the dot-to-dot game.

5. The first trial

The game was used for a first trial in March 2013. The tests were carried out in a middle school, in Pino Torinese (Turin). The trial group consisted of two classes, both attending the first year and with the same English teacher. Both classes had already learned the numbers from 0 to 100 some weeks before the test. Their textbook contained some traditional exercises about numbers; most of them had been carried out during the hours about numbers, with an

assessment test at the end of the learning unit. Both groups also have arithmetic classes four hours a week. No member of either group was described as afflicted by dyscalculia, i.e. the difficulty in understanding the number system also in the first language. Therefore, it was assumed that all the subjects knew the concept of number and, in particular, the numbers between 0 to 100 in both L1 and L2. These prerequisites were necessary in order to analyse the mistakes from a cognitive point of view as well.

A more detailed description of the two classes follows.

5.1. Description of the two classes

Class 1C – 18 children, between ten and twelve years old. As two pupils are afflicted by a serious mental and physical disability, the trial group consisted in 16 children (8 boys and 8 girls). One suffers from dyslexia, but he took part to the trial anyway, as dyslexia does not affect listening abilities and the exercise does not require reading abilities.

Class 1D – 17 children (7 boys and 10 girls), age from ten to twelve. Three of them are afflicted by dyslexia, but they took part to the trial as well and so did another girl with Special Educational Needs.

In the two trial groups children with foreign origins were few; this avoided problems in the evaluations connected with the interference of the first language on both Italian and English. In particular, a girl in class 1C had an Italian father and a German mother. She was born in Italy and used Italian as the main language at home. The only student with foreign origin in class 1D was a girl born in Italy from Brazilian parents. She asserted using mostly Italian and only seldom if ever Portuguese when speaking at home.

The children were asked about additional English learning activities. As the majority of the children (14 out of 18 in class 1C, 14 out of 17 in class 1D) were attending an English course in their free time, this factor did not affect the homogeneity of the two groups.

The teacher had also been asked to give each class an approximate evaluation before the tests were held. Class 1C received an average B-level, while in class 1D the average evaluation was only C+. The two notes correspond to 9/10 and 8.5/10 respectively in the Italian evaluation system[4].

5.2. Carrying out the experiment

The test was split in two meetings of one hour each for both classes. In the first hour both classes started with a quick revision of numbers in English, using common exercises such as “write these numbers in letters”. Each child carried out this revision first, and then every exercise was checked again as a group activity. The group revision was a quick way to get a first impression of each child's participation in class activities, which could be evaluated as quite good for almost all subjects. After the warm-up described above, class 1D was given the dot-to-dot exercise[5], while class 1C had to deal with the comparison exercise, the common “listen and

[4] This evaluation corresponded to the arithmetic mean of the grades the children had got on their report card at the end of the first school semester, one month before the experiment was carried out. Probably a direct evaluation of the children would have been more precise, but it was not possible because of the little time granted for the experiment.

[5] The dot-to-dot game was provided in A4 format. It was made sure that the number tags were big enough for all children to read (font size 14). The pattern in *Appendix* is in a smaller version than the one given to the children.

circle the right number" activity. Both groups were allowed to listen to the recording twice. Some time (about three minutes) was left between the two listening turns, in order to allow the children to correct their answers. During both tests, children were asked to use a pen of a different colour for each listening exercise, so that the changes between the first and the second listening activities could be easily read. The results of these two tests are given in section 4.3. A week later, both classes were given the same review test (Appendix 3). The children had to listen to a new recording, consisting this time thirty numbers: they had to recognize them and to write them down on a white piece of paper. The purpose of this exercise was to evaluate their listening comprehension in a natural situation, i.e. without having a range of numbers to pick from. This test was also used in order to understand whether the two different exercises, the game and the circling exercise, affected the children's knowledge of numbers in English. The children listened to this recording twice as well. The numbers were read from the same English native speaker with a pause of three or four seconds between each number.

After all tests had taken place a comparison of the results followed.

5.3. First results

The outcomes of the dot-to-dot exercise were quite positive. Two students completed the pattern correctly after the first listening. One of them was dyslexic, but he was attending several English courses in his school-free time. Nine pupils obtained the correct pattern after the second listening and only three children did not manage to complete the drawing.

The circling exercise had different outcomes. Three children recognized all the numbers. However, all of them needed some corrections after the second listening activity. This is quite significant in comparison with the dot-to-dot exercise, which could be totally understood by two children after just one listening

Most of the pupils (11/16) in class 1C ended up recognizing between 15 and 19 of the 20 numbers given. A girl with learning impairment was the only one scoring 13/20.

It could be argued that a comparison between two exercises of different kind is methodologically unreliable. Nevertheless, it has been shown that the same material (the two groups used the same numbers, on the same record) can be used in two different ways, giving different outcomes. It must not be forgot that the children using the dot-to-dot pattern succeeded in recognising all numbers, despite being classified as less competent in English than the other group.

An interesting explanation for this outcome is the role of the dot-to-dot game, and of didactic games in general, as powerful instruments for teachers. They help revising a subject in an amusing way, and thanks to their lack of complexity they allow children to score good results. When used in everyday school practice they could boost children's confidence towards their competence in the foreign language. The dot-to-dot game had probably this effect on class 1D, but further studies should evaluate the effect of the use of games in the same class examining a longer time interval and more activities.

The results of the last listening test, the same for both classes, are useful in order to evaluate the effectiveness of the dot-to-dot game as a revision exercise. The score for class 1D was 26.6/30, whereas class 1C had an average score of 26.8/30. The scores were calculated in the following way: first, the arithmetic mean of correct answers in each class was calculated. Then, this mean was put in ratio with the total number of answers in the exercises, i.e. 30. The scores were converted into decimals, in order to compare them with the average English level given by the teacher for each class. Class 1D got an average score of 8.5/10, therefore confirming the average English knowledge grade. In class 1C the average score was 8.9/10, whereas the starting evaluation for this group was 9/10. This group's results were therefore a

little lower than the expected score, although it could be observed that a 0.1 variation is not significant. According to these results, the dot-to-dot game was not more effective than the traditional activity as a revising tool. Nevertheless, it did not affect the children competence, leading them to a very similar result, but in a more pleasant way. The children in class 1D got a good score, according to their competence, but they avoided the stress of a complex, or boring, revision exercise.

6. In-depth analyses of the results

The results of the exercises were useful primarily to test the effectiveness of dot-to-dot games while reviewing numbers in EFL classes. Moreover, the exercises were useful also to get an overview of the most frequent mistakes (usually of phonetic or of cognitive nature) made by the students while learning English numbers. The following analyses try to explain –from both points of view - the mistakes made by the children completing the exercise.

6.1. Outcomes of the dot-to-dot game and their phonetic aspects

The results of the dot-to-dot game can be examined through a systematic analysis of the phonetic mistakes. This analysis was carried out considering all observable mistakes in the dot-to-dot games handed in by the children.

The occurrences in the 15 papers examined were the following.

Group 1 - Discrimination between tens and units:
Thirty-six (/ˈθɜ:(r)ti- sɪks/) confused with *sixty-three* (/ˈsɪksti-θri:/): 1 time.
Forty-nine (/ˈfɔ:(r)ti-naɪn/) confused with *ninety-four* (/ˈnaɪnti-fɔ:(r)/): 3 times.

These two mistakes involve the discrimination between tens and units; they occurred rarely, therefore it could be gathered that this discrimination is not the main problem for Italian learners of English in the listening comprehension of numbers.

Group 3 - Discrimination between the voiceless dental fricative /θ/ and the voiceless labiodental /f/:
Thirty-six (/ˈθɜ:(r)ti-sɪks/) confused with *forty-six* (/ˈfɔ:(r)ti-sɪks/): 2 times.
Thirty-nine (/ˈθɜ:(r)ti-naɪn/) confused with *forty-nine* (/ˈfɔ:(r)ti- naɪn/): 10 times.

This was the most recurrent error, with a frequency of 66% in the tests examined. This frequency could be explained by observing that the number thirty and its compounds represent a critical pronounce point at the beginning of the word. The voiceless dental fricative /θ/ is one of the phonemes of the English language which are unfamiliar to the Italian speaker's ear (Pulcini 2009: 80). As already highlighted, understanding the first syllable in a word can be particularly difficult during a listening comprehension exercise. This is probably the reason why the mistaken discrimination between /θ/ and /f/ occurs with so high frequency.

Group 4 - Discrimination between short and long vowels:
Sixteen (/ˌsɪksˈti:n/) confused with *sixty* (/ˈsɪksti/): 5 times.
Seventeen (/ˌsev(ə)nˈti:n/) confused with *seventy* (/ˈsev(ə)nti/): 3 times.

The discrimination between long and short vowels is involved in these mistakes. Italian speakers get into great difficulties when they have to discern between long and short vowels in the English language, as this distinction does not exist in the same form in the Italian

phonologic system. Nevertheless, these mistakes did not occur with a very high frequency; this result was surprising. A first explanation may be that these utterances (i.e. seventeen and seventy for instance) have to be distinguished listening to the ending syllable, which is probably easier to understand during a listening comprehension exercise.

Sixteen (/ˌsɪksˈtiːn/) confused with *seventeen* (/ˌsev(ə)nˈtiːn/): 5 times.

This is an unexpected, albeit quite frequent, mistake. It is probably caused by a difficulty in memorizing the tags six (/sɪks/) and seven (/ˈsev(ə)n/) in the second language. It could be hypothesized that, as both words start with the same phoneme /s/, this similarity causes confusion in the learner's mind. On the other hand, the same mistake does not occur with the same frequency in the discrimination between four (/fɔː(r)/) and five (/faɪv/), although these two number words begin with the same phoneme (the voiceless labiodental /f/) as well. A further section of this paper suggests a cognitive explanation of the matter; however, the search for an explanation for this phenomenon should be the goal of further, in-depth research.

6.2. Outcomes of the free listening and their phonetic aspects

In order to conduct a more complete analysis of the errors and their occurrence, a close examination of the mistakes in the free listening comprehension exercise was deemed necessary. The tests examined were only those of the children who had carried out the dot-to-dot pattern during the first hour, although both test groups had been put through the same revision test. The examined tests were 15.

Group 3 - Discrimination between the voiceless dental fricative /θ/ and the voiceless labiodental /f/:
Thirty-nine (/ˈθɜː(r)ti-naɪn/) confused with *forty-nine* (/ˈfɔː(r)ti-naɪn/): once.
Thirty (/ˈθɜː(r)ti/) confused with *forty* (/ˈfɔː(r)ti/): once.
Thirty-eight (/ˈθɜː(r)ti-eɪt/) confused with *forty-eight* (/ˈfɔː(r)ti- eɪt/): 10 times.
Thirty-four (/ˈθɜː(r)ti-fɔː(r)/) confused with *forty-four* (/ˈfɔː(r)ti-fɔː(r)/): 9 times.
Thirty-seven (/ˈθɜː(r)ti-sev(ə)n/) confused with *forty-seven* (/ˈfɔː(r)ti-sev(ə)n/): 8 times.

These mistakes can be all connected with the previously analysed difficulties in discriminating the voiceless dental fricative /θ/. At least one error of this kind can be found in every paper examined. As a consequence, it may be stated once again that these critical points need to be stressed more during the learning unit about numbers. The children's ability in discriminating this sound from /f/ should be trained with exercises about both the listening comprehension ability and the oral production. Since the pupils encounter so great difficulty in recognizing these sounds, it is very likely that they will have the same (or maybe more) problems in uttering them as well.

Group 4 - Discrimination between short and long vowels:
Seventy (/ˈsev(ə)nti/) confused with *seventeen* (/ˌsev(ə)nˈtiːn/): 5 times.
Sixty (/ˈsɪksti/) confused with *sixteeen* (/ˌsɪksˈtiːn/): 2 times.
Eighty (/ˈeɪti/) confused with *eighteen* (/ˌeɪˈtiːn/): 4 times.
Forty (/ˈfɔː(r)ti/) confused with *fourteen* (/ˌfɔː(r)ˈtiːn/): 4 times.

It is again important to underline the significance of teaching vowel length correctly. In Italian vowel length is determined by consonant length, whereas in English long and short vowels can be found in the same position. In addition, the group of teen numbers poses difficulties to the native speakers as well. As suggested by Wells (2012),teen numerals are all

lexically double-stressed, and therefore susceptible to 'stress shift' in running speech. This becomes a greater difficulty for non-native speakers when it comes to understanding a native speaker pronouncing numbers in longer utterances. This phenomenon was not traceable in the recordings used for the tests; nevertheless, it must be taken into consideration when teaching the pronunciation of these numbers.

It is useful to point out that in this test only a certain number of errors concerning the distinction between six (/ˈsɪks/) and seven (/ˈsev(ə)n/) was recorded. The errors were about three compounds, sixty-one (/ˈsɪksti-wʌn/), sixty-three (/ˈsɪksti-θri:/) and sixty-five (/ˈsɪksti-faɪv/), confused with seventy-one (/ˈsev(ə)nti/wʌn/), seventy-three (/ˈsev(ə)nti-θri:/) and seventy-five (/ˈsev(ə)nti-faɪv/) respectively, hence revealing a connection with the unexpected type of errors in the dot-to-dot pattern. We suggest that this type of error should be analysed in depth in future research.

These observations could lead to a far wider discussion about the role of phonology in EFL teaching in Italy. Swan and Smith (2001) suggest that the main difficulties for Italian learners lie in the areas of stress and rhythm. These difficulties concern not only numbers, but also EFL as a whole. Teachers should be probably more aware of phonetics while working; both concentrating on their own pronunciation and making sure that the children get a proper competence of the English phonetics. Concentrating on the phonetics of common but also important elements such as numbers could be a good way to introduce phonological matters in the classroom practice.

6.3. Cognitive difficulties while learning and understanding numbers in L2

The errors noticed in the dot-to-dot pattern and in the free listening comprehension test can be analysed also from a cognitive point of view. Some numbers can be more difficult to acquire in the native language too; consequently, they may also be hard to learn and to use in a second language. According to Fisher (1993), the first group of difficult numbers comes just after the number 10. Up to ten, every number has its own written meaning, expressed by an Arabic digit. Starting from ten (the basis of our numbering system), however, they are compounded, as we need to take 0 to 9 digits assigning them a new meaning according to their position.

Many tests, for instance the experiments of Kamii (1985), showed that children run into specific difficulties in learning the number **nineteen**, as it marks the starting point of a new ten (from number twenty on). Compound numbers such as **twenty-two** or **fifty-four** are easier than those of the teen group, as the number word allows the speaker to discriminate between the ten (**fifty**, **sixty**…) and the unit. The Italian and the English languages are quite similar from this point of view. Number words from twenty on are formed always using the same regular pattern, ten + unit. Therefore, it can be gathered that an Italian native speaker will learn these numbers in English faster than if asked to learn the same number words in the French orin the German language. The French language, as already mentioned, is more difficult as its numerical system includes some traces of the vigesimal system, using twenty as a basis. We have, therefore, quatre-vingts (four times twenty) instead of eighty. German number words after **twenty** are different both from the Italian and from the English ones: in this system the unit is pronounced first and followed by the word for twenty or the other tens. Therefore, Italian students would find them more difficult from a cognitive point of view. The English number words for digits 13 to 19 show the unit before the –teen; in Italian number words for digits 13 to 16 do the same but number words for digits 17, 18 and 19 show the tens before units as in the digit itself.

In the dot-to-dot game we did not find mistakes connected to such different number word structures, but we found the number word sixteen (/ˌsɪksˈti:n/) confused with seventeen (/sev(ə)nˈti:n/). This mistake could be observed in five of the fifteen tests. In the free listening

comprehension exercise no trace of this type of error could be found; children were tested with three numbers from 13 to 19, i.e. **sixteen**, **seventeen** and **eighteen**. The mistakes are more likely to be explained from a phonetic point of view, since the children attending secondary school already possess an adequate knowledge of numbers from ten on in their native language; mistakes on the cognitive side might be more numerous when performing the experiment with children of younger age (from 6 to 10 years old). In that case, the poor knowledge of these numbers in Italian might lead to a greater number of mistakes in English as well.

Which numbers might be cognitively difficult for native Italian speakers at middle school level? This subject is quite wide and it cannot be examined in depth in this paper; as a suggestion, however, new tests should involve the difficulties connected with very big numbers (one thousand and so on) and their compounds, as these numbers have in English an internal organization which is different from the corresponding Italian words. In addition, in Italian dates are not pronounced as if they were formed by the number of the first two digits followed by the number of the second two; therefore, we suggest they should be tested as well.

7. Conclusions

The dot-to-dot game was first developed as a simple review exercise, but after the trial, it proved a multifaceted resource. The results of the trial were also useful for some considerations about the difficulties faced by Italian students while learning English numbers and in this way, this game can be of help for both students and teachers. Foreign language teachers appreciated it when it was presented as a task during a training course[6], because of the great number of different applications and effects these exercises offer, without being excessively complicated both in the preparation and in the execution; this further proves its usefulness in the didactic practice. Future research should focus on the enhancement of this kind of exercises, developing new versions, which could be useful for different teaching and learning purposes.

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[6] The gamewas presented during a workshop of the training course "ICT and CLIL. Task based activities in foreign language learning" Torino 13-14th April 2015. The course made part of the dissemination activities of PETALL (Pan European Task –based Activities f or Language Learning) European Project 530863-LLP-1-2012-1-NL-KA2-KA2MP.

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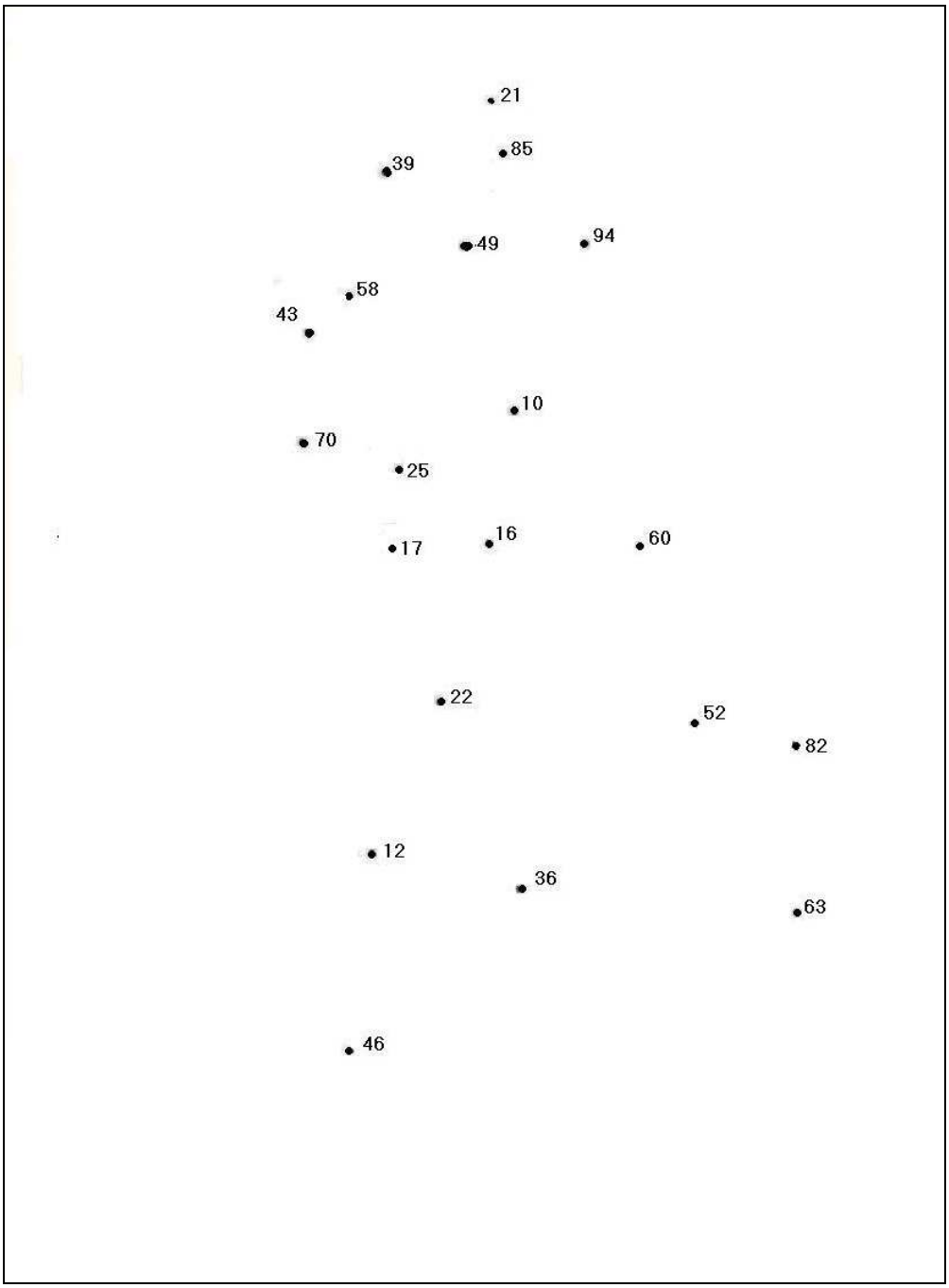
Appendix 1 – Dot-To-Dot Pattern

Follow the voice and complete the drawing. Start from number 25.



Appendix 2 – Alternative Exercise

Listen and circle the right number.

a)	35	25	52
b)	17	60	70
c)	43	33	46
d)	58	85	48
e)	49	59	39
f)	21	12	81
g)	65	85	95
h)	49	94	84
i)	49	94	84
j)	3	11	10
k)	60	16	50
l)	22	82	52
m)	22	82	52
n)	63	73	36
o)	26	36	46
p)	26	36	46
q)	21	12	20
r)	22	92	12
s)	60	16	50
t)	70	20	17

Appendix 3 – List of Numbers in the Review Test

25 *twenty-five*
16 *sixteen*
38 *thirty-eight*
42 *forty-two*
37 *thirty-seven*
94 *ninety-four*
49 *forty-nine*
71 *seventy-one*
65 *sixty-five*
48 *forty-eight*
18 *eighteen*
63 *sixty-three*
4 *four*
40 *forty*
88 *eighty-eight*
20 *twenty*
56 *fifty-six*
95 *ninety-five*
29 *twenty-nine*
17 *seventeen*
7 *seven*
34 *thirty-four*
73 *seventy-three*
67 *sixty-seven*
55 *fifty-five*
80 *eighty*
2 *two*
51 *fifty-one*
78 *seventy-eight*
44 *forty-four*