

# The effects of explicit spelling instruction on the orthographic performance of Spanish students in the third cycle of Primary Education

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**ABSTRACT:** In this paper, we aim to shed light on the explicit-implicit paradigms in connection to English spelling, perhaps the most representative area caught up in this controversy. To this end, we report on a research study with a pre-test/post-test/delayed post-test control group design carried out in order to determine whether a systematic, explicit intervention program in the teaching of English spelling implemented with Spanish third cycle of Primary Education students in an experimental group develops in such pupils superior orthographic abilities to those spontaneously promoted by its implicit learning in students of a control group. The results are eloquent: ANOVA, the T Test, and successive discriminant analyses reveal that our treatment indeed produces a differential and durable effect, as the experimental group achieves the highest means in the post- and delayed post-tests on practically all the main parts, layers, and aspects sampled, with statistically significant differences in its favor.

**RESUMEN:** En este trabajo pretendemos arrojar luz sobre los paradigmas explícito e implícito, en relación con la ortografía inglesa, quizás el área que más nos puede ayudar a esclarecer esta controversia. Con este fin, hemos realizado una investigación con un diseño de grupo de control pre-test/post-test/seguimiento para determinar si un programa sistemático de enseñanza de ortografía inglesa desarrollado con alumnos/as de tercer ciclo de Educación Primaria en un grupo experimental desarrolla en éstos/as habilidades superiores a las que espontáneamente promueve su aprendizaje implícito en los/as alumnos/as de un grupo control. Los resultados son elocuentes: el ANOVA, la Prueba de T y el análisis discriminante evidencian que nuestro tratamiento ha producido un claro efecto diferencial y duradero, ya que el grupo experimental obtiene medias más altas en el post-test y la prueba de seguimiento en la práctica totalidad de las partes, dimensiones y aspectos muestreados, con diferencias estadísticamente significativas a su favor.

## 1. INTRODUCTION

In all domains of L2/FL teaching, the explicit and implicit paradigms have appealed to researchers, particularly from the mid-1960s onwards. In Stern's words (1992: 327), "A key issue in second language pedagogy is whether the learner should be taught to approach the learning task consciously as an intellectual exercise, or whether he should be encouraged to avoid thinking about the language and absorb it intuitively". McLaren, Green,

and Mackintosh (1994: 329) equally stress that they “have become remarkably popular areas of research”.

Of all the L2/FL learning areas caught up in this controversy, spelling is one of the most, if not the most, representative and problematic. Indeed, countless authors testify to the prolonged, heated debate it has originated between implicit, whole language, top-down, or whole-to-part approaches and explicit, traditional, bottom-up, or part-to-whole views. Hildreth (1962), already in the 60s, hints at the contention between modern methods of indirect spelling instruction and those which continue to favor systematic teaching. Well-known is Krashen’s (1993) forceful vindication of reading as the sole source of orthographic development (as formulated in his Reading Hypothesis), vs. other authors who claim reading is not effective or sufficient to learn or improve spelling and who thus strongly uphold the direct, explicit, and systematic teaching of this discipline (Funnell, 1992; Schlagal, 1992; Sterling, 1992; Moseley, 1994; Bosman and Van Orden, 1997; Ehri, 1997; Perfetti, 1997; Honig, 2001). The dispute continues into the decade of the 90s, up to our present day. Gentry and Gillet (1993: 2), for instance, sum up the state of the question superbly:

At present, two philosophies of spelling education are pulling in opposite directions like the entangled lines of two kites in flight. Whole language and traditional views of spelling education have crisscrossed in an inextricable tangle of theories, attitudes, and myths. The resulting tension threatens to break both lines.

Rosencrans (1998: 4) also captures the essence of the controversy admirably:

Research into the area of written language development presents opposing viewpoints. Whole language theorists are often cited as suggesting that no formal spelling be taught [...]. They argue that through immersion in a language program rich in independent writing children will learn to spell through a natural progression. Traditionalists argue that direct instruction, phonics rules, and a structured, sequential word-study program are necessary. [...] Such diverse viewpoints, both based on viable research, have confused teachers. Practice, therefore, is polarized [...].

Templeton and Morris (1999: 102) are also emphatic in claiming that “spelling has [...] been a flashpoint in the debate between more integrated, whole-language-oriented instruction and more structured, part-to-whole instruction”.

All these accounts indeed evidence that spelling is a moot point in approaches to instruction. Not only is it contentious, however; it is according to some authors, the thorniest of issues in this respect. Gentry and Gillet (1993: 1) buttress this idea, paraphrasing Ethel Buchanan (1991): “If anything will defeat whole language, [...] it is what we do with spelling”. It seems, hence, that there is no better angle from which to examine the explicit-implicit dimensions than English spelling. And this is precisely what we did in carrying out a classroom-based, experimental study with a pre-test/post-test control group design, to which we added a delayed post-test, in order to investigate the possible differential effect and the durability of an explicit, systematic intervention program in the teaching of English spelling on the orthographic performance of Spanish students in the third cycle of Primary Education (ages 10-11). We now report on its research design, results, and conclusions.

## 2. RESEARCH DESIGN

### 2.1. Objectives

The objectives of our study were fundamentally three:

- I. To determine whether a systematic, explicit intervention program in the teaching of English spelling implemented with Spanish fifth-grade students in an experimental group develops in such pupils superior orthographic abilities than those spontaneously promoted by its implicit learning in fifth-grade students of a control group.
- II. To assess the degree of permanence or durability of such orthographic knowledge in the students of our experimental and control groups six months after the conclusion of our intervention, that is, when these pupils were in sixth grade.
- III. To determine which variable(s) is/are truly responsible for the differences between the experimental and control groups' orthographic performance, were such a divergence to exist.

### 2.2. Sample of Subjects

The subjects of our sample were Spanish male and female students in fifth grade of Primary Education in the academic year 2000-2001 of a private school in the city of Granada. In this educational institution, there is a predominance of pupils with a middle socioeconomic level.

The school had three groups of students in each grade of Primary Education. The law in force compels all schools to randomly assign learners to each group. In our case, for fifth grade, there were three already existing groups of students, that is, what Seliger and Shohamy (1989: 136) term "natural" groups, "in the sense that they already exist prior to research". From them, we randomly chose one as our experimental group (5°B) and considered the remaining two (5°A and 5°C) as our control group. In our type of research design, it is of extreme importance for the experimental and control groups to be made up of homogeneous students, as Seliger and Shohamy (1989: 141) point out: "Implicit in the use of control groups is the important assumption that the control group represents the same population as the experimental group: it is as if we are comparing the same individuals with and without the treatment". Or, in Nunan's terms (1991: 255): "To all intents and purposes, the groups are meant to be identical in all respects except for the experimental treatment, whatever that might be". In our case, sociocultural homogeneity was ensured, as we previously mentioned, by the school's grouping system. Nonetheless, we employed an initial verbal intelligence assay (ERV) to further guarantee such homogeneity. And, indeed, we did not find any statistically significant differences in the verbal intelligence of our experimental and control groups:

ERV	5°A/5°B	5°A/5°C	5°B/5°C
Analogies ( <i>p</i> )	.131	.922	.099
Word Grouping ( <i>p</i> )	.210	.854	.322
Inferences ( <i>p</i> )	.839	.280	.259
Series ( <i>p</i> )	.946	.403	.384
Total ( <i>p</i> )	.354	.954	.368

Table 1. Statistical comparison of the experimental and control groups on the verbal intelligence test

Thus, from the outset, we could firmly and safely claim that our experimental and control groups contained homogeneous subjects.

The experimental class (5°B) comprised twenty-four students. The other two groups (5°A and 5°C) were made up by twenty-four and nineteen pupils, respectively. We now represent, in a more detailed manner, the exact number of subjects, subdivided also according to gender, with which we worked in each of the three classes:

	BOYS	GIRLS	TOTAL
5°A (CONTROL)	23	1	24
5°B (EXPERIMENTAL)	17	7	24
5°C (CONTROL)	14	5	19
TOTAL	54	13	67

Table 2. Sample of subjects

### 2.3. Variables

In our study, we considered three main types of variables: *dependent*, *independent*, and *moderator* ones.

- The *dependent variable* corresponded to the orthographic performance on the spelling test of the students in both the experimental and control groups. That is, to their performance on six main dimensions and numerous subspects selected as representative of this level (cf. Appendix I for a complete account of the spelling aspects considered).
- In turn, the *independent variable* was the explicit and systematic intervention program for the teaching of English spelling, or in Seliger and Shohamy's terms (1989: 137), "the treatment", which they define as "a *controlled* and *intentional* experience, such as exposure to a language teaching method specially constructed for the experiment ...".
- Finally, as *moderator variables*, we selected the following:
  1. Verbal intelligence
  2. Motivation

3. The students' performance on the following curricular areas studied throughout the course of fifth grade of Primary Education: English, Spanish Language and Literature, Mathematics, and Science.

#### 2.4. Instruments

The instrument employed to measure our dependent variable was an English spelling test consisting of a very clear-cut and well-established taxonomy of spelling dimensions and aspects which we believed should be mastered at the end of Primary Education (five were the layers taken into consideration: the visual/auditory, morphological, orthographic, and semantic realms and capitalization and punctuation). In order to test these aspects, we employed three basic testing facets: dictation (of a short text and of isolated words), free composition, and a proofreading text for spelling error recognition and correction. With dictation in general, we aimed to test spelling productively and auditorily, both with a text, where weak forms, linking, or assimilation come into play, and with isolated words with orthographic difficulty. A necessary complement to dictation in testing spelling productively was free writing, of great value as it is the means through which children evince their ability to use their knowledge of spelling to generate text. Finally, the proofreading section enabled us to test English orthography receptively and visually, as well as to encourage the learner to see, experience, rethink, and reflect upon spelling misconceptions. In addition, we attempted to endow all three methods with a communicative character that would hopefully help the students realize the significance of English writing and spelling outside the confines of the classroom, and thus to motivate them in the completion of the test. In this sense, we made the text dictation a note from the students' mother, asking them to do some food shopping; the free writing, a description of their best friend, required by the Interpol as (s)he had gone missing; and the proofreading, an e-mail from a Welsh pen pal (or rather, keypal). We drew up the test ourselves, as there were no published standardized tests suitable for Spanish EFL learners at the level in which we were interested (cf. Appendix II for teacher's version of the test).

In turn, the instrument corresponding to the independent variable was an intervention program implemented over the course of the academic year 2000/2001 (from the first week of October to the third of June) with our experimental group of twenty-four fifth-grade students. We provided direct, explicit spelling instruction within the English classroom period for an average of fifteen to twenty minutes per class, twice a week (on Mondays and Thursdays). The principles which informed our instruction involved focusing on the spelling layers, predictable patterns and testing facets included in our pre-, post-, and delayed post-tests; employing varied activities, classroom organizations, and multisensory procedures; teaching representative and orthographically challenging spelling words, cyclically revised, recorded alphabetically in notebooks, and tested every two weeks in short exams; overtly modeling spelling strategies; raising orthographic awareness from the outset; providing continuous encouragement, positive reinforcement, and numerous prizes in order to foster extrinsic motivation; and embedding all spelling activities within the broader language arts curriculum of reading and writing, as well as integrating instruction within learners' general English class so as to prevent the intervention program from becoming a mere add-on or stand-alone activity.

If we now center our attention on the instruments employed to control the moderator variables, we should, to begin with, mention that verbal intelligence was measured by means of the ERV (*Ejercicios de Razonamiento Verbal*) test designed by Pelechano *et al.* in 1976. The latter is characterized by Pelechano (1989: 114-115) as follows. The ERV assay is made up of four parts corresponding to four factors of verbal intelligence. The first subtest is that of analogies (A) and it evaluates general vocabulary and general information knowledge. It is a version reduced to thirty-nine elements of the verbal factor of Bennett *et al.*'s *Tests de Pronóstico del Rendimiento Académico*, published by T.E.A. (Madrid, 1967), with the APT as their English original (*Academic Promise Tests*, published by the Psychological Corporation in New York in 1962). The second subtest is that of word grouping (P) and it is aimed at exploring inductive reasoning with conceptual discrimination. It is made up by a selection of items from the word grouping test factor of the North American edition of Thurstone's *Primary Mental Ability*, grades 9 to 12. In turn, the third subtest is devoted to inferences (I) and it is a factor of deductive reasoning in the form of syllogisms. The original items belong to test 9 inferences (levels 2 and 4) of the *California Test of Mental Maturity* (California Test Bureau, California, 1964). The fourth and final subtest focuses on series (R) and Pelechano *et al.* decided to incorporate it in the light of the results obtained in their 1976 study. It is a factor of verbal reasoning from Thurstone's PMA (*Primary Mental Ability*), adapted by Yela and published by T.E.A.

Pelechano is again the author of our motivation assay (MA), which he himself once more describes (1994: 360) in the following terms. This test basically isolates four motivational factors of achievement and anxiety: (i) vain desire to work and self-esteem (containing 10 items); (ii) anxiety in the face of exams (with a negative-inhibitory content and made up of 9 elements); (iii) lack of interest in studying (comprising 9 items); and (iv) realistic personal self-demand (composed of 7 elements).

Finally, academic achievement was represented by the students' grades in the following areas: English, Spanish Language and Literature, Mathematics, and Science. Such marks were expressed in terms of A – B – C – D – E – F, since, although the school, respecting the educational norm, qualified students' achievement according to *Progresá Adecuadamente* and *Necesita Mejorar*, it equally made use of this other scoring system, whose detailed rendering is represented in the table below:

A	SITUACIÓN MUY DESTACADA ( <i>OUTSTANDING PERFORMANCE</i> ) (9-10)
B	SITUACIÓN DESTACADA ( <i>NOTABLE PERFORMANCE</i> ) (8-9)
C	PROGRESA ADECUADAMENTE ( <i>PROGRESSES ADEQUATELY</i> ) (6-7,5)
D	PROGRESA CON DIFICULTAD ( <i>PROGRESSES WITH DIFFICULTY</i> ) (4,5-5,5)
E	NECESITA MEJORAR ( <i>NEEDS IMPROVEMENT</i> ) (3-4)
F	BAJO RENDIMIENTO ( <i>LOW ACHIEVEMENT</i> ) (0-2,5)

Table 3. Scoring system of the school where the investigation was carried out

## 2.5. Procedure

We began by administering our pre-test in the second half of September of the year 2000 to each of the three classes of fifth-graders who constituted both our experimental and control groups. The English spelling test was administered in a single session to each of the groups; that is, in approximately sixty minutes (roughly fifteen for each facet, with the text dictation taking slightly longer on some of the applications), the exam was administered to each of the classes. The administrator (and corrector) was always the author of the test. We should equally mention that, prior to their application, each of the test parts was contextualized in Spanish, as we not only read the instructions with the students, but also anticipated exactly what they would find in each section (in line with Martínez López's, 1989: 50, recommendations for the application of dictation in EFL). In addition, in the two dictations, we not only read the sentences or words repeatedly in English, but also translated them as we dictated, so as to avoid possible confusion or errors resulting from lack of understanding. Students were reassured that the spelling test would not be counted in their grade, but that the results were to be part of a study to understand more about children's spelling. They were asked to do the best they could, even when they were uncertain of the spelling of a word.

During these last two weeks of September, we equally administered the test corresponding to our moderator variables, namely, the ERV (verbal intelligence) and MA (motivation) assays. However, the latter were administered, not to each group individually, but to the three fifth grades together, with the help of two psychologists with ample experience in applying tests of this type, and over the course of a single session lasting approximately sixty minutes. The motivation test took around twenty-five minutes to apply, while very specific time spans were allotted to the administration of the verbal intelligence one: ten minutes for the analogy section; five minutes for word grouping; ten minutes for inferences; and six minutes for the series part (thus, just over half an hour for the application of the whole test).

In the first week of October, 2000, we commenced the implementation of our intervention program with our experimental group, where the author of this study provided them with systematic, explicit spelling instruction for an average of fifteen to twenty minutes on Mondays and. The remaining two groups (control) followed the ordinary development of their curricular materials, where spelling did not appear as a systematic or specific content. The random assignment of the participants to the experimental and control groups, as well as their homogeneity in sociocultural level and verbal intelligence, was previously established, as we mentioned in the description of our sample of subjects.

After the conclusion of our intervention program, in the third week of June of the year 2001, we administered our spelling post-test in exactly the same manner as the pre-test (that is, to each group individually and over the course of approximately sixty minutes). Six months later, on the third week of December of the year 2001, we applied our final delayed post-test.

## 2.6. Statistical Methodology

Employing the SPSS (*Statistical Package for Social Sciences*) program, in its 10.0 version, we calculated:

1. The statistical significance of the differences between the experimental and control groups in the verbal intelligence test in order to establish the homogeneity of all the subjects in our sample.
2. The F statistic (analysis of variance: ANOVA) in order to generally perceive the existence or lack of existence of statistically significant differences between the groups which have participated:
  - a. Control groups: within-groups before and after, and after and six months following the conclusion of the intervention
  - b. Experimental group: within-group before and after, and after and six months following the conclusion of the intervention
  - c. Control and experimental groups: between-groups before, after, and six months following the conclusion of the intervention
3. The statistical significance of the differences between the means of the experimental and control groups (by means of the T Test) in the spelling exam before, after, and six months following our intervention program in order to determine the effects and durability of our treatment.
4. The variable(s) responsible for the differences between the experimental and control groups by means of discriminant analysis.

### **3. RESULTS**

#### **3.1. ANOVA**

##### **3.1.1. Introduction**

In an initial phase, by means of the ANOVA statistical technique, we calculated:

1. The intragroup differences, before and after, and after and six months following the conclusion of our intervention, in the experimental and control groups (ANOVA).
2. The intergroup differences, before, after, and six months following the conclusion of the intervention program, between the experimental and control groups (ANOVA).

These techniques enabled us to appraise generally whether the diverse means of the groups which participated in our investigation were significantly different, that is to say, the existence of significant within-group and between-group differences, before, after, and six months following the conclusion of our treatment. The existence of such divergences then allowed us to proceed to the next phase of our analysis, where, with the help of the T Test, we detected in a detailed manner exactly which means were significantly different in favor of each group.



### 3.1.2. Before and after the intervention

#### 3.1.2.1. Within-group differences, before and after the intervention

		Sum of Squares	df	Mean Square	F	Significance
5ªA (CG)	TEST*MOMENT	3050.208	1	3050.208	30.760	.000
5ªC (CG)	TEST*MOMENT	2256.516	1	2256.516	51.273	.000
5ªB (EG)	TEST*MOMENT	40774.533	1	40774.533	373.175	.000

Table 4. Within-group differences, before and after the intervention

**Note:** **TEST** refers to our spelling test and includes the scores obtained on the text and individual word dictations, the free composition, the proofreading, and the sum of these four parts of the exam. **MOMENT** alludes to the comparison of the scores obtained at the outset of the experience and at the end of the latter.

The F statistic enables us to affirm at a confidence level of 100% that the students in each of the three groups which participated in our investigation obtained significantly different and superior scores after one year. This means, on the one hand, that the subjects in the control groups significantly improved their marks in the spelling test employed merely by following their usual methodology. On the other, it also indicates that the pupils in the experimental group significantly ameliorated their initial results at the end of our intervention

#### 3.1.2.2. Between-group differences, before and after the intervention

##### 3.1.2.2.1. Before: 5ªA (control group) and 5ªB (experimental group)

	Sum of Squares	df	Mean Square	F	Significance
Text Dictation (pre-test)	1281.333	1	1281.333	6.578	.014
Individual Word Dictation (pre-test)	136.688	1	136.688	2.319	.135
Free Composition (pre-test)	638.021	1	638.021	2.803	.101
Proofreading (pre-test)	.750	1	.750	.125	.726
Sum of the previous four parts (pre-test)	5418.750	1	5418.750	4.636	.037

Table 5. Between-group differences, before the intervention (5ªA-5ªB)

According to our data, there are statistically significant differences between these two groups in the first part of the test (the text dictation) at a confidence level of 99%. There are none, however, on the remaining three facets. In the total score of the whole test, we find significant differences at a confidence level of 97%.

**3.1.2.2.2. Before: 5°C (control group) and 5°B (experimental group)**

	Sum of Squares	df	Mean Square	F	Significance
Text Dictation (pre-test)	1154.558	1	1154.558	5.864	.020
Individual Word Dictation (pre-test)	441.120	1	441.120	6.790	.013
Free Composition (pre-test)	734.885	1	734.885	2.598	.115
Proofreading (pre-test)	8.448	1	8.448	1.147	.291
Sum of the previous four parts (pre-test)	8531.638	1	8531.638	7.230	.010

*Table 6. Between-group differences, before the intervention (5°C-5°B)*

We locate statistically significant differences in the text and individual word dictations and in the total score of the spelling test. There are no divergences in the remaining methods.

**3.1.2.2.3. After: 5°A (control group) and 5°B (experimental group)**

	Sum of Squares	df	Mean Square	F	Significance
Text Dictation (post-test)	2241.333	1	2241.333	6.030	.018
Individual Word Dictation (post-test)	4466.021	1	4466.021	15.416	.000
Free Composition (post-test)	1017.521	1	1017.521	5.974	.018
Proofreading (post-test)	8427.000	1	8427.000	108.371	.000
Sum of the previous four parts (post-test)	54945.333	1	54945.333	20.112	.000

*Table 7. Between-group differences, after the intervention (5°A-5°B)*

After our systematic intervention program, we can speak of statistically significant differences between this control group and the experimental one in the four individual facets as well as on the spelling test as a whole. The confidence level is of 100% on three occasions and of 99% in the remaining two.

**3.1.2.2.4. After: 5°C (control group) and 5°B (experimental group)**

	Sum of Squares	df	Mean Square	F	Significance
Text Dictation (post-test)	1930.187	1	1930.187	5.874	.020
Individual Word Dictation (post-test)	2599.939	1	2599.939	9.622	.003
Free Composition (post-test)	277.347	1	277.347	2.578	.116
Proofreading (post-test)	8012.095	1	8012.095	94.826	.000
Sum of the previous four parts (post-test)	38461.926	1	38461.926	15.699	.000

*Table 8. Between-group differences, after the intervention (5°C – 5°B)*

This analysis of variance reveals statistically significant differences between these two groups in all the variables under consideration, except for the free composition. Of the four significant differences found, three are at a confidence level of 100% and one, at 98%.

### 3.1.3. *After and six months following the conclusion of the intervention*

In this phase, we analyzed the results obtained by the students who participated in our investigation six months after the application of the intervention program. The aim was to determine the existence of statistically significant differences between the subjects in the control and experimental groups. In other words, at this point, we strived to ascertain the permanence or durability of the effect which our intervention program exerted after six months had elapsed.

#### 3.1.3.1. *Within-group differences, after and six months following the intervention*

		Sum of Squares	df	Mean Square	F	Significance
6°A (CG)	TEST*MOMENT	114.126	1	114.126	6.457	.018
6°C (CG)	TEST*MOMENT	61.959	1	61.959	1.876	.188
6°B (EG)	TEST*MOMENT	7.704	1	7.704	.481	.495

*Table 9. Within-group differences, after and six months following the intervention*

**Note:** **TEST** refers to our spelling test and includes the scores obtained on the text and individual word dictations, the free composition, the proofreading, and the sum of these four parts of the exam. **MOMENT** alludes to the comparison of the scores obtained at the end of the experience and six months after its conclusion.

According to these data, the control group 6°A obtains, six months after the conclusion of our intervention program, statistically different and superior scores on the delayed post-test. The same cannot be affirmed with respect to the other control group or to the experimental one. It seems that these two classes do not significantly ameliorate their results six months after the conclusion of the intervention program. Nonetheless, despite 6°A's improvement, this control group continues to present statistically inferior outcomes to those of the experimental one, as we shall observe in the section devoted to the commentary of the results obtained on the T Test.

### 3.1.3.2. *Between-group differences, six months after the intervention program*

#### 3.1.3.2.1. *6°A (control group) and 6°B (experimental group)*

	Sum of Squares	df	Mean Square	F	Significance
Text Dictation	999.188	1	999.188	2.615	.113
Individual Word Dictation	2775.521	1	2775.521	14.606	.000
Free Composition	910.021	1	910.021	11.827	.001
Proofreading	7008.333	1	7008.333	89.911	.000
Sum of the previous four parts	39273.521	1	39273.521	17.283	.000

*Table 10. Between-group differences, six months after the intervention (6°A-6°B)*

The table above clearly evinces the statistically significant differences between this first control group (6°A) and the experimental one (6°B) in three of the four testing facets (individual word dictation, free composition, and proofreading) and on the spelling test as a whole. The confidence level is of 100% in all four cases. We do not find, however, statistically significant differences in the text dictation, perhaps owing to the fact that it employs spelling words belonging predominantly to a single semantic field – food – on which all three sixth-grade classes had taken a test in their regular English classroom the week prior to our administration of the delayed post-test and with which they were all, consequently, familiar.

Nonetheless, in general, we observe that the results obtained with the between-group ANOVA immediately after the conclusion of the intervention program are maintained six months afterwards. Indeed, on the post-test, we came across statistically significant differences between 6°A and B in the four individual facets, as well as on the spelling test as a whole.

If these statistically significant differences which we now find were to be in favor of the experimental group, we could not only affirm that our intervention program produces better results immediately after its finalization, but also that its effect is maintained six months following its conclusion.

#### 3.1.3.2.2. *6°C (control group) and 6°B (experimental group)*

	Sum of Squares	df	Mean Square	F	Significance
Text Dictation	1238.032	1	1238.032	3.341	.075
Individual Word Dictation	2508.271	1	2508.271	13.872	.001
Free Composition	1097.528	1	1097.528	11.017	.002
Proofreading	6968.213	1	6968.213	89.715	.000
Sum of the previous four parts	40752.745	1	40752.745	18.605	.000

*Table 11. Between-group differences, six months after the intervention (6°C-6°B)*

The results obtained in the previous subheading are repeated here: the analysis of variance reveals statistically significant differences between this second control group and the experimental one on exactly the same three parts (individual word dictation, free composition, and proofreading) and on the spelling test as a whole. The confidence level is again 100% on all four occasions. It remains to be seen whether the differences continue to be, as in the post-testing phase of our study, in favor of the experimental group.

#### **3.1.4. Conclusion**

In sum, the statistical analysis carried out in this phase (ANOVA) allows us to ascertain that:

1. There are statistically significant within-group differences, before and after the development of the intervention program, in both control groups, as well as in the experimental one, with respect to the spelling test employed in this investigation. The only group to significantly ameliorate its results from the post- to the delayed post-tests is 6<sup>o</sup>A.
2. We can also speak, in general, of statistically significant differences between the control and experimental groups prior to the treatment, after its finalization, and six months following its conclusion.

### **3.2. T Test**

#### **3.2.1. Introduction**

The results obtained with ANOVA clearly justify our undertaking the next phase of analysis of our data. In it, we employed the T Test to determine in a detailed manner on which specific parts, dimensions, and subspects of our orthography exam each group was significantly superior or inferior.

#### **3.2.2. Pre-test**

If we commence by focusing on the pre-test, we observe the following means and the following differences between them:

PRE-TEST	5ª MEAN (CORRECT RESPONSES)	5ª STANDARD DEVIATION	5ª MEAN (CORRECT RESPONSES)	5ª STANDARD DEVIATION	5ª MEAN (CORRECT RESPONSES)	5ª STANDARD DEVIATION	5ª MEAN (CORRECT RESPONSES)	5ª STANDARD DEVIATION	F/A/B p	SIGNIFICANT DIFFERENCE IN FAVOR OF	F/A/C p	SIGNIFICANT DIFFERENCE IN FAVOR OF	F/B/C p	SIGNIFICANT DIFFERENCE IN FAVOR OF
Total	142.83	15.44	122.38	12.30	150.95	15.97	150.95	15.97	0.037	5A	0.531	5C	0.012	5C
1ª Part	47.58	8.46	37.25	6.80	47.68	6.80	47.68	6.80	0.014	5A	0.983	5C	0.020	5C
2ª Part	21.08	13.90	17.71	16.69	24.16	16.99	24.16	16.99	0.135	5A	0.274	5C	0.017	5C
3ª Part	43.13	2.76	35.83	2.11	44.16	3.33	44.16	3.33	0.101	5A	0.824	5C	0.115	5C
4ª Part	32.04	36.19	31.79	32.07	32.68	37.07	32.68	37.07	0.726	5A	0.493	5C	0.291	5C
I. Visual/Auditory Dimensions	75.71	19.07	65.29	15.53	79.00	19.19	79.00	19.19	0.044	5A	0.578	5C	0.013	5C
A. Blends	21.00	5.31	18.96	4.46	22.68	4.37	22.68	4.37	0.156	5A	0.261	5C	0.009	5C
A.1. Initial Blends	15.33	3.82	14.13	3.03	16.74	2.92	16.74	2.92	0.231	5A	0.193	5C	0.007	5C
A.2. Medial Blends	3.46	0.88	3.17	0.87	3.68	0.75	3.68	0.75	0.255	5A	0.370	5C	0.042	5C
A.3. Final Blends	2.21	1.41	1.67	1.63	2.26	1.48	2.26	1.48	0.225	5A	0.902	5C	0.223	5C
B. Digraphs	4.21	2.50	3.54	1.69	5.37	3.27	5.37	3.27	0.286	5A	0.210	5C	0.036	5C
B.1. Initial Digraphs	1.67	1.27	1.25	0.85	2.32	1.70	2.32	1.70	0.189	5A	0.160	5C	0.010	5C
B.2. Medial Digraphs	1.71	1.20	1.67	0.82	2.11	1.24	2.11	1.24	0.889	5A	0.297	5C	0.194	5C
B.3. Final Digraphs	0.83	0.87	0.63	0.58	0.95	0.91	0.95	0.91	0.332	5A	0.678	5C	0.165	5C
C. Double Letters	2.04	1.43	1.21	1.25	1.89	1.66	1.89	1.66	0.037	5A	0.761	5A	0.144	5C
C.1. Double Consonants	1.29	1.37	0.92	1.10	1.21	1.36	1.21	1.36	0.301	5A	0.847	5A	0.437	5C
C.2. Double Vowels	0.75	0.53	0.29	0.46	0.68	0.58	0.68	0.58	0.003	5A	0.704	5A	0.022	5C
D. Silent Letters	0.21	0.41	0.21	0.41	0.37	0.50	0.37	0.50	1.000	5B	0.256	5C	0.256	5C
E. Vowels	28.17	5.86	23.75	5.29	27.42	6.19	27.42	6.19	0.009	5A	0.690	5A	0.047	5C
E.1. /i/	4.63	1.35	2.83	1.09	3.74	1.41	3.74	1.41	0.000	5A	0.041	5A	0.022	5C
E.2. /e/	1.13	0.34	1.13	0.34	1.21	0.42	1.21	0.42	1.000	5B	0.475	5C	0.475	5C
E.3. /a/	1.92	1.10	1.13	0.78	1.84	0.90	1.84	0.90	0.001	5A	0.812	5A	0.001	5C
E.4. /u/	1.08	0.58	1.17	0.64	1.37	0.76	1.37	0.76	0.639	5B	0.187	5C	0.360	5C
E.5. /ae/	2.83	0.38	2.58	0.65	2.74	0.65	2.74	0.65	0.114	5A	0.572	5A	0.449	5C
E.6. /ɔ/	2.00	0.83	1.96	0.62	1.89	0.57	1.89	0.57	0.846	5A	0.626	5A	0.729	5B
E.7. /θ/	3.42	1.38	3.63	1.38	4.00	1.41	4.00	1.41	0.603	5B	0.181	5C	0.386	5C
E.8. /ʃ/	4.75	0.85	4.25	1.22	3.74	0.99	3.74	0.99	0.108	5A	0.001	5A	0.137	5B
E.9. /r/	1.33	0.56	1.04	0.62	1.32	0.82	1.32	0.82	0.096	5A	0.220	5C	0.220	5C
E.10. /nɔ/	1.92	0.97	1.63	0.65	2.21	0.71	2.21	0.71	0.229	5A	0.261	5C	0.008	5C
E.11. /aɪ/	2.96	0.75	2.25	1.11	3.11	0.88	3.11	0.88	0.013	5A	0.557	5C	0.009	5C
E.12. /ɛr/	0.21	0.51	0.38	0.58	0.26	0.45	0.26	0.45	0.294	5B	0.711	5C	0.480	5B
F. Diphthongs	11.96	3.56	10.50	2.77	12.32	3.18	12.32	3.18	0.120	5A	0.734	5C	0.052	5C
F.1. /əʊ/	1.83	1.31	1.25	0.90	1.74	1.15	1.74	1.15	0.079	5A	0.798	5A	0.138	5C
F.2. /aʊ/	1.00	0.00	1.00	0.00	1.05	0.23	1.05	0.23	-	5B	0.266	5C	0.266	5C
F.3. /aɪ/	2.42	0.93	1.92	0.88	2.42	0.84	2.42	0.84	0.062	5A	0.987	5C	0.063	5C
F.4. /eɪ/	1.92	0.78	1.79	0.83	2.21	0.85	2.21	0.85	0.593	5A	0.251	5C	0.115	5C
F.5. /ɔɪ/	1.25	0.74	1.29	0.69	1.47	0.70	1.47	0.70	0.841	5B	0.314	5C	0.398	5C
F.6. /ɪθ/	2.88	0.61	2.63	0.82	2.95	0.78	2.95	0.78	0.240	5A	0.735	5C	0.200	5C
F.7. /əʊ/	0.13	0.34	0.04	0.20	0.00	0.00	0.00	0.00	0.306	5A	0.083	5A	0.328	5B
F.8. /ʊθ/	0.54	0.51	0.58	0.50	0.53	0.51	0.53	0.51	0.777	5B	0.923	5A	0.716	5B
G. Triphthongs	0.04	0.20	0.25	0.44	0.05	0.23	0.05	0.23	0.042	5B	0.871	5C	0.067	5B
G.1. /aʊθ/	0.00	0.00	0.04	0.20	0.00	0.00	0.00	0.00	0.328	5B	-	5C	0.380	5B

PRE-TEST	S'A MEAN (CORRECT RESPONSES)	S'A STANDARD DEVIATION	S'B MEAN (CORRECT RESPONSES)	S'B STANDARD DEVIATION	S'C MEAN (CORRECT RESPONSES)	S'C STANDARD DEVIATION	S'A/B <i>p</i>	SIG. DIFFERENCE IN FAVOR OF	S'A/C <i>p</i>	SIG. DIFFERENCE IN FAVOR OF	S'B/C <i>p</i>	SIG. DIFFERENCE IN FAVOR OF
G.2. /aθ/	0.04	0.20	0.21	0.41	0.05	0.23	0.084	5B	0.869	5C	0.127	5B
H. Phonograms	8.08	2.84	6.86	2.17	8.89	2.88	0.105	5A	0.362	5C	0.012	5C
II. Morphological Dimension	11.42	2.78	9.79	2.17	11.84	2.71	0.029	5A	0.617	5C	0.011	5C
A. Derivational Relationships	9.25	1.73	8.25	1.67	9.84	2.19	0.047	5A	0.342	5C	0.010	5C
A.1. Prefixes	4.58	0.88	4.58	0.78	4.95	0.71	1.000	5B	0.140	5C	0.116	5C
A.2. Suffixes	4.67	1.43	3.67	1.13	4.89	1.73	0.010	5A	0.646	5C	0.008	5C
B. Inflectional Relationships	2.17	1.34	1.54	0.98	2.00	1.11	0.072	5A	0.665	5A	0.164	5C
III. Spelling Dimension	5.04	2.42	4.79	1.74	4.89	2.42	0.684	5A	0.845	5A	0.872	5C
A. Suffixes	0.96	0.46	0.96	0.36	0.68	0.67	1.000	5B	0.140	5A	0.120	5B
A.1. Consonant Doubling	0.17	0.38	0.00	0.00	0.21	0.42	0.043	5A	0.725	5C	0.018	5C
A.2. ACD	0.00	0.00	0.00	0.00	0.05	0.23	-	5B	0.266	5C	0.231	5C
A.3. Drop Silent e	0.79	0.41	0.92	0.28	0.42	0.51	0.229	5B	0.014	5A	0.000	5B
A.4. Change <i>y</i> to <i>i</i>	0.00	0.00	0.04	0.20	0.00	0.00	0.328	5B	-	5C	0.238	5B
B. /e/ai	0.75	0.44	0.67	0.70	1.05	0.62	0.625	5A	0.069	5C	0.000	5C
C. Plurals	0.54	0.66	0.42	0.58	0.37	0.60	0.490	5A	0.372	5A	0.792	5B
C.1. es	0.29	0.46	0.21	0.41	0.16	0.37	0.000	5A	0.000	5A	0.682	5B
C.2. s	0.25	0.44	0.21	0.41	0.21	0.42	0.738	5A	0.766	5A	0.986	5C
C.3. <i>y</i> = <i>s</i> + <i>es</i>	0.00	0.00	0.00	0.00	0.00	0.00	-	5B	-	5C	-	5C
D. Ou	0.75	0.74	0.58	0.65	0.79	0.85	0.412	5B	0.872	5C	0.375	5C
E. Soft and Hard e/g	2.04	1.30	2.17	1.20	2.00	1.29	0.731	5B	0.917	5A	0.667	5B
E.1. c	0.42	0.49	0.48	0.47	0.45	0.47	0.69	-	0.70	-	0.83	-
E.2. g	0.40	0.49	0.40	0.48	0.37	0.46	0.71	-	0.72	-	0.53	-
IV. Semantic Dimension	7.88	3.01	6.63	1.58	7.42	1.50	0.081	5A	0.524	5A	0.100	5C
A. Homophones	4.13	0.74	4.00	1.10	3.95	1.03	0.647	5A	0.513	5A	0.872	5B
B. Word Roots	1.38	0.58	1.08	0.28	1.16	0.37	0.033	5A	0.144	5A	0.476	5C
C. Clipping	0.13	0.34	0.00	0.00	0.11	0.32	0.076	5A	0.844	5A	0.108	5C
D. Compounds	1.39	0.46	1.33	0.70	1.32	0.67	0.810	5B	0.934	5C	0.934	5B
E. Contractions	0.46	0.78	0.21	0.51	0.89	0.94	0.195	5A	0.103	5C	0.004	5C
F. Saxon Genitive	0.04	0.20	0.00	0.00	0.00	0.00	0.338	5A	0.328	5A	-	5C
V. Capitalization and Punctuation	1.13	1.33	0.25	0.44	1.89	1.63	0.004	5A	0.095	5C	0.000	5C
A. Capitalization	0.29	0.55	0.17	0.38	0.58	0.51	0.365	5A	0.083	5C	0.004	5C
B. Punctuation	0.83	1.09	0.08	0.28	1.32	1.42	0.002	5A	0.214	5C	0.001	5C
Markes	0.21	0.41	0.00	0.00	0.26	0.45	0.022	5A	0.685	5C	0.007	5C
B.1. !	0.29	0.46	0.00	0.00	0.32	0.48	0.005	5A	0.868	5C	0.010	5C
B.2. ?	0.29	0.55	0.08	0.28	0.38	0.56	0.108	5A	0.256	5C	0.021	5C
B.3. ,	0.00	0.00	0.00	0.00	0.16	0.69	-	5B	0.331	5C	0.331	5C
B.4. .	0.00	0.00	0.00	0.00	0.00	0.00	-	5B	-	5C	-	5C
B.5. :	0.00	0.00	0.00	0.00	0.00	0.00	-	5B	-	5C	-	5C

Table 12. Statistical comparison of the experimental and control groups on the pre-test

KEY	
	HIGHEST MEANS
	LOWEST MEANS
	IDENTICAL MEANS ACROSS THE THREE CLASSES

Thus, we clearly remark that at this initial stage of our investigation, the experimental group (5°B) obtains the poorest results on the greatest number of orthographic aspects (as many as fifty-six), including the general test, its four main parts, its five major dimensions, and most of the subcategories within them (all of them highlighted with a green background). It only presents the best outcomes on twelve occasions, involving the long vowel /ð:/; the diphthong /Uð/; both triphthongs; the rules for adding suffixes, and, within them, dropping silent *e* and changing *y* to *i*; soft and hard *c/g*; and compounds (all marked with a yellow background in our table). However, it is only on triphthongs and the drop silent *e* rule that there is a statistically significant difference in favor of 5°B, when compared to 5°A and C, respectively.

On the contrary, the control classes exhibit the highest means on the greatest number of spelling aspects, especially 5°C, who displays the best performance on forty-three categories, nearly double the twenty-four on which 5°A obtains the highest outcomes. And what is more, the difference between the control and experimental groups' means is statistically significant on twenty-eight of these categories for 5°C and on nineteen of them for 5°A (outlined with blue numbers in the above table). That is, both 5°A and 5°C are significantly better than the experimental group on the test as a whole; on the text dictation; on the visual/auditory dimensions; on double vowels; on vowels in general; on the /I/, /Λ/, and /a:/ in particular; on the morphological dimension; on derivational relationships and, within them, on suffixes; on consonant doubling; on capitalization and punctuation; on general punctuation marks; and, specifically, on exclamation points and question marks. In turn, 5°C is significantly superior to 5°B, from a statistical point of view, on twelve additional aspects, namely, the individual word dictation; blends (general, initial, and medial ones); general and initial digraphs; /u:/; phonograms; the 'i before e' rule; contractions; capitalization; and the apostrophe. Finally, 5°A significantly outperforms the experimental class on double letters, the *-es* plural, and word roots. We should equally point out that these differences are significant at a confidence level of 99% or even more for eleven aspects in 5°A's case and for twenty-two in 5°C's.

The control classes evince the worst results on a practically identical number of aspects: fifteen for 5°C and sixteen for 5°A (indicated with a green background). The three groups obtain exactly the same means on two categories: plural formation by changing *y* to *i* and adding *-es* and the colon (distinguished with a turquoise background).

Hence, on the pre-test, the experimental group obtains the poorest outcomes on the greatest number of spelling aspects, by statistically significant differences in favor of the control classes (especially 5°C, which comes across as the best performer), and most often at extremely high confidence levels. It exhibits the highest results on the lowest number of categories and with statistical significance solely on two of them.

### 3.2.3. *Post-test*

This situation dramatically changes on the post-test, as the following results distinctly portray:



POST-TEST	S <sup>A</sup> MEAN (CORRECT RESPONSES)	S <sup>A</sup> STANDARD DEVIATION	S <sup>B</sup> MEAN (CORRECT RESPONSES)	S <sup>B</sup> STANDARD DEVIATION	S <sup>C</sup> MEAN (CORRECT RESPONSES)	S <sup>C</sup> STANDARD DEVIATION	S <sup>A/B</sup> <i>p</i>	S <sup>A/C</sup> SIGNIFICANT DIFFERENCE IN FAVOR OF	S <sup>B/C</sup> SIGNIFICANT DIFFERENCE IN FAVOR OF	SIGNIFICANT DIFFERENCE IN FAVOR OF
Total	196,08	19,30	263,75	19,26	203,53	16,56	0,000	SB	0,581	SC
1 <sup>st</sup> Part	69,67	14,07	83,33	19,53	69,84	11,32	0,018	SB	0,975	SC
2 <sup>nd</sup> Part	36,21	15,08	55,50	10,63	39,84	10,22	0,000	SB	0,354	SC
3 <sup>rd</sup> Part	52,96	6,217	62,17	11,08	57,05	5,22	0,018	SB	0,114	SC
4 <sup>th</sup> Part	37,25	48,15	63,75	56,08	36,79	39,52	0,000	SB	0,787	SA
I. Visual/Auditory Dimensions	106,50	27,69	142,21	33,68	108,68	23,81	0,000	SB	0,786	SC
A. Blends	27,00	6,37	30,17	5,35	28,05	4,18	0,069	SB	0,519	SC
A.1. Initial Blends	18,04	3,78	20,21	3,24	19,47	2,61	0,039	SB	0,168	SC
A.2. Medial Blends	4,50	0,78	4,50	0,66	4,63	0,60	1,000	SB	0,535	SC
A.3. Final Blends	4,46	2,26	5,46	2,04	3,95	1,68	0,115	SB	0,417	SA
B. Digraphs	7,96	3,30	11,13	4,24	8,21	3,26	0,006	SB	0,804	SC
B.1. Initial Digraphs	2,92	1,14	3,88	1,45	3,26	1,59	0,014	SB	0,411	SC
B.2. Medial Digraphs	2,83	1,20	3,75	1,87	2,37	1,26	0,050	SB	0,227	SA
B.3. Final Digraphs	2,21	1,50	3,50	1,35	2,58	1,26	0,003	SB	0,394	SC
C. Double Letters	3,71	2,53	7,42	3,11	3,47	2,41	0,000	SB	0,758	SA
C.1. Double Consonants	3,08	2,22	6,63	2,55	2,84	2,22	0,000	SB	0,725	SA
C.2. Double Vowels	0,63	0,49	0,79	0,78	0,63	0,68	0,382	SB	0,972	SC
D. Silent Letters	1,96	1,23	5,33	2,76	2,00	1,60	0,000	SB	0,924	SC
E. Vowels	36,54	7,71	49,33	10,63	36,26	8,12	0,000	SB	0,910	SA
E.1. /i/	5,38	1,56	7,00	1,38	4,89	1,41	0,000	SB	0,301	SA
E.2. /e/	1,63	0,71	2,83	0,87	1,53	0,70	0,000	SB	0,650	SA
E.3. /a/	2,67	0,87	3,67	0,92	2,68	1,06	0,000	SB	0,953	SC
E.4. /u/	1,46	0,66	1,79	0,41	1,74	0,56	0,042	SB	0,142	SC
E.5. /æ/	2,96	0,20	3,00	0,00	3,00	0,00	0,323	SB	0,380	SC
E.6. /ɔ/	2,38	0,49	2,17	0,48	2,26	0,65	0,146	SA	0,540	SA
E.7. /θ/	5,83	1,52	7,58	2,21	5,89	1,45	0,003	SB	0,894	SC
E.8. /ð/	4,75	1,39	6,38	1,79	4,89	1,45	0,001	SB	0,742	SC
E.9. /ɛ/	1,92	0,88	3,83	1,93	1,68	1,06	0,000	SB	0,436	SA
E.10. /œ/	2,67	0,96	4,00	1,14	2,63	0,76	0,000	SB	0,894	SA
E.11. /æɪ/	4,25	1,03	4,79	1,53	4,21	1,23	0,158	SB	0,909	SA
E.12. /θɪ/	0,67	0,82	2,29	0,75	0,84	0,90	0,000	SB	0,512	SC
F. Diphthongs	17,50	4,76	19,71	5,53	18,47	3,53	0,145	SB	0,462	SC
F.1. /aʊ/	2,71	1,52	3,04	1,63	3,05	1,13	0,467	SB	0,399	SC
F.2. /aɪ/	1,00	0,29	1,33	0,48	1,26	0,45	0,006	SB	0,027	SC
F.3. /aɪə/	3,04	0,55	3,04	0,69	3,00	0,58	1,000	SB	0,812	SA
F.4. /eɪ/	3,79	1,56	4,17	1,55	3,21	0,98	0,408	SB	0,164	SA
F.5. /ɔɪ/	1,38	0,65	1,71	0,55	1,84	0,37	0,061	SB	0,005	SC
F.6. /θɪ/	3,75	1,15	4,58	1,18	3,89	0,94	0,017	SB	0,660	SC
F.7. /eθ/	0,92	0,78	0,88	0,80	0,74	0,81	0,855	SA	0,464	SA
F.8. /ʊθ/	0,88	0,34	0,96	0,20	0,95	0,23	0,306	SB	0,429	SC
G. Triphthongs	0,25	0,53	0,63	0,65	0,21	0,42	0,034	SB	0,787	SA
G.1. /aɪə/	0,04	0,20	0,25	0,44	0,00	0,00	0,042	SB	0,380	SA
G.2. /aɪθ/	0,21	0,41	0,38	0,49	0,21	0,42	0,212	SB	0,986	SC
H. Phonograms	11,58	3,91	17,00	5,32	12,53	3,42	0,000	SB	0,412	SC

II. Morphological Dimension	15,71	4,44	21,42	5,01	16,37	3,56	0,000	5B	0,591	5C	0,001	5B
A. Derivational Relationships	13,00	3,43	17,25	4,16	13,84	2,87	0,000	5B	0,396	5C	0,003	5B
A.1. Prefixes	6,04	1,00	6,50	0,83	6,05	0,85	0,091	5B	0,969	5C	0,090	5B
A.2. Suffixes	6,96	2,65	10,75	3,77	7,79	2,55	0,000	5B	0,305	5C	0,004	5B
B. Inflectional Relationships	2,71	1,60	4,17	1,40	2,53	1,02	0,002	5B	0,653	5A	0,000	5B
III. Spelling Dimension	6,75	2,45	11,17	2,73	7,42	1,84	0,000	5B	0,327	5C	0,000	5B
A. Suffixes	6,54	0,59	1,71	0,95	0,79	0,54	0,000	5B	0,157	5C	0,000	5B
A.1. Consonant Doubling	0,13	0,34	0,67	0,48	0,05	0,23	0,000	5B	0,429	5A	0,000	5B
A.2. ACD	0,04	0,20	0,04	0,20	0,00	0,00	1,000	5B	0,328	5A	0,380	5B
A.3. Drop Silent e	0,38	0,49	0,71	0,46	0,74	0,45	0,020	5B	0,018	5C	0,840	5C
A.4. Change y to i	0,00	0,00	0,29	0,46	0,00	0,00	0,005	5B	-	5C	0,005	5B
B. i.e.l	1,38	0,58	1,83	0,64	1,32	0,48	0,012	5B	0,714	5A	0,004	5B
C. Phrals	0,50	0,66	2,38	0,77	0,47	0,51	0,000	5B	0,000	5A	0,000	5B
C.1. es	0,53	0,48	0,75	0,44	0,16	0,37	0,003	5B	0,186	5A	0,000	5B
C.2. s	0,17	0,38	0,75	0,44	0,32	0,48	0,000	5B	0,261	5C	0,004	5B
C.3. y->i+es	0,00	0,00	0,88	0,34	0,00	0,82	0,029	5B	-	5C	0,000	5B
D. Ou	0,54	0,66	1,04	0,86	1,00	0,82	0,197	5B	0,055	5C	0,873	5B
E. Soft and Hard c/g	3,79	1,22	4,21	0,98	3,84	1,01	0,197	5B	0,885	5C	0,240	5B
E.1. c	0,88	0,22	0,88	0,31	0,52	0,35	0,53	-	0,49	-	0,66	-
E.2. g	0,68	0,46	0,82	0,35	0,74	0,44	0,49	-	0,55	-	0,52	-
IV. Semantic Dimension	10,21	2,32	13,38	2,84	10,37	2,11	0,000	5B	0,817	5C	0,000	5B
A. Homophones	4,29	0,81	5,38	0,82	4,11	0,74	0,000	5B	0,434	5A	0,000	5B
B. Word Roots	2,50	0,72	3,42	1,06	2,37	0,68	0,001	5B	0,545	5A	0,000	5B
C. Clipping	0,29	0,46	0,33	0,48	0,32	0,48	0,762	5B	0,869	5C	0,906	5B
D. Compounds	1,25	0,79	1,54	0,83	1,47	0,70	0,221	5B	0,339	5C	0,772	5B
E. Contractions	1,46	0,98	2,00	1,06	1,21	0,92	0,073	5B	0,398	5A	0,014	5B
F. Saxon Genitive	0,42	0,50	0,71	0,46	0,89	0,32	0,043	5B	0,000	5C	0,126	5C
V. Capitalization and Punctuation	3,96	2,91	15,00	3,38	3,63	2,63	0,000	5B	0,702	5A	0,000	5B
A. Capitalization	1,71	2,18	6,71	1,81	1,42	2,41	0,000	5B	0,688	5A	0,000	5B
B. Punctuation Marks	2,25	1,57	8,29	1,99	2,21	1,65	0,000	5B	0,937	5A	0,000	5B
B.1. !	0,25	0,44	0,92	0,28	0,26	0,45	0,000	5B	0,924	5C	0,000	5B
B.2. ?	0,29	0,46	0,92	0,28	0,37	0,50	0,000	5B	0,607	5C	0,000	5B
B.3. ,	1,54	1,10	3,08	1,25	1,32	1,25	0,000	5B	0,533	5A	0,000	5B
B.4. .	0,17	0,64	2,54	1,06	0,26	0,81	0,000	5B	0,672	5C	0,000	5B
B.5. :	0,00	0,00	0,83	0,38	0,00	0,00	0,000	5B	-	5C	0,000	5B

Table 13. Statistical comparison of the experimental and control groups on the post-test

KEY	
	HIGHEST MEANS
	LOWEST MEANS

After our explicit intervention, the experimental group obtains the highest outcomes on as many as seventy-two orthographic aspects (practically all the ones considered) (highlighted again in yellow), only being worst on two: medial blends (along with 5°A) and the vowel /.../ (with a green background). The poorest performer is now 5°A, with lowest means on forty-eight and best results on five (though on three of them, it coincides with 5°B): /ɔ/, /aI/, /ɛ ð/, advanced consonant doubling, and soft and hard *c*. 5°C is not far behind, with the worst outcomes on thirty-three headings and the highest on only six: medial blends, /æ/ (here, along with 5°B), /ðU/, /ɔI/, the drop silent *e* rule, and the saxon genitive.

However, on none of these aspects on which the control classes outperform the experimental group are they significantly better from a statistical point of view. Nor is 5°B significantly worse on the categories on which it evinces the poorest outcomes. But it is definitely significantly superior to 5°A on as many as fifty-six headings and to 5°C on fifty-one (indicated with the numbers in blue), including the whole test, its four main facets, the five general dimensions sampled, and absolutely all punctuation marks. Furthermore, this is the case at fantastically high confidence levels – 100% on thirty-four occasions with respect to 5°A and on twenty-nine with respect to 5°C.

#### 3.2.4. *Delayed post-test*

Six months after the conclusion of our intervention, the situation discerned in the post-test remains practically unaltered, as can be appreciated in the following table:

DELAYED POST-TEST	6 <sup>A</sup> MEAN (CORRECT RESPONSES)	6 <sup>A</sup> STANDARD DEVIATION	6 <sup>B</sup> MEAN (CORRECT RESPONSES)	6 <sup>B</sup> STANDARD DEVIATION	6 <sup>C</sup> MEAN (CORRECT RESPONSES)	6 <sup>C</sup> STANDARD DEVIATION	6 <sup>A/B</sup> P	SIGNIFICANT DIFFERENCE IN FAVOR OF	6 <sup>A/C</sup> P	SIGNIFICANT DIFFERENCE IN FAVOR OF	6 <sup>B/C</sup> P	SIGNIFICANT DIFFERENCE IN FAVOR OF
Total	217,63	48,61	274,83	46,71	212,84	46,92	0,00	6B	0,97	6A	0,00	6B
1 <sup>st</sup> Part	78,42	20,85	87,54	18,15	76,74	20,57	0,11	6B	0,79	6A	0,07	6B
2 <sup>nd</sup> Part	39,75	13,73	54,96	13,84	39,58	12,93	0,00	6B	0,66	6A	0,00	6B
3 <sup>rd</sup> Part	58,83	9,66	67,54	7,78	57,37	12,23	0,00	6B	0,51	6A	0,00	6B
4 <sup>th</sup> Part	40,63	7,34	64,79	10,10	39,16	6,83	0,00	6B	0,75	6A	0,00	6B
I. Visual/Auditory Dimensions	119,63	30,99	147,54	30,66	117,11	28,78	0,00	6B	0,79	6A	0,00	6B
A. Blends	19,08	5,35	31,08	3,54	29,63	4,02	0,12	6B	0,72	6C	0,18	6B
A.1. Initial Blends	19,13	3,52	20,25	2,31	19,68	2,40	0,20	6B	0,54	6C	0,44	6B
A.2. Medial Blends	4,58	0,58	4,75	0,44	4,76	0,65	0,27	6B	0,10	6A	0,01	6B
A.3. Final Blends	5,29	1,94	6,08	1,38	5,58	1,68	0,11	6B	0,61	6C	0,29	6B
B. Digraphs	8,79	3,45	11,08	3,79	8,42	3,70	0,03	6B	0,74	6A	0,03	6B
B.1. Initial Digraphs	3,04	1,30	3,63	1,31	3,00	1,56	0,13	6B	0,92	6A	0,16	6B
B.2. Medial Digraphs	3,33	1,40	4,08	1,64	2,79	1,55	0,10	6B	0,23	6A	0,01	6B
B.3. Final Digraphs	2,42	1,50	3,38	1,44	2,63	1,38	0,03	6B	0,63	6C	0,09	6B
C. Double Letters	5,29	3,01	9,00	2,99	4,47	2,80	0,00	6B	0,37	6A	0,00	6B
C.1. Double Consonants	3,79	2,57	7,42	2,41	3,00	2,21	0,00	6B	0,29	6A	0,00	6B
C.2. Double Vowels	1,50	0,66	1,58	0,72	1,47	0,77	0,68	6B	0,90	6A	0,63	6B
D. Silent Letters	2,71	1,55	5,83	2,39	2,68	1,97	0,00	6B	0,96	6A	0,00	6B
E. Vowels	40,63	8,88	50,63	9,44	39,58	8,56	0,00	6B	0,70	6A	0,00	6B
E.1. /i/	5,92	1,47	6,75	1,62	5,68	1,38	0,07	6B	0,60	6A	0,03	6B
E.2. /e/	1,96	0,95	3,13	1,03	1,74	0,81	0,00	6B	0,42	6A	0,00	6B
E.3. /a/	2,96	1,04	3,42	0,97	2,95	0,97	0,12	6B	0,97	6A	0,12	6B
E.4. /u/	1,75	0,53	1,71	0,46	1,74	0,45	0,77	6A	0,93	6A	0,84	6C
E.5. /æ/	2,92	0,28	2,96	0,20	2,95	0,23	0,56	6B	0,70	6C	0,87	6B
E.6. /ɔ/	2,54	0,51	2,75	0,44	2,63	0,50	0,14	6B	0,56	6C	0,41	6B
E.7. /θ/	6,29	1,81	7,33	1,49	6,16	1,92	0,03	6B	0,82	6A	0,03	6B
E.8. /ð/	5,58	1,61	6,83	1,58	5,22	1,45	0,01	6B	0,58	6A	0,00	6B
E.9. /i:/	3,46	1,06	4,71	1,94	2,11	1,29	0,00	6B	0,95	6C	0,00	6B
E.10. /u:/	4,42	1,10	3,96	1,30	2,89	0,81	0,16	6B	0,07	6A	0,00	6B
E.11. /æ:/	4,21	1,21	5,13	1,12	4,53	1,12	0,04	6B	0,76	6C	0,09	6B
E.12. /θ:/	0,79	0,72	1,92	0,93	0,89	0,88	0,00	6B	0,67	6C	0,00	6B
F. Diphthongs	19,63	5,77	21,50	4,99	19,26	5,13	0,23	6B	0,83	6A	0,16	6B
F.1. /θi/	2,88	1,42	3,29	2,95	1,47	0,30	0,60	6A	0,87	6C	0,42	6B
F.2. /ai/	1,54	0,51	1,46	0,59	1,58	0,51	0,60	6A	0,81	6C	0,48	6C
F.3. /aɪ/	3,29	0,86	3,92	1,06	3,58	0,90	0,03	6B	0,29	6C	0,27	6B
F.4. /eɪ/	4,00	1,69	4,17	1,37	3,52	1,50	0,71	6B	0,25	6A	0,10	6B
F.5. /ɔɪ/	1,75	0,44	1,88	0,34	1,79	0,54	0,28	6B	0,79	6C	0,53	6B
F.6. /iθ/	4,46	1,32	5,04	1,00	4,84	1,06	0,09	6B	0,70	6A	0,33	6B
F.7. /eθ/	0,88	0,80	1,08	0,72	0,82	0,90	0,35	6B	0,90	6A	0,33	6B
F.8. /θθ/	0,79	0,41	0,67	0,48	0,79	0,42	0,34	6A	0,99	6A	0,38	6C
G. Triphthongs	0,04	0,61	0,88	0,90	0,47	0,61	0,58	6B	0,15	6A	0,10	6B
G.1. /aɪθ/	0,04	0,20	0,46	0,51	0,32	0,50	0,00	6B	0,43	6C	0,01	6B
G.2. /aθθ/	0,71	0,62	0,42	0,58	0,37	0,50	0,10	6A	0,06	6A	0,78	6B
H. Phonograms	12,83	4,38	17,58	5,09	12,68	4,53	0,00	6B	0,91	6A	0,00	6B

DELAYED POST-TEST Dimension	6 <sup>A</sup> MEAN (CORRECT RESPONSES)	6 <sup>A</sup> STANDARD DEVIATION	6 <sup>B</sup> MEAN (CORRECT RESPONSES)	6 <sup>B</sup> STANDARD DEVIATION	6 <sup>C</sup> MEAN (CORRECT RESPONSES)	6 <sup>C</sup> STANDARD DEVIATION	6 <sup>A/B</sup> <i>p</i>	SIGNIFICANT DIFFERENCE IN FAVOR OF	6 <sup>A/C</sup> <i>p</i>	SIGNIFICANT DIFFERENCE IN FAVOR OF	6 <sup>B/C</sup> <i>p</i>	SIGNIFICANT DIFFERENCE IN FAVOR OF
II. Morphological Dimension	16,88	4,22	20,42	3,67	16,79	4,65	0,00	6B	0,95	6A	0,01	6B
A. Derivational Relationships	14,38	3,24	16,63	2,68	14,26	3,69	0,01	6B	0,92	6A	0,02	6B
A.1. Prefixes	5,92	0,78	6,33	0,70	6,00	1,11	0,06	6B	0,77	6C	0,24	6B
A.2. Suffixes	8,42	2,67	10,29	2,65	8,26	3,02	0,02	6B	0,86	6A	0,02	6B
B. Inflectional Relationships	2,54	1,38	3,79	1,28	2,53	1,35	0,00	6B	0,97	6A	0,00	6B
III. Spelling Dimension	9,71	2,46	11,71	3,00	8,32	2,47	0,02	6B	0,07	6A	0,00	6B
A. Suffixes	1,50	0,59	2,00	0,78	1,21	0,63	0,02	6B	0,13	6A	0,00	6B
A.1. Consonant Doubling	0,21	0,41	0,75	0,44	0,11	0,32	0,00	6B	0,38	6A	0,00	6B
A.2. ACD	0,00	0,00	0,04	0,20	0,00	0,00	0,33	6B	-	6C	0,38	6B
A.3. Drop Silent e	0,96	0,20	0,92	0,28	0,89	0,32	0,56	6A	0,43	6A	0,81	6B
A.4. Change y to i	0,33	0,48	0,29	0,46	0,21	0,42	0,76	6A	0,38	6A	0,56	6B
B. /e/ç/	0,59	2,13	2,13	0,80	1,37	0,60	0,01	6B	0,35	6A	0,00	6B
C. Plurals	0,96	0,81	1,71	0,95	0,79	0,63	0,01	6B	0,46	6A	0,00	6B
C.1. es	0,43	0,50	0,71	0,46	0,42	0,51	0,04	6B	0,98	6A	0,06	6B
C.2. s	0,54	0,51	0,38	0,49	0,32	0,48	0,26	6A	0,15	6A	0,69	6B
C.3. y⇒+es	0,00	0,00	0,63	0,49	0,08	0,23	0,00	6B	0,33	6C	0,00	6B
D. Qu	1,50	0,72	1,42	0,78	1,21	0,71	0,70	6A	0,20	6A	0,38	6B
E. Soft and Hard ç/g	4,21	1,10	4,46	0,83	3,74	1,10	0,38	6B	0,17	6A	0,02	6B
E.1. c	0,83	0,36	1,06	0,27	0,79	0,25	-	6B	-	6A	-	6B
E.2. g	0,85	0,36	1,82	0,33	0,72	0,46	-	6B	-	6A	-	6B
IV. Semantic Dimension	9,67	2,44	13,04	3,11	10,26	2,40	0,00	6B	0,43	6C	0,00	6B
A. Homophones	4,46	0,83	5,54	0,59	4,37	0,76	0,00	6B	0,72	6A	0,00	6B
B. Word Roots	1,96	0,95	2,96	1,30	2,00	0,75	0,00	6B	0,88	6C	0,00	6B
C. Clipping	0,17	0,38	0,29	0,46	0,16	0,37	0,31	6B	0,94	6A	0,30	6B
D. Compounds	1,46	0,78	1,75	0,74	1,63	0,60	0,19	6B	0,43	6C	0,57	6B
E. Contractions	1,38	1,06	2,13	0,90	1,58	0,84	0,01	6B	0,50	6C	0,05	6B
F. Saxon Genitive	0,25	0,44	0,38	0,49	0,53	0,51	0,36	6B	0,07	6C	0,33	6C
V. Capitalization and Punctuation	2,92	2,24	14,58	2,76	3,00	2,31	0,00	6B	0,91	6C	0,00	6B
A. Capitalization	0,38	0,49	6,75	1,59	0,68	0,89	0,00	6B	0,18	6C	0,00	6B
B. Punctuation Marks	2,54	2,25	7,83	2,26	2,32	1,95	0,00	6B	0,73	6A	0,00	6B
B.1. !	0,33	0,48	0,96	0,20	0,37	0,50	0,00	6B	0,82	6C	0,00	6B
B.2. ?	0,33	0,48	0,96	0,20	0,37	0,50	0,00	6B	0,82	6C	0,00	6B
B.3. ,	1,50	1,25	3,38	1,06	1,26	1,24	0,00	6B	0,54	6A	0,00	6B
B.4. .	0,38	1,01	1,88	1,48	0,32	0,95	0,00	6B	0,85	6A	0,00	6B
B.5. ;	0,00	0,00	0,54	0,51	0,00	0,00	0,00	6B	-	6C	0,00	6B

Table 14. Statistical comparison of the experimental and control groups on the delayed post-test

KEY
HIGHEST MEANS
LOWEST MEANS

Thus, as in the post-test, in this third phase, the experimental group obtains higher means than its control counterparts on practically all the aspects considered (seventy out of seventy-nine, highlighted in yellow), only two less than in the post-test, where it excelled most on seventy-two. It only presents the poorest outcomes on three categories (with a green background): /U/, /aU/, and /U∂/, a vowel and two diphthongs, precisely orthographic aspects on which 6°B did not receive explicit instruction.

6°C is now the group which presents the lowest means on the greatest number of aspects (including the overall test, its four parts, and all its dimensions, save the semantic layer and capitalization and punctuation, where 6°A's score is poorest): fifty-two, nearly double the amount on which the other control class obtains the worst outcomes. It only evinces the best results on three categories: /aU/, /U∂/, and the saxon genitive. Hence, the control class which started out being significantly superior to the remaining two and continued to be the best of the two control groups in the post-test, now drops back and becomes the poorest performer in the delayed post-testing phase. However, although its results are statistically inferior to those of the experimental class, there is no statistically significant difference between its means and those of 6°A, so that our instruction seems to have distinguished between the experimental and control groups, causing the latter to be and, what is more important, to stay, more homogeneous in their performance.

Thus, 6°A, though not significantly different from the other control class, is in a middle position in terms of performance, with worst outcomes on twenty-seven occasions (on three of which it coincides with 6°C: advanced consonant doubling, *-es*, and the colon) and highest ones on seven: /U/, /U∂/ (again, along with 6°C), /aI∂/, drop silent *e* (this result coincides with the post-test), changing *y* to *i*, plural marker *-s*, and *qu*.

However, as occurred in the post-test, on none of these aspects on which the control classes outperform the experimental group are they significantly better from a statistical point of view. Nor is 6°B significantly worse on the three categories on which it evinces the poorest outcomes. But it is definitely significantly superior to 6°A on forty-three headings and to 6°C, on forty-five (indicated with the numbers in blue), including again the whole test, three of its main facets (all of them except the text dictation, where we observed a more homogeneous performance of the three groups), the five general dimensions sampled, and absolutely all punctuation marks. Furthermore, this is once more the case at fantastically high confidence levels – 100% on twenty-nine occasions with respect to 6°A and on thirty-three with respect to 6°C.

### 3.3. Discriminant analysis

With this statistical technique, we strived to assess the discriminating potential of the different variables (independent and moderator) with which we carried out our investigation in the three groups of subjects (5°A, 5°B, and 5°C). That is, we sought to isolate those variables which best classify the students in their respective groups. We can summarize the results obtained after having carried out successive discriminant analyses at the outset and at the end of the intervention program as follows:

1. At the start of the experience, the students in the experimental and control groups are homogeneous in terms of intellectual, motivational, and academic performance variables.

The only differences which can be detected are on some parts of the spelling test we have designed, and are always in favor of the control groups.

2. The discriminating power of the canonical variables found at the outset of the investigation is limited. This implies that, at this initial stage, although there are certain differences between the groups, the result of the discriminant analysis is poor.
3. At the end of the intervention program, the results change radically. Although the subjects continue to be homogeneous on the academic, motivational, and intellectual variables, the discriminating power of the spelling test increases considerably, to the point of becoming almost ideal. Indeed, both in the discriminant analysis carried out for 5°A/5°B and in that performed for 5°B/5°C, the individual word dictation and the proofreading are the variables which correctly classify almost 100% of the cases (exactly 97.9% for 5°A/5°B and 97.7% for 5°A/5°C).
4. The results of the discriminant analysis at the end of the program endorse its effectiveness. Sure enough, if the students of the experimental and control groups were homogeneous at the outset of our study and continue to be homogeneous after its finalization on all the variables studied (motivational, intellectual, and academic) except on those corresponding to the spelling test, we must assign the observed differences and the discriminating power of two of its parts to the effects which our intervention program has exerted.
5. Consequently, these discriminant analyses confirm the central hypothesis of this investigation, namely, that an explicit, systematic intervention program in the teaching of English spelling does produce a differential effect in the orthographic performance of Spanish students in fifth grade of Primary Education, developing superior orthographic abilities in those pupils who have received such direct instruction. The outcomes of our discriminant analyses equally testify to the reliability of our spelling test, which has been capable of discriminating the subjects in our sample at the end of the experience, reliability already confirmed in a previous investigation (Pérez Cañado, 2000) and now further ratified.

#### 4. DISCUSSION AND CONCLUSIONS

**Objective I.** The ANOVA (analysis of variance) and T Test validated our central hypothesis: a systematic, explicit intervention program in the teaching of English spelling implemented with Spanish fifth-grade students in an experimental group does develop in such pupils superior orthographic abilities than those spontaneously promoted by its implicit learning in fifth-grade students of a control group.

The ANOVA already testified to this, as it allowed us to detect, on the one hand, statistically significant intragroup differences before and after the development of the intervention program in all three groups, something which means that the subjects in the experimental and control classes significantly ameliorated their initial results on our spelling test. On the other, it also enabled us to discern statistically significant intergroup differences between the control and experimental groups prior to the treatment and after its finalization, though on a greater number of testing facets after our intervention.

The T Test then allowed us to determine in favor of whom these means were significantly different and on which specific parts, dimensions, and subspects of our orthography exam

each group was significantly superior or inferior. And the results could not be more eloquent: on the pre-test, the experimental group obtained the poorest outcomes on the greatest number of spelling aspects (fifty-six); by statistically significant differences in favor of the control classes (on twenty-eight categories in favor of 5°C, which came across as the best performer, and on nineteen of them in favor of 5°A); and most often at extremely high confidence levels. It only presented significantly higher results on triphthongs and the drop silent *e* rule. However, on the post-test, there was a dramatic change, with the experimental class achieving the highest means on practically all the main parts, layers, and aspects sampled (seventy-two out of seventy-nine considered); with statistically significant differences with respect to both control classes in its favor (on fifty-six headings with respect to 5°A and on fifty-one with respect to 5°C); and at remarkably high confidence levels (100% on thirty-four occasions with respect to 5°A and on twenty-nine with respect to 5°C). Thus, without room for doubt, from being significantly worst on the pre-test, the experimental class evolved to significantly best.

**Objective II.** What is more, it remained significantly best. Indeed, the results obtained on the delayed post-test testified to the fact that the marked differential effect produced by our instructional program was durable. The ANOVA (analysis of variance) evinced statistically significant between-group differences on the test as a whole and on three of its facets (individual word dictation, free composition, and proofreading), although now within-group differences were only detected for 6°A. And the T Test proved that these differences continued to be in favor of the experimental group, who still obtained the highest means on practically all the main parts, layers, and aspects sampled (seventy out of seventy-nine); with statistically significant differences in its favor with respect to 6°A on forty-three headings and to 6°C on forty-five; and again at tremendously high confidence levels (100% on twenty-nine occasions with respect to 6°A and thirty-three with respect to 6°C). Thus, another hypothesis received confirmation: the orthographic knowledge attained by the experimental group as a result of our explicit and systematic intervention persists, something which once more reinforces the value of our instructional program.

**Objective III.** It is indeed the latter which was responsible for the differences we clearly discerned between the experimental and control groups' orthographic performance. The discriminant analyses carried out revealed that none of our moderator variables – not verbal intelligence, not motivation, and not the students' academic performance on the curricular areas of English, Spanish Language and Literature, Mathematics, and Science – accounted for the differences found. Rather, they should be ascribed to our independent variable, that is, our intervention program, as it was the orthographic variables of the spelling test (and particularly of two of its parts: the individual word dictation and the proofreading) which had the greatest discriminating potential.

In the light of these results, we can conclude that our intervention program or treatment was carried out focusing on the idoneous orthographic aspects and following the adequate instructional principles. Our outcomes also enable us to adhere to or, on the contrary, to revise the claims of some of the most notable authors in connection with our topic of study.

Thus, to begin with, our results highlight the importance of *noticing* or *consciousness-raising* (as Schmidt, 1994 or Sharwood-Smith, 1981 maintain) in English spelling instruction.



Sure enough, merely drawing our students' conscious attention to certain orthographic rules and patterns and the little time we spent explicitly working with these spelling aspects (fifteen to twenty minutes, twice a week), as the students unfortunately did not spend much other time reviewing at home, clearly proved beneficial in ameliorating the experimental subjects' orthographic abilities.

Our outcomes equally seem to point to the fact that *practice* has a significant role in learning to spell in a foreign language. Through it, explicit knowledge became implicit, spontaneous, and automatic and there has been *transfer* of those orthographic aspects which were explicitly taught to spontaneous writing, focused more on meaning and less on form (the free composition, on which the experimental group improved so notably over the course of the fifteen months in question). This circumstance would seem to back up R. Ellis' (1985, 1994, 2000), N. Ellis' (1994), Bialystok's (1994), or Sharwood-Smith's (1981) theories of interface, but would appear to refute Krashen's forceful case in favor of non-interface and against explicit spelling instruction's effect on those facets which are not focused on form.

We must also reject, in view of our outcomes, Krashen's (1989: 450) conclusion that, when spelling instruction produces gains over no instruction, they are either "modest", "wash out", require "extraordinary efforts", or are not impressively different from "incidental growth". Indeed, the experimental group's gains as a result of our explicit instruction were remarkable with respect to the uninstructed control classes; they were, without room for doubt, durable; no extraordinary efforts were made on our part or on that of the students: fifteen to twenty minutes of exposure and awareness-raising twice a week (most often without further studying on the part of the subjects) were sufficient to yield fantastic differences; and the incidental growth of the controls was nowhere nearly as significant or impressive as that of the experimental learners.

Thus, all in all, our results seem to suggest that, when it comes to the learning of spelling in a Foreign Language context, we should be, as Sipe (2001: 267) puts it, against "laissez-faire classrooms". In other words (Sipe, 2001: 266, 272), we should not be trapped into thinking that children's rate of growth is predetermined, as if any attempts to assist were an intrusion and a dangerous action, like forcibly opening the petals of a flower bud, and thereby ruining the flower. ... Active interaction by the teacher and judicious use of direct, explicit instruction can help children along the literacy road (Spiegel, 1992). For some children this is critical; simply waiting for them to bloom will not help (Clay, 1991a).

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## APPENDICES

## APPENDIX I

## I. English spelling test:

## A. Visual/Auditory Dimensions

## 1. Consonant Blends

- a. Initial: bl-; br-; cl-; cr-; dr-; fl-; fr-; gr-; pl-; pr-; sc-; sch-; sk-; sl-; sm-; sn-; sp; st-; str-; sw-; thr-; tr-; tw-
- b. Medial: -dr-; -gr-; -pl-; -tr-; -tw-
- c. Final: -ld; -lt; -nd; -ng; -nk; -nt; -sk; -st

## 2. Consonant Digraphs

- a. Initial: ch- /k/; ch- /tʃ/; ph-; sh-; th-; wh-
- b. Medial: -ck-; -ch-; -ph-; -tch-; -th- /ð/; -th- /q/
- c. Final: -ck; -ch; -ph; -sh; -th

## 3. Double letters

- a. Consonants: bb; dd; ff; gg; ll; mm; nn; pp; rr; ss; tt; zz
- b. Vowels: ee; oo

## 4. Silent letters and letter combinations: b; dge; g; gh; h; k; l; n; s; t; w

## 5. Vowels:

## Short

- a. /I/: a; ai; e; es; i; ies; u; ui; y
- b. /e/: a; e; ea; ie
- c. /ʌ/: o-e; o; ou; u
- d. /U/: oo; u
- e. /æ/: a
- f. /ɔ/: a; au; o
- g. /θ/: a; e; er; ion; ious; le; o; our; u; ure

## Long

- h. /ɔ:/: a; al; au; aw; oa; ol; or; ore; ou
- i. /i:/: e; ea; ee; ei; ey; i; ie
- j. /u:/: eau; o; oo; ou; u; ui
- k. /a:/: a; ant; aph; ar; ask; ast
- l. /θ:/: ir; ur

## 6. Diphthongs

- a. /θU/: o-e; o; oa; oe; ow
- b. /aI/: i-e; i; igh(t); uy; y-e; y
- c. /eI/: a-e; a; ai; ange; ay; e; ea
- d. /Iθ/: e; ea; eo; ere; ian; io
- e. /aU/: ou; ow
- f. /Uθ/: our
- g. /ɔI/: oi; oy
- h. /eθ/: are; ere

## 7. Triphthongs

- a. /aUθ/: flower
- b. /aIθ/: drier; giant; scientist

## 8. Phonograms: -ack; -age; -ail; -ale; -ame; -an; -ank; -at; -ate; -aw; -ay; -eat; -ell; -est; -ice; -ick; -ight; -ill; -in; -ine; -ing; -ip; -it; -ock; -ore; -uck

## B. Morphological Dimension

## 1. Derivational relationships

- a. Prefixes: bi-; multi-; re-; sub-; super-; tele-; un-

- b. Suffixes: -age; -al; -ence; -ent; -er; -ese; -ess; -ful; -ian; -ify; -ion; -ious; -ish; -ist; -ite; -ity; -ly; -teen; -th; -ure; -y
    - 2. Inflectional relationships: Suffixes: -ed; -es; -est; -ing; -s
- C. Spelling/Orthographic Rules
  - 1. Adding suffixes: consonant doubling; advanced consonant doubling; drop silent *e*; change *y* to *i*
  - 2. Ie/ei
  - 3. Plurals: add *s*; add *es*; change *y* to *i* and add *es*
  - 4. Qu
  - 5. Soft and hard *c/g*
- D. Semantic Dimension
  - 1. Homophones
  - 2. Word roots: cycle; geo; multi; photo; sci; sig
  - 3. Clippings
  - 4. Compounds
  - 5. Contractions
  - 6. Saxon genitive
- E. Punctuation and Capitalization
  - 1. Capitalization
  - 2. Punctuation marks
    - a. Exclamation mark
    - b. Question mark
    - c. Apostrophe
    - d. Comma
    - e. Colon
- F. Madrid Fernández's Taxonomy of Spelling Errors (for the composition and proofreading)
  - 1. Omission of silent letters
  - 2. Omission of initial letters
  - 3. Omission of final letters
  - 4. Omission of double consonants
  - 5. Omission of syllables
  - 6. Omission of digraphs
  - 7. Addition of letters
  - 8. Substitution of letters
  - 9. Substitution of homophone words
  - 10. Transposition of letters
  - 11. Omission of apostrophes
  - 12. Separation of words which should be spelled as one
  - 13. Capitals
  - 14. Omission of commas
  - 15. Omission of colons
  - 16. Double exclamation mark
  - 17. Double question mark

## APPENDIX II

### SPELLING TEST

#### 1.- DICTADO:

a.- A CONTINUACIÓN TE DICTARÁN UN TEXTO BREVE. SE TRATA DE UNA NOTA QUE TE HA DEJADO EN CASA TU MADRE. ESCUCHA CON ATENCIÓN Y REPRODUCELA FIELMENTE PARA QUE PUEDES SABER EL FAVOR QUE TE PIDE.

Hello, dear!

I need to ask you a favour. I can't be back home before half past eight because I've got a meeting at the office. Can you please go to the supermarket which is opposite the railway station and buy some food? Here's a list of everything you must get:

- Twelve eggs
- One kilo of tomatoes
- Two kilos of onions
- Thirty slices of bread
- A packet of cereal
- Two packets of chocolate biscuits
- Strawberries and oranges
- Three bottles of milk
- Four bottles of fizzy water
- You can also buy some vanilla ice-cream if you want.

I leave you five thousand pesetas to do the shopping. Don't forget the change! And if it's cold, put on your brother's yellow jacket.

Thanks very much.

Love,  
Mother

b.- ESCRIBE LAS PALABRAS QUE A CONTINUACIÓN TE DICTARÁN.

1.- Classify 2.- Bright 3.- Photograph 4.- Pretty 5.- Rhyme 6.- School 7.- Swimming pool 8.- Bicycle 9.- Snack 10.- Strip 11.- Stripe 12.- Island 13.- Giant	14.- Excellent 15.- Biggest 16.- Scientist 17.- Beginning 18.- Signed 19.- Field 20.- Churches 21.- Christmas 22.- Busy 23.- Thumb 24.- Toy store 25.- Nineteenth 26.- Maths	27.- Kitchen 28.- Village 29.- Quickly 30.- Badge 31.- Multiply 32.- Princess 33.- Football 34.- Furniture 35.- Noisy 36.- Carefully 37.- Daughter 38.- Autumn 39.- There	40.- Delicious 41.- Difference 42.- Turkeys 43.- Drier 44.- Quizzes 45.- Receive 46.- Between 47.- Smell 48.- Difficult 49.- O'clock 50.- Toast
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2.- TU MEJOR AMIGO/A HA DESAPARECIDO. SUS PADRES TE PIDEN QUE HAGAS UNA DESCRIPCIÓN LO MÁS DETALLADA POSIBLE DE ÉL/ELLA PARA LA POLICÍA EXTRANJERA. CUÁNTOS MÁS ASPECTOS INCLUYAS, MÁS POSIBILIDAD HABRÁ DE QUE LO/A ENCUENTREN (nombre, edad, lugar de procedencia, domicilio, lugar y hora donde fue visto/a por última vez, descripción física, altura, ropa que llevaba puesta, características de su familia, sus gustos y actividades preferidas, ...).

3.- UN NUEVO AMIGO GALÉS – CHUCK OWEN – TE HA ESCRITO UN CORREO ELECTRÓNICO. TÚ DECIDES CONTESTARLE, PERO ANTES TE DAS CUENTA DE QUE TIENE MUCHÍSIMAS FALTAS DE ORTOGRAFÍA. ¡CORRÍGESELAS!

Para: [jpg@moebius.es](mailto:jpg@moebius.es)

Asunto: A pen pal from Wales

Deer freind,

¡Hello! ¿How are you? My names Chuck and I'm from Wales. I rite yu becos I wont to have a spanis pen pal. Do yu wont to have a britis pen pal to?

I leave in a flat, Ive got a baeutyfull blak dog as a pet, and mi favorit fuds are mit and frut (I dont like to eat unhelthy thins). Mi favorit subjct's geografi and mi favorit animales are dolfins. Mi hobys are waching television\_ scatebording\_ skying\_ and traveling. Ive got pen pals from meny difrent nationalitys: french, greec, portugues, austreilian, and even japones, but I dont now any one in you're cuntry.

Plaese anser mi sun. I'm veri luky to have such a sheshal pen pal.

Chuck

P.S. Heres my E-mail\_ [chuck@utf.co.uk](mailto:chuck@utf.co.uk). Or if you prefer, I also give you my home adress:

25, Flauer Strit,

Cardiff,

BH1 3XL,

Wales (Graet Britain)