

EXPLICIT TEACHING AND REMEDIAL EDUCATION IN SPELLING FOR PUPILS WITH POTENTIAL DYSLEXIA/DYSORTHOGRAPHIA

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Abstract: This article summarizes a paper about an *Innovative Method of Teaching Spelling to Writing Learners: A Spelling Teacher's Endeavour to Improve Scholastic Literacy* presented by the authors at the 20th European Conference on Literacy in Madrid on July 6, 2017. It describes an experiment in teaching spelling to 9 and 10-year-old third-grade pupils in Quebec who had been diagnosed with dyslexia/dysorthographie¹ or were poor spellers. The personalized teaching approaches used to help third-grade pupils were based on research by Stanké *et al.* (2015-2018). The interventions' impacts on the spelling learners are also discussed.

¹ The experiments were part of a Master's research project by Mélanie Dutemple (researcher) with guidance from André C. Moreau and Brigitte Stanké (Dutemple, 2017). Ms. Dutemple received research grants from the Équipe de recherche en littérature et inclusion for her Master's and PhD studies.

Introduction

Literacy skills² are essential for scholastic success. Not only do they open doors to other learning, they are important for students' personal and social relationships (MEES, 2017). Spelling plays a vital role in literacy. In fact, spelling difficulties can have serious consequences for a student's future education (Van Grunderbeeck, Théorêt, Chouinard and Cartier, 2003). French-speaking children frequently have difficulty with spelling, owing to the fact that the French writing system is not transparent (Sprenger-Charolles, 2016). Comparison of French with a transparent language like Dutch, in which every phoneme maps to only one grapheme (Écalle and Magnan, 2010), illustrates the spelling difficulties that French-speaking students face. Écalle and Magnan (2010) observed three main difficulties relating to the complexity of the French spelling system: a given grapheme may have various values (the grapheme "s" can represent the phoneme /s/ or /z/, for example); a given phoneme may be written with different graphemes (the sound /ɛ̃/ can be written as "in", "ain", or "ein"), and a number of letters are silent (like the "d" in "dard"). More specifically, there are 130 graphemes for 36 phonemes in French. Spelling difficulties are even greater for students with learning difficulties. In Canada and Québec, as in other pluralistic and democratic societies, the education systems endeavour to take this student diversity, the main characteristic of a heterogeneous class, into account in teaching (Potvin, 2014).

This article focuses on the ability of inclusive schools³ to respond better to students with diverse learning needs, particularly students with dyslexia/dysorthographie. More specifically, it reports the results of a spelling remediation project involving two pupils with learning disorders, one of whom had been diagnosed with dyslexia/dysorthographie. The project is based on a study by Stanké, Moreau, Dumais, Royle and Lafontaine (2015-2018) of a method of teaching spelling to third-grade elementary students, both weak and good spellers.

² "Literacy" refers to the ability of a person, group or community to understand and communicate information using language and various media in order to participate actively in society in various contexts (Lacelle, Lafontaine, Moreau and Laroui, 2016).

³ The expression "inclusive school" (or class) refers to an educational trend that promotes inclusive or universal teaching in a heterogeneous class; this education targets success for all the students, including those who have learning difficulties or disorders like dyslexia/dysorthographie.

Background and Objectives

Many researchers agree that spelling should be taught explicitly (Brodeur, Chapleau and Laplante, 2013; Cogis, 2005; Pacton and Afonso Jaco, 2015; Perruchet and Pacton, 2004). Research has shown that explicit teaching of spelling helps students learn to spell, whether or not they are dyslexic/dysorthographic (Brodeur, Chapleau and Laplante, 2013; Daigle, Montésinos-Gelet, and Plisson, 2013).

Quebec's Ministry of Education (MELS) has therefore recommended that universities develop future educators' skills in teaching spelling (MELS, 2008). In 2014, when it created the first official spelling list, the MELS reiterated the importance of changing the teaching methods used by Quebec's educators and special education teachers who explicitly taught very little or no spelling and tended to delegate the task of learning vocabulary to parents via homework (MELS, 2014). However, such changes are slow to happen, partly because Québec's schoolteachers have expressed a need for training in teaching spelling explicitly (Daigle and Bastien, 2015).

The study's objective relates to this training need expressed by Québec educators and to the didactic skills to develop for teaching spelling. The study documents the impact of teaching spelling and providing remediation based on spelling conventions and supports it with recent research in the field in order to help elementary school pupils who have dyslexia/dysorthographie.

Theory underlying the innovative method

The study is based on Seymour's theoretical model for foundation literacy acquisition (Seymour, Aro and Erskine, 2003). According to this model, in order to learn to read and spell, the child must develop a logographic process that enables words or parts of words to be recognized quickly; an alphabetic process that supports the decoding of letters and their sounds; an orthographic framework that confers the ability to use general knowledge about words, including the components of conventional spelling and root words; and a morphographic structure that enables a writer to code affixes and use knowledge of irregular words (Desrochers, 2011; Laplante, 2013). It is the orthographic process, specifically the process of learning French spelling conventions, that this study aimed to improve.

Complexity of French spelling

As mentioned, the French writing system is complex and students cannot simply rely on pairing phonemes and graphemes to spell words. Since the 26 letters in the French alphabet correspond to 36 phonemes, the challenges involved are significant. On the one hand, some graphemes are associated with more than one phoneme; for example, in French the phonemes /k/ and /ʃ/ can both be written [with the grapheme] “ch” (chœur, chapeau). On the other hand, several graphemes can be associated with a given phoneme; the phoneme /o/, for instance, can be written with a number of graphemes, including “o”, “au” and “eau” (Jolicoeur, 2007). In fact, French-speaking students can rely on phoneme-grapheme correspondence for spelling only half of their words (Jolicoeur, 2007; Pacton and Afonso Jaco, 2015). They therefore must not only learn the rules that enable them to transpose phonemes into graphemes, they must also learn spelling conventions and morphological conventions (Brodeur, Chapleau and Laplante, 2013; Pacton, 2010; Pacton and Afonso Jaco, 2015).

Spelling conventions reflect what occurs most often in the language (Daigle, 2012-2015). For example, in French, the phoneme /o/ is most frequently written as “au” in the initial position in words and “eau” in the final position and the phoneme /ʒi/ is never written as “ji”. The main spelling conventions are linked to contextual rules (“lampe”, not “lanpe”), spelling legality (“bal”, not “bbal”), lexical boundaries (“tentèrent”, not “t’entèrent”) and silent letters (“bond”)

(Daigle, 2012-2015).

Implicit learning and explicit teaching of spelling

General knowledge of spelling is first acquired implicitly, through repeated exposure when reading, which means it is not intentionally learned or explicitly taught. When exposed frequently to words, even irregular words, students spell them better than when they are less exposed to the words (Martinet, Valdois and Fayol, 2004). For example, students understand very quickly where in a word a consonant may or may not be doubled. Even when writing non-words, they are aware that the [o] sound in the end position is written as “eau” in French (Pacton, Fayol and Perruchet, 1999). They also understand that vowels are almost never doubled, even when this has not been explicitly taught to them (Bégin, 2008). Implicit learning stems from what students have already experienced and involves “adapting to a complex

situation without understanding the origin or reasons for the adaptation.” (Perruchet, 1998, p. 15).

However, some students have difficulty learning certain spellings implicitly or are less exposed to words because of difficulty learning to read. For these students, implicit learning of spelling is not sufficient. In fact, learning how to spell a word is not always related to exposure through reading: avid readers are not necessarily good spellers (Pacton and Afonso Jaco, 2015). For students who have difficulty learning to read and especially for those who have been diagnosed with dyslexia/dysorthographia, explicit teaching of spelling is necessary because they lack sufficient implicit awareness of spelling conventions (Bégin, 2008; Brodeur *et al.*, 2013). Remedial intervention is essential to help these students learn new skills and compensate for a disability or resolve difficulties (Legendre, 2000, p. 1096).

Many studies have demonstrated the effectiveness of teaching spelling strategies explicitly in focused interventions that limit exposure to errors (Gillespie and Graham, 2014; Goodwin and Ahn, 2010; Graham, Harris and McKeown, 2013; Rogers and Graham, 2008). By teaching spelling explicitly (Perruchet and Pacton, 2004), educators facilitate students’ long-term retention of spelling, even when they have persistent difficulty learning to read and spell (Bégin, 2008; Brodeur, Chapleau and Laplante, 2013). In fact, when targeted remediation is suggested, it produces significant progress, even in students who find spelling very difficult (Brodeur, Chapleau and Laplante, 2013), because learning to spell can be particularly hard for students with permanent disabilities, especially dyslexia/dysorthographia.

Definition of dyslexia/dysorthographia

The Diagnostic and Statistical Manual of Mental Disorders (DSM–5) considers dyslexia and dysorthographia to be “specific learning disorders”. These disorders involve below-average academic performance despite targeted interventions. The symptoms include inaccurate or slow and laborious word identification, difficulty with reading comprehension, difficulty with spelling, and difficulty with written expression (American Psychiatric Association, 2013). Persistent difficulty learning phoneme-grapheme correspondences, spelling words by sound, or adhering to spelling conventions (usual spelling of words) are the most frequent and most persistent symptoms of dysorthographia (Boutin, 2012a; Laplante, 2013; Stanké, 2016a) (Alberti, Baneath, Boutard, Clément and Gatignol, 2006; Stanké, 2016b). For example, a pupil with

dysorthographie might write “champignon” as “champion”, ignoring the phonology, or might use the letter “j” to write the word “girafe” as “jirafe” when the “ji” combination does not exist in French (spelling convention ignored).

The persistent difficulties of dyslexia/dysorthographie pose challenges for teachers and remedial spelling teachers, especially given the lack of research on learning French spelling compared to research on reading (Daigle and Bastien, 2015); spelling is a neglected area of speech therapy research (Alberti, Baneath, Boutard, Clément and Gatignol, 2006). The study of spelling remediation for pupils with dyslexia/dysorthographie therefore met a real need.

Method

The method used in interventions with dyslexic/dysorthographic pupils considers recent research on the principles that support learning to spell (Stanké, 2016b; Vinter, Pacton, Witt and Perruchet, 2010; Wanzek, Vaughn, Wexler, Swanson, Edmonds and Kim, 2006): 1) teaching strategies; 2) immediate correction; 3) explicit teaching of spelling and morphological rules; 4) repetition through games; and (5) error-free learning. The combination of these five principles in the teaching method developed by Stanké *et al* (2015-2018), on which this study is based, is innovative. It teaches how to use the rules that apply to spelling conventions. For this experiment, the following spelling conventions were taught: oy-ill; in-ain; eau-ot and ant-ent.

The experiment was first conducted in an inclusive school with two heterogeneous classes of third-grade students (Stanké *et al.*, 2015-2018). Two pupils were then selected for one-on-one remediation. They were chosen intentionally as they had persistent difficulty learning to spell, but had different types of difficulty. They were given the pretest from the BALE writing skills test battery (Jacquier-Roux, Lequette, Pouget, Valdois and Zorman, 2010). One of the pupils participating in the study (Pupil 1) had dyslexia/dysorthographie documented by a psychologist and a special-education teacher, as well as diagnosed attention deficit hyperactivity disorder (ADHD). The other pupil (Pupil 2) had completed the first year of elementary school in Europe and showed a major delay in spelling at the beginning of the project but had not been diagnosed with dyslexia/dysorthographie.

The classroom experiment took place over a four-week period. Each week, one spelling convention was introduced in the classrooms. The innovative teaching method was the same for each convention. On day one, ten words per convention were given in a dictated pretest in

class. Every other day during the week, the spelling convention was repeated explicitly in class. Word Sudoku and hidden word games exposed the pupils repeatedly to correctly spelled words. At the end of the week, the same ten words were dictated in posttest-1. One month later, a new posttest-2 containing the same spelling conventions with different words was given in class.

In one-on-one remediation, in addition to the four spelling conventions taught in class, conventions related to the two pupils' difficulties and to words that were in the third-grade classroom program were taught. To determine what difficulties the pupils were having and what items needed to be added to the remediation interventions, a non-word dictation and a word dictation were given during the first session. The words and non-words were selected on the basis of the main spelling conventions. Also, after the ten individual remediation sessions, the two pupils concerned answered a posttest and a questionnaire regarding their opinion of what they learned about spelling.

The researcher observed and participated as a teacher during the four weeks with the class group and as a remedial spelling educator during the ten-week individual interventions with two of the students who had the most difficulty learning to spell. The remediation sessions were held in a room outside the classroom.

To document the experiment, the participant observation method was used to describe and enhance understanding of all the remediation activities. The observations were recorded in a log. Artefacts produced by the pupils were also kept for analysis and to assess the remediation interventions (Fortin and Gagnon, 2016).

Results

The experiment documented the contribution of teaching and remediation in spelling based on spelling conventions in one-on-one remediation sessions. The results are analyzed here.

In individual pre-test 1, 55 words from the Quebec Ministry of Education spelling list (MELS, 2014) were given in a dictation to the two pupils receiving individual coaching in spelling from the researcher. Pupil 1, diagnosed with dyslexia/dysorthographie, successfully spelled 25% of these words. In addition to spelling errors, he made a number of phonological errors. For example, he wrote "lasser" for "laisser", "noriture" instead of "nourriture", "nondre" for "nombre" and "prmettre" for "promettre". Pupil 2, who had persistent difficulties, spelled 36% of the words correctly and his errors were almost all spelling-related. In a remedial context, the

phonological errors and some basic conventions in French (“m” before “b” and “p”, for example) had to be taught before teaching the four spelling conventions targeted by the project.

At the end of the remediation intervention, both targeted pupils had made substantial progress. Pupil 1’s (dyslexic/dysorthographic) results on the posttest administered at the end of the ten weeks showed very good retention of the conventions learned in the first half of the remediation. However, it was more difficult to measure retention of the conventions learned in the second part of the remediation. This can be partly explained by the fact that at the end of the experiment, the dysorthographic pupil, who had access to technological tools, expressed an aversion to writing dictation by hand. He then decided to choose the same spelling option for all his posttests. This reaction did not relate to his interest in the new explicit method for teaching spelling. Furthermore, during the intervention, this pupil was asked to orally explain the conventions taught more than one month after he had been taught them and he gave perfect answers. He also made substantial progress and managed, on average, to write 75% of the words correctly in the posttest. Pupil 2, who had a lot of difficulty with spelling, made even greater progress. During the remedial intervention, his scores were even higher: he obtained 85% on the posttest. However, although he was better at applying the rules taught in the classroom, unlike the dyslexic/dysorthographic pupil, Pupil 2 still had difficulty explaining them.

To determine what the two pupils learned from the remedial spelling intervention, a questionnaire was also administered. The pupils had to take a position regarding the usefulness of the learning strategies or activities that could help them spell written words correctly. Their answers showed that they were aware of what could help them. For Pupil 1 (dyslexic), three things had been very helpful, while three other things were helpful. According to Pupil 2, who had difficulty with spelling, all the spelling remediation strategies were very helpful. All the spelling strategies and activities used in the intervention were thus positively rated by both pupils. According to their answers, it appears that they were aware of the fact that the learning strategies and activities contributed positively to learning spelling.

However, although both pupils recognized the importance of the learning strategies and activities, that does not mean they will always be able to correctly spell words governed by the four rules taught. On the questionnaire, although Pupil 2 correctly spelled 100% of the words corresponding to the conventions taught, Pupil 1, with dyslexia/dysorthographia, applied two rules perfectly (the rules regarding “eau-ot” and “ent-ant”), but correctly spelled only 50% of the

words relating to the other two rules (“in-ain” and “oy-ill”). Pupil 1 nevertheless appeared to be aware of his difficulty, which helped him make optimal use of the technological tools as soon as they were introduced because he knew what he had to pay attention to in spelling. Therefore, at the end of the spelling remediation intervention, both pupils had made progress in terms of knowledge of spelling strategies and conventions. Moreover, both pupils greatly improved their French marks after this experiment.

The most concrete result of this study is the remedial spelling intervention model that the researcher developed. An illustration based on the verb “voyager” is provided in the appendix.

Discussion and conclusion

The objective of the experiment was to document the impact of teaching spelling and providing remediation based on spelling conventions with support from recent research in the field in order to help elementary school pupils who have dyslexia/dysorthographia. This objective was achieved. Among other things, the experiment measured the impact of the experimental method (Stanké *et al.*, 2015-2018) on the learning of pupils who were poor spellers in a targeted remediation intervention (explicit teaching of spelling conventions). Even for the dyslexic/dysorthographic pupil, the following principles of the error-free teaching method (Stanké, 2016b; Vinter, Pacton, Witt and Perruchet, 2010) had positive effects on learning: (1) teach spelling strategies; (2) correct immediately; (3) explicitly teach spelling and morphological conventions; (4) repeat the information; and (5) make learning error-free (Wanzek, Vaughn and Wexler 2006).

Further research with a larger number of students would confirm the contribution of personalized remediation, based on spelling conventions, for dyslexic/dysorthographic students. In addition, for teachers, access to a learning scale based on spelling-conventions would improve spelling education and would help them develop spelling skills in elementary-school pupils. This scale currently does not exist, but the researcher’s doctoral objective is to develop this scale by 2021.

Appendix

The most concrete result of this study is the remedial spelling intervention model that the researcher was able to develop. The verb “voyager” provides an illustration.

1. First, teach each phoneme, for example to avoid frequent inversions in the consonant, consonant, vowel (CCV) structure by pupils with dyslexia/dysorthographie. Stanké’s *L’apprenti Sage* (2006) provides an image that would be good to link to the MELS spelling list (2012). It would help students assimilate a word while thinking about what it would become if a phoneme was removed.



2. Think about the syllables in the word and observe that “y” separates into two “i”s

Voi/ia/ger

3. Draw on prior knowledge to find other words that contain a “y” (“noyer”, “broyer”, “joyeux”, for instance)
4. Discover the following spelling convention: within a word, the sound “yod” is written with the letter “y” if this sound comes after the sound “oi”. (Stanké and Dumais, 2016)
5. Identify the word’s classification and note that “voyager” is the infinitive of a verb. Comment on the morphological convention stating that verbs in the first group end in “er”.
6. As needed, use mnemotechnic or visual-semantic strategies (Valdois, 2004) like those in the following illustration from *L’orthographe illustrée*:



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