IMPROVING THE MASTERY OF RELATIVE CLAUSE IN FRENCH L1 SECONDARY CLASSES: THE EFFECTS OF AN INTERVENTION BASED ON VERBAL INTERACTIONS ON WRITTEN SYNTACTIC STRUCTURES

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Abstract
Using the accurate relative pronoun (RP) in a formal writing task in French presents challenges for writers since they seem to be influenced by forms used in the popular oral variety of French which are far from the linguistic norm (Blanche-Benveniste, 2010). Studies describing the teaching of the relative clause (RC) in the secondary classroom have highlighted the problems encountered by students not only with handling this grammatical object, but also with using their grammatical knowledge in revising their text (Dolz & Schneuwly, 2009). However, to our knowledge, no study has yet been conducted to conceive and test an intervention for teaching RCs in French L1 classes.
Based on theoretical and empirical work converging toward the fostering of sustained verbal interactions throughout grammatical and revision instruction, a series of lessons was implemented with 52 grade nine students enrolled in a French course (Montreal, Canada). Pretest and posttest texts were analysed in terms of RC frequency, usage and accuracy. While no difference was found in the general frequency of RCs, results show a significant increase in the use of complex RPs. Students, especially the weaker ones, also make significantly fewer mistakes overall on RPs and also on complex RPs. These results could indicate that certain structures associated with complexity and formal register are used more frequently and more accurately during written production after our intervention. Our results contribute to the ongoing discussion on the complementarity between direct grammar instruction and writing and revision instruction and their positive impact on students' syntactic constructions in texts.

Keywords: grammar and writing instruction, verbal interactions, French L1, relative clause, metalinguistic abilities

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1. INTRODUCTION

The aim of our research is to see how the mastery of the relative clause (RC) in formal written text in French evolves following an instructional intervention. Writers, especially expert ones, make a notable use of RCs in their texts since they play a major role in textual cohesion. At the border between "micro-syntax" and "macro-syntax" (Béguelin, 2000), RCs create cohesion in a text, according to both rules of repetition and of progression (Boivin & Pinsonneault, 2008).

A relative clause (RC) is a type of subordinate clause introduced by a relative pronoun (RP). Depending on several syntactic as well as semantic features of the structure, the choice of RP form requires a certain level of sentence analysis. It is no surprise that the (written) production of RCs poses many challenges, especially to native speakers of French (Paret, 1991; Béguelin, 2000; Chartrand, 2012). They seem to be influenced by nonstandard forms used in the popular oral variety of French which are far from the linguistic norm (Gadet, 1992; Blanche-Benveniste, 2010). One of the most emblematic types of mistakes regarding RP usage is the generalization of "QUE" ("that") to several contexts where another RP is required. "QUE" would be used as a "master key" RP (Blanche-Benveniste, 2010) and its nonstandard oral uses (Gadet, 1992) seem to affect written uses, resulting in errors in writing (Paret, 1991; Béguelin, 2000). Pronouns "DONT" ("whose", "of whom") and preposition+"LEQUEL" ("to/before/for which", "whereby") are associated with prestige and formal language variety (Béguelin, 2000; Tellier & Valois, 2006). These pronouns are used more sparsely by students in their academic written texts and also appear problematic for learners (de Calan, 1972; Paret, 1991; Walz, 1981).

Numerous studies describe the difficult handling and appropriating of RCs by learners in French L1 classes (Boivin, 2009; Canelas-Trevisi, 2009a, 2009b; Dolz & Schneuwly, 2009). Another important difficulty for students is to *revise* their text with regards to linguistic norm and to use their grammatical knowledge in this complex task (Becker, 2006; Chabanne, 2004; Hayes, 2004). While all linguistic aspects are likely to be tackled during revision, studies have shown that the actual revision of linguistic elements more frequently concerns lexical or grammatical spelling and often neglects to address syntactic constructions (Blain & Lafontaine, 2010; Butterfield, Hacker, & Albertson, 1996).

However, in our knowledge, no study has yet been conducted to conceive and test an intervention for teaching of RCs in French L1 classes that takes into account the revision process. We implemented a classroom intervention aiming to improve the mastery of RCs by French L1 secondary students and their writing revision process. In order to do so, we adopt a socioconstructivist perspective and anchor our intervention in the fostering of verbal interactions (see section 2.3). Our study does not document the actual verbal interactions occurring during the intervention, but focuses on the visible changes in the written production of RCs after the intervention. The questions that underlie our research are:

Following a classroom intervention targeting the RC and the revision process,

a) which changes in the usage of relative pronouns can be observed in texts?
b) which changes in the accuracy of relative pronouns can be observed in texts?
c) how does the intervention affect the changes in the usage and accuracy of relative pronouns according to the initial level of RC mastery?

2. CONCEPTUAL FRAMEWORK

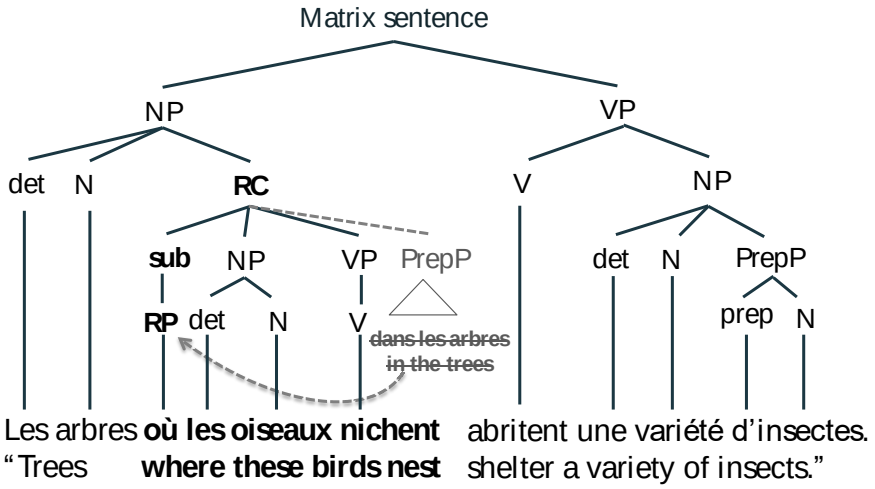
Section 2.1 describes the relative clause in French as well as challenges regarding the use of the accurate relative pronoun with regards to written linguistic norm. Section 2.2 presents revision in the writing process as a key moment for the writer to consciously mobilise relevant grammatical knowledge in order to improve the written text. Section 2.3 gathers instructional approaches drawn from grammar instruction and revision instruction as well as cooperative learning, approaches which all converge towards the principle of fostering verbal interactions.

2.1 The relative clause in French

While the RC contributes to textual cohesion, this syntactic structure can also be described on a sentence level. The following section is based on grammatical descriptions regarding what is acceptable according to written linguistic norm. The relative clause (RC) is a type of subordinate clauses embedded in a noun phrase and introduced by a pronoun, the relative pronoun (RP). From a semantic perspective, the RC provides additional information about the noun, information often inserted directly after the noun (restrictive, or determinative RC) or isolated from it with commas and thus less tightly bound to the noun phrase (non restrictive, or explicative RC) (Béguelin, 2000).

The relative clause embedding can be represented by a syntactic tree, as shown in Figure 1.

Figure 1. Syntactic tree of a sentence with relative clause



The RP has two roles. First, it embeds the subordinate clause into the matrix sentence. Secondly, in more unique manner, this subordination marker assumes the role of pronoun by maintaining coreference with the antecedent noun as well as fulfilling a grammatical function in the subordinate clause (Boivin & Pinsonneault, 2008; see examples (1) and (2) below table 1). In figure 1, the dotted arrow and the crossed phrase illustrate this phenomenon.

French RPs are generally of six types: "QUI"; "QUE"; "OÙ"; "DONT", "LEQUEL" preceded by a preposition (noted prep + "LEQUEL") and "QUI" or "QUOI" preceded by a preposition (noted prep + "QUI"/"QUOI") (Boivin & Pinsonneault, 2008). Table 1 presents examples of complex sentences embedding a RC according to different types of RP.

The RP (bold in examples) corresponds to a syntactic phrase that is revealed when reconstructing the "phrase de base" or basic sentence[1]. Certain pronouns, such as "QUE" ("that"), replace a noun phrase (NP), as shown in (2).

(1) *"Herons are the birds [**that** Clara prefers]*^{RC}*."*
basic sentence: *Clara prefers **these birds*** $^{NP\text{ - Direct compl of verb}}$

[1] *The choice of RP is based essentially on syntactic criteria. In French, for instance, the RP QUI is used to assume the grammatical function of subject indistinctively from the human or non-human feature of its antecedent. However, certain semantic criteria exist for some RP. A complete description of the RP can be found in Riegel, Pellat & Rioul (2014).*

Table 1. Types of relative pronouns used in French

Type of relative pronoun	Example
"QUI"("who", "that", "which")	Clara, [**qui** est fascinée par les oiseaux] ^{RC}, adore les cardinaux. "*Clara, [**who** is fascinated by birds] ^{RC}, loves cardinals*."
"QUE"("that")	Les hérons sont les oiseaux [**que** Clara préfère]^{RC} "*Herons are the birds [**that** Clara prefers]^{RC}*."
"OÙ"("where")	Les arbres [**où** les pics vont] ^{RC} abritent une variété d'insectes. "*Trees [**where** woodpeckers go] ^{RC} shelter a variety of insects*."
"DONT"("whose","of which/whom")	Les colibris [**dont** le métabolisme est très élevé] ^{RC} se nourrissent sans cesse. "*Hummingbirds [**whose** metabolism is very high]^{RC} feed constantly*."
prep+"LEQUEL"and variants ("to/before/(…) which/whom", "whereby")	Les organismes [**desquels** depend la protection de la forêt] ^{RC} sont de plus en plus sous-financés. *"Organizations [**upon which** the protection of the forest depends] ^{RC} are increasingly underfunded."*
prep+"QUI"/"QUOI"("on/for/ to/(…) which/whom")	Les experts [**sans qui** le comportement des oiseaux serait méconnu]^{RC} collectent des données régulièrement. "*Experts [**without whom** the behaviour of birds would be unknown] ^{RC} collect data frequently.*"

Others, such as "DONT" ("whose", "of which/whom"), replace a prepositional phrase (PrepP), as in example (3).

(2) *"Hummingbirds [**whose** metabolism is very high]^{RC} feed constantly."*

basic sentence: *the metabolism **of hummingbirds**$^{PrepP\ -\ Noun\ compl}$ is very high*.

This distinction is based on the category of the phrase replaced, which then leads to classifying RPs into two categories: simple forms, for pronouns that replace the NP ("QUI", "QUE"), and complex forms ("DONT", "OÙ", prep + "LEQUEL", prep + "QUI"/"QUOI") for pronouns that replace the PrepP (Boivin & Pinsonneault, 2008; Paret, 1991).

The relativization of a phrase to construct and embed a RC implies two syntactic operations: replacement of the phrase by a pronoun and movement of the pronoun in the initial position of RC (or WH-movement, Labelle, 1990). The use of complex RP requires in some cases the replacement of the entire PrepP by a RP ("DONT", "OÙ"). In other cases, only the NP in the PrepP is replaced by a pronoun ("LEQUEL", "QUI", "QUOI"). In the latter cases, the movement of the preposition with the pronoun is

obligatory in French (Labelle, 1996). In English, the relativization of certain PrepPs is made by using a simple RP ("who", "that") and by keeping the preposition in place, as shown in example (3). These "pied-piping" RCs, often found in children's oral productions (Diessel, 2004; Labelle, 1996), are grammatical in standard English but are considered as non-grammatical structures in standard French, as shown in example (4).

(3) *Clara pets the dog **that** she grew up **with**.*
Basic sentence: *She grew up **with the dog**[PrepP - Indirect compl of verb].*

(4) ** Clara caresse le chien **qu'**elle a grandi **avec**.*
*Clara caresse le chien **avec lequel** elle a grandi.*

The low frequency of these complex RPs and their lower accuracy rate compared to simple RPs (Béguelin, 2000; de Calan, 1972; Paret, 1991; Walz, 1981) could indicate that the relativization of PrepP entails more difficulty for French writers.

From a theoretical point of view, reconstructing the basic sentence, also known as basic clause or "kernel sentence" (e.g. Saddler & Graham, 2005), is of great help for writers analysing a sentence during the revision process in search for potential mistakes, such as those related to the choice of RP. For instance, "QUE" ("that"), which replaces a NP direct complement of verb, is often used where another RP is needed (see introduction). In the example (5) from Tellier (2002), the basic sentence corresponding to the RC produces an ungrammatical sentence since the verb "to go" ("aller", *va*) needs an indirect complement built with the prep "à" (to) (go *to* this restaurant), and not a direct complement (*go this restaurant). From the basic sentence, the writer can notice more easily that the corresponding basic sentence (5) is not the one meant (6): the phrase to be replaced by the RP is a PrepP indirect complement referring to a location. Two different RPs would meet these conditions and lead to a correct RC (6): OÙ ("where") and AUQUEL ("to which", see prep+"LEQUEL" in table 1)

(5) ** "Le restaurant **qu'**on va le plus souvent, c'est La Sila."*
** The restaurant **that** we go the most often, it's La Sila.*
corresponding basic sentence: **On va **ce restaurant** [NP - direct compl] le plus souvent.*
We go **this restaurant [NP - direct compl] the most often.*

(6) correct basic sentence: *On va **à ce restaurant** [PrepP - indirect compl] le plus souvent.*
*We go **to this restaurant** [PrepP - indirect compl] the most often.*
*" Le restaurant **où/auquel** on va le plus souvent, c'est La Sila."*
*The restaurant **where/to which** we go the most often, it's La Sila.*

In this perspective, the basic sentence model is envisioned as a powerful tool for detection and correction of grammatical mistakes during revision, particularly for mistakes of sentence construction such as ones with RPs (Boivin, 2012; Boivin & Pinsonneault, 2008; Chartrand, 2012).

To lead to effective use during text revision, grammatical knowledge, about RCs for instance, may be constructed attached or not to actual writing, which would call for grammar instruction (Fontich, 2016). While Roger and Graham's meta-analysis

(2008) has shown positive effects of grammar instruction on writing, other meta-analyses have shown negative effects on the quality of students' texts (Graham & Perin, 2007; Koster, Tribushinina, de Jong, & van den Bergh, 2015). This has contributed to raising reservations about grammar teaching, regardless of the instructional approach used (Myhill, 2005). A closer look at the method can shed light on what type of interventions were included in the "grammar instruction" category, including grammar teaching that is decontextualized from actual language use[2]. The authors explain: "(...) when grammar is taught in isolation, and not in a 'real' writing context, it may not be clear to students how to apply what they learned when writing a text." (Koster et al., 2015: 268) Indeed, the grammar-writing articulation in language teaching appears not only crucial to help students diagnose and correct grammatical mistakes in their texts (Arseneau, 2016; Boivin & Pinsonneault, 2016; Nadeau & Fisher, 2006), but also to make them aware of the usefulness of certain linguistic forms and structures to convey their message efficiently and accurately (Hayes, 2004; Myhill & Jones, 2007). Over the years, grammar teaching approaches that embed grammar into writing tasks have been elaborated in order to maximise the potential of mobilisation of grammatical knowledge in writing contexts without neglecting the linguistic knowledge itself (Arseneau, 2010; Nadeau & Fisher, 2006). Recent quasi-experimental studies testing contextualised grammar (Jones, Myhill, & Bailey, 2013; Myhill, Jones, Lines, & Watson, 2012) as well as case studies (e.g. Rodríguez-Gonzalo, 2015) have shown positive results on writing.

2.2 Revision in writing process and the mobilisation of grammatical knowledge

From a cognitive perspective, writing is generally understood as a process comprising three non linear processes: planning, translating and reviewing, or revision (see Becker, 2006). It is during revision phase that the operations pertaining to adhering to the linguistic norm are carried out (Roussey & Piolat, 2005).

Revision is defined and modeled as a process comprising three fundamental subprocesses: text processing (critical reading), reflection (problem solving, decision making) and text production (Hayes, 1996). Driven by the goal of improving a written text (Roussey & Piolat, 2005), revision may operate under a global (cohesion) or a local scope, regarding spelling and sentence construction for instance (Hayes, 2004). During critical reading, the writer, in search for local problems, may detect a problem, such as a potential error on a RC construction. The diagnosis of the problem,

[2] *As remarked by a reviewer, there is an ongoing discussion about the inclusion of sentence-combining or not in grammar instruction. Meta-analyses treated them as separate instructional approaches and found significant results of sentence-combining (or sentence construction) on writing (Rogers & Graham, 2008; Graham & Perin, 2007). Even though they end up treating them as separate approaches for the sake of clarity, Andrews et al. (2004) mentioned in the introduction that grammar teaching and sentence-combining are two "sentence-level grammar" instructional approaches (p. 1) coming "under the umbrella of 'grammar' teaching." (p. 5).*

eventually based on the reconstruction of basic sentence corresponding to the RC (Boivin, 2012; see section 2.1), could lead to the conclusion that the RP used is erroneous in the context. If the decision made is to fix the problem (and not to ignore the problem or delay the action, Hayes, 2004), the writer would produce new text for instance by replacing the targeted RP with the one judged more accurate among "QUI", "QUE", "OÙ", "DONT", prep+"LEQUEL" and prep+"QUI"/"QUOI".

Often linked to grammatical accuracy goals, sentence editing should not be reduced to seeking adequacy to the linguistic norm. The writer may also modify sentences written with the aim of improving clarity and elegance (Hayes, 2004; Myhill & Jones, 2007). In the case of RC constructions, this could mean modifying the sentence to use a complex RP such as "DONT" and "AUQUEL" (prep+LEQUEL) in an attempt to switch to a more formal language register (Béguelin, 2000).

Text revision requires metalinguistic abilities, which necessitate in turn grammatical knowledge (Alamargot & Chanquoy, 2004; Fontich, 2014; Gombert, 1992; Lefrançois, 2005). Construed as a manifestation of metacognition (Gombert, 1992), the notion of metalinguistic ability involves two cognitive processes (or components): the analysis of representational structures and the control of selective attention (Bialystok, 2001). The analysis process refers to the ability "to construct mental representations with more detail and structure than was part of their initially implicit knowledge" (Bialystok, 2001: 178). This process involves explicit linguistic knowledge, as a higher level of explicitness of the representations will make the linguistic knowledge easier to access and to mobilise consciously and intentionally for problem solving (Bialystok, 2001; Simard, Foucambert, & Labelle, 2013). The control process refers to the ability to direct attention to relevant information retrieved from the environment (or "stimulus field", Bialystok, 2001) or from the mental representations, and to integrate it in real time in the problem to be solved (Simard *et al.*, 2013: 48). A problem that involves conflict between two or more competing mental representations to find a correct solution, thus requiring to attend to one of these representations and to resist to attend to the other(s), is considered more metalinguistic in terms of control. For Bialystok (2001), "(…) any task that places high demands on these processes is metalinguistic" (p. 178). By involving sentence analysis to diagnose problems and control of attention to solve detected problems (Roussey & Piolat, 2005), the revision task definitely requires metalinguistic abilities to lead to actual improvements to the text written (Alamargot & Chanquoy, 2004; Gombert, 1992; Lefrançois, 2005). We postulate that the development of metalinguistic abilities may rely on verbal interactions.

2.3 Instruction benefitting from verbal interactions

2.3.1 Grammar instruction and inductive approach (tutorial interactions)

In order to be solicited productively during revision, the basic sentence needs to be modeled, and the inductive approach is a good way to do so. As opposed to the

deductive enunciation of rules, the inductive approach aims to make the learner discover linguistic rules and regularities based on a set of examples (Vincent & Lefrançois, 2013). Following the teacher's guiding questions, or *scaffolding* (Barth, 2004; Bruner, 1983), the utterances given as examples in language classes are observed and manipulated (Nadeau & Fisher, 2006), for example by reconstructing the basic sentence in order to observe the correspondence between a RP and a syntactic phrase. Fundamentally interactive, the inductive approach entails cognitive benefits from the verbal interactions induced between teacher and students, allowing the students engaged in the activity to activate prior knowledge and thus prepare for the anchorage of new knowledge (Nadeau & Fisher, 2006). Guided application of analysis tools such as the basic sentence model would also prepare for autonomous mobilisation of these tools during the writing and linguistic revision processes (Arseneau, 2010; Fisher & Nadeau, 2014; Fontich, 2016).

Verbal interactions, in the context of the inductive approach, often require the use of metalanguage. Metalanguage, defined as a set of terms used to speak about the language (Boivin & Pinsonneault, 2008; Lord & Elalouf, 2016), is built on the observations of regularities by labeling the syntactic units extracted from the examples ("relative pronoun", "relative clause", "basic sentence", ...). The use of metalanguage contributes to the construction of a conceptual framework in order to apprehend linguistic realities collectively and then individually. Metalanguage is crucial for the development of metalinguistic abilities because it supports the analysis of representational structures process since "(…) metalinguistic behavior [is] based on knowledge that is more explicit and more formal than that needed for more ordinary linguistic performance." (Bialystok, 2001: 178). Metalanguage also allows to focus attention on the labeled units by enhancing the "noticing" process (Schmidt, 1990). This noticing process increases language awareness and leads to enhanced language learning (Svalberg, 2007). This is why many researchers point out the importance of adopting a rigorous metalanguage and of encouraging students to use it (Arseneau, 2016; Fisher & Nadeau, 2014; Myhill, Jones, Watson, & Lines, 2013). Grammatical instruction may facilitate its usage. As suggested by Fontich (2016), verbal interaction adequately prompted by grammar instruction could trigger a progressively more appropriate use of metalanguage.

2.3.2 Revision instruction (collaborative dialogue)

Research has shown that collaborative revision leads to the production of better texts in terms of grammatical accuracy as well as syntactic complexity, compared to individually produced texts (Blain & Lafontaine, 2010; Rodríguez-Gonzalo, 2015; Storch, 2005; Storch & Wigglesworth, 2007). Interestingly, the comments do not only benefit the writer receiving it, but also the collaborator providing it. Indeed, the provider is given precious opportunities to verbalise thoughts and to reason about language, as Swain and Watanabe (2013) pointed out: "During collaborative dialogue, one or both speakers may refine their knowledge or come to a new or deeper

understanding of a phenomenon. Speakers (or writers) are using language as a cognitive tool to mediate their own thinking and that of others." (p. 1). Another study has shown that peer revision helps students solve language related problems and gain control of the task (Villamil & de Guerrero, 1996).

An individual revision activity, where a writer revises his/her own text, requires metalinguistic abilities (see section 2.2). The socioconstructivist approach postulates that these individual metalinguistic abilities would first develop during collaborative work. These activities allow to develop metalinguistic abilities at the intersection of both Vygotskian planes, inter-mental and intra-mental planes, as described by Fontich (2016).

Despite the rarity of research on the place of grammatical terminology in the revision process for first language speakers (Myhill et al., 2013), we postulate that the verbal interactions during the collaborative dialogue in peer revision activities might benefit from the use of metalanguage. Metalanguage, which requires grammatical knowledge to be efficient, is one of the components of metalinguistic abilities, and of the revision process itself (see section 2.2). Metalanguage could help students to provide precise feedback to peers during the revision process and thus to receive and appropriately integrate comments in the text produced.

2.3.3 Cooperation (cooperative interactions)

Verbal interactions are precisely at the core of socioconstructivist instructional approaches because of the cognitive gains that they entail. Researchers in the field of cooperative learning have stated specific conditions that would help transform mere group work in order to reach, through positive interdependence, the essence of working together: cooperation. One condition is the setting up of a common goal for the group, a goal that is not reachable unless all group members engage in the task (Johnson & Johnson, 2009a; Slavin, 2003), therefore corresponding to a "conjunctive" type of task (Abrami et al., 1999; Kerr & Bruun, 1983). The design of the task itself helps to reach another condition, "individual accountability", which can be emphasized for instance by attributing roles and responsibilities to every group member (Jaques & Salmon, 2007).

Meeting the conditions described with respect to task design is likely to induce verbal interactions between group members. However, a full cooperative setting will not be achieved unless the last condition is met: promoting verbal interactions (Johnson & Johnson, 2009b; Slavin, 2003). Indeed, a meticulous implementation of cooperative group work requires each group member to provide explanations in a "collective scaffolding"-like dynamic (Donato, 1994), receive and use them to solve a problem or to discuss concepts with group members (Johnson & Johnson, 1990; Krol, Janssen, Veenman, & van der Linden, 2004; Webb, 2008). Explicitly encouraging students to interact verbally in a positive interdependence context optimizes the learning benefits that result from verbal interactions (Krol et al., 2004; Lonning, 1993; Slavin, 2015).

The attention to task design, or "engineering", and to promoting verbal interactions has led to the elaboration of various group work structures such as the seminal "Jigsaw" (Aronson, Blaney, Stephan, Sikes, & Snapp, 1978) and "Teams-Games-Tournaments" (TGT) (De Vries & Slavin, 1978), that allowed operationalization, empirical testing and refinement of the cooperative learning conditions. Numerous empirical studies comparing cooperative conditions with competitive or individual conditions have found significant effects on learning in favour of cooperation (see Slavin, 2003, Johnson & Johnson, 2009 and Puzio & Colby, 2013). These conclusions echo those of recent meta-analyses in writing instruction showing strong effect sizes for the peer assistance condition found in collaborative writing settings (Graham & Perin, 2007; Koster et al., 2015).

2.4 Summary

Based on these transversal premises, a classroom intervention targeting RCs and the revision process should foster sustained verbal interactions throughout the grammatical and revision activities. In these verbal interactions, students would discuss RC constructions, rely on the basic sentence to solve problems regarding the choice of RP and use metalanguage to negociate and justify actions. Following the implementation of an intervention that fosters verbal interactions for the learning of the RC by French L1 secondary students, our research aims to document the changes in the RC produced in texts, both in terms of the usage and of the accuracy of RPs.

Two elements may be then observed: on the one hand, the general frequency of RP usage, and of different types of RP, and on the other hand, the accuracy of the RP used. Because our intervention aims at improving the students' knowledge in ordinary classrooms, it is interesting to observe if our intervention entails the same pattern of results on all students or if differences between students can be observed. The details of the method, including the intervention, are described in the next section.

3. METHOD

The study takes place in a more general research project which aims to document, evaluate and transform classroom grammar and writing instruction practices. This project has led to other contributions, namely on the effectiveness of research approaches in classroom environment (Arseneau, Foucambert, & Lefrançois, 2016) and on the elaboration of a model for grammar and writing instruction (Boivin & Pinsonneault, 2016).

3.1 Participants

The intervention was led in a French course given in a public school in a low socioeconomic area in Montreal, Quebec (Canada). French is the language of instruction and this course is part of the normal curriculum of the provincial educational system.

The teacher, who has 15 years teaching experience, volunteered to implement the series of lessons with her three classes. In sum, 52 grade nine students (M: 15.0 years old) participated. A short questionnaire allowed to gather information about the students regarding characteristics such as: gender **(**32 males; 20 females); first language spoken (French: 42 students; other: 10 students); schooling (regular schooling, i.e. students who have never repeated a year: 41; non regular schooling, i.e. students who have repeated a year or more: 11).

3.2 Intervention

The series of lessons implemented consisted of nine 75-minute lessons which took place over three weeks of the regular classroom session. Echoing the notion of cycles, every lesson was given a first time, then adjusted and given a second time, and then final adjustments were made for the third iteration. We made sure of the adequacy of the actual implementation of the lessons with the objectives by analysing the researcher logbook, the teacher logbook and the video recording of the lessons (see Arseneau *et al*., 2016). The lessons were organized in two phases.

Phase 1 (lessons 1 to 4) aims to induce the grammatical notions regarding the RC and to model relevant grammatical reasoning for choosing the adequate RP in writing contexts through sustained verbal interactions between the teacher and the learners. In three activities involving the observation and manipulation of examples, the teacher uses "solving questions" (Barth, 2004) to draw attention to the following regularities:

1) The RC is a syntactic sentence (subject + predicate) that is found in a noun phrase where it fills the function of noun complement.
2) The RC is introduced by a pronoun, the RP. The RP replaces a phrase in the basic sentence corresponding to the RC.
3) The form of the RP varies according to the features of the pronominalized phrase. To choose or verify the RP in a text, the reconstruction of a basic sentence model is suggested.

Encouraged to use the metalanguage introduced, the students answer teacher's questions and actively annotate the examples to formalize the observations. Each activity culminates with the formulation and validation of the rule by the students, finally transcribed individually with various original examples. A table displaying the six types of RPs with examples (see Table 1) is then annotated and discussed with the class. Ready-made posters and reference "aide-mémoire" tables support and help make explicit the constitution of a common metalanguage pertaining to

syntactic units. It also functions as a "tool box" for sentence analysis operations, including the basic sentence model.

The goal of phase 2 (lessons 5 to 9) of the intervention is the appropriation of notions and their mobilisation in revision through promoting verbal interactions in cooperative settings. With our "Cooperative syntactic tree activity" adapted from the Jigsaw II group work structure (Slavin, 1996), the students must combine given simple sentences using RCs and represent the embedding schematically by building a syntactic tree. The work sequence is organized to make each student explain grammatical material first to group members, and then to the whole class when presenting their syntactic tree poster. This decontextualised activity is followed by several contextualised grammar activities, arranged to progress toward the modeling of revision processes in authentic writing situations. In a cooperative dyad (Krol et al., 2004), students have to insert information given in a text using RCs, carefully choosing the RP. Reading the text before and after the insertion of RCs fuels discussions around the enriching effects produced by adding these RCs in a narrative text. Adapted from the "Teams-Games-Tournaments" group work structure (De Vries & Slavin, 1978), our quiz "Find the erroneous relative pronoun!" starts with a caucus period where students discuss in order to identify and correct mistakes with RPs in every sentence given, followed by the quiz part where the quickest team to raise their hand proposes and justifies a correction. In the "Cooperative mistakes hunting activity" which ends the series of lessons, the students are advised that the text to revise not only contains RC mistakes, but also mistakes of various types (lexical or grammatical spelling, punctuation, other syntactic mistakes). In the form of a tournament, each team (not only the quickest) is required to propose a correction and a justification. In the two final activities, the score system makes it so that the points are doubled when a correct justification (using metalanguage) is provided. In order to vary the spokesperson, a rule is set: every group mate must have given an answer before someone speaks for a second time.

A more detailed description of the lessons and learning activities is shown in Table 2.

Table 2. Overview of the series of lessons

Lesson	Activities	Week
-	Pretest – written production	week 1
	PHASE 1 - Recall of prior knowledge and induction of notions about RCs, using *tutorial interactions*	
1	Annotation and completion of a table recalling the basic sentence constituents. (collectively) **Activity: Observation and manipulation of sentences,** targeting a rule: *The RC assumes the function of noun complement in **NP**.* (collectively)	week 2
2	Annotation and completion of a table recalling the main syntactic phrases (i.e. NP, VP, PrepP), categories (i.e. noun, verb, preposition), and functions (subject, predicate, direct compl., indirect compl.) using syntactic trees(collectively) Formulation of a written definition for the RC of and generation of new examples of RC. (individually, then collectively)	
3	**Activity: Observation and manipulation of sentences,** targeting a rule: *The RC is introduced by the relative pronoun, whose form varies (QUI, QUE, DONT, etc.)* (collectively) Formulation of a written definition for the RP and generation of new examples of RC using various RPs. (individually, then collectively)	
4	**Activity: Observation and manipulation of sentences,** targeting a rule: *The form of the RP depends mainly on the syntactic features (syntactic category and function) of the corresponding phrase in the basic sentence.* Annotation of a table describing relevant criteria for choosing the RP with new examples of various RPs. (collectively)	week 3
	PHASE 2 - Appropriation of notions and mobilisation in writing (*cooperative interactions*)	
5	**Modeling of syntactic tree schematization**	
6	**Activity *Cooperative syntactic tree,*** in **cooperative groups (Jigsaw II)** • schematization of the basic sentences given to combine • choice of the RP, with justification • schematization of the embedding (matrix) sentences	
7	**Interactive oral presentation of the *Cooperative syntactic tree* –** description of tree and justification of the choice of RP to the class **Exercise *Explaining the use of RPs***, individually	week 4
8	Correction of the exercise, with justification (collectively) **Activity "*Enrich a text by inserting RCs*"**, **cooperative dyads + correction (**collectively**)**	
9	**Activity "*Find the erroneous RP!*"**, in **cooperative groups (**"Teams-Games-Tournaments"**)** • caucus • quiz with oral justifications **Activity "*Cooperative mistake hunting*"**, in **cooperative groups (**"Teams-Games-Tournaments"**)** • caucus • tournament with oral justifications	
-	Posttest: written production	week 5

3.3 Material and procedures

Immediately before and after the intervention, the pretest and posttest occurred. For both the pretest and posttest, students were asked to write by hand a 300 word text during three normal classroom periods. The production for pretest was a book review genre of text (argumentative), requiring students to report their impressions on a novel read. The production for posttest was a literary story, requiring students to tell a story based on feelings (narrative). Both genres are known to encourage the production of RCs (Chartrand, 2012). The choice to have two different genres in the writing tasks was made to address the internal validity error known as the testing error (Whitley & Kite, 2013). This error occurs especially when only one group is tested at two different times with the same task. In this case, the result of the posttest is biased by the participant's knowledge of the pretest. Because we have only one group, we choose to have two different writing tasks. The studies exploring the effects of two genres on the writing process and product show that the genre may influence the process, but its effects on the product is more ambiguous. If Beauvais, Olive et Passerault (2011) found differences on the final product between two genres using relatively restricted qualitative scale, the study of Deane (2014) showed that the factor weight of 13 variables follows the same pattern for the two genres (argumentative, narrative; see Deane, 2014, Table 2).

To increase the comparability of the tests, we included the same precisions regarding the text produced in terms of minimal numbers of RCs and of words expected (300 words). Based on empirical studies (Diessel, 2004; Paret, 1991), one could have expected students to produce very low amount of complex RP such as "DONT", and "AUQUEL" (prep+ "LEQUEL"). Since we wanted to observe the changes in the accuracy of various RP in texts, we decided to include an instruction to ensure the production of different RC structures: "your text has to include at least five sentences structured as follows", and provide five examples respectively using RPs "QUI", "QUE", "OÙ", "DONT", and "AUQUEL" (prep+ "LEQUEL").

3.4 Coding and data analysis

The 104 texts collected (52 for pretest and 52 for posttest) were first integrally transcribed. The verification by an assistant of 10% of the texts transcribed indicated very high fidelity of the transcription (percentage of identical word spelling or punctuation mark: 98%). Using HyperRESEARCH (ResearchWare Inc., 2017), we coded every RC found per text according to two main categories: RC with correct use of RP (see Table 1); RC with erroneous use of RP. Each RC was labelled according to the RP actually used ("QUI", "QUE"; "OÙ"; "DONT"; prep+"LEQUEL"; prep+"QUI"/"QUOI";

other subordination marker used as a RP[3]). An erroneous use of RP is found when the replacement of the RP actually used by the correct RP would have rectified the structure according to linguistic norm. The coding by a second coder of 10% of the texts chosen randomly indicated a high correlation between the two coders (Cronbach Alpha =.96). In order to easily compare the RCs produced independently to the number of words per written productions, the occurrence frequency is calculated on a 100 words basis (Wilcox, Yagelski, & Yu, 2014).

For all the analyses, we employed the same 2 x 2 x 2 x 3 mixed design, crossing the within-subjects dependent variable of time (pretest and posttest) with the between-subject independent variables of gender **(**male or female), first language spoken (French or other) and the initial level of the student regarding the RP mastery (lower, medium, higher). The variables relating to gender and the first language spoken seem to have effects on the students' performance and their integration in the statistical model allow us to control them.

To construct the variable of the initial level of the participant, a Principal Components Analysis (PCA) was conducted to synthetize three variables included in the model: percentage of erroneous use of RP (pretest), percentage of erroneous use of simple RP (pretest), percentage of erroneous use of complex RP (pretest). The results showed that the first component explains 68.3% of the variance and has an Eigen value of 2.05. This is a classical effect of level often built by this type of analysis (Flament & Milland, 2005). The position of subjects on this component will represent their initial level. We then categorized this continuous variable in three equal groups: students with lower initial level (n = 17), students with medium initial level (n = 15); students with higher initial level (n = 20). Due to certain equal values on the first component, the number of students among the level groups is slightly different.

4. RESULTS

4.1 Frequency of relative clauses (RC)

439 RCs were produced at pretest and 389 RCs at posttest. At pretest, students produced longer texts (mean: 353.6 words; standard error: 7.5), comprising on average 2.40 RCs per 100 words (SE: 0.12). At posttest, students' texts were shorter (*M*: 317.1 words; *SE*: 11.3) and comprised on average 2.36 RCs per 100 words (*SE*: 0.15). The ANOVA conducted revealed only a main significant effect of the time variable (pre-post) on the number of words per text ($F(1,45) = 6.44$; $p = 0.01$; $\eta_p^2=0.13$; $d_{\text{Cohen}} = 0.77$). Neither the between-subjects variables (all $F_s < 1$) nor the repeated measures variable (time) were found significant according to the number of RCs per 100 words.

[3] *In French, the use of interrogative subordination markers instead of RP to embed a RC in a noun phrase produces erroneous structures. For example:*

Le côté invraisemblable est l'une des raisons [pourquoi** je l'ai lu]*^{RC}

*The implausible side is one of the reasons [**why** I read it]*

Also, the interactions between time and the between-subjects variables were not significant (all $F_s < 1$).

4.2 Frequency of relative pronouns (RP) according to their category

Table 3 presents the individual means of simple and complex RPs used on all RPs in the RCs found in texts.

Table 3. Individual raw mean percentages and standard errors of relative pronouns (RPs) used for pretest and posttest, according to the category of RP and the initial level of mastery

Group of students	Pretest		Posttest	
	Simple RPs	Complex RPs	Simple RPs	Complex RPs
All students (n=52)	76.1 (2.9)	23.9 (2.9)	66.0 (3.9)	34.0 (3.9)
Lower level students (n=17)	69.7 (4.2)	30.3 (4.2)	62.7 (5.7)	37.3 (5.7)
Medium level students (n=15)	83.6 (4.6)	16.4 (4.6)	69.8 (6.2)	30.2 (6.2)
Higher level students (n=20)	75.1 (4.1)	24.9 (4.1)	65.6 (5.5)	34.4 (5.5)

The ANOVA revealed a main effect of the time variable on the individual percentage of complex RPs ($F(1,45) = 5.63$; $p = 0.02$; $\eta_p^2 = 0.11$; $d_{Cohen} = 0.71$). Indeed, students produced significantly more RCs using complex RPs after the intervention, increasing their mean percentage from 23.9% to 34.0%. Consequently, the percentage of simple RPs decreased from almost 3/4 of RPs (M: 76.1%) to less than 2/3 (*M*: 66.0%). The ANOVA did not reveal main effects for the variables of gender ($F(1,45) = 0.63$; $p = 0.43$), first language spoken ($F(1,45) = 1.75$; $p = 0.19$) or of the level ($F(1,45) = 1.94$; $p = 0.16$) with regards to the frequency of complex RPs. The interactions between time and the variables of gender, first language and level were not significant ($F_s < 1$).

4.3 Accuracy of the relative pronoun used

We saw that students used more complex RPs after the intervention. This increased use of syntactic structures that are not frequent in students' language production, especially in writing, could have led to more errors.

Table 4 presents the mean percentage of erroneous use of RPs, first combined (all RPs) and then differentiated according to the categories used previously, i.e. simple RPs and complex RPs.

Table 4. Individual raw mean percentages and standard errors of erroneous use of relative pronouns (RP) for pretest and posttest, according to the category of RP and the initial level of the student

Group of students	Pretest			Posttest		
	All RP	Simple RP	Complex RP	All RP	Simple RP	Complex RP
All students (n=52)	10.7 (1.9)	3.3 (1.2)	24.9 (4.8)	6.7 (1.3)	2.2 (1.3)	14.4 (2.9)
Lower level students (n=17)	27.3 (1.5)	9.5 (1.8)	55.7 (4.7)	11.3 (2.2)	2.2 (2.3)	21.9 (4.8)
Medium level students (n=15)	6.2 (1.6)	0.6 (1.9)	30.6 (6.0)	3.7 (2.3)	3.3 (2.4)	6.6 (6.1)
Higher level students (n=20)	0.0 (1.4)	0.0 (1.7)	0.0 (4.0)	5.1 (2.0)	1.3 (2.2)	12.5 (4.1)

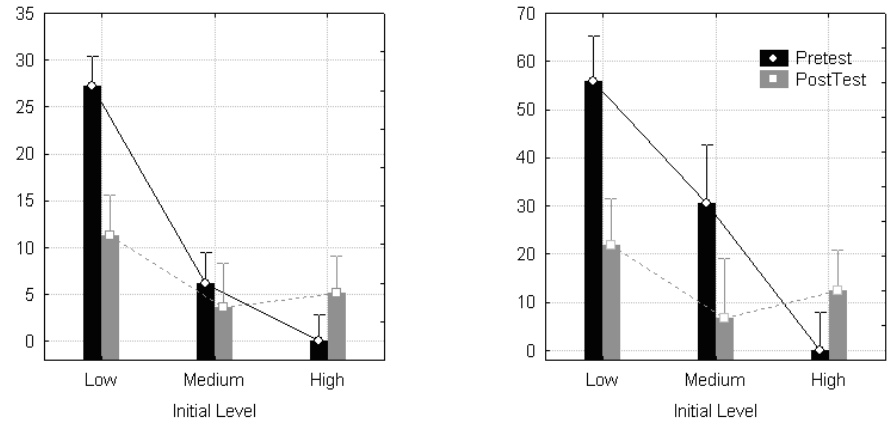
First, we conducted an ANOVA on the erroneous use of all RPs. It revealed a main effect of the time variable on the individual percentage of erroneous RPs ($F(1, 42) = 8.35$; $p = 0.006$; $\eta_p^2=0.17$; $d_{Cohen} = 0.91$). At pretest, the use of nearly 1 RP out of 10 was a mistake (M: 10.7%). For the posttest, approximately 1 RP out of 15 (M: 6.7%) was used erroneously.

We observed also a main effect of the first language variable on the individual percentage of erroneous RPs ($F(1, 42) = 9.72$; $p = 0.003$; $\eta_p^2=0.19$; $d_{Cohen} = 0.97$). Students who have French as a first language ($n = 42$) used on average 9.4% of erroneous RPs while students with another first language ($n = 10$) used significantly less erroneous RPs, 5.8%.

No interactions between time and the variables of gender and first language were significant ($F_s < 1$), but the interaction between level and time was significant ($F(2, 42) = 19.80$; $p < 0.001$; $\eta_p^2 = 0.48$; $d_{Cohen} = 1.92$). As described by Cohen (1988), this effect can be qualified as very large.

The only significant between-subjects variable was the level ($F(2, 44) = 4.21$; $p = 0.02$; $\eta_p^2=0.16$; $d_{Cohen} = 0.87$) with the lower level students making significantly more errors on overall RP use than the two other groups, according to post hoc tests (Scheffé post hoc tests showed that the low level group is significantly lower that the two other groups; lower – medium: $p < 0.001$; lower – high: $p < 0.001$; medium – high: $p < 0.06$). No interactions between time and the variables of gender and first language were significant ($F_s < 1$), but the interaction between level and time was nearly significant ($F(2, 42) = 2.78$; $p = 0.07$). The simple RP errors of the lower level students (9.5%) reached the general average at the posttest (2.2%).

Figure 2. Individual raw mean percentages of erroneous RP used, according to initial level of the student and time. LEFT PANEL: all RP. RIGHT PANEL: complex RPs. Vertical bars denote 0.95 confidence intervals.



Secondly, we conducted an ANOVA on the erroneous use of complex RPs. It revealed time as a significant factor for the individual percentage of erroneous complex RPs ($F(1, 32) = 13.15$; $p < 0.001$; $\eta_p^2=0.29$; $d_{Cohen} = 1.28$). Note that this is a large effect.

Again, the only significant between-subjects variable was the level ($F(2, 32) = 19.26$; $p < 0.0001$; $\eta_p^2=0.18$; $d_{Cohen} = 0.94$) with the lower level students making significantly more errors of complex RP use than the two other groups, according to post hoc tests (Scheffé post hoc tests showed that the low level group is significantly lower that the two other groups; lower – medium: $p < 0.01$; lower – high: $p < 0.001$; medium – high: $p < 0.2$). No interaction between time and the variables of gender and first language was significant ($F_s < 1$), but the interaction between level and time was significant ($F(2, 32) = 19.48$; $p < 0.001$; $\eta_p^2=0.55$; $d_{Cohen} = 2.21$). Once again, note that this is a very large effect according to Cohen (1988). The post hoc tests showed that the lower level group made significantly fewer errors on complex RP use ($p < 0.001$), when compared to the medium level group ($p = 0.03$). The higher level group did not show significant difference in posttest ($p = 0.14$).

5. DISCUSSION

We wanted first to observe the changes in the usage of relative pronouns in texts produced before and after our intervention. No significant differences regarding the frequency of RCs in texts were found (section 4.1), which could be due to the instruction of producing a minimal number of RCs. However, we observed a significant evolution toward more complex RPs in students' texts produced at posttest (section

4.2). The mean percentage of complex RP per text went from 23.9% to 34.0%, a relative increase of 42%.

Despite the explicit instruction to ensure the production of RCs of various types, the texts produced at pretest lacked syntactic diversity in terms of RC structures, as students made sparse use of complex relative pronouns (RP) and favoured in 3 times out of 4 the simple RPs "QUI" ("who", "that") and "QUE" ("that") (Table 3). As a complementary perspective on the use of simple and complex RPs in texts, Table 5 presents the type of RPs used in pretest and posttest RCs.

Table 5. Global percentages of relative pronoun (and numbers) used in relative clauses for pretest and posttest, according to the type or RP

Types of relative pronouns	Pretest (*n*=439)	Posttest (*n*=389)
QUI ("who", "which")	53.3% (234)	46.3% (180)
QUE ("that")	20.7% (91)	16.5% (64)
OÙ ("where")	8.4% (37)	13.6% (53)
DON'T ("whose", "of which")	8.4% (37)	10.3% (40)
Prep+LEQUEL and variants ("before whom", "whereby")	6.8% (30)	11.8% (46)
Prep+QUI/QUOI ("on/for/to/(…) which/whom")	2.1% (9)	0.5% (2)
Other subordination markers ("why")	0.2% (1)	1.0% (4)

At pretest, students made massive use of RP QUI, which accounted for more than half of all RPs in the RCs identified. QUE, the second most frequent, counted for more than 1/5 of all uses of RPs. Together, these two RPs, categorised as "simple RPs" (i.e. replacing a NP in the basic sentence, see section 2.2), accounted for almost 3/4 (74.0%) of RPs produced. Consequently, "OÙ", "DONT", prep+"LEQUEL" and prep+"QUI"/"QUOI", categorised as complex RPs (i.e. replacing a PrepP), showed a low frequency of use in pretest texts with rates all under 10.0%. This portrait was consistent with the one painted by Paret (1991) for texts produced by grade nine writers where, in absence of any instruction inducing the production of various RCs, 86.0% of RCs were constructed using "QUI" (70%) or "QUE" (16%) (Paret, 1991).

At posttest, the ranking of RPs based on frequency was very similar to the one observed at pretest, but the distribution among the different types of RPs tended to be more balanced. Indeed, while "QUI" and "QUE" still dominated (62.8%), their respective percentages decreased. Now, three complex RPs out of four were used more than 10% ("OÙ" – 13.6%; prep+"LEQUEL" – 11.8% ; "DONT" – 10.3%). This increased complexity of the RP also came with an increase of the relative frequency of other subordination markers, such as erroneous interrogative markers in RP positions (Table 3), which could indicate a certain exploration toward alternative ways of introducing a RC.

Moreover, the diversification of the RPs used (Table 5) and the significantly greater use of complex RPs (Table 3) could indicate that certain structures associated with complexity and formal register ("DONT" and prep+"LEQUEL") are less intimidating and easier to handle during written production. By more frequently integrating structures generally perceived as belonging to higher spheres of language expertise (Tellier & Valois, 2006), students seemed to operate along a social alignment with formal contexts such as academic writing: "(…) writing, including revision, is not a set of decontextualized skills to be mastered and deployed but a meaning-making activity, rooted in social contexts, and reflecting power relations between different groups" (Myhill & Jones, 2007: 325).

Secondly, we wanted to observe the changes in the accuracy of relative pronouns in texts. The results showed a significant decrease of the general erroneous RPs used, from 10.7 to 6.7% (Table 4). This general decrease of RP mistakes is mainly due to the large diminution of complex RP errors (Table 4). The raw mean of complex RP errors went from 24.9% to 14.4%, a relative decrease of approximately 57%.

The RPs for which students made the most mistakes at pretest are the complex forms "DONT", "OÙ", (prep +) "LEQUEL" and prep + "QUI/QUOI". In this specific category, more than 1 RP out of 4 is erroneous. This means that students committed 8 times more errors (proportionally) when handling complex RPs (24.9%) compared to simple RPs (3.3%), results that confirm the particular challenges raised by complex RPs (Béguelin, 2000; Dolz & Schneuwly, 2009; Paret, 1991). Students sometimes use an erroneous complex RP instead of a simple form, as exemplified in 6 where "QUE" ("that") should be used (coded as an erroneous use of "DONT"). More often, the wrong complex form was used, as exemplified in 7 where "DONT" ("of which") belongs instead of prep+"LEQUEL" ("to whom").

(7) ** Ce roman [**dont** je vais vous présenter]* ^{RC} *m'a été recommandé par un de mes amis.*
This novel [of which** I will present]* ^{RC} *was recommended to me by a friend of mine.*

(8) ** Ces "je t'aime" étaient aussi sincères que ceux [**auxquels** je me rappelais]*^{RC}*.*
These "I love you" were as sincere as those [to whom** I remembered]* ^{RC}*.*

At posttest, after three weeks of classroom intervention, complex RP errors were proportionally less than half as frequent as they were at pretest, significantly decreasing to 14.4%.

Another result that we obtained is the significantly higher mean of RP errors for French L1 students compared to students having another first language, which confirms the particular difficulties of native speakers of French with using the correct RP, as noted by other studies (e.g. Paret, 1991; Béguelin, 2000). This is true at the pretest and at the posttest, and this is independent of the frequency of RP use. Despite the absence of this aspect from our initial research questions, the reality of the participating classes required us to take this variable into account. A possible explanation is that the encounter with complex RPs by students with another first

language has almost exclusively occurred in a formal context, such as the academic context where the complex RPs are used more accurately.

Third, we wanted to determine if the changes in the usage and accuracy of RP were affected by the initial level of RC mastery by students. In order to observe eventual differences, three subgroups of students were built (students with lower level, students with medium level, students with higher level) using a Principal Components Analysis (see section 3.5). The results did not show an effect of the level on the frequency of complex RPs, meaning that the changes between subgroups of level were not significantly different after the intervention (Table 3). All groups increased in terms of complexity.

The results showed a very large effect of the interaction between level and time for accuracy of RP used and especially on the accuracy of complex RP (Figure 2). Even if the difference of erroneous use of complex RPs for the higher level students is not significant from pretest to posttest, we observed significant decreases for both the lower level group (of 60.7%, from 55.7 to 21.9%) and the medium level group (and of 78.4%, from 30.6 to 6.6%).The fact that the weaker and the medium students displayed the most drastic evolutions regarding complex RP accuracy is encouraging in terms of the impact of grammar and writing instructional intervention for this type of population. These results are consistent with the findings of Rogers and Graham's meta-analysis (2008) showing an increased effect of grammar instruction on weaker students. Nadeau and Fisher's study (2014) showed that low-achieving students are the ones who benefitted the most from instructional approaches based on the verbalisation of grammatical reasoning, which concretely reduced the gap between the highest achievers and the lowest achievers in terms of grammatical mistakes in writing.

General discussion and implications

Even though the actual verbal interactions were not specifically observed, our results tend to support the relevance of "metalinguistic activity" (Fontich, 2016) or "languaging" (Swain & Watanabe, 2013) for the efficiency of grammar and writing instruction in French classes. Our intervention massively surrounds the fostering of verbal interactions. The core of the lessons consists in the implementation of group interactions about a grammatical object, the relative clause, during which groups of students were engaged in solving grammatical problems. The socioconstructivist perspective postulates that the learning occurring in groups would impact future individual performance (Vygotsky, 1978). This is what our results could indicate since we observed an individual increase of complexity and of accuracy of the grammatical structure that was learned in interactive group activities.

Stemming from a specific intervention on RC and RP use, the combined effects of increased complexity and increased accuracy could be seen as an unexpected outcome since the first uses of non mastered structures is likely to result in errors. At least, two elements differ in our context. First, our subjects have been exposed for

several years to all types of RPs and their low use of certain complex RPs may be due to an avoidance of complex structures. This is a completely different situation compared to learners of a second language who are exposed for the first time to the structure of RC and the forms of RPs. Secondly, since the intervention focuses on the mechanism of the RC embedding, the students can now rely on explicit syntactic knowledge to analyse the sentences produced in order to diagnose and correct eventual mistakes.

The model of the series of lessons in Table 6 proposes a blueprint of the design of the series of lessons based on theoretical assumptions developed in our conceptual framework. In phase 2, the verbal interactions among students sought bring them to appropriate grammatical reasoning relevant for writing purposes. The arrangement of activities allowed a progression from isolating to articulating linguistic procedures: producing decontextualised sentences, producing sentences in a given text, revising decontextualised sentences for a given type of mistake, revising a text for various types of mistakes, producing an original text and revising it for various types of mistakes (the text written for posttest). Motivated by the achievement of a common goal during cooperative activities, students propose and justify sentence constructions and corrections using basic sentence structure and metalanguage. The syntactic analysis tools are considered concrete strategies for detection and correction of mistakes in text revision. This movement from decontextualised to contextualised grammatical work, transcended by verbalisations, could allow students to develop a range of metalinguistic abilities linked to the control of selective attention during writing (Bialystok, 2001; see section 2.2).

Table 6. Model of the series of lessons

Phase 1	Phase 2
From **verbal interactions occurring between the teacher and the learners** ("tutorial interactions")	*To* **verbal interactions occurring between learners** ("cooperative interactions")
From **modeled use of metalanguage and of basic sentences**	*To* **autonomous use of metalanguage and of basic sentence**s
From **targeting the linguistic analysis,** a component of metalinguistic abilities	*To* **targeting the control of linguistic processes**, a component of metalinguistic abilities
From **activating prior knowledge and "discovering" new notions**	*To* **progressively mobilising notions into writing and revision**

Our results also support the necessity of directly teaching of grammar prior to or embedded in writing and revision, which is congruent with the contextualised grammar instruction position (Fontich, 2016). In phase 1, verbal interactions are used in order to lay the foundation of the grammatical reasoning relevant for writing. Through an inductive approach, the explicitation of students' prior knowledge of sentence construction is solicited, which facilitates the anchorage of new knowledge. The observation and manipulation of written utterances in search for structural regularities and particularities was conducted under the teacher's

guidance and appealed to syntactic tools such as the basic sentence model. The verbalisation of grammatical reasoning and the formalisation of observations were construed as imbricated within metalanguage, as teacher and students introduced and employed linguistic labels to describe concrete examples. This allows the students and teacher to "share common ground" when discussing grammar issues (Fontich, 2014: 262). Thus, knowledge was made available for language report, which echoes the development of metalinguistic abilities pertaining to the analysis of representational structures (Bialystok, 2001; see section 2.2).

Limitations and future research

In the absence of control group, our results cannot be generalised to other groups of students. A quasi-experimental design including a control group would allow to bypass this limit. A quasi-experimental study with three groups could be conducted: one with a traditional grammar teaching on RC (limited verbal interactions among students, isolated from writing; Dolz & Schneuwly, 2009); one with an intervention on RC based on verbal interactions and on revision process; and the last one with no particular intervention. A differed posttest included in such a study would enhance the conclusions.

In this study, we investigated the outcome, on written syntactic structures, of an intervention based in part on fostering verbal interactions. No data were collected regarding the actual verbal interactions taking place during our intervention, which did not allow us to observe the amount and content of the interactions, as well as the use of metalanguage at different times of the intervention. This type of analysis conducted by Fontich (2014) and Boivin (2009) in case studies allowed fine-grained observations of the interactions between students, but did not evaluate the effects on writing. The choice to conduct our study in regular classrooms and to document the effects for all students involved made the observation of the actual interactions beyond our objectives. As done previously for other grammatical contents (Myhill et al., 2012; Rodríguez-Gonzalo, 2015), studies establishing links between the verbal interactions about the relative clause during learning activities and the improvement on written product could overcome the limits of both types of observations taken in isolation.

Also, the data analysis focussed on the usage and accuracy of the RC structure in finished written texts, but no instrument documented the process that students went through in producing RCs and revising them at pretest and posttest. Are the students using RPs that are more accurate directly in the translating process? Are the students revising their initial production to achieve accuracy of RP use? What about complexity? The use of modern software such as Scriptlog or Inputlog (Leijten & Van Waes, 2013) would allow for the observation the written product in the light of the writing process.

6. CONCLUSION

The intervention integrated principles at the core of effective teaching practices validated in different fields: grammar instruction, writing instruction and cooperative learning. Yet, by rigorously documenting not only the effects through different variables measuring general frequency, complexity as well as accuracy according to between-subject differences such as the initial level, but also the series of lessons during which they occurred, our project allows for a better understanding of the features of an intervention that may lead to similar improvements in written syntax.

Often placed in opposition, the direct grammar instruction and the writing and revision instruction should be taught complementarily. The metalinguistic abilities (analysis component) developed through explicit grammatical work must be mobilised in problem-solving contexts, such as revision tasks when the cognitive load is increased (Koster et al, 2015; Nadeau & Fisher, 2006). Finally, engaging students in sustained verbal interactions with others using powerful conceptual tools within sequenced grammar-writing activities might positively impact the linguistic complexity of students' texts.

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