

THE MASTERY OF VERB AGREEMENT IN FRENCH AND ITS LINK TO THE COMPLEXITY OF NPS IN STUDENTS' WRITING

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Abstract

This paper presents results related to subject-verb agreement errors made by 6th grade students (aged 10-11) and by 8th grade students (aged 13-14). Starting from the observation that there is no significant improvement in the verbal agreement made by 8th grade students in comparison with 6th grade students, we propose that this lack of improvement over time is due to the complexity of the type of syntactic contexts used by the two groups of students, which has an effect on verbal agreement. These contexts are: 1) the internal structure of subject NPs, and 2) the syntactic configuration. Our results show that the 8th grade students produce a greater proportion of complex subject NPs than the 6th grade students, as well as more constructions with a specific syntactic configuration and a complex NP. A mixed effects logistic regression indicates there is a significant effect of the NP type and of the agreement within the NP. Our study adds to previous studies on verb agreement as it is based on data produced in a writing situation. It also contributes to documenting and supporting the concept of syntactic maturity, which claims that older students use more complex syntactic structures than younger ones.

Keywords: subject-verb agreement, syntactic structure, syntactic maturity, noun phrase

1. INTRODUCTION

Agreement is an important concept in linguistics as well as in language instruction, as was shown by Van Rijt and Coppens (2017). Agreement is a phenomenon that can broadly be defined as the morphological marking of an element in relation to another. This marking may be audible and/or reflected in the spelling. Within the context of language instruction, the phenomenon of agreement, found among others in Romance languages as well as in Germanic languages (Goschler, 2014) may raise difficulties for students learning the language, especially in writing.

The mastery of subject-verb agreement has been the focus of a large number of studies on oral production and on writing (Bock & Cutting, 1992; Brissaud, 2007; Brissaud & Cogis, 2004; Cogis & Brissaud, 2003; Fayol & Got, 1991; Fayol & Largy, 1992; Fayol, Largy & Totureau, 1993; Franck et al., 2006; Franck, Vigliocco & Nicol, 2002; Gauvin, 2011; Manesse & Cogis, 2007; Largy et al 2004; Negro et al 2005). In French, this specific case of agreement in writing falls under the category of grammatical spelling, more specifically under ‘agreement governed by the subject of the sentence’. It is a source of difficulty and its mastery by novice writer requires time.

This paper presents results related to subject-verb agreement errors made by 6th grade students (aged 10-11) and by 8th grade students (aged 13-14)¹. These results are part of a larger study on syntactic errors, grammatical spelling errors, and lexical spelling errors identified in Quebec students’ written texts (Boivin & Pinsonneault, 2018). In that study, we described the categories of errors made by primary school students of 4th (aged 8-9) and 6th (aged 10-11) grade and by secondary school students of 8th (aged 13-14) and 11th (aged 16-17) grade². We identified and coded errors in 969 texts written by students as part of mandatory province-wide writing exams. The analysis of the data provided a detailed portrait of the students’ grammatical difficulties (Boivin & Pinsonneault, 2018).

As can be expected, the students’ performance improves with their grade. For example, the average number of errors per 100 words in the domain of grammatical spelling (which notably includes agreement within the NP, subject-verb agreement and past participle agreement) is 4.48 in 4th grade and 1.58 in 11th grade. We were thus expecting that subject-verb agreement would similarly improve with the level; in particular that the 8th grade students would perform better than the 6th grade students and would make significantly fewer subject-verb agreement errors. However, this is not what the analysis of the data revealed: with respect to agreement governed by the subject, there is no significant difference between the number of errors per 100 words made by 6th grade students (1.08) and 8th students (1.34), (cf. Boivin & Pinsonneault, 2018). More precisely, the 8th grade students do not perform better on verbal agreement than the 6th grade students. The 6th grade students make

¹ The errors in subject-verb agreement made by adults will not be discussed here.

² In Quebec, primary school goes from 1st to 6th grade, and secondary school from 1st to 5th grade, for a total of 11 years. For convenience, we numbered them from 1 to 11.

even more errors than the 6th grade students, although the difference is not significant (3.18% for the 6th grade and 4.49% for the 8th grade students).

The concept of syntactic maturity may be useful to better understand these results. It states that texts written by students showing a high level of syntactic maturity are characterized by the presence of specific syntactic constructions (Hunt, 1965; Paret, 1991). More specifically, according to Paret's (1991) study for French, texts written by syntactically more mature students meet three criteria: (1) constituent mobility, the fact that constituents that are mobile are indeed moved; (2) a relatively large number of optional constituents in sentences and phrases; and (3) the presence of complex sentences (juxtaposed and coordinate clauses as well as subordinated clauses). Thus, according to the concept of syntactic maturity, NPs containing one or more complements (criteria 2) realized as a relative clause, as a completive subordinate clause or as a participial clause (criteria 3), are indicators of a certain degree of syntactic maturity.

In sum, according to the concept of syntactic maturity, syntactically mature students are expected to use more complex syntactic structures than less mature ones.

Our proposal for the absence of a significant difference between the 6th grade students and the 8th grade students with respect to verb agreement is as follows: the complexity of the syntactic contexts, which falls under the concept of syntactic maturity, has an impact on verbal agreement. These syntactic contexts are: 1) the internal structure of subject NPs, and 2) the syntactic configurations, that is the order of the phrases in the sentence. Therefore, in accordance with the concept of syntactic maturity, we might expect older students to produce more complex structures than younger ones. The production of more complex structures may create more difficulties, as the complexity makes it harder to identify the head of the subject NP, which generates more subject-verb agreement errors. The lack of difference between the two groups could then be attributed to this higher production of complex structures by the older students.

The article is organized as follows. Section 2 outlines the theoretical framework underlying our analysis. Section 3 presents the methodology. In section 4 we present the results, followed by a discussion of these results in section 5. In the conclusion, we present the limits of our analysis, and discuss how the mastery of subject-verb agreement is linked to syntactic maturity, a concept that has been used very little in the past years, but, that we believe may prove useful to shed light on our results.

2. THEORETICAL FRAMEWORK

The theoretical framework underlying our analysis is Modern Grammar (as opposed to traditional grammar), which is a grammatical description of the language based on a linguistic approach (Riegel, Pellat & Rioul, 2016; Gobbe & Tordoir, 1986; Genevay, 1994; Chartrand, 1999/2011; Boivin & Pinsonneault, 2008, Nadeau & Fisher, 2006). The main features of the linguistic approach are 1) to analyse the language as a system, 2) to provide a formal description of the language, identifying the linguistic units on the basis of their syntactic and morphological properties, and 3) to develop a model that is descriptively and explanatorily adequate. For example, the linguistic approach states that the hierarchical structures of sentences and the internal structures of phrases are established by means of syntactic manipulations (movement, deletion, substitution and addition), a basic sentence model of the form NP + VP (Noun Phrase and Verb Phrase), as well as a general schema for the internal structure of phrases, i.e. Specifier + Head + Complements (Chartrand, 1999/2011; Boivin & Pinsonneault, 2008; in press).

In this framework the phenomenon of agreement, viewed primarily as a reflection of syntactic relationships between phrases in the sentence, requires at least a minimal analysis of the sentence: identification of the two obligatory constituents of the sentence (NP and VP) and the head of each one. The realization of agreement involves two fundamental dimensions: the donor-recipient approach and three syntactic agreement systems, both of which are discussed in the following section.

2.1 Agreement in French

First, in French, the donor-recipient approach states that nouns and pronouns are donors: these categories transfer their morphological features (number, gender or person) to verbs, auxiliaries, past participles, adjectives and determiners, which are recipients³. Second, some modern grammars identify three agreement systems in French (Chartrand, 1999/2011, Boivin & Pinsonneault, 2008): agreement within the NP, agreement governed by the subject, and agreement governed by the direct complement. An agreement system is a set of syntactic contexts in which agreement is determined by a given element. Agreement within the NP is responsible for the agreement of adjectives and determiners within the NP, and is determined by the head of the NP. Agreement governed by the subject is responsible for the agreement of the verb, the past participle with *être* (to be), the subject complement⁴ and the past participle of essentially pronominal verbs; it is the head of the subject NP that transfers its morphological features. Agreement governed by the direct complement is responsible for the agreement of the past participle with *avoir* (to have), the object

³ Some authors use the terms *contrôleur* (for source) and *cible* for donor and recipient (Bessler, 1999).

⁴ We translate “*attribut du sujet*” and “*attribut du complément direct*” as “*subject complement*” and “*object complement*” respectively, following the SIL Glossary of linguistic terms.

complement, and the past participle of occasionally pronominal verbs, and is determined by the head of the direct complement. Therefore, the realization of agreement in French involves 1) the identification of the recipient, 2) the identification of the relevant agreement system, and 3) the identification of the donor.

By concentrating on subject-verb agreement, we can see that this specific case of agreement expresses the very strong link between the NP subject and the VP, the two obligatory syntactic phrases of the sentence. In concrete terms, subject-verb agreement is realized as the transmission of morphological features, number, and person, from a noun or a pronoun to a verb or an auxiliary. The relevant system here is agreement governed by the subject since it is the system responsible for the subject-verb agreement. The specific rule for the agreement of the verb is formulated as follows:

The verb agrees with the head of the subject NP, it receives its number and person features from the head of the subject NP (Boivin & Pinsonneault, 2008; in press). In order to properly apply the rule, it is crucial to identify the head of the subject NP. But this identification is not always easy, in particular when the NP is complex, as we will see the next section.

2.2 *The internal structure of NPs and the syntactic configurations linked to the agreement*

The internal structure of the subject NP ranges from a minimal NP, which contains no complement, to a complex NP, defined as an NP with one or more complements. We present the various realizations of the subject NPs in examples below. The NPs appear within square brackets. These contexts are found in our data and correspond to typical realizations of NPs, that is, those that are described in the literature (see among others Riegel et al., 2016; Gobbe & Tordoir, 1986).

The examples⁵ in (1a-b) are illustrations of a minimal NP that we label “type A”⁶. A minimal NP of type A can be realized either as an NP containing a referential determiner and a noun, or as an NP containing the pronoun *cela* ‘that’ or the pronoun *il* ‘it’, ‘s/he’.

Minimal subject NP (type A)

a. *[Cette grippe] est survenue au début du 20e siècle, et un Canadien sur six était sur d’attraper le dangereux virus.*

[This flu] arrived at the beginning of the 20^e century, and one out of six Canadians was sure to catch the dangerous virus

⁵ All the examples are excerpts from the corpus of written texts mentioned above (see 3.1 for a more precise description of the corpus). We have maintained all the errors that were present in the sentences, and the glosses incorporate these errors as well. Given the presence of such errors, we do not provide a genuine translation.

⁶ We used the term “type A” only to describe one possible realization of a minimal NP, it has no theoretical status.

b. [Il] *oublia d'avertir les ouvriers et partit avertir son patron de l'affaiblissement du pont.*

[He] *forgot to advise the workers and went to warn his boss of the collapsing of the bridge*

The sentences in (2a-b) exemplify a minimal NP of type B⁷, e.g. an NP combining a quantified determiner and a noun, or an NP realized as the relative pronoun *qui*. The internal structure of these NPs is not more complex in comparison to type A, but seems to us to be more likely to generate errors. The head of the quantified NPs, notably those with a complex determiner like *la plupart de* (most of) or *la majorité de* (the majority of), may be more difficult to identify, and the relative pronoun *qui* requires the identification of its antecedent NP in order to correctly mark agreement on the verb.

Minimal subject NP (type B)

a. [la plupart de ces gens] *était des personnes très importants dans leur compagnie*

[Most of these people] *was very important people in their company*

b. J'ai lis votre carnet [qui] *a comme sujet : Le Saint-Laurent*

I read your notebook [which] *has a topic : Le Saint-Laurent*

The examples in (3) illustrate a complex NP. A complex NP is an NP whose head noun appears with one or more complements. The complement may be realized by an adjectival phrase as in (3a), a prepositional phrase as in (3b), a noun phrase as in (3c) or a subordinate clause as in (3d). The complement appears in bold.

Complex subject NP

a. [Les **premières** personnes à l'avoir eu] *sont les fermiers et les fermières car ils ont des porcs dans leur ferme et c'était plus facile a attrappé la grippe.*

[The first people to catch it] *were the farmers because they had pigs on their farm and it was easier to catch the flu.*

b. Et [les symptômes **du virus de la grippe espagnol**] *est : La toux, fièvre avec une grande faiblesse*

And [the symptoms of the Spanish flue virus] *is: cough, fever with a severe weakness.*

c. [Theodore Cooper, **un ingénieur en chef chargé des travaux du pont**], *aurait pu changer le cours des événements.*

[Theodore Cooper, an engineer in chief responsible for the works of the bridge], *could have changed the course of the events.*

d. C'est alors le début d'une grande misère, car [les femmes, **ayant perdu leurs maris**], *n'ont plus de moyen de subsistance.*

It is then the beginning of a great misery, because [the women, having lost their husbands], *do not have means of sustenance.*

We considered also that the coordination of two NPs in subject position qualifies as a complex subject NP; this is shown in (4).

⁷ Again, the use of the term «type B» has no theoretical status, it is simply used to distinguish between two types of minimal NP.

Coordination of NPs

[L'hécatombe qu'elle a provoquée et les changements qu'elle a apportés à la vie] ne sont pas près d'être oubliés.

[The hecatomb that it has caused and the changes that it has brought to life] are not close to being forgotten.

The above set of syntactic contexts may have an impact on verb agreement.

Now we turn to non-canonical syntactic configurations, which could also increase difficulties in subject-verb agreement. The syntactic configurations involve a variation of the order of the syntactic phrases in the sentence, the basic order being NP VP. This category includes sentences in which the subject has been inverted, as in (5a), sentences in which a complement pronoun intervenes between the subject NP and the verb, as in (5b), and sentences in which a sentential complement has been moved between the subject NP and the VP, as in (5c).

Non-canonical syntactic configurations

a. À bord se trouve [1477 passagers]

On board is [1477 passengers]

b. Cela [nous] rapelle à tous cette tragédie survenue il y a cent ans [...]

This reminds [us] all that this tragedy which happened a hundred years ago [...]

c. Les gens [en 1918] n'étaient pas très propre et les familles étaient nombreuses ce qui n'aida pas.

People [in 1918] were not very clean and the families were big which did not help.

We also found in our corpus some rare examples that illustrate the combination of the two contexts, that is, a complex NP subject and a non-canonical syntactic configuration. The sentences in (6) illustrate this combination. In (6a), the subject NP contains a relative clause, and a complement pronoun is found between the subject NP and the verb. In (6b), the complex subject NP is separated from the verb by a pronoun (*se*).

a. J'aimerais en apprendre d'avantage sur la dernière nuit de l'Empress of Ireland parce que [des histoires comme celle la qui ce sont passées pour vrai] [m']interesse beaucoup et je ne savais pas que cela s'était produit avant aujourd'hui.

I would like to learn more about the last night of the Empress of Ireland because [stories like this one that happened for real] [me]-interest a lot and I did not know that it had happened before today.

b. C'est à dire que [la travée du pont centrale] [se] trod et tombe dans les eaux froide du St-Laurent, et en fesant un bilan de 13 morts et 14 blessés.

That is to say that [the central span of the bridge] [itself] warped and fell into the cold waters of the Saint-Lawrence, resulting in 13 dead and 14 injured.

From these syntactic contexts, we created five variables, i.e. (1) Minimal NP type A, (2) Minimal NP type B, (3) Complex NP, (4) Syntactic configuration and minimal NP, and (5) Syntactic configuration and complex NP. These variables will be relevant to describe and explain the production of complex contexts by the younger and older students, and the difference between the two groups with respect to verb

agreement. Based on these variables and on the theoretical framework, we formulate and explain our two hypotheses:

- Hypothesis 1 (H1): Older students produce more subject NPs with a complex internal structure than younger students, as well as more non-canonical syntactic configurations, notably those where phrases intervene between the subject NP and the VP.
- Hypothesis 2 (H2): Complex subject NP and non-canonical syntactic configurations generate more verb agreement errors.

Regarding H1, research has shown that the syntactic structure of the subject NP can have an effect on subject-verb agreement and increase the production of what the literature has identified as attraction errors. Attraction errors occur when the verb agrees with a noun that is within a complement of the head of the NP. For example, Bock and Cutting (1992) showed that when the complement between the head of the NP and the verb is a prepositional phrase, more attraction errors are observed than when the complement is a relative clause. This effect has also been observed by Franck, Vigliocco and Nicol (2002) and Negro et al. (2005). These studies suggest that syntactic factors, and more precisely factors relative to the syntactic structure of the complement in the NP subject, play an important role in the agreement process. Because our data contains many different syntactic contexts in the subject NP, we chose to group them into categories, minimal NP to complex NP. This allows us to have a more general portrait of the effect that the structure of the subject NP can have on subject-verb agreement. Therefore, while previous research has shown that attraction errors are mainly linked to the effect of the syntactic structure of the complement, we make the hypothesis that when such a complement is present in the subject NP, which we call a complex NP subject, more errors can be observed than when there is no complement at all (minimal NP subject).

We also hypothesize that when the sentence structure is non-canonical, it is more difficult to make the relevant analysis and to properly mark subject-verb agreement. This structure represents a typical type of difficulty when processing subject-verb agreement and the head of the subject must be properly identified in order to avoid agreement with the complement.

3. METHODOLOGY

3.1 *Corpus*

Our analysis is based on a total of 2788 verbs found in eighty texts: 40 texts out of the 220 texts written by 6th grade students and 40 texts out of the 250 texts written by 8th grade students. These texts have been randomly selected from a larger corpus consisting of almost 1000 texts. The texts were written as part of mandatory province-wide writing examinations. The conditions under which these texts have been written are clearly established, and are uniform for each grade. For all the students

in each grade across the province of Quebec, the instructions and the time allowed to students for writing their text are the same; students also have access to equivalent reference manuals. The instructions given by the teachers to the students are stated in a guide (*Guide d'administration de l'épreuve*) and most teachers have some experience with such examination contexts. In such a setting, the students are aware that they must try to do their best on the exam.

It is worth mentioning that our study is based on free (*non orienté*) writing production, as opposed to dictation or sentence completion. As a result, our study focuses on the mastery of subject-verb agreement in writing situations. While written productions do not allow the total experimental control of variables, they do allow for the observation of syntactic complexity.

There was an equal number of texts written by boys and girls⁸. Table 1 gives some general information on the corpus.

Table 1. A general description of the corpus

Level	N of texts	Average N of words per text	Average N of verbs per text
6 th grade	40	337	39
8 th grade	40	364	36

As for the genres of the texts⁹, the 6th grade students had to give their own opinion about an information leaflet describing the Saint-Lawrence River. The 8th grade students were asked to write an expository text on one of the three following topics: “the Spanish flu”, “the fall of the Quebec bridge”, and “the wreck of the Empress of Ireland”¹⁰.

3.2 Coding and analysis

For each verb, the internal structure of the subject NP has been specified and the subject NP has been coded either as a minimal NP of type A (1), a minimal NP of type B (2) or a complex NP (3). Moreover, the cases involving a non-canonical syntactic configuration were identified and correspond to the variable (4) if the subject is a minimal NP, and to the variable (5) if the subject is a complex NP. The proposed variables range from the simplest cases to the most complex ones. This coding allows us to evaluate the “real weight” of each variable in verbal agreement errors. The table below represents the five variable and their internal structures.

⁸ The difference between boys and girls with respect to verb agreement was not the focus of our study, so it will not be discussed in many details.

⁹ As pointed out by one reviewer, it is possible that the genre of text (opinion vs expository) influences or has an impact on the constructions produced by the student. This is part of the limits of our study.

¹⁰ The topics were given as follows in French: la grippe espagnole, la chute du pont de Québec and le naufrage de l'Empress of Ireland.

Table 2. *The five variables and their internal structure*

Variable	Internal structure
(1) Minimal NP type A	[_{NP} referential determiner + N] [_{NP} pronoun _{demonstrative/personal}]
(2) Minimal NP type B	[_{NP} quantifying determiner + N] [_{NP} subject relative pronoun]
(3) Complex NP	[_{NP} determiner + N + PP/AP/NP/subordinate clause] [_{NP}] _{subject} conjunction [_{NP}] _{subject}
(4) Minimal NP and syntactic configuration	[_{NP}] _{subject} [_{VP} pronoun _{complement} V ...] [_{NP}] _{subject} [_{XP}] _{adjunct/sentential complement} [_{VP} ... V ...] [_{VP} ... V ...] [_{NP}] _{subject}
(5) Complex NP and syntactic configuration	[_{NP}] _{subject} [_{VP} pronoun _{complement} V ...]

We will focus on agreement in number. Following Cogis and Brissaud (2003) among others, we consider that agreement in number is realized by the presence of the inflections *-nt* or *-s* on the verb or the auxiliary, even though *-s* is not typically a verbal number inflection but rather associated with the nominal number inflection. In other words, we adopt the general principle that the presence of *-nt* or *-s* signals the marking of agreement in number onto the verb.

4. RESULTS

In order to test our hypotheses, repeated below for convenience, we conducted two statistical analyses on our data, i.e. analysis A and analysis B.

- H1. Older students produce more subject NPs with a complex internal structure than younger students, as well more non-canonical syntactic configurations, notably the ones where phrases intervene between the subject NP and the VP.
- H2. Complex subject NPs and non-canonical syntactic configurations generate more verb agreement errors.

First, we will present a descriptive analysis, showing the percentage of verbs that appear in the five syntactic contexts, according to the students' level (as the independent variable).

Second, we used a mixed effects logistic regression to measure the effect of the five variables on verbal agreement marking.

4.1 Descriptive analysis

We begin with the presentation of the distribution of the frequency of each syntactic context, along with the number and the percentage of errors in verbal agreement in each context for both grades.

Table 3. Syntactic contexts and verbal agreement errors for 6th and 8th grade

Context	6th grade				8th grade			
	N of contexts	% of contexts	N errors in verb agreement	% errors in verb agreement	N of contexts	% of contexts	N errors in verb agreement	% errors in verb agreement
Minimal NP type A	1091	75,35%	18	1,65%	771	56,24%	21	2,72%
Minimal NP type B	90	6,22%	10	11,11%	165	12,03%	16	9,76%
Complex NP	75	5,18%	4	5,33%	225	16,41%	8	4,21%
Minimal NP & syntactic configuration	180	12,43%	11	6,11%	175	12,76%	12	6,78%
Complex NP & syntactic configuration	12	0,83%	3	25%	35	2,55%	3	8,57%

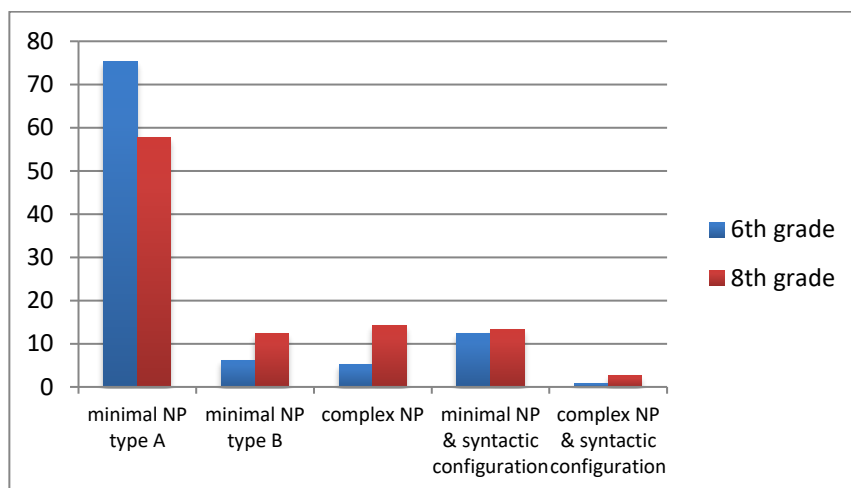
Generally, we can observe that 8th grade students produce a lower proportion of minimal subject NP of type A than the 6th grade students. Recall that the type A minimal subject NP refers to a referential determiner and a noun, or to a pronoun; this is the most frequent syntactic context for both groups (75.35% for the 6th grade and 56.24% for the 8th grade students), but minimal NP of type A represents 19.11 point of percentage less for the 8th grade students than for 6th grade students.

The older students produce a larger proportion of minimal subject NPs of type B (12.03%) and of Complex subject NPs (16.41%) than the younger students (6.22% type B and 5.18% complex NP). These results confirm our first hypothesis: the 8th grade students produce a greater proportion of complex subject NPs than the 6th grade students.

There is only a slight difference between the 6th grade students and the 8th grade students in the percentage of use of syntactic configurations with minimal NPs (12.43% and 12.76% respectively). But the older students produce more constructions with a syntactic configuration and a complex NP (2.55% vs 0.83%).

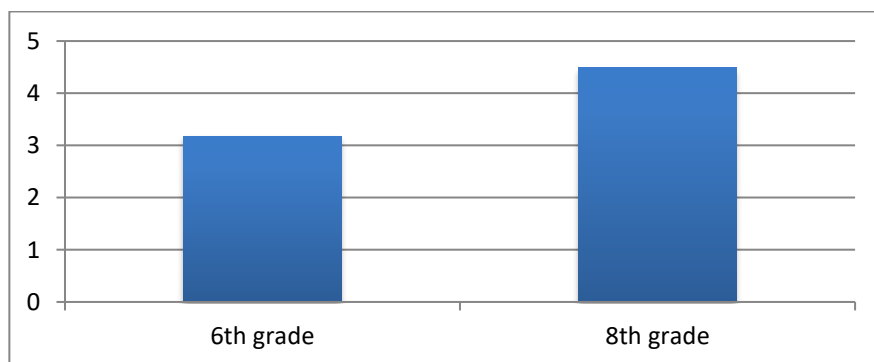
The results are shown in the following bar chart.

Figure 1. Distribution of the five variables for 6th grade and 8th grade students (percentage)



We now turn to the verbal agreement errors. For the two levels, the percentage of verbal agreement errors is relatively low. The 6th grade students have an error rate of 3.18% and the 8th grade students have an error rate of 4.49%, but this difference is not significant.

Figure 2. Percentage of verbal agreement errors for 6th and 8th grade



4.2 Analyses: Mixed effects logistic regression

In order to see if there is a significant effect regarding subject-verb agreement, we used a mixed effects logistic regression. It must be mentioned that we added a variable related to the participants ability to master agreement within the NP

(agreement w/ NP)¹¹. This variable helps to characterize more precisely our participants and relate this variable to the results. As shown in Table 4, there is an effect of the NP type ($p < 0.0001$) and of the agreement within the NP ($p = 0.0036$), but the grade is not significant. In other words, the structure of the NP has an effect on the correct marking of agreement, the latter cannot be attributed to the level (or grade). The interaction between NP type and level is also not significant, which means that the effect of the type of NP, and the agreement within the NP, are the same for both levels.

Table 4. Results of Type III test of Fixed Effects

Variable	df num.	df den.	F	p-value
NP type	4	2697	12.72	<.0001
Agreement w/ NP	1	2697	8.49	0.0036
Level	1	2697	1.11	0.2928
NP type*Level	4	2697	1.01	0.3984

Table 5 presents the estimate and the odds ratio for correct verbal agreement. We observe a statistical significance in three cases. The Minimal NP type A is different from the Complex NP and syntactic configuration: the odds ratio (*OR*) is 0.117, which means that there is 0.117 times less chance (88.3%) to correctly mark the agreement on the verb when the subject is a complex NP and syntactic configuration. The Minimal NP of type A is also different from Minimal NP and syntactic configuration, there is 0.293 less chance (70.7%) that the verb will be correctly marked for agreement when the subject is a Minimal NP and syntactic configuration. Finally, the Minimal NP of type A is different from the Minimal NP of type B: the odds ratio is 5.245, which means that there is a 94.75% higher chance that the verb will be properly marked for agreement when the subject NP is of type A rather than of type B.

Moreover, it is interesting to note that agreement within the NP can be a good predictor of the mastery of verbal agreement, as indicated by an *OR* of 0.9. This observation needs more investigation.

¹¹ This refers to the agreement of the determiner and the adjective within the NP.

Table 5. Estimate and odd ratios for correct verbal agreement

Variable	estimate	standard error	df	t	p-value ^a	OR	IC OR
Agreement w/ NP	-0.1058	0.03633	2697	-2.91	0.0036	0.9	0.838 0.966
NP type:							
Complex NP vs Minimal NP type A	-0.8952	0.3585	2697	-2.5	0.0916	0.409	0.154 1.087
Complex NP vs Minimal NP type B	0.762	0.3859	2697	1.97	0.2786	2.143	0.747 6.143
Complex NP vs Minimal NP & syntactic configuration	0.3328	0.3871	2697	0.86	0.9115	1.395	0.485 4.013
Complex NP vs Complex NP & syntactic configuration	1.2528	0.5625	2697	2.23	0.1699	3.5	0.754 16.252
Complex NP & syntactic configuration vs Minimal NP type A	-2.148	0.4927	2697	-4.36	0.0001	0.117	0.03 0.448
Complex NP & syntactic configuration vs Minimal NP type B	-0.4908	0.5129	2697	-0.96	0.8743	0.612	0.151 2.483
Complex NP & syntactic configuration vs Minimal NP & syntactic configuration	-0.9201	0.5117	2697	-1.8	0.3748	0.398	0.099 1.611
Minimal NP & syntactic configuration vs Minimal NP type A	-1.228	0.2748	2697	-4.47	<.0001	0.293	0.138 0.62
Minimal NP & syntactic configuration vs Minimal NP type B	0.4293	0.3106	2697	1.38	0.6394	1.536	0.658 3.587
Minimal NP type A vs Minimal NP type B	1.6572	0.274	2697	6.05	<.0001	5.245	2.483 11.081

^a The p-value has been adjusted with the Tukey correction for the multiple comparisons of the variable NP type.

5. DISCUSSION

Our study has highlighted the fact that verb agreement is firstly dependent on syntactic contexts and not on the level of the students.

The results presented in this paper confirm our first hypothesis: older students produce a larger proportion of subject NPs whose internal structure is more complex than younger students and they also produce a larger proportion of non-canonical

syntactic configurations. We identified differences as far as the complexity of the structures used by students of the 6th grade and of the 8th grade is concerned.

As we mentioned above, the 8th grade students do not perform better than the 6th grade students in regards to verbal agreement. The 8th grade students even seem to make slightly more errors than the 6th grade students. We view these results as related to the syntactic behaviour of the older students: they produce more complex subject NPs than the younger students.

We showed that the complexity of the subject NP plays an important role in the success of verb agreement. These results are similar to the conclusions of work that focused on the role of the syntactic structure (internal structure) of the subject NPs on the production of verbal agreement (Negro et al. 2005).

Our second hypothesis on complex NP subjects and non-canonical syntactic configurations generating more verb agreement errors is partially confirmed. While we cannot state that complex NP subjects or non-canonical syntactic configurations will generate more errors, we can identify contexts in which there is a high probability that the agreement will be correctly marked. When a student is faced with a complex NP, he has more chances to make an agreement error than when he produces a Minimal NP of type A. This is also true in the non-canonical syntactic configuration where an element intervenes between the verb and the NP subject.

Furthermore, in our data the percentage of verb agreement errors is rather low, a fact that can be partly explained by the method of our study. In most of the research on verbal agreement, participants must accomplish a dual task during verb agreement: they have to write a text with imposed constraints, this method increases agreement errors (Fayol & Got, 1991). In our research, because our data comes from written productions, students could choose simpler syntactic contexts, thus avoiding errors, and they also had time to revise their texts using grammar books. Contrary to experimental settings, the context can be seen, to a certain extent, as fostering the best performance possible.

Also, our findings indicate that agreement within the NP is an excellent indicator of the mastery of verbal agreement; similar results have been presented by Nadeau and Fisher (2009).

6. CONCLUSION

Further research will be necessary to determine the exact weight of the “components” of each variable in verb agreement. More specifically, it is important to have a more precise and controlled analysis of the “components” of the variables linked to non-canonical syntactic configurations. For example, it is reasonable to think that the presence of a complement pronoun, or a sentential complement which has been moved between the subject NP and the verb, will have more of an impact on verb agreement than the presence of a negative marker. Since our data is based on written texts, it has not been possible to control for the effect of each “component”.

Moreover, there were no occurrences of a complex NP as an inverted subject or with a moved sentential complement.

Nevertheless, our study brings an important contribution to current research on verb agreement, in that it is based on data produced in a writing situation, instead of a dictation context, as is usually the case.

Our work also illustrates the relevance of the concept of syntactic maturity. The confirmation of our first hypothesis, namely that the 8th grade students use more complex subject NPs and more non-canonical syntactic configuration, points in this direction. However, the development of syntactic maturity indicated by the use of these complex syntactic contexts does not manifest as properly marked agreement on the verb in these contexts. The concept of syntactic maturity offers a framework where it is possible to precisely analyze and identify the students' difficulties. Taking this concept into account sheds a light on the behaviour of the 8th grade students with respect to verb agreement. If true that the older students perform worse than the younger ones in regards to verbal agreement marking, we cannot ignore that the older students produce and use more complex syntactic configurations, which constitute contexts where agreement errors are more likely to be produced.

This paper has shown that the mastery of verb agreement is largely linked to the syntax of phrases, more specifically to the complexity of phrases. This has a direct consequence on language instruction. Since the knowledge of the internal structure of NPs as well as the structure of the sentence is essential to success in subject-verb agreement, students must acquire a solid knowledge of these grammatical notions. Grammar instruction must then target and prioritize work on syntax. In this sense, this paper highlights some specific grammatical contexts that must be taught, namely the internal structure of the NP and the syntactic structure of the sentence.

To put it another way, this study points out the importance of syntax and the need to pay particular attention to the syntax of the sentence itself when dealing with notions that may seem far removed from the syntax. Agreement is often considered as related to spelling, a domain sometimes treated independently of the syntax of the sentence. However, improving the students' writing skills, and in particular their grammatical spelling skills, is largely dependent on the analysis of the syntactic structures of the language.

AUTHORS' NOTE

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REFERENCES

- Bessler, P. (1999). *Une analyse morphosyntaxique de l'accord grammatical en français*. [A morphosyntactic analysis of grammatical agreement in French]. Québec, Canada: Presses de l'Université Laval.
- Bock, K. & Cooper Cutting, J. (1992). «Regulating Mental Energy: Performance Units in Language Production». *Journal of Memory and Language*, 31(1), 99-127.
[https://doi.org/10.1016/0749-596X\(92\)90007-K](https://doi.org/10.1016/0749-596X(92)90007-K)
- Boivin, M.-C. & Pinsonneault, R. (sous presse). *La grammaire moderne: une description grammaticale du français*. [Modern grammar: a grammatical description of French]. 2nd edition. Montréal, Canada: Chenelière Éducation.
- Boivin, M.-C. & Pinsonneault, R. (2018). Les erreurs de syntaxe, d'orthographe grammaticale et d'orthographe lexicale des élèves québécois en contexte de production écrite. [Errors in syntax, grammatical spelling, and lexical spelling in the writing productions of Quebec's students]. *Revue canadienne de linguistique appliquée*, 21(1), 43-70. <https://doi.org/10.7202/1050810ar>
- Boivin, M.-C. & Pinsonneault, R. (2008). *La grammaire moderne. Description et éléments pour sa didactique*. [Modern grammar: description and elements for grammar instruction]. Montréal, Canada: Beauchemin/Chenelière éducation.
- Brissaud, C. (2007). Acquisition et didactique du français. [French language acquisition and instruction]. In É. Falardeau, C. Fisher, C. Simard & N. Sorin (Eds.), *La didactique du français. Les voies actuelles de la recherche* (pp. 219-234). Québec, Canada: Presses de l'Université Laval.
- Brissaud, C., & Cogis, D. (2004). Pour un réexamen des relations entre grammaire et orthographe : l'exemple de la notion de sujet [For a re-examination of the relationships between grammar and spelling: the case of the notion of subject]. In C. Vargas (Ed.), *Langue et études de la langue: approches linguistiques et didactiques* (pp. 247-256). Aix-en-Provence, France: Publications de l'Université de Provence.
- Chartrand, S., Aubin, D., Blain, R. & Simard, C. (1999/2011). *Grammaire pédagogique du français d'aujourd'hui*. [Pedagogical grammar of today's French]. Boucherville, France: Graficor.
- Cogis, D. & Brissaud, C. (2003). L'orthographe: une clé pour l'observation réfléchie de la langue? [Spelling: a key for the reflexive observation of the language?]. *Repères*, 28, 47-70.
<https://doi.org/10.3406/reper.2003.2421>
- Fayol, M. & Got, C. (1991). Automatisation et contrôle dans la production écrite: les erreurs d'accord sujet-verbe chez l'enfant et l'adulte. [Automatism and control in written production: subject-verb agreement errors in children and adults]. *L'année psychologique*, 91(2), 187-205.
<https://doi.org/10.3406/psy.1991.29453>
- Fayol, M. & Largy, P. (1992). Une approche fonctionnelle de l'orthographe grammaticale [A functional approach to grammatical spelling]. *Langue française*, 95, 80-98.
<https://doi.org/10.3406/lfr.1992.5773>
- Fayol, M., Largy, P. & Totereau, C. (1993). Apprentissage et mise en œuvre de l'accord sujet-verbe chez les enfants de sept à quatorze ans. [Learning and implementation of subject-verb agreement in children aged 7 to 14]. In J. P. Jaffré, L. Sprenger-Charolles & M. Fayol, *Lecture-écriture, acquisition : les actes de La Villette* (pp. 193-202). Paris, France: Nathan.
- Franck, J., Lassi, G., Frauenfelder, U. H. & Rizzi, L. (2006). Agreement and movement: A syntactic analysis of attraction. *Cognition*, 101(1), 173-216. <https://doi.org/10.1016/j.cognition.2005.10.003>
- Franck, J., Vigliocco, G. & Nicol, J. (2002). Subject-verb agreement errors in French and English: The role of syntactic hierarchy. *Language and Cognitive Processes*, 17(4), 371 -404.
<https://doi.org/10.1080/01690960143000254>
- Gauvin, I. (2011). *Interactions didactiques en classe de français: enseignement / apprentissage de l'accord du verbe en première secondaire* [Didactic interactions in the French L1 classroom: teaching / learning of verbal agreement in 7th grade]. Unpublished doctoral dissertation, Université de Montréal.
- Genevay, E. (1994). *Ouvrir la grammaire*. [Opening the grammar]. Lausanne, Switzerland: Loisirs et pédagogie.
- Gobbe, R., & Tordoir, M. (1986). *Grammaire française*. [French grammar]. Saint-Laurent, France: Trécarré.

- Goschler, J. (2014). Variation between singular and plural subject-verb agreement in German: A usage-based approach. *Yearbook of the German Cognitive Linguistics Association*, 2(1), 191-206. <https://doi.org/10.1515/gcla-2014-0012>
- Hunt, K. W. (1965). *Grammatical structures written at three grade levels*. Research Report 3, Champaign, IL: NCTE.
- Largy, P., Chanquoy, L., & Dédéyan, A. (2004). Orthographic revision: the case of subject-verb agreement in French. In L. Allal, L. Chanquoy and P. Largy (Eds.), *Revision: Cognitive and Instructional Processes* (pp. 39-62). Dordrecht: Kluwer Academic Publishers. https://doi.org/10.1007/978-94-007-1048-1_4
- Manesse, D. & Cogis, D. (2007). *Orthographe, À qui la faute?* [Spelling. Whose fault is it?]. Issy-les-Moulineaux, France: ESF.
- Nadeau, M. & C. Fisher (2006). *La grammaire nouvelle. La comprendre et l'enseigner*. [New grammar. Understanding and teaching new grammar. Montréal, Canada: Gaetan Morin / Chenelière Éducation.
- Negro, I., Chanquoy, L., Fayol, M., & Louis-Sidney, M. (2005). Subject-verb agreement in children and adults: serial or hierarchical processing? *Journal of Psycholinguistic Research*, 34(3), 233-258. <https://doi.org/10.1007/s10936-005-3639-0>
- Paret, M.-C. (1991). *La syntaxe écrite des élèves du secondaire*. [The syntax of secondary school students]. Montréal, Canada: Faculté des sciences de l'éducation.
- Riegel, M., Rioul, R. & Pellat, J.-C. (2016). *Grammaire méthodique du français*. [A methodical grammar of French]. 6th édition. Paris, France: Presses Universitaires de France.
- Van Rijt, J. & Coppen, P.-A. (2017). Bridging the gap between linguistic theory and L1 grammar education—experts' views on essential linguistic concepts. *Language Awareness*, 26(4), 360-380. <https://doi.org/10.1080/09658416.2017.1410552>