Chapter 7. Discussion and conclusions

In this chapter, I summarize the findings of this dissertation, discuss their implications for language education and make some suggestions for future research on the L1 and L2 acquisition of inflections in written language production.

7.1 Summary of the findings

The first part of this dissertation is concerned with the analysis and the acquisition of gender inflection. More specifically, in chapter 2, I provided a detailed analysis of gender agreement within the generative framework. I also linked the structural analysis of gender agreement in adjectives and past participles to the particular case of gender agreement constructions in French. On the basis of these analyses, well-founded predications can be made with respect to the level of the syntactic complexity of different types of gender agreement constructions in French. Chapter 3 gives a state-of-the-art on the L1 and L2 acquisition of gender inflection. More precisely, the acquisition order of gender inflection in native speakers is related to the size of the syntactic domain in which the particular type of gender agreement takes place. This developmental ordering has mainly been investigated in spoken language. The observed effect can best be explained by the fact that agreement constructions that are hosted in a larger syntactic domain, require more computational resources than those that are hosted in a smaller syntactic domain. Consequently, in the first case, fewer cognitive resources are available for the production of gender inflection which leads to a decrease of the production accuracy. Furthermore, the overt phonological expression of gender inflection has a positive effect on the accuracy of written language production.

In L2 literature, both topics did not receive much attention. The few studies dedicated to the effect of syntactic complexity on written L2 production revealed a similar observation as for native speakers. With respect to the potential effect of phonological expression on gender marking in written L2, no previous studies could be found.

In chapter 4, I tested the potential effect of syntactic complexity on the written production of gender inflection. The following agreement constructions were used: noun-adjective, clitic-past participle and noun-past participle agreement constructions. For both native speakers and second language learners of French, the results showed that more writing errors are found in agreement constructions.
exhibiting a larger syntactic domain. This suggests that the increased level of syntactic complexity probably requires extra computational efforts to process these sentences. Furthermore, the data revealed that, in both native speakers and second language learners, past participle agreement elicited more writing errors than noun-adjective agreement.

Chapter 5 addressed the question of whether the phonological expression of gender inflection (overt vs. covert nature) and the lexical category of the word to be inflected (adjective vs. past participle) have an effect on the accuracy of gender inflection in written French. In this respect, the target items were in attributive or predicative positions in order to account for potential interactions between syntactic complexity, phonological expression and lexical category. The results showed that, in both native speakers and second language learners of French, the syntactic complexity of the sentence and the lexical category of the target item have an effect on the accuracy of gender inflection in written French. More specifically, gender inflection in adjectives elicited fewer writing errors than in past participles. Here also, the syntactic complexity of the sentence influences the accuracy of gender inflection: predicative constructions elicited more writing errors than attributive ones. With respect to the phonological expression of gender inflection, this factor only has an effect on the written production of gender inflection within certain levels of syntactic complexity and with particular lexical categories. In adjectives for instance, ‘silent’ gender inflection elicited more writing errors than overtly expressed ones in the native speakers’ written productions. Furthermore, in attributive positions, overtly expressed gender inflection elicited fewer writing errors than ‘silent’ ones in second language learners.

In chapter 6, I evaluated the performance of three French digital grammar and spell checkers (Antidote, BonPatron and Scribens) in order to test whether they could be effective to improve the students’ performance at writing gender inflection. The results showed that the performance of these grammar and spell checkers differ in particular agreement constructions. More precisely, I used the test items of the experiment reported on in chapter 4, and submitted these items to the grammar and spell checkers. The results revealed that these checkers performed better in noun-adjective and noun-past participle constructions than in clitic-past participles ones. Subsequently, I compared these results to those reported in chapter 4 to test whether French grammar and spell checkers perform better than language users. The comparisons showed that the checkers developed for native speakers of French (i.e. Antidote and Scribens), performed better than language users in noun-adjective and noun-past participle agreement constructions. However, in clitic-past participle agreement constructions, native speakers performed better than these grammar and spell checkers. With respect to checkers developed for second language learners of French (i.e. Antidote and BonPatron), BonPatron reached a similar level of performance than these language lear-
Comparisons between Antidote and second language learners showed that Antidote outperformed these learners in noun-adjective and noun-past participle agreement constructions, but not in clitic-past participle agreement constructions.

### 7.2 Pedagogical implications

Based on the results of the experiments reported on in this dissertation, some implications for writing instruction in language education and the division of writing exercises in educational material can be made. Firstly, the results of the experiment reported in chapter 4, suggest that the syntactic complexity of the sentence constrains the L1 and L2 acquisition of gender inflection in written French. More precisely, the higher the level of syntactic complexity is, the more cognitive effort is engaged in terms of memory requirements (cf. Moscati & Rizzi 2014). For writing instruction in both native and second language education, my advice would be to follow a gradual scale of syntactic complexity. Within such a context, teachers of French language should firstly instruct gender inflection in sentences representing smaller syntactic domains (e.g. *la voiture verte* ‘the green car’ instead of *la voiture est verte* ‘the car is green’). Applying gender agreement in such a local syntactic domain is taken to require very little cognitive effort from the language learner. The same implication can be made for publishers of educational material for both native and second language instruction. More specifically, the division of grammar or writing exercises in educational material should go hand in hand with a gradual scale of the syntactic complexity of sentences. Grammar or writing exercises aiming to learn gender inflection in written French, therefore, needs to firstly focus on sentences representing a smaller syntactic domain. More complex sentences should be included in grammar exercises in the way that they represent a gradual scale of syntactic complexity.

Moreover, in both native and second language education, the instruction on gender inflection in written French, should firstly target gender inflection in adjectives. Based on the results of the experiment reported on in chapter 5, inflection in past participles has been shown to be acquired after that in adjectives.

This experiment also revealed that the phonological expression of gender inflection does not have an overall effect on the accuracy of gender inflection in both L1 and L2 written French. However, in particular lexical categories and certain agreement constructions, this effect occur. More precisely, ‘silent’ gender inflection in adjectives elicited more writing errors than overtly expressed gender inflection in native speakers of French. In writing exercises for native speakers of French, specific attention needs to be paid to these particular adjectives in order to make these native speakers aware of this particular feature of gender inflection.
The effect of phonological expression is also found in L2 learners of French: adjectives and past participles in attributive positions elicited more writing errors in ‘silent’ gender inflection than in overtly expressed gender inflection. Here also, specific attention needs to be paid to these particular categories in writing exercises for L2 learners of French.

As shown in Vernon (2000), the use of digital grammar and spell checkers are claimed to enrich the pedagogy in language education. To improve the students’ performance in the written production of French gender inflection, these checkers could be effective (cf. Heift & Schulze 2007). Focusing on the types of agreement constructions tested in chapter 4, Antidote and Scribens outperformed both the native speakers and L2 learners of French in noun-adjective and noun-past participle constructions. Therefore, these grammar and spell checkers might be effective to improve the students’ performance in these particular constructions. In contrast, Antidote and Scribens might not be effective to improve the students’ performance at writing gender inflection in clitic-past participle constructions.

My advice for the software designers of both French grammar and spell checkers is to improve their performance in this respect.

Another advice I would make is to improve the performance of BonPatron in each of the types of agreement constructions tested in chapter 4. As such, this grammar and spell checker may be effective for the education of L2 French in this respect.

7.3 Suggestions for future research

As shown in the experiments reported on in chapter 4, the syntactic complexity of the sentence is proportionally related to the accuracy of gender inflection in written language production. Due to extra computational resources required by more complex sentences, more writing errors occur in these sentences. In order to gain more insights in the cognitive effort when processing complex sentences in French, it would be interesting to investigate the processing of complex sentences involving gender inflection in French by means of a self-paced moving window experiment. More precisely, the reading times of target items that exhibit gender violations could be measured in sentences representing different levels of syntactic complexity. In this respect, reading times of target items that exhibit gender violations may differ with respect to the syntactic complexity of sentences. The results can probably support the outcomes of the experiments reported on in this dissertation from a processing point of view. Processing research may also support the structural approach as a measure of syntactic complexity, instead of the linear one.
In the experiment reported on in chapter 5, no overall effect of the phonological expression of gender inflection has been observed in written French. This holds for both native speakers and second language learners. With respect to both types of language users, it would be interesting to conduct a similar study on languages exhibiting inflections with different levels of phonological salience, such as Spanish vs. French, and to test whether the level of phonological salience has an effect on the written production of grammatical inflection. In Spanish for instance, the gender inflection is overtly expressed and exhibits a high level of phonological salience (Renaud 2013b) (e.g. in un hombre guapo ‘a man smart-M.S.’ vs. una mujer guapa ‘a woman smart-F.S.’). In French, however, the gender inflection only influences the phonological expression of the preceding consonant in particular cases and might be therefore less phonologically salient (e.g. in un cadeau vert /vɛʁ/ ‘a green present-M.S. vs. une table verte /vɛʁt/ ‘a green table-F.S.’).

With respect to second language learners only, an interesting suggestion can be made for the potential increase of the effect of phonological expression on written gender inflection in class rooms with much oral input. Ågren (2013) for instance, found that the written productions by second language learners of French are negatively influenced by the partially ‘silent’ nature of the French inflectional system. This finding contrasts with previous work (i.e. Ågren 2008, 2009) in which the author found no phonological effect on written French. She suggests that differences in language input might account for these contrasts with previous studies. My suggestion is to conduct a contrastive study on the effect of oral language input in the L2 class room on the accuracy of written inflections in French.

Another suggestion for future research I would like to make is to carry out an experiment aiming to compare language users and digital grammar and spell checkers in other types of grammatical constructions. As such, the usefulness of these checkers for language learners can be tested in a more specific way. To test the effectiveness of digital grammar and spell checkers in language education, it would be interesting to investigate the effect of these checkers on the language users’ performance in some complex grammatical constructions, such as in past participle agreement constructions. This effect can be tested by means of some intervention studies.