As set out in the introduction, this dissertation aims to provide new insights in the L1 and L2 acquisition of gender agreement constructions in written language production. I will focus on the effect of the syntactic complexity of agreement constructions and the phonological expression of gender marking on the accuracy of L1 and L2 French gender marking. To account for a measure of syntactic complexity, I opted to analyze the syntactic structure of the gender agreement constructions under investigation within a generative framework. More precisely, I adopt the idea that the size of the syntactic domain of a particular construction can be taken as a relevant measure of the syntactic complexity of this construction. As an increased level of syntactic complexity is shown to constrain language acquisition, my final goal is to test whether agreement constructions with a higher level of syntactic complexity, exhibit lower accuracy rates in written language.

In the present chapter I define my working definition of syntactic complexity, describe what the structural analyses for adjective and past participle constructions are and give an overview of the adjectival paradigm in French.

In the first section of this chapter, I will define the concept of syntactic complexity used in this dissertation in view of a level ordering of the syntactic configurations hosting the agreement constructions under investigation. In the second section, I will describe how gender agreement in adjectives and past participles is incorporated in the syntax. Based on the findings presented in the previous sections, I will rank the agreement constructions under investigation with respect to their structural complexity in the third section. In the fourth section, then, I will summarize the main aspects of the previous sections and finally, in the fifth section, I will present the inflectional paradigm of adjectives and past participles in French and Dutch.

2.1 Level ordering in syntactic complexity

2.1.1 The size of the syntactic domain

According to Hawkins (1994), the human processor follows a clear principle of efficiency involving the size of the syntactic domain in which a particular gram-
mathematical relation can be processed. In languages and structures in which domain size can vary in performance, there is a preference for the smallest possible domains. This organizing principle has been conveniently labeled the *Minimize Domains* efficiency principle according to which ‘the human processor prefers to minimize the connected sequences of linguistic forms and their conventionally associated syntactic and semantic properties in which relations of combination and/or dependency are processed’ (Hawkins 2004, p. 32).

Several quantitative measures have been proposed in the literature to operationalize this concept of syntactic complexity. Within the context of the *Minimize Domains* principle, a very convenient way to determine the structural domain of a particular construction is to count the number of syntactic nodes by which it is composed. Under such a view, the cognitive resources required to process a particular utterance are proportionally related to the size of the syntactic domain of these utterances. More precisely, constructions exhibiting more syntactic nodes are taken to be more complex and cognitively more demanding than those that have fewer nodes and are therefore also smaller syntactic domains (Roll et al. 2007).

The idea that the size of the syntactic domain measured in terms of the number of syntactic nodes goes hand in hand with its processing complexity, can be exemplified by transitive verbs that may take either a noun or an utterance as its complement. For example, sentences such as (1a) are less difficult to process than (1b), due to the fact that the object of *to claim* is more deeply embedded in the syntactic tree in the latter case (see e.g. Diessel & Tomasello 2005). As can be observed in the relevant tree structures provided in (2), there are only three nodes in (1a) whereas there are seven nodes in (1b).

(1a) She claimed the reward
(1b) She claimed she had won the race

(2a) [TP she [VP claimed [DP the reward]]]
(2b) [TP she [VP claimed [CP wh [TP she [AuxP had [VP won [DP the race]]]]]]]

---

1. In a generative perspective a syntactic node can be decomposed into a terminal node and non-terminal nodes (Chomsky 1956). A terminal node contains the lexical item (e.g. a noun or a verb), while non-terminal nodes represent the syntactic category (e.g. NP/N’ or VP/V’). Within such a context, the combined syntactic representation of a terminal node and non-terminal nodes can be labeled as the maximal projection of a particular constituent. In this dissertation a syntactic node is to be considered as the maximal projection of a particular constituent.
As such, this basic concept of syntactic complexity provides a straightforward answer to the fact that embedded clauses have been shown to be more difficult to be processed by language learners as compared to simple clauses.

As an important interim conclusion, I thus take the size of the syntactic domain measured in terms of the total number of nodes of a given construction to be a highly relevant measure of syntactic complexity.

### 2.1.2 Constituent movement

In the previous section, I have analyzed syntactic complexity in terms of the number of nodes by which the syntactic domain of a particular construction is made up. I have deliberately chosen to illustrate this concept based on utterances in which the constituents are occupying a fixed position with respect to the verbal predicate. In this section, I will argue that within a given syntactic domain, complexity is further determined by the movement of particular constituents out of their base position.

My motivation to also take into account constituent movement as a second factor determining syntactic complexity comes again from language acquisition research. At several occasions, it has been shown that by merely counting the nodes by which the syntactic domain is built, one cannot account for very fine-grained patterns in the acquisition of constructions with the same number of nodes. Considering relative clauses, for instance, it has been shown at numerous occasions (e.g. Aydin 2007; Adani 2011) that there is a clear asymmetry between subject and object relative clauses, with subject relatives being acquired significantly earlier by L1 learners. In a subject relative clause such as (3a) *The girl that loves my brother, is from Amsterdam* the relativized DP may be taken to have moved out of the subject position of the embedded clause whereas in (3b) *The girl that my brother loves, is from Amsterdam* the same relativized DP has moved out of the internal object position. In agreement with O’Grady (1997) there is a clear structural difference between both types of relative clauses:

\[
(3a) \quad \text{The girl}_i \left[CP \, wh_i \, that \, \left[TP \, t_i \left[VP \, \text{loves my brother}\right] \right] \right] \text{is from Amsterdam}
\]

\[
(3b) \quad \text{The girl}_i \left[CP \, wh_i \, that \, \left[TP \, \text{my brother } [VP \, \text{loves } t_i] \right] \right] \text{is from Amsterdam}
\]

In (4a) and (4b) I give the corresponding tree structures. In these structures, one can clearly observe that there is a difference between both types of relative clauses in terms of the number of syntactic nodes by which the relativized DP is separated from its original position. The attested asymmetry in the acquisition of both types of relative clauses has thus been related to a complexity difference between the corresponding movement operations.
2.1.3 Complexity ordering: adjectives and past participles

Based on 2.1.1 and 2.1.2, I take syntactic complexity to be defined in two ways: firstly, the size of the syntactic domain of a particular construction in terms of the total number of nodes by which it is composed, secondly, the complexity of the derived word order defined in terms of the number of syntactic nodes intervening between the moved element and its original position. With respect to the complexity of the derived word order, the number of syntactic nodes between the moved element and its original position can be taken as a relevant measure for the length of constituent movement.

In this section, I want to apply the same analysis to two types of adjectives, i.e. attributive and predicative adjectives, and three types of past participles, i.e. attributive past participles and past participles in passive and relative clauses. In English, attributive adjectives typically occupy a prenominal position as in (5a) whereas predicative adjectives most often occur as the complement of to be or another copular verb (to become, to seem) as in (5b):

(5a) The big car  
(5b) The car is big

With respect to past participles, attributive past participles occupy in most cases the prenominal position as in (6a) whereas past participles in passive (6b) and relative (6c)\(^2\) clauses are selected by the auxiliaries to be and to have respectively:

(6a) The written letter  
(6b) The letter is written (by the man)

---

2. I am aware of the fact that also in active clauses with the canonical word order (e.g. I have written the letter), the past participle is selected by the auxiliary to have. As my experimental conditions only contain past participles in passive and relative clauses, I have not included these particular past participles in active clauses.
The letter that I have written

The syntactic structures corresponding to the examples (5a) and (5b) are given in (7a) and (7b). In these structures, one can clearly observe that after syntactic movement has taken place, the attributive adjective differs in the total number of syntactic nodes between the noun and the adjective with respect to the predicative one.

(7a) \[\text{DP the}\_{i[DP} \text{big[DP t}_{i[NP} \text{car}]]}]^{3} \quad \text{(Schoorlemmer 2009)}

(7b) \[\text{CP[IP the car[VP is XP [DP [t}_{i} \text{AP [big]]]]]} \quad \text{(Kayne 1994)}

Differences in the number of syntactic nodes between the noun and the participles can also be observed in the constructions exemplified in (6a), (6b) and (6c). The syntactic structures of these constructions are presented in (8a), (8b) and (8c) respectively:

(8a) \[\text{DP the[CP wh[TP [VP [V written[NP letter]]]]]} \quad \text{(Kayne 1994)}

(8b) \[\text{CP[TP the letter[ AuxP is[VP [V written[DP t}_{i}]]]]]} \quad \text{(Baker, Johnson, Roberts 1989)}

(8c) \[\text{DP the[CP letter, that[TP I[AuxP have[VP [V written[NP t}_{i}]]]]]} \quad \text{(Kayne 1994)}

Based on the size of the syntactic domain of these constructions in terms of the number of syntactic nodes between the noun and the adjective (7) / the past participle (8) in the surface structure and the length of constituent movement defined in terms of the number of syntactic nodes intervening between the moved noun and its original position (7b, 8b, 8c) as a highly relevant measure of syntactic complexity, one can rank these constructions from ‘the least complex’ to ‘the most complex’ (table 1). The motivation behind this ranking is to be sought in the fact that the combined effect of the size of syntactic domains and the length of constituent movement constrains language acquisition. More precisely, smaller syntactic domains with shorter constituent movements can be taken as less complex to be processed than larger ones with longer constituent movements. Under such a view, the constructions presented in (7) and (8), can be ranked with respect to their syntactic complexity:

---

3. Schoorlemmer (2009) claims that in Germanic languages, the attributive adjective is adjoined to the DP projection. Therefore, there is no functional projection between the adjective and the noun.
Table 1. Syntactic complexity: ranking adjective and past participle constructions in English

<table>
<thead>
<tr>
<th>Rank</th>
<th>Size of syntactic domain quantified in terms of the number of intervening nodes between noun and adjective/past participle in the surface structure</th>
<th>Length of constituent movement quantified in terms of the number of intervening nodes between moved noun and its original position</th>
<th>construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Attributive adjective (7a)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Attributive past participle (8a)</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>Predicative adjective (7b)</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>2</td>
<td>Past participle in passive clause (8b)</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>3</td>
<td>Past participle in relative clause (8c)</td>
</tr>
</tbody>
</table>

As an important ad interim conclusion, I may thus conclude that adjectives and past participles in attributive contexts are the least complex constructions in English whereas past participles in relative clauses are the most complex ones.

2.2 The syntax of agreement

In section 2.1 I have shown that different constructions hosting adjectives and past participles can be ranked amongst each other based on their internal structural complexity. A particular feature of the French language is that in such constructions the adjective or past participle typically agrees with the nominal expression to which it is linked in gender and/or number. Consider for instance the translation of (7a) and (7b) in French:

(9a) La grande voiture
     The-F.S. big-F.S. car-F.S.
     ‘The big car’

(9b) La voiture est grande
     The-F.S. car-F.S. is big-F.S.
     ‘The car is big’

In what follows, I will describe how these agreement phenomena may be described in terms of a so-called Probe-Goal relation (2.2.1), how the semantics of the gender feature may be incorporated into syntax (2.2.2) and finally, how all
these factors combine with each other in the analysis of adjectival and past participle agreement constructions in French (2.2.3).

2.2.1 Agreement as a Probe-Goal relation

In the past century, the phenomenon of agreement has been an extensive research topic. Bloomfield (1933) for example, treated agreement as a superordinate term for three types of formal relations: concord or congruence (e.g. adjectival agreement), government (e.g. matrix verbs with their arguments) and cross-reference (e.g. anaphoric relations). These three types of formal relations have in common that two (or more) elements of the sentence interact with each other in either a semantic or syntactic way (cf. Steele 1978 in a working definition of agreement in (10)).

(10) The term agreement commonly refers to some systematic covariance between a semantic or formal property of one element and a semantic or formal property of another.

(Steele 1978, p. 610)

A couple of decades later, the ‘systematic covariance’ between elements in the clause has been defined in a more specific way within a generative framework (e.g. Chomsky 2000, 2001). More precisely, Chomsky (2000, 2001) claims that syntactic agreement is the result of a feature-checking relation in which (semantically) uninterpretable and (syntactically) unvalued features of the Probe are checked against the interpretable and valued ones of the Goal. This feature-checking relation has to take place in the c-command domain of the Probe. Moreover, the Goal is the element which bears some interpretable and valued formal feature and the Probe is the element which bears some uninterpretable and unvalued formal feature. From this perspective Chomsky takes uninterpretable features to be unvalued and interpretable features to be valued, since the syntax can only inspect whether a feature is valued and not whether the semantics has assigned interpretability to this feature. This account is referred to as the Valuation/Interpretability Biconditional, stated in (11).

(11) Valuation/Interpretability Biconditional
A feature F is uninterpretable iff F is unvalued

(Chomsky 2001: p.5)
With respect to the structural conditions for the feature-checking relation between the Goal and the Probe, Chomsky (2000, 2001) distinguishes between four conditions:

(i) c-command (i.e. the Probe and the Goal have to be sisters in a c-command relation);
(ii) matching (i.e. the valued features of the Goal have to match with the unvalued ones of the Probe);
(iii) activeness (i.e. both the Probe and the Goal have to be active: they must bear unvalued and valued features respectively); and
(iv) locality (i.e. the c-command relation between the Probe and the Goal has to be as local as possible: no intervening Goal is allowed between the Probe and the matching Goal)

In addition, Chomsky argues that feature-checking takes place in a bidirectional way. As such, in most cases the Goal bears a valued feature and checks the unvalued one of the c-commanding Probe. This means that feature-checking takes place in a downwards direction. However, in some particular contexts the Goal can bear an unvalued feature as well (e.g. in EPP-driven movement in which the presence of an unvalued feature on the Goal drives this specific movement (Chomsky 2000, 2001)). When the Goal bears an unvalued feature, feature-checking will take place in an upwards direction. Within such a context, the valued feature of the c-commanding Probe must check the unvalued counterpart on the Goal (see also Pesetsky & Torrego 2006 a.o.).

Based on the Valuation/Interpretability Biconditional and the structural conditions, Chomsky proposes the following definition for Agree:

\[
(12) \text{Agree } \alpha \text{ can agree with } \beta \text{ iff:}
\]
\[
a. \alpha \text{ carries at least one unvalued and uninterpretable feature and } \beta \text{ carries a matching interpretable and valued feature.}
\]
\[
b. \alpha \text{ c-commands } \beta
\]
\[
c. \beta \text{ is the closest goal to } \alpha
\]
\[
d. \alpha \text{ bears an unvalued uninterpretable feature}
\]

(Zeijlstra 2010, p. 2)

However, Zeijlstra (2010) argues that the standard definition of Agree, given in (12), does not account for syntactic phenomena such as Multiple Agree (i.e. agreement between a Probe and multiple Goals, such as in nominative constructions in Japanese (see 13)) or Negative Concord (i.e. multiple negative elements together constitute a sentential negation, as in Czech (see 14)).
(13) John-[ga] [yosouijouni nihonjin-[ga] eigo-[ga]
John.NOM than.expected the.Japanese.NOM English.NOM
hidoku] kanji-ta
bad.INF thought
'It seemed to John that the Japanese are worse at speaking English than he had expected'
(Hiraiwa 2001, p. 76)

(14) nikdo ne volá niko[h]
obody NEG. calls NEG.
'Nobody is calling'
(Zeijlstra 2004, p. 251)

In (13) for instance, the nominative case marking on three DP’s (i.e. being the Goals) is the result of a feature checking relation with the T₀ (i.e. being the Probe) in the matrix clause, since infinitive verbs cannot check nominative case (Ura 2000). According to the description of Agree in (12), agreement between the highest DP and T₀ blocks agreement with the lower DP’s, as the inactive Goal intervenes between T₀ and the lower DP (i.e. the locality condition). Consequently, Multiple Agree would be ruled out.

Another problem of the standard theory of Agree comes from negative concord in Czech (as in (14)). More specifically, in (14), two isolated negative elements (i.e. nikdo ‘nobody’ and niko[h], constituting the negation), which bear both [uNeg], have to be checked against [iNeg] in the negative element ne (Ladusaw 1992), exemplified in (15).

(15) [TP nikdo[uNeg]] [NegP nevolá[iNeg] t| niko[h]][uNeg]]
(Zeijlstra 2004, p. 251)

In (15) the negative head ne and two Probes nikdo and niko[h] constitute together one semantic negation. In contrast to the standard theory of Agree, the Probe niko[h] is c-commanded by its matching Goal ne, which is expected to rule out Agree. The interpretable feature of the negative head in negative concord languages (e.g. Czech), however, has been discussed in more recent research (e.g. Zeijlstra 2004, 2008). Zeijlstra (2004, 2008) argues that for negative concord the negative head cannot be the carrier of the semantic negation, but that the interpretable feature [iNeg] originates in an abstract operator Op. Additionally, ne in Czech bears an uninterpretable feature [uNeg] as well, as in (16).

(16) [Op[iNeg] [TP nikdo[uNeg] nevolá[uNeg] niko[h][uNeg]]]
(Zeijlstra 2004, p. 251)
The re-analysis of negative concord in (14) leads to the Agree configuration in which the Goal (i.e. the abstract operator $Op\, [iNeg]$) c-commands the negative Probes: $[uNeg]-[uNeg]-[uNeg]$ (cf. a similar analysis for sequence of Tense in which the Goal c-commands the Probes as well (Zeijlstra 2010)). This analysis in which the Goal c-commands the Probe seems also to solve the locality problem in nominative case marking in (13). More specifically, if TP carries the interpretable feature $[iT]$, all DP’s in the c-commanding domain are Probes bearing the uninterpretable feature $[uT]$, as in (17). In this way, the feature-checking relation between the c-commanding Goal and the highest Probe does not block agreement with lower Probes, since there is no intervening Goal.

(17) $\begin{array}{c}
[TP \ T^o \ [vP \ DP \ Vfin \ [...] \ DP \ [...] \ DP \ ...]]] \\
[iT] \quad [uT] \quad [uT] \quad [uT] \quad [uT]
\end{array}$

(Zeijlstra 2010, p. 20)

Based on the proposal that the Goal has to c-command the Probe in Agree (referred to as *Upward Agree* (Bošković 2007; Zeijlstra 2010)), Zeijlstra (2010) claims that Agree has to take place in a unidirectional way (see also Bošković 2007), instead of a bidirectional way, as in Chomsky (2000, 2001). More specifically, the Goal always bears interpretable or valued features and c-commands the Probe carrying uninterpretable or unvalued features. As a result, Zeijlstra proposes a revised version of Agree, as in (18).

(18) $Agree: \ \alpha$ can Agree with $\beta$ iff:
   
   a. $\alpha$ carries at least one uninterpretable or unvalued feature and $\beta$ carries a matching interpretable or valued feature
   
   b. $\beta$ c-commands $\alpha$
   
   c. $\beta$ is the closest goal to $\alpha$

(Zeijlstra 2010, p. 17)

2.2.2 The valuation vs. the interpretability of the gender feature

According to Zeijlstra (2010)’s revised version of Chomsky (2000, 2001)’s definition of Agree, agreement is claimed to be the result of a feature-checking configuration in which the uninterpretable or unvalued feature of the Probe is checked/valued against the interpretable or valued counterpart of the c-commanding Goal. However, in contrast to the *Valuation/Interpretability Biconditional*, Pesetsky & Torrego (2007) suppose that the interpretability and the valuation of a feature have to be considered in a more specific way. They claim that one and the same feature is not always interpretable iff it is valued or that it is uninterpretable
iff it is unvalued. For instance, a semantically interpretable feature can be syntactically unvalued as well (e.g. the Tense feature in TP bears a semantic interpretation, but it is syntactically unvalued). Besides the (semantic) interpretation of a feature, they also distinguish the independent (syntactic) valuation of the same feature. This latter operation is related to the syntactic specification of the lexical element (e.g. the gender feature on adjectives or determiners). This dichotomy between valuation and interpretation can also be supported by the Tense feature on the verb (he) must. (he) must is uninterpretable for tense in the lexicon, as the present or past tense are not distinctive. However, in a syntactic configuration the Tense feature on (he) must is valued by the Tense feature on TP. One and the same feature can thus be semantically uninterpretable in the lexicon, but syntactically valued in a feature-checking relation.

This dichotomy between the interpretability and the valuation of features can account for the gender feature as well (e.g. Kramer 2014; Ihsane & Sleeman 2016; Sleeman & Ihsane 2016). Kramer (2014) for instance adopts the framework of Distributed Morphology (Halle & Marantz 1993) to distinguish between natural and grammatical gender on nouns in Amharic. Natural gender on nouns is related to the biological sex (e.g. mist ‘woman’ bearing [+fem] in Amharic), while grammatical gender is an arbitrarily assigned gender in the lexicon (e.g. mäkina ‘car’ bearing [+fem] in Amharic). Within the framework of Distributed Morphology nouns can be decomposed into a nominalizing head n and the nominal root (e.g. Marantz 2001, Arad 2003), as in (19) for the noun hammer.

\begin{center}
(19)
\end{center}

(Kramer 2014, p. 7)

In this NP-internal structure, the gender feature is on the nominalizing head n, instead of on the nominal root. Moreover, the feature of natural gender is claimed to be interpretable on n, while the feature of grammatical gender is uninterpretable on n (Kramer 2014).

Based on Kramer's analysis of gender in Amharic, I assume that in nouns with natural gender in French (e.g. animate nouns, such as femme ‘woman-F.S.’ in
French), \( n \) can therefore bear \([+\text{fem}]\) or \([-\text{fem}]\) for feminine or masculine gender respectively, since the gender feature is interpretable on \( n \). In some contexts the biological sex of animate nouns is unknown in the discourse and as a result, there is no gender on \( n \) (referred to as plain \( n \) (Kramer 2014, p. 9)), such as in étudiant ‘student-M.S.’ in French for instance. The default masculine gender, then, is assigned to this particular noun.

With respect to inanimate nouns (e.g. maison ‘house-F.S.’ in French) the gender feature on \( n \) is uninterpretable, since inanimate nouns do not have natural gender. Consequently, inanimate nouns take the masculine gender as a default, such as in animate nouns with unknown natural gender. However, many inanimate nouns bear \([+\text{fem}]\) as the gender feature (e.g. maison ‘house-F.S.’ which is feminine in French). In line with Pesetsky & Torrego (2007)’s dichotomy between the interpretability and the valuation of features, Kramer (2014) proposes for Amharic that feminine inanimate nouns bear an uninterpretable \([+\text{fem}]\) on \( n \) as a valued grammatical gender. The gender feature thus can be semantically interpretable (e.g. in nouns with natural gender) or semantically uninterpretable (e.g. in inanimate nouns). In inanimate nouns the gender feature is uninterpretable, but it can be syntactically valued as \([+\text{fem}]\) in feminine inanimate nouns.

Extending this proposal to French, the gender feature on \( n \) is (semantically) interpretable in animate nouns, which is related to \([+\text{fem}]\) gender for feminine nouns or to \([-\text{fem}]\) gender for masculine nouns. In inanimate nouns, the gender feature on \( n \) is (semantically) uninterpretable, but \( n \) has a plain \( n \) (i.e. no natural gender) which results in masculine gender as a default. Despite of the uninterpretable gender feature on inanimate nouns, the gender feature can have \([+\text{fem}]\) as syntactically valued in feminine inanimate nouns (i.e. ‘grammatical’ gender).

Building on Kramer (2014), Atkinson (2015) claims for French that gender is located in two positions and argues that gender in French is on the root of the noun as an uninterpretable feature in the case of grammatical gender. For natural gender, the gender feature is interpretable on \( n \). However, Atkinson’s proposal for gender in French does not account for gender mismatches such as la victime ‘the-F.S. victim-F.S.’ or la sentinelle ‘the-F.S. sentinel-F.S.’, which can refer to men (as observed by Ihsane & Sleeman 2016). More specifically, both la victime and la sentinelle are animate nouns, but are not specified for natural gender in the lexicon. Because of the lack of an interpretable gender feature in these constructions, the masculine default gender is expected (i.e. *le victime ‘the-M.S. victim-F.S.’). To solve this problem, Ihsane & Sleeman (2016) leave the Distributed Morphology approach and adopt an analysis in which gender heads its own projection inside the DP (cf. Picallo 1991). They replace the nominal root and the head \( n \) for gender by NP and GenderP respectively, as in (20).
Whereas in Kramer (2014) gender is located in a NP-internal position, in Ihsane & Sleeman (2016) it is located in both an NP-internal and NP-external position. In the NP-external projection (i.e. GenderP) natural gender is encoded, while in the NP-internal position (i.e. on the NP) grammatical gender is encoded. Consequently, in animate nouns which are taken to be (semantically) interpretable, the GenderP carries the interpretable gender feature, whose value is inherited from NP. However, in inanimate nouns, which are (semantically) uninterpretable in the lexicon, NP bears the uninterpretable gender feature. As a result, the grammatical gender is assigned to the noun. As such, the NP is always uninterpretable, but GenderP bears an interpretable gender feature in animate nouns. For gender mismatches, such as in \textit{la victime} and \textit{la sentinelle}, the GenderP carries an uninterpretable gender feature, since these animate nouns are uninterpretable in the lexicon. Consequently, the grammatical gender ([+fem] for \textit{la victime} and \textit{la sentinelle}) is inherited from the noun and is not necessarily related to a female person.

Supporting evidence for an NP-external GenderP comes from partitive constructions in French, as in (21) and (22) (Sleeman & Ihsane 2016).

(21) La /*le plus jeune de ces
    The-F.S. /*the-M.S. most young-F.S. of these-F.P.
    sentinelles a une barbe
    sentinels-F.P. has a beard
    ‘The youngest of these sentinels has a beard’
    (Sleeman & Ihsane 2016, p. 9)

(22) La plus compétente de mes anciens
    The-F.S. most competent-F.S. of my-M.P. former-M.P.
    professeurs
    professors-M.P.
    ‘The most competent of my former professors’
    (Sleeman & Ihsane 2016, p. 5)
In (21) the natural gender cannot be inherited from the situational context. As such, the feature on the head of GenderP is semantically uninterpretable. However, in (21) the superlative adjective construction *la plus jeune* ‘the youngest’ agrees with the grammatical gender of *sentinelle*, which implies that agreement takes place with the grammatical gender.

A different phenomenon shows up in (22) in which the gender feature in GenderP dominating an empty noun in the left part of the partitive construction, is specified as feminine in the situational context. However, *professeurs* agrees with *anciens* ‘former’ with its default masculine grammatical gender.

Sleeman & Ihsane (2016) thus demonstrate that agreement with the interpretable gender feature in GenderP can take place independently of agreement with the grammatical gender feature on the NP. As such, agreement with the grammatical gender takes place in a small syntactic domain (e.g. in *mes anciens professeurs* ‘my-M.P. former-M.P. professors-M.P.’), while agreement with the interpretable gender feature covers a big syntactic domain, as in (22) in which *la plus compétente* ‘the-F.S. most competent-F.S.’ agrees with the feminine interpretable gender feature in GenderP, above *professeurs* ‘professors-M.P.’. This is in line with the Agreement Hierarchy (Corbett 1979): the more local agreement takes place, the more agreement is syntactic. The bigger the agreement domain is, the more agreement is semantic.

The dichotomy between the interpretability and the valuation of the gender feature can thus be related to two independent projections (i.e. GenderP for natural gender and the NP for grammatical gender). With respect to adjectival agreement, the noun is taken to be the Goal which can bear a (syntactically) valued gender feature (i.e. grammatical gender), but it is (semantically) uninterpretable for gender. As for the Probe-Goal relation, I adopt Zeijlstra’s definition of Agree given in (18). The Probe, such as an adjective or a past participle, has to value its unvalued gender feature against the c-commanding noun (after Zeijlstra 2010). In both feminine animate and inanimate nouns for example, the valued [+fem] gender feature on the noun values the unvalued counterpart on the adjective or the past participle. Likewise for both masculine animate and inanimate nouns, the valued [-fem] gender feature on the noun values the unvalued one on the adjective or the past participle. In line with the gender mismatch in (22) and Corbett’s Agreement Hierarchy, I will investigate in this dissertation if syntactic agreement is more vulnerable in language acquisition if the distance between agreeing elements in the surface structure is bigger.

Based on Zeijlstra (2010)’s revised version of Agree and Ihsane & Sleeman (2016)’s proposal for gender, I adopt the following working definition for gender agreement in adjectives and past participles:
(23) *Agree*: the adjective/past participle can Agree with the noun iff:
a. the adjective/past participle carries at least one unvalued feature and the noun carries a matching valued feature
b. the noun c-commands the adjective/past participle
c. the noun is the closest goal to the adjective/past participle

2.2.3 Gender agreement in adjectives

In the present paragraph I present some typical gender agreement configurations, like the ones exhibited by noun-adjective and noun-past participle agreement. The first section will be dedicated to gender agreement in attributive and predicative noun-adjective constructions in French. In the second section gender agreement in past participle configurations in French will be set out by focusing on past participle agreement with a fronted object (i.e. an object clitic and a full noun), in a reduced relative clause and in a passive construction.

In Romance languages, predicative adjectives are generally taken to be selected by the copula and have to agree with the subject of that copula, as in (24) for masculine and (25) for feminine in French.

(24) Le cadeau est grandø
    The-M.S. present-M.S. is big-M.S.
   ‘The present is big’

(25) La voiture est grande
    The-F.S. car-F.S. is big-F.S.
   ‘The car is big’

In (24) the unvalued gender feature of the predicative adjective *grand* is valued against the valued masculine gender feature (i.e. [-fem]) of *cadeau* ‘present’, which results in a null morpheme on *grand*. Likewise, in (25) it is the valued feminine gender feature (i.e. [+fem]) of *voiture* ‘car’ which values the unvalued gender feature of the predicative adjective *grand* ‘big’. As a result, the inflection morpheme –e is added on *grand*.

With respect to attributive adjectives, it is the noun which selects the adjective. The noun has in turn to value the unvalued gender feature of the adjective in the same way as in predicative adjectives. Moreover, in Romance languages, the attributive adjective can precede or follow the noun in the surface structure, as exemplified for French in (26) and (27) respectively.
Structural differences between attributive and predicative adjectives constructions can also be observed. More precisely, as Kayne (1994) claims, predicative adjectives originate in a small clause hosting the noun and the adjective. Out of this clause the noun raises to a higher syntactic position (see (28)).

(28) \[ CP[IP[la\ [VP[\[\[V\ est\ [XP[\[DP[t_i]AP[grand\ e]]]]\]]]]]\]

'La voiture est grande'

In (28) the copula in the predicative construction selects a small clause (i.e. XP) which contains the noun and the adjective. Since the Goal (i.e. the noun) c-commands the adjective as the Probe, the unvalued gender feature of the adjective is valued against the valued counterpart on the noun (after Zeijlstra 2010). Finally, the noun moves to [spec,IP], which gives rise to the predicative construction.

In attributive adjectives, feature checking takes place DP-internally. More specifically, Schoorlemmer (2009) claims that in Romance languages, the attributive adjective is adjoined to a functional projection (e.g. XP) lower than DP, as exemplified in (29)\textsuperscript{4}.

(29) \[ DP[la[XP[\[NP[\[\[NP\ voiture]]]]]]\]]\]

'La grande voiture'

\textsuperscript{4} I am aware of the fact that adjectives in French frequently occur in postnominal position. As my experimental conditions only contain pronominal adjectives, I have not included the syntactic analysis of postnominal adjectives.
In (29), as Schoorlemmer (2009) claims, agreement between the noun and the adjective takes place in an indirect way. More precisely, the first step is the establishment of the agreement relation between the noun and the D. Then, the D (i.e. the Goal) values the unvalued gender feature of the adjective. As such, the adjective bears the same valued gender feature as the noun.

2.2.4 Gender agreement in past participles

Besides gender agreement in adjectives, Romance languages exhibit gender agreement in past participles as well. In French for instance, the past participle agrees with the direct object, such as an NP (see (30)) or an object clitic (see (31)), iff the direct object is in a higher position than the past participle.

(30a) Le ballon qu’ on a trouvé
The-M.S. ball-M.S. that we have found-M.S.
‘The ball (that) we found’

(30b) La boutique qu’ on a trouvé
The-F.S. shop-F.S. that we have found-F.S.
‘The shop (that) we found’

(31a) Je l’ ai arrosé, (l’arbre)
I it-M.S. have watered-M.S. (the tree-M.S.)
‘I watered the tree’

(31b) Je l’ ai arrosée, (la plante)
I it-F.S. have watered-F.S. (the plant-F.S.)
‘I watered the plant’

In the deep structure the noun or the object clitic, being the Goal, c-commands the past participle as the Probe and values the unvalued gender feature on the past participle. This feature-checking relation is claimed to take place in a particular functional projection, such as PastPartP (Kayne 1994; Belletti 1999). Belletti (1999) for instance proposes that past participle agreement (henceforth: PPA) with an object clitic originates in PastPartP in which the object clitic is located in the specifier position and the past participle in the head position (see (32)).

(32) [TP[AgrOP CL cl [Aux[PastPartP t cl [PastPartP V t] ⋯ [VP V t DP t]]]]]

In (32) the object clitic has moved from DP to the specifier of PastPartP, while the past participle has moved from the VP to the head position of PastPartP. As a
result, the Goal (i.e. the object clitic) c-commands the Probe (i.e. the past participle) and valuation of the gender feature takes place. The past participle, then, remains in PastPartP and the object clitic raises to its final landing site in AgrOP between TP and AuxP.

In the same way as PPA with an object clitic, PPA with a fronted noun finds its origin in PastPartP as well (Kayne 1994). More precisely, Kayne (1994) argues that the configuration of PPA with a fronted noun must be considered as a relative clause selected by a D (see (33)).

\[(33) \quad [\text{DP}_{CP} \text{NP}_i]_{TP}[\text{Aux}_i[\text{PastPartP}_j[\text{PastPart}_i[\text{VP}_j[\text{V}_j[\text{DP}_t]]]]]]\]

Within the CP domain the noun moves from the lowest DP to the specifier of PastPartP. The past participle, then, moves from the VP to the head of PastPartP. As a consequence, the noun c-commands the past participle and values the unvalued gender feature on the past participle. Finally, the noun moves further to the specifier of CP, where the Goal c-commands the Probe.

Moreover, PPA with a fronted noun can also occur without the auxiliary projection, the relative pronoun in C and the subject in [spec,TP], which is known as the reduced relative clause (Kayne 1994), as in (34) for French.

\[(34a) \quad \text{Le message qu' on a écrit} \quad \text{'The written message'}\]
\[(34b) \quad \text{La lettre qu' on a écrite} \quad \text{'The written letter'}\]

Since the reduced relative clause is related to the ‘complete’ relative clause, the structural configuration in (33) is taken to be the basis of the reduced relative clause (Kayne 1994) (see (35) for the example in (34b)).

\[(35) \quad [\text{DP}_i \text{CP}_j \text{lettre}_i]_{TP}[\text{PastPartP}_j[\text{PastPart}_i[\text{écrite}_j[\text{VP}_j[\text{V}_j[\text{NP}_t]]]]]]\]

As in ‘complete’ relative clauses, the direct object moves from NP to the specifier of PastPartP in order to value the unvalued gender feature of the past participle. The noun, then, moves further to the [Spec,CP] position.

Finally, PPA shows up in passive constructions in Romance languages, as in French (see 36).
(36a) Le message est écrit (par cet homme)
The message is written (by this man) ‘The message is written (by this man)’

(36b) La lettre est écrite (par cet homme)
The letter is written (by this man) ‘The letter is written (by this man)’

In line with the structural analysis of relative clauses in (33), Baker, Johnson & Roberts (1989) argue that the NP raises in passive constructions as well, as in (37).

(37) [IP NP, [I e [VP (v) + -en [NP ti]]]]

However, this analysis is based on passive constructions in English. As English does not have PPA, my assumption is that passive constructions in French contain the PastPartP projection to account for PPA in passives. Based on the configuration of PPA with a clitic object in (32) and the configuration of PPA with a fronted noun in (33), I assume that the structure of PPA in passive constructions in French is as in (38) for the example in (36b).

(38) [CP [TP La lettre [AuxP est [PastPartP ti [PastPart écrite [VP (v) [DP ti]]]]]]]]

In (38) the noun moves from the DP to the specifier of PastPartP to value the unvalued gender feature of the past participle. Then, the noun raises further to the [Spec,TP] position to check the EPP feature, which leads to the passive construction with PPA.

2.3 Syntactic level ordering of agreement constructions in French

As described in section 2.1, syntactic complexity may be defined in terms of the size of the syntactic domain of a particular construction. This size can be quantified by the total number of nodes by which the syntactic domain is composed in the surface structure. Furthermore, the length of constituent movement in terms of the number of syntactic nodes between the moved constituent and its original position, is a second factor determining syntactic complexity. Based on the structural analyses of the agreement constructions in French, one can rank these constructions with respect to their level of syntactic complexity (table 2). The motivation behind this ranking is the same as for the ranking in English (table 1): smaller syntactic domains with shorter constituent movements can be taken as less complex to be processed than larger ones with longer constituent movements. In case of the
same size of the syntactic domain, the length of constituent movement can however vary (cf. constructions of subject vs. object relative clauses in section 2.1.2). In such a context, constructions with longer constituent movements are taken to be more complex than those with shorter constituent movements. Based on the combined effect of the size of syntactic domains and the length of constituent movements, one can rank the constructions presented in section 2.2.4 (table 2). Rank 1 represents the least complex construction and rank 4 the most complex one.

Table 2. Syntactic complexity: ranking adjective and past participle constructions in French

<table>
<thead>
<tr>
<th>Rank</th>
<th>Size of syntactic domain</th>
<th>Length of constituent movement</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>quantified in terms of the number of intervening nodes between noun and adjective/past participle in the surface structure</td>
<td>quantified in terms of the number of intervening nodes between moved noun/clitic and its original position</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>‘La grande voiture’</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>‘La voiture est grande’</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>3</td>
<td>‘Je l’ai arrosée’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>‘La lettre écrite’</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>3</td>
<td>‘La lettre est écrite’</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>4</td>
<td>‘La boutique qu’on a trouvée’</td>
</tr>
</tbody>
</table>

As an important ad interim conclusion, I may thus conclude that constructions hosting attributive adjectives, are the least complex constructions in French whereas relative clauses with past participles are the most complex ones. Despite the fact that predicative adjectives are hosted in a syntactic domain exhibiting the same size as that in which attributive past participles, passive past participles and clitic – past participle relations are hosted, the length of constituent movement in the latter constructions, is longer than in predicative adjectives. As such, predicative adjectives can be taken as less complex. Finally, I may conclude that in French, constructions hosting attributive past participles, passive past participles and clitic – past participle relations, exhibit the same level of syntactic complexity.

2.4 Summary

In the first section I defined the working definition of syntactic complexity for this dissertation. Based on the fact that embedded clauses are more difficult to be acquired as compared to simple clauses, I concluded that the size of the syntactic
domain in terms of the total number of syntactic nodes by which it is built, is a very relevant measure of syntactic complexity. In addition to the size of the syntactic domain, the length of constituent movement in terms of the number of syntactic nodes between the moved constituent and its original position, can be taken as a second factor determining syntactic complexity. Evidence for this comes from acquisition research on subject and object relative clauses. Focusing on two types of adjective constructions, i.e. attributive and predicative, and three types of past participle constructions, i.e. attributive past participles, passive past participles and relative clauses with past participles, I ranked these constructions with respect to their structural complexity.

In the second section I focused on the above mentioned constructions in French and described the structural analysis of gender agreement in the syntax. For this purpose, I adopted Zeijlstra (2010)’s approach for Agree as a working definition of adjectival agreement in adjectives and past participles. In this definition, I abandoned the notions of interpretable and uninterpretable features, building on Ihsane & Sleeman (2016)’s arguments in favor of the existence of different syntactic projections representing the dichotomy between the interpretability and the valuation of the gender feature (after Pesetsky & Torrego 2007). According to Ihsane & Sleeman (2016), the (semantic) interpretation of the gender feature is located in GenderP above the NP, while the (syntactic) value of the gender feature is on the noun. This approach is built on Kramer (2014)’s analysis, yet partially differs from it with respect to the projections of natural and grammatical gender. While in Kramer (2014) gender is an NP-internal feature (both the semantic interpretability and the syntactic value), in Ihsane & Sleeman (2016) gender is split up in the NP-external interpretability and the NP-internal syntactic value. Since adjectival agreement is taken to be a syntactically local operation, I assume that it is the syntactic value on the noun which is involved in gender agreement with adjectives and past participles.

Building on these structural analyses of adjective and past participle agreement constructions in French and the definition of syntactic complexity described in section one, I ranked the adjective and past participle constructions in French with respect to their level of syntactic complexity.

2.5 The paradigm of gender agreement in French and Dutch

In the previous sections I presented the syntactic mechanism that underlies gender agreement in adjectives and past participles in French. Since gender agreement ‘behaves’ differently in Romance languages, such as French, with respect to Germanic languages, such as Dutch, I will give an overview of the paradigm of gender agreement in French and Dutch. The first section will be dedicated to
adjectival inflections in both written and spoken French. In the second section adjectival inflections in both written and spoken Dutch will be presented.

2.5.1 *The gender inflection in French*

In French, gender can be categorized in two variants: masculine and feminine. Both the masculine and feminine gender are determined on the noun, in the case of grammatical gender, and in GenderP, in the case of natural gender (see section 2.2). The masculine gender selects the definite article *le* and the indefinite article *un*, as in (39a), while the feminine gender selects *la* as its definite article and *une* as its indefinite article, as in (39b). With respect to noun-adjective agreement, the unvalued gender feature of the adjective is valued against the valued one of the noun. In a masculine context, this feature-checking relation is not overtly reflected on the adjective in written language⁵ (see (39a)). In a feminine context, however, the adjective shows an overt gender inflection in written language (i.e. + *e*) (see (39b)).

(39a) Le / Un cadeau vert

The-M.S. / A-M.S. present-M.S. green-M.S.

‘The / a green present’

(39b) La / Une voiture verte


‘The / a green car’

In addition to the attributive noun-adjective contexts in (39), the adjective in predicative contexts behaves similarly in written language, as exemplified in (40). The definiteness of the article does not have an effect on the inflection of the adjective.

(40a) Le / Un cadeau est grand

The-M.S. / A-M.S. present-M.S. is big-M.S.

‘The / A present is big’

⁵ In adjectives exhibiting stem alternations (e.g. *beau*-M.S. vs. *belle*-F.S. ‘beautiful’), both the masculine and feminine gender are expressed by the gender-specific stem. Adjectives derived from other lexical categories (e.g. *menteur*-M.S. vs. *menteuse*-F.S. ‘lying’), express the gender by means of a gender-specific suffix. In this dissertation I only focus on regularly non-derived adjectives (e.g. *vert* ‘green’ or *grand* ‘big’) and do not take these particular adjectives into consideration.
In contrast to the overt feminine gender inflection in written language, this inflection on the adjective in spoken language is not phonologically expressed in most cases, because of elision with the stem-final vowel. Consequently, the adjective in a masculine context is similar to the adjective in a feminine context in spoken language (cf. (41a) vs. (41b)). This holds for both attributive and predicative constructions.

(41a) La / Une tableau carréø /kare/  
The-F.S. / A-F.S. board-F.S. square-F.S.  
'The / A square board'

(41b) La / Une table carrée ø/kare/  
The-F.S. / A-F.S. table-F.S. square-F.S.  
'The / A square table'

However, in some particular adjectives the feminine inflection is phonologically expressed. More precisely, the phonological expression of the inflection is required if the stem ends in a consonant (see (42)).

(42a) Le / Un livre vertø /vet/  
The-M.S. / A-M.S. book-M.S. green-M.S.  
'The / A green book'

(42b) La / Une voiture verte ø/vert/  
'The / A green car'

With respect to past participle agreement in written French, the past participle agrees with the direct object if the latter precedes the past participle. Here, the gender inflection is the same as for adjectives (i.e. no overt inflection on the past participle in a masculine context and + e in a feminine context), as in (43) for a ‘full noun’ direct object and in (44) for a clitic direct object.

(43a) Le / Un ballon qu’ on a trouvéø  
The-M.S. / A-M.S. ball-M.S. that we have found-M.S.  
'The / A ball (that) we found'
In contrast to past participle agreement in written French, the feminine gender inflection in spoken language is optional (Belletti 2006). In adjectives which have a stem-final consonant (e.g. in (42b)), the inflection is obligatory expressed in spoken French. Nevertheless, in past participles the feminine inflection can be phonologically expressed, even when the stem-final letter is a consonant (see (45)).

(46a) Het kleine huis /klinə/  
The-ntr little-suffix house-ntr  
‘The little house’

2.5.2 The gender inflection in Dutch

In Dutch, gender can be divided in two variants: neuter and non-neuter (henceforth ntr and nntr respectively) (Corver & van Koppen 2009). The neuter gender is characterized by the definite article het (e.g. het huis ‘the-ntr house-ntr’), while the non-neuter gender selects the definite article de (e.g. de auto ‘the-nntr car-nntr’). The indefinite article, however, is een in both the neuter and non-neuter gender (e.g. een huis ‘a-ntr house-ntr’ and een auto ‘a-nntr car-nntr’).

With respect to noun-adjective agreement, the attributive adjective in a definite context always takes the inflection –e in both written and spoken language, regardless of the gender (see (46a) for neuter and (46b) for non-neuter)
In an indefinite context, however, no overt inflection on the adjective shows up in the neuter gender (see (47a)), while overt inflection on the adjective is present in the non-neuter gender (see (47b)).

(47a) Een kleinø huis
    'A little house'

(47b) Een groene auto
    'A green car'

In contrast to attributive contexts, the adjective never exhibits overt inflection in predicative contexts, as in (48).

(48a) Het huis is kleinø
    'The house is little'

(48b) De auto is groenø
    'The car is green'

(48c) Een huis is kleinø
    'A house is little'

(48d) Een auto is groenø
    'A car is green'

With respect to past participles in Dutch, the stem-final consonant is –d/-t for regularly inflected verbs (see (49)) and –en for verbs with irregular forms (see (50)). In contexts with a predicate, both variants do not show overtly expressed inflections in both written and spoken language.
In attributive contexts, past participles with a stem-final –d/-t, however, exhibit an overt inflection (i.e. –e) in both written and spoken language, while past participles with a stem-final –en do not (see 51).

Gender inflection in Dutch, thus, exhibits a totally different pattern with respect to French. This typological contrast may lead to an increased complexity of the acquisition of gender inflection by Dutch learners of French. As shown in the introduction, the syntactic complexity and the phonological expression seem to also constrain language acquisition. In the next chapter, I will provide a state of the art on the effect of both factors on the written production of inflections.