**RESEARCH**

# Mastering complex Swedish NPs: A comparison of non-immersion pupils and immersion L1 Finnish pupils

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The aim of this article is to study the extent to which some of the most complex types of Swedish noun phrases (NPs) have been mastered in a grammaticality judgement test in L2 Swedish of Finnish-speaking 16-year-old non-immersion pupils (n = 44) compared with 15-year-old immersion pupils (n = 86). The study concentrates on *double definiteness*, NPs with both *possessive/genitive and adjective attributes*, and NPs with the synonymous demonstrative pronouns *den här* and *denna* ("this"). In previous studies, these NPs have been difficult for L2 learners irrespective of their L1, including immersion students. The studied NP types represent two types of complexity: *formal complexity* and *complexity of the relationship between form and meaning*.

The research questions concern the order in which the studied forms are mastered, the hierarchy of difficulty for the different types of complexity, and the differences between non-immersion and immersion students. Analyses at the individual level show that formally complex NPs are used accurately more often than those with a complex relationship between form and meaning in both groups. This result is similar to the one achieved in a previous study with the same test with 12- and 15-year-old immersion students as informants. The differences between non-immersion and immersion students are small and usually statistically insignificant, i.e., the studied structures were difficult for the informants irrespective of the learning context.

## 1 Introduction

Children acquiring Swedish as their first language (L1) acquire definiteness and article use in noun phrases (NPs) at an early stage and without difficulties (e.g., Bohnacker, 1997, 2003). Previous studies, however, have proved that practically all L2 learners of Swedish have problems with these grammatical structures, irrespective of their L1 (e.g., Axelsson, 1994). The problems are most obvious when the learner's L1 lacks definiteness morphology, but the formal complexity of Swedish NPs makes them difficult even for learners who are able to utilise their L1 in the choice of definiteness (Eriksson & Wijk-Andersson, 1988; Axelsson, 1994). Hyltenstam's research (1988, 1992) shows that Swedish NPs are also difficult for high-level learners of L2 Swedish, such as immigrants who have lived in Sweden for decades; their inaccuracies are rare but qualitatively similar to those made by less advanced learners, such as the omission of definiteness endings.

A multitude of studies in Sweden and Finland have addressed the acquisition of NPs in L2 Swedish. However, the most complex NP types, such as those with a noun in the definite form preceded by an adjective attribute (commonly called *double definiteness* in Swedish; see Section 2 below) and those including a pronominal or genitive attribute (henceforth PRG attributes; see Section 2 below), have not gained much attention since they tend to be sporadic in the spontaneous data (Axelsson, 1994; Nyqvist, 2013, 2018). A recent study with 12-year-old and 15-year-old Finnish-speaking immersion pupils (Nyqvist, unpublished ms), however, showed that these complex NPs were still problematic at the end of immersion (i.e., at the age of 15), irrespective of the fact that the informants had acquired their Swedish in early total immersion; they started immersion day care at approximately 4–5 years of age (see Bergroth, 2007: p. 18) and had had a considerable share of their instruction in all school subjects in Swedish during the nine-year-long comprehensive school attendance. (For the actual percentages of instruction in Swedish and Finnish in the different grades in immersion, see Bergroth & Björklund, 2013: p. 109).

The aim of this study is to explore how Finnish-speaking non-immersion pupils learning Swedish in a formal setting perform on a grammaticality judgement test (henceforth *test*) previously used for immersion students at the sixth- and ninth-grade levels (Nyqvist, unpublished ms). The analysis occurs at the individual level and concentrates

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on certain complex NP types that have otherwise not previously gained attention. Immersion pupils usually reach a higher level of competence in Swedish than most non-immersion students (e.g., Nyqvist, 2018: p. 72, in press; see also Bergroth, 2015: p. 108). Therefore, there is reason to study whether this result is repeated in the case of these specific NP types.

Housen and Simoens (2016: p. 164) summarise different sets of factors affecting *L2 difficulty* or *cognitive complexity*, and two of them are relevant for this study. *Feature-related difficulty*, i.e., the intrinsic properties of the studied structures (such as complexity of form or function) on the one hand and their input properties (e.g., frequency and saliency; see also Goldschneider & DeKeyser, 2005) on the other hand can explain why certain structures are difficult for all learners. Another central question in this study is whether *context-related difficulty*, i.e., the learning context (which in this article is immersion vs. non-immersion) affects the acquisition of the studied structures.

## 2 What makes definiteness difficult in L2 Swedish?

According to the usage-based approach, second language acquisition can be viewed as a process of determining linguistic constructions, or form-meaning mappings that can be words as well as whole utterances. The constructions undergo stages of more or less conscious analysis and become gradually more complex and categorised as varying grades of abstractness. The learners discover regularities in these constructions and start varying them, eventually discovering the abstract formulae behind the concrete utterances (Ellis & Robinson, 2008; Bybee, 2008; Lieven & Tomasello, 2008). Thus, grammar is an implicit, cognitive organisation of a learner's concrete language experience that continually develops as new constructions are added to the inventory (Bybee, 2008: p. 216). This is especially evident in immersion settings that do not contain formal learning at all in the early stages, but is also relevant for the communicative language teaching method used in non-immersion settings (Ellis 2008: p. 825), although the learners in immersion settings naturally receive more input and have an opportunity to participate in meaningful interactions to a greater extent than those in non-immersion settings.

Long (1990) has stated, however, that certain aspects of an L2 are unlearnable from the input only—certain grammatical constructions are harder to acquire than others. For instance, traits occurring frequently in the input such as definite forms of nouns in Swedish are easy to learn, as the repetition strengthens memory representations and makes them more accessible. Extremely frequent sequences can be acquired as unanalysed wholes and may thus help the learner analyse similar, less frequent sequences (Bybee, 2008: p. 222). Another central factor affecting the grade of difficulty is salience, or ease in recognising a certain construction in the input. Definiteness markers in Swedish, for example, are notorious for their low saliency, which makes them difficult to acquire, although the endings and articles *per se* are high frequency in the language (e.g., Ellis, 2016: pp. 348–349).

As the NPs relevant to this study are known to be low frequency in the language and the definiteness marking is insalient in the input (Goldschneider & DeKeyser, 2005: pp. 47, 60), I now turn my focus to complexity as the most important factor determining the difficulty of the studied NP types. The term *complexity* assumes two different meanings in the linguistic literature. In this article, it is used as a synonym for *difficulty* (DeKeyser, 2016: p. 353). In other contexts, complexity can mean a desirable trait in the production of an L2 learner: the use of subordinate clauses, for example, increases the complexity of the L2, which can be seen as a positive phenomenon, as the L2 thus resembles the language produced by native speakers (Ellis & Barkhuizen, 2005: p. 139).

DeKeyser (2005: p. 8) summarises three viewpoints of grammatical difficulty: *meaning*, *form*, and *relationship between form and meaning*. Meaning is difficult for an L2 learner when it is novel (i.e., foreign to the L1 of the learner or other L2s they might have acquired), abstract, or both. It is important to remember that morphological definiteness is a relatively rare trait in the languages of the world, as only a third of them have either indefinite or definite articles, and less than 8% of them have both an indefinite and a definite article (Haspelmath, 1998: p. 274). Therefore, the Swedish language belongs to the minority. Hence, problems that are typical of Finnish learners of L2 Swedish might be typical of learners of L2 Swedish with many different L1s lacking articles.

Definiteness exists in Finnish as a semantic category and is usually interpretable from the context, word order or common knowledge (Hakulinen et al., 2004: pp. 1360–1361). Since Finnish lacks morphological definiteness (Karlsson, 2008: p. 7), Swedish definiteness morphology is, especially at the beginning, a notorious source of difficulty for Finnish learners of L2 Swedish (e.g., Axelsson, 1994; Nyqvist, 2013). Definiteness morphology is also difficult to interpret from the input and is resistant to grammar instruction (DeKeyser, 2005: p. 5), and the difficulties are present in every NP the learner produces since every noun must be coded for definiteness. According to DeKeyser (2005: pp. 6–7), the role of morphology should be strengthened in instruction, for example, by directing the attention of the L2 learners to the morphology when analysing the input, as the learners could otherwise easily ignore it. This happens especially when the L2 includes grammatical categories that the L1 lacks (DeKeyser, 2005: p. 7; see also Filipović & Hawkins, 2013: p. 168), which is the case for Finnish learners of L2 Swedish as far as definiteness morphology is concerned (see also Jarvis & Odlin, 2000; Odlin, 2003).

Formal difficulty has often been seen as the most typical form of complexity, i.e., the number of choices a learner is obliged to make when picking the accurate morphemes/allomorphs in an utterance. This problem is especially obvious when the target language has a rich inflectional system (DeKeyser, 2005: p. 6). The inflection of nouns in Swedish is less complex than in many other languages, but the structure of Swedish NPs is still rather complex (Philipsson, 2004: p. 125): the nouns are either non-neuter or neuter and the plural ending has seven

different allomorphs (Teleman et al., 1999a: pp. 58, 63). Moreover, both articles and definiteness endings inflect for grammatical gender, and the definiteness endings also inflect for number (Teleman et al., 1999a: pp. 96–102). A typical trait of Swedish nouns is that the indefinite singular nouns have an indefinite article similar to, e.g., English or German (e.g., en katt, "a cat"), but the definite form has an ending that is sometimes called the *definite end article* (in plurals, it is added to the plural ending, see example 2 below; Teleman et al., 1999a: pp. 101–102). Hence the definiteness of the Swedish NPs can be called "asymmetric and obscure" (Philipsson, 2004: p. 126, my translation).

If a noun in the definite form is preceded by an adjective attribute, the NP also includes a separate definite front article that inflects for grammatical gender and number (Teleman et al., 1999a: p. 302). As shown in (1) below, the adjective attribute also has a definite ending (Teleman et al., 1999a: p. 96):

1.  *den        stor-a  katt-en*
    ART.SG.NN.DEF big-DEF cat-SG.NN.DEF
    'the big cat'

The plurals are especially complex, as the nouns include both the plural ending and the definiteness ending:

2.  *de        stor-a  katt-er-na*
    ART.PL.DEF big-DEF cat-PL.NN.DEF
    'the big cats'

This NP type is commonly called *double definiteness*, but it actually uses three morphemes to convey one definite meaning and thus includes a lot of *redundancy*. One meaning is expressed with several grammatical morphemes that are not all semantically necessary (DeKeyser, 2005: p. 8), which an L2 learner is obliged to take into account. If the redundant element is also novel or abstract, the learning task becomes even more difficult (DeKeyser, 2005: p. 6). As Lahtinen (1993: p. 181) puts it, double definiteness offers an L2 learner many opportunities to make the wrong choice. The definite front article can be optional in certain NPs with double definiteness if the adjective attribute has a superlative form or is replaced by an ordinal number, such as in *minsta barnet* or *sista tåget* ("the youngest/smallest child", "the last train", Teleman et al., 1999b: p. 77). The definiteness ending can be omitted in determinative use, i.e., if the NP is followed by a relative clause, e.g., *den intressanta bok som vi läste…* ("the interesting book that we read…" Teleman et al., 1999a). These traits make double definiteness even more confusing for the L2 learner, but they will not be treated more thoroughly, as the actual test does not deal with these aspects of definiteness marking.

DeKeyser (2005: p. 8) defines redundancy as a type of difficulty concerning the relationship between form and meaning, but it could also be a purely formal phenomenon: double definiteness includes a lot of redundancy at a formal level, as the definiteness is marked three times in an NP, but it occurs only in the definite meaning, and

the relationship between form and meaning is a simple one. Furthermore, redundancy is present in Swedish NPs where definiteness is lexically expressed: the PRG attributes determine the form of the noun. For example, the phrase below includes two morphemes (three, if the optional adjective attribute is included) expressing definite meaning: the definite pronoun *den här* ("this"), the definite form of the noun and the possible adjective attribute (Teleman et al., 1999a: pp. 220, 318):

3.  *den här  (glad-a)      hund-en*
    DEM.SG.NN (happy-DEF) dog-SG.NN.DEF
    'this (happy) dog'

The third type, i.e., the difficulty in the relationship between form and meaning, is independent from the first two types. Both form and meaning can be simple *per se*, but if the relationship between them is complex, learning problems occur. The possessive attributes in Swedish are formally simple words with concrete meanings that also have equivalents in Finnish. NPs with possessive attributes are formed following a simple rule that does not include exceptions. Possessive attributes are always constructed using a noun in the indefinite form, although they always have a definite meaning (Teleman et al., 1999b: p. 25), and hence the correlation between form and meaning is low, i.e., problematic (DeKeyser, 2005: p. 7). This does not occur solely in NPs with possessive and genitive attributes but also with some definite pronominal attributes, notably *denna* ("this") and *samma* ("same"), which are also constructed using an indefinite noun (Teleman et al., 1999a: pp. 307, 439). If these NPs also include an adjective attribute, it adds to the complexity of the NP, as the adjective also has a definite form (Teleman et al., 1999a: p. 220):

4.  *Min/Johns      (glad-a)      hund*
    1POSS.NN.SG/John-GEN (happy-DEF) dog-SG.NN.INDEF
    'my/John's (happy) dog'

5.  *denna    (glad-a)      hund*
    1DEM.NN.SG (happy-DEF) dog-SG.NN.INDEF
    'this (happy) dog'

Another type of complex relationship is a situation where different forms have the same meaning (DeKeyser, 2005: p. 8). This is the case with the demonstrative pronouns *denna* and *den här* (both meaning "this"; see examples 3 and 5 above). These pronouns, moreover, are constructed using different noun forms; *denna* uses the indefinite form (Teleman et al., 1999a: pp. 220, 307) and *den här* uses the definite one (Teleman et al., 1999a: p. 318). NPs with *denna* are formally simple because they do not include redundancy: the definiteness is expressed by only one grammatical element, the PRG attribute. The relationship between form and meaning, on the other hand, is rather problematic: the definite meaning is expressed using a noun in the indefinite form. However, in *den här glada hunden* (see above), form and meaning go hand in hand, so these NPs may appear less complex as far as the

relationship between form and meaning is concerned. However, they are structurally more complex, as definite meaning is expressed using both the demonstrative pronoun and the definiteness ending of the noun.

Frequency (an aspect of *feature-related difficulty* in the taxonomy by Housen & Simoens, 2016: p. 164) plays an important role in the relationship between form and meaning. If the relationship is straightforward, the structure does not need to be particularly frequent to be rapidly acquired, but if the relationship is complex, not even high frequency can facilitate the learning. If the relationship is something between complex and straightforward, the frequency might play a decisive role (DeKeyser, 2005: pp. 10–11). In previous studies with spontaneous data (e.g., Nyqvist, 2013, 2018, in press), the possessive attributes have been frequent, the genitive attributes somewhat less frequent and the definite attributes infrequent. Hence, it is also probable that the frequencies play a part in the accuracy in this study; e.g., possessive and genitive attributes are easier than the less frequent attributes, which was actually the case in Nyqvist (unpublished ms).

## 3 Previous research

In the following the most relevant previous research on complex Swedish NPs is summarised. Research on the acquisition of definiteness in L2 Swedish has been manifold (for an overview, see Nyqvist, 2013 [in Swedish]; Nyqvist, 2016 [in English]; 2018 [in English]), but most studies are based on spontaneous data and are thus highly likely to yield different results than tests. Moreover, these studies have not focused on complex NPs. Hence, in the following I will concentrate on studies with informants that most resemble the ones in this study.

At present, Nyqvist (2013) is the one of the most extensive longitudinal studies on the acquisition of definiteness and article use by Finnish-speaking non-immersion L2 learners of Swedish (spontaneous written and oral material from pupils in comprehensive school, grades 7–9), but it included only sporadic NPs with double definiteness with low accuracy scores (29% in singular and 0% in plural). Even the NPs with PRG attributes were too sparse for a proper analysis.

Double definiteness and most types of NPs with PRG attributes were also sparse in spontaneous written data by 12- and 15-year-old immersion pupils (Nyqvist, 2018, in press). Furthermore, the accuracy scores were lower in the ninth grade (60% in singulars, 45% in plurals) than in the sixth grade (71% in singulars, 54% in plurals), which might depend on the inherent difficulty of the studied structures, but also on the fact that immersion students receive less instruction in Swedish in grades 7–9 than in grade 6. In PRG attributes, accuracy scores were at the same level in possessive and genitive attributes (over 90% in both grades and both types of PRG attributes), as well as in the definite attributes constructed using definite nouns (accuracy score of over 80% in both grades); NPs with both a PRG and an adjective attribute were too low frequency to be analysed. Conversely, definite attributes constructed using nouns in the definite form were mastered significantly better in both grades than the ones

constructed using nouns in the indefinite form. However, even these NP types were too low frequency to be analysed at the individual level. As the data in Nyqvist (2013, 2018, in press) was insufficient and differed fundamentally from the data used in the present study, one can only state that the informants seem to have problems with double definiteness, and it is therefore necessary to study them further with another kind of data.

In Nyqvist (unpublished ms), an analysis was carried out of the results of Finnish-speaking immersion pupils in the sixth and ninth grades (n = 77 and n = 86, respectively) who completed the same grammaticality judgement test as the informants of the current study. The analyses at both the group and individual levels showed that the formally complex NPs had higher accuracy scores than those with a complex relationship between form and meaning in both grades. The frequency of the NP type played a central part; the frequent NPs were mastered at a higher level than the less frequent ones. There were still some informants in both grades who did not reach the 75% level of accuracy in any of the studied NPs, which showed how difficult the studied NP types were. From within this context, the current paper considers the following research questions and hypotheses:

1. RQ1: In what order are the studied structures mastered in the L2 Swedish of the non-immersion group? How can this be explained?
   · H1: The orders are similar to the ones discovered in the analysis of immersion students: double definiteness in the singular is mastered before the plural, and the more frequent PRG attributes are mastered before the less frequent ones (Nyqvist, unpublished ms).
2. RQ2: What kind of complexity is most difficult for the non-immersion group?
   · H2: As the differences between more and less advanced L2 learners are quantitative rather than qualitative (Hyltenstam, 1988, 1992), it is likely that even in this study, double definiteness, i.e., formal complexity, is acquired earlier than most NPs with PRG attributes, where the complexity occurs in the relationship between form and meaning (as in Nyqvist, unpublished ms).
3. RQ3: What kinds of differences are there between the non-immersion and the immersion students?
   · H3: 75% use is more common in immersion than in non-immersion instruction, as previous comparative studies (Nyqvist, 2018, in press) have shown that immersion students have higher accuracy than non-immersion students. However, it is important to note that these previous studies have focused on spontaneous material.

## 4 Methodology
### 4.1 Participants
The informants were 16-year-old non-immersion pupils in an upper secondary school in Southwest Finland (n = 44). They had received instruction in around 450 lessons in Swedish in a comprehensive school since the age of 11, commonly called *syllabus A2 Swedish* (see FNBE, 2014: p. 42; Government Decree 422/2012), so they have been

learning Swedish at school for six years. According to the *National Core Curriculum for Basic Education* (FNBE, 2004), the pupils have to reach CEFR level A2 in writing and speaking to be able to reach a score of "good" at the end of comprehensive school (FNBE, 2004: p. 122). This is likely to be their level also after the first year in upper secondary school, as "good" on the test in Swedish in the Matriculation Examination (i.e., the national final exam of the upper secondary school in Finland) corresponds approximately to a level no higher than a "low B1" (Juurakko-Paavola & Takala, 2013: p. 28). During the first year in the upper secondary school, they had taken three of six obligatory courses[1] in Swedish (FNBE, 2015: p. 89–90, 234).

The informants were compared to 15-year-old Finnish immersion pupils (n = 86) from all regions providing immersion in Finland (Ostrobothnia, Southwest Finland, and Uusimaa region) who began to learn Swedish at day care and have received 50% of all their instruction in the comprehensive school system in Swedish (Bergroth & Björklund, 2013: p. 109). The starting age varies in different communes (for an overview, see Bergroth, 2007: p. 18), but all immersion students in this study have learned Swedish for more than nine years. The standards set for competence in the immersion language vary in different communes, but they are essentially higher than in the non-immersion instruction context: pupils have to reach B-level on the CEFR scale in order to reach the level of "good" at the end of immersion (i.e., in the ninth grade).[2] All informants had started learning English at the age of nine, the non-immersion pupils as their L2 and the immersion students as their L3 (FNBE, 2014: p. 42).

As SLA in immersion settings occurs mainly via communication (e.g., Baker, 2011), one can assume that the non-immersion students have received more formal instruction than the immersion students, although the role of explicit grammar instruction has also decreased in non-immersion settings in Finland (Jaakkola, 2000: p. 151). According to Axelsson (1994: p. 99), double definiteness is a structure that L2 learners may never master completely in formal instruction. This implies that these NPs would be easier for immersion students who have acquired Swedish via communication and have been exposed to fundamentally more input. The test used in this study, on the other hand, might favour informants who have received formal instruction. Hence, it is interesting to compare these two informant groups.

This study is part of a larger project in which the grammatical competence (in Swedish) of immersion students in the sixth and ninth grades is compared to that of first-year students in upper secondary schools. Data in the project consist of both spontaneous writing (narratives of 150–200 words) and diverse grammar tests eliciting low frequency structures. Immersion students are compared to students one year older because writing longer texts is not part of traditional Swedish instruction in the Finnish comprehensive school, whereas it is a regular activity in the upper secondary school.

The project as a whole emphasises the grammatical competence of immersion students, that has not previously gained much attention in Finland (e.g.,

Bergroth & Björklund, 2013), and the non-immersion group acts as a control group. The aim of this study, however, is to compare the results of the non-immersion students to the results of the ninth-graders in immersion schools, which were previously presented in Nyqvist (unpublished ms). This means that the roles in the data have been changed: the group usually acting as a control group has temporarily become the principal informant group. Hence, the population of non-immersion students is smaller than that of the control group, although the situation in most studies is the opposite.

### 4.2 Test

As the studied structures tend to be low frequency in spontaneous data (Axelsson, 1994; Nyqvist, 2018, in press, 2013), the study used a grammaticality judgement test, i.e., elicited data, to make sure the studied NPs occurred often enough. An advantage of using such a test for data collection is that it becomes possible for the informant to concentrate maximally on the formal aspects of the language, but the results are not directly comparable to the results of the spontaneous data. Various types of data usage may dramatically affect the output of the informants (see Tarone, 1988: p. 12–13). In the current test, for example, the informants did not need to formulate the NPs, but only needed to choose between two given alternatives. Hence, they did not need to consider grammatical gender or accurate plural endings of the nouns. All nouns in the test were also high frequency. The test could not be made too long, therefore it covers only a small assortment of different PRG attributes. The informants were expected to choose the right form of the noun, as the problems concerning the choice of the noun form is common for both NPs with double definiteness and for those with a PRG attribute.

The test consists of 28 NPs, and 12 of them concern double definiteness in the singular (non-neuter and neuter nouns) and the plural (non-neuter nouns). The remaining 16 NPs include 4 different types of PRG attributes in total: 4 NPs with possessive attributes and 4 with genitive attributes (these NPs also include adjective attributes). These manifest a complex relationship between the form and the meaning (definite meaning, but constructed using an indefinite noun), but are frequent in the language use.

On the other hand, the test includes 4 NPs with the demonstrative pronoun *denna* and 4 with the demonstrative pronoun *den här*. Both pronouns mean "this", but *denna* has a complex relationship between form and meaning similar to that of NPs with either possessive or genitive attributes, whereas *den här* occurs only in formally complex NPs. As far as style is concerned, *denna* can also be classified as a literary pronoun, whereas *den här* occurs in both spoken and written language. Hence, *denna* is also less frequent in the input.

### 4.3 Analysis: Implicational scaling

The method of analysis used in this study is implicational scaling, which is a way to analyse the data at the individual level. Implicational scaling shows whether the mastery of something (e.g., double definiteness in the plural) implies the mastery of something else (e.g., double definiteness in

the singular). If this is the case, it can be concluded that the singular has been mastered before the plural and an acquisition order can be established. The mastery of the studied NP types has been operationalised as *accurate use at the 75% criterion* (henceforth *75% use*). If an informant chooses the right form in 75% (i.e., three of four) of instances of a specific NP type, they are assumed to have mastered it.

## 5 Results

The results from the analysis are presented in this section. In the scales below, the studied NP types are horizontally ordered from the easiest to the most difficult, with the NP with the most informants using it at the 75% criterion standing farthest to the left. The learners are vertically ordered according to how many constructions they complete. Due to the large number of informants, the rows in the tables represent groups of informants. The column "in total" shows how many informants there are in the actual group.

Accurate use at the 75% criterion is marked in **Tables 1** and **2** with plusses (+) and accuracy below 75% is marked with minuses (–). The exclamation marks (!) stand for deviations from the ideal implicational scales. The three informants in Group 3 (**Table 1**), for example, fulfil the criterion in plurals but not in neuter singulars, although the 75% use of neuter singulars is more common in the data than that of plurals (34 informants vs. 26). Due to the deviations, the statistical validity of the scales has been established by calculating the *coefficient for reproducibility* and *the coefficient of scalability* ($C_{rep}$ and $C_{scal}$ in the tables below, the limiting values being 0.9 and 0.6, respectively; Hatch & Lazaraton, 1991: pp. 210, 212). Note that the tables below include only the results from the non-immersion group. For the tables from the immersion group, see the appendix.

### 5.1 Double definiteness

Focusing first on double definiteness, the scale was valid, thus an acquisition order can be established: non-neuter singulars > neuter singulars > plurals as shown in **Table 1**. This is not surprising. Double definiteness is even more complex in the plural than in the singular because the noun has two endings, and this tendency can be seen even in the few occurrences of double definiteness in spontaneous data (Nyqvist, 2018, in press). Hence, hypothesis 1 holds that the acquisition order was identical to that of the immersion pupils. The difference between the 75% use of non-neuter and neuter nouns can be explained by the fact that the non-neuter nouns are more frequent in the language (Teleman et al., 1999a: p. 59). The difference between non-neuter and neuter nouns was insignificant (p = 0.08), but the plural was 75% accurately used by significantly fewer informants than non-neuter singular forms in the non-immersion group (p = 0.001; p = 0.000 in the immersion group).

Accurate use at the 75% criterion of the different forms is a little more common in the non-immersion group than in the control group with immersion students: 52% of the informants use all forms with 75% accuracy (44% in the immersion group), and 75% of the informants use singulars with 75% accuracy (76% in the immersion group). Hence hypothesis 3 is falsified in the case of double definiteness. Up to 91% of the informants use non-neuter singulars, 77% use neuter singulars, and 59% use plurals with 75% accuracy when the corresponding percentages in the immersion group are 88%, 83%, and 55%. All differences between the two informant groups are insignificant, however. Three informants in the non-immersion group (two in the immersion group) did not use any of the studied forms 75% accurately at the end of immersion.

### 5.2 PRG attributes

Moving on to PRG attributes, the scale was valid, and an acquisition order identical to the one in the immersion group was *den här* > genitive attribute with an adjective > possessive attribute with an adjective > *denna*, as shown in **Table 2**. Hence, hypothesis 1 also holds here. The formally complex but "logical" *den här* was mastered first, and then came genitive and possessive attributes that have a complex relationship between form and meaning, but that are rather common in the input, which means that even hypothesis 2 holds true: formal complexity was less problematic than the complexity in the relationship between form and meaning.

Accurate use at the 75% criterion for most of these attributes was very common: *den här* was used with 75%

**Table 1:** Accurate use at the 75% criterion of double definiteness in the non-immersion group.

| Group | non-neuter sg | neuter sg | pl | in total | % | deviations |
|---|---|---|---|---|---|---|
| 1 | + | + | + | 23 | 52% | 0 |
| 2 | + | + | – | 10 | 23% | 0 |
| 3 | + | – | +! | 3 | 7% | 3 |
| 4 | + | – | – | 4 | 9% | 0 |
| 5 | – | +! | – | 1 | 2% | 1 |
| 6 | – | – | – | 3 | 7% | 0 |
| | **40** | **34** | **26** | **44** | **100%** | **4** |

$C_{rep}$ 0.97, $C_{scal}$ 0.92.

**Table 2:** Accurate use at the 75% criterion of the studied PRG attributes in the non-immersion group.

| Group | den här | gen+adj | poss+adj | denna | in total | % | deviations |
|---|---|---|---|---|---|---|---|
| 1 | + | + | + | + | 3 | 7% | 0 |
| 2 | + | + | + | – | 20 | 45% | 0 |
| 3 | + | + | – | +! | 2 | 4.5% | 2 |
| 4 | + | + | – | – | 4 | 10% | 0 |
| 5 | + | – | +! | +! | 2 | 4.5% | 4 |
| 6 | + | – | – | +! | 1 | 2% | 1 |
| 7 | + | – | +! | – | 2 | 4.5% | 2 |
| 8 | + | – | – | – | 2 | 4.5% | 0 |
| 9 | – | +! | +! | +! | 2 | 4.5% | 0 |
| 10 | – | +! | +! | – | 1 | 2% | 2 |
| 11 | – | – | +! | – | 2 | 4.5% | 2 |
| 12 | – | +! | – | – | 2 | 4.5% | 2 |
| 13 | – | – | – | +! | 1 | 2% | 0 |
| | **36** | **34** | **32** | **11** | **44** | **100%** | **15** |

$C_{rep}$ 0.91, $C_{scal}$ 0.84.

accuracy by 81% of the informants, genitive attributes by 77%, and the possessive ones by 73% of the informants in the non-immersion group. With the exception of the possessive attributes, the percentages were higher in the immersion group (85%, 80%, and 70%, respectively), but the differences were statistically insignificant. Hence, hypothesis 3 holds true to some extent for the PRG attributes. A common trait in both groups is that *denna* is used with 75% accuracy by a minority of informants (25% in the non-immersion group and 37% in the immersion group). It is significantly more difficult than the other studied PRG attributes (p = 0.000 in all cases in both informant groups), as it is both low frequency and has a complex relationship between form and meaning.

Only three informants accurately used all studied attributes 75% of the time (20 in the immersion group). In other words, the number of informants using all studied PRG attributes with 75% accuracy is significantly higher in the immersion group than in the non-immersion group (p = 0.015). The majority (45%) of non-immersion students (37% of immersion students), however, accurately used the three easiest ones 75% of the time, but the difference between these groups is not statistically significant.

When accuracy at the 75% criterion of double definiteness and that of the studied PRG attributes were compared, one could see that accurate use at the 75% criterion was most common in NPs with double definiteness in the singular and in those with the demonstrative pronoun *den här*. An accuracy of 75% was likewise common in NPs with both genitive/possessive and adjective attributes, whereas accurate use at the 75% criterion of double definiteness in the plural and *denna* was considerably less common. *Denna* was used significantly less often at 75% accuracy than all other studied NP types (p = 0.000 in all cases, except double definiteness in the plural, where p = 0.005), whereas double definiteness in

the plural was used with 75% accuracy significantly less often than double definiteness in the singular and *den här* (p = 0.000 in both). It is also important to remember that NPs with possessive and genitive attributes also include adjective attributes, augmenting their (formal) complexity: the higher frequencies might explain why possessive and genitive attributes are still mastered to a greater extent than *denna*. The same phenomena were repeated in the immersion group.

In other words, the NP types used most often with 75% accuracy by informants are the ones where the complexity is purely formal. Frequency, on the other hand, also played a part because genitive and possessive attributes were accurately used 75% of the time more often than *denna*, although the relationship between form and meaning was similarly complex in both. The low level of 75% use in double definiteness in the plural possibly depended on the especially high level of complexity (i.e., the noun has two endings) and the low frequency of the NP type in the input.

## 6 Discussion and conclusion

The aim of this study was to explore the extent to which certain complex NP types of Swedish are mastered by 16-year-old non-immersion learners of L2 Swedish (n = 44) when compared to the results of 15-year-old immersion students (n = 86) in a grammaticality judgement test concentrating on certain NP types that are either formally complex or those in which the complexity lies in the relationship between the form and the meaning.

Previous statistical comparisons of grammatical competence (with spontaneous data) between immersion and non-immersion students have shown that immersion students usually master definiteness in Swedish NPs at a significantly higher level of accuracy. The findings of this study are, to some extent, along the same lines: immersion

students do master all the NPs with PRG attributes to a larger extent, but the non-immersion students, on the other hand, perform better in double definiteness. Most of these differences, however, lack statistical significance. The only exception is the percentage of informants fulfilling the 75% criterion in all studied types of PRG attributes, which is significantly higher in immersion than in non-immersion. Hence, the learning context (i.e., non-immersion vs. immersion) appears to play a relatively small part in the current data.

The studied NP types are mastered in an identical order in both groups, and this can be explained by the feature-related factors of difficulty, notably their complexity. Double definiteness in the singular and NPs with *den här*, i.e., two types of formally complex NPs, were mastered first. NPs with genitive and possessive attributes, where the complexity lies in a complex relationship between form and meaning, were also mastered by the majority of informants in both groups, seemingly due to their high frequency in the language. Double definiteness in the plural and NPs with the definite attribute *denna* were, by contrast, mastered by significantly fewer informants: both are low frequency in the language, and the most difficult of the studied NPs has a complex relationship between form and meaning. The same order was manifested in spontaneous data.

Hence one can assume that formal complexity might be a smaller problem for the informants (in both non-immersion and immersion settings) than the complexity of the relationship between form and meaning – a phenomenon often mentioned by Swedish teachers during this project. According to them, the learners of L2 Swedish often comment on the "lack of logic" they perceive in many Swedish PRG attributes. Frequency, on the other hand, plays an important part: high frequency NPs are mastered by most informants, although the relationship between form and meaning is complex. With the exception of *denna*, informants in both groups master the studied NPs in the test at an essentially higher level than in spontaneous data.

It should be noted, however, that the current study has its limitations, such as the population of the non-immersion students is rather small and all of the informants are from the same upper secondary school. Also, the test as an elicitation method concentrates on the studied structures but it does not reveal anything of the informants' practical knowledge of the language, although it is the main aim of the language instruction. Furthermore, the test concentrates on only a few PRG attributes: it is possible that, for example, the rather frequent PRG attribute *samma* ("same") might lead to different results than *denna* which was used in the test.

To conclude, it would be beneficial to study these NPs in spontaneous data in the future by eliciting sufficiently obligatory occurrences for these structures in both immersion and non-immersion students and with bigger informant populations. This way, it would be possible to unravel whether the current findings, suggesting a difficulty hierarchy for different types of complexity, can be generalised to larger populations.

## Notes
1  38 lessons excluding homework (FNBE, 2015: p. 234).
2  There are no upper secondary schools providing immersion in Finland (Bergroth, 2015: pp. 44, 51).

## Additional File
The additional file for this article can be found as follows:

· **Appendix.** Implication scales for the immersion students (Nyqvist, unpublished ms). DOI: https://doi.org/10.22599/jesla.33.s1

## References
**Axelsson, M.** (1994). *Noun phrase development in Swedish as a second language. A study of adult learners acquiring definiteness and the semantics and morphology of adjectives.* Stockholm: Stockholm University Centre for Research and Bilingualism.

**Baker, C.** (2011). *Foundations of Bilingual Education and Bilingualism.* 5th edition. Clevedon: Multilingual Matters.

**Bergroth, M.** (2007). *Kielikylpyperheet valokeilassa. Taustat ja odotukset* [Immersion families in the spotlight. Their backgrounds and expectations]. Publications of the University of Vaasa. Retrieved from: http://www.uva.fi/materiaali/pdf/isbn_978-952-476-204-5.pdf.

**Bergroth, M.** (2015). *Kotimaisten kielten kielikylpy* [Immersion of the National Languages]. Publications of the University of Vaasa. Retrieved from: http://www.uva.fi/materiaali/pdf/isbn_978-952-476-617-3.pdf.

**Bergroth, M.,** & **Björklund, S.** (2013). Kielikylpyohjelman tutkimustuloksia Suomessa [Results from immersion studies in Finland]. In: Tainio, L., & Harju-Luukkainen, H. (eds.), *Kaksikielinen koulu – tulevaisuuden monikielinen Suomi/Tvåspråkig skola – ett flerspråkigt Finland i framtiden* [Bilingual school – a plurilingual Finland of the future], 91–114. Helsinki: Finnish Educational Research Association. Studies in Pedagogy 62.

**Bohnacker, U.** (1997). Determiner phrases and the debate on functional categories in early child language. *Language Acquisition, 6*(1), 49–90. DOI: https://doi.org/10.1207/s15327817la0601_3

**Bohnacker, U.** (2003). Nominal phrases. In: Håkansson, G., Josefsson, G., & Platzack, C. (eds.), *Acquisition of Swedish grammar*, 195–259. Amsterdam: John Benjamins Comp.

**Bybee, J.** (2008). Usage-based grammar. In: Robinson, P., & Ellis, N. C. (eds.), *Handbook of cognitive linguistics and second language acquisition*, 216–236. New York: Routledge.

**DeKeyser, R.** (2005). What makes learning second language grammar difficult? A review of issues. *Language Learning, 55*, 1–25. DOI: https://doi.org/10.1111/j.0023-8333.2005.00294.x

**DeKeyser, R.** (2016). Of moving targets and chameleons: Why the concept of difficulty is so hard to pin down. *Studies in Second Language Acquisition*, *38*(2), 353–363. DOI: https://doi.org/10.1017/S0272263116000024

**Ellis, N. C.** (2016). Salience, Cognition, Language Complexity, and Complex Adaptive Systems. *Studies in Second Language Acquisition*, *38*(2), 341–351. DOI: https://doi.org/10.1017/S027226311600005X

**Ellis, N. C.,** & **Robinson, P.** (2008). An introduction to cognitive linguistics, second language acquisition, and language instruction. In: Robinson, P., & Ellis, N. C. (eds.), *Handbook of cognitive linguistics and second language acquisition*, 3–24. New York: Routledge.

**Ellis, R.** (2008). *The study of second language acquisition* (2nd ed.). Oxford: Oxford University Press.

**Ellis, R.,** & **Barkhuizen, G.** (2005). *Analysing learner language*. Oxford: Oxford University Press.

**Eriksson, A.,** & **Wijk-Andersson, E.** (1988). Swedish nouns and articles in German and Polish students' Swedish writing. *FUMS Rapport*, *141*. Uppsala University.

**Filipović, L.,** & **Hawkins, J. A.** (2013). Multiple factors in second language acquisition: The CASP model. *Linguistics*, *51*(1), 145–176. DOI: https://doi.org/10.1515/ling-2013-0005

**FNBE 2004 = Finnish national board of Education.** (2004). *Perusopetuksen opetussuunnitelman perusteet* [Core Curriculum for Basic Education]. Helsinki: Finnish National Board of Education. Retrieved from: http://www.oph.fi/download/139848_pops_web.pdf.

**FNBE 2014 = Finnish National Board of Education.** (2014). *Koulutuksen tilastollinen vuosikirja 2014* [Statistical annuals of education 2014]. Helsinki: Finnish National Board of Education. Retrieved from: http://www.oph.fi/download/163331_koulutuksen_tilastollinen_vuosikirja_2014.pdf.

**FNBE 2015 = Finnish National Board of Education.** (2015). *Lukion opetussuunnitelman perusteet* [Core Curriculum for General Upper Secondary Schools]. Helsinki: Finnish National Board of Education. Retrieved from: http://www.oph.fi/download/172124_lukion_opetussuunnitelman_perusteet_2015.pdf.

**Goldschneider, J.,** & **DeKeyser, R.** (2005). Explaining the "natural" order of L2 morpheme acquisition in English: A meta-analysis of multiple determinants. *Language Learning*, *55*(S1), 27–77. DOI: https://doi.org/10.1111/1467-9922.00147

**Government Decree 422/2012.** Retrieved from: http://www.finlex.fi/fi/laki/alkup/2012/20120422#Lidp450669344 [English translation at: http://www.oph.fi/download/179422_distribution_of_lesson_hours_in_basic_education_2012.pdf].

**Hakulinen, A., Vilkuna, M., Korhonen, R., Koivisto, V., Heinonen, T. R.,** & **Alho, I.** (2004). *Iso suomen kielioppi* [Big Finnish grammar]. Helsinki: The Finnish Literature Society.

**Haspelmath, M.** (1998). How young is standard average European? *Language Sciences*, *20*(3), 271–287. DOI: https://doi.org/10.1016/S0388-0001(98)00004-7

**Hatch, E.,** & **Lazaraton, A.** (1991). *The research manual: Design and statistics for applied linguistics*. Boston, Mass: Heinle & Heinle.

**Housen, A.,** & **Simoens, H.** (2016). Introduction: Cognitive perspectives on difficulty and complexity in L2 acquisition. *Studies in Second Language Acquisition*, *38*(2), 163–175. DOI: https://doi.org/10.1017/S0272263116000176

**Hyltenstam, K.** (1988). Att tala svenska som en infödd – eller nästan [To speak Swedish as a native speaker – almost]. In: Hyltenstam, K., & Lindberg, I. (eds.), *Första symposiet om svenska som andraspråk. Volym 1: Föredrag om språk, språkinlärning och interaktion* [First symposium in Swedish as a L2. Volume 1: Presentations on language, language learning and iInteraction], 138–156. Stockholm: Stockholm University, Centre for Research on Bilingualism.

**Hyltenstam, K.** (1992). Non-native features of near-native speakers. On the ultimate attainment of childhood L2 learners. In: Harris, R. (ed.), *Cognitive processing in bilinguals*, 351–368. Amsterdam: Elsevier Science Publishers. DOI: https://doi.org/10.1016/S0166-4115(08)61505-8

**Jaakkola, H.** (2000). Kielitiedosta kielitaitoon [From the knowledge about languages to the language proficiency]. In: Kaikkonen, P., & Kohonen, V. (eds.), *Minne menet kielikasvatus? Näkökulmia kielipedagogiikkaan* [Where are you going, language education? Viewpoints into language pedagogy]. Jyväskylä: University of Jyväskylä.

**Jarvis, S.,** & **Odlin, T.** (2000). Morphological type, spatial reference and language transfer. *Studies in second language acquisition*, *22*(4), 535–556. DOI: https://doi.org/10.1017/S0272263100004034

**Juurakko-Paavola, T.,** & **Takala, S.** (2013). *Ylioppilastutkinnon kielikokeiden tulosten sijoittaminen lukion opetussuunnitelman perusteiden taitotasoille.* [How to place the results of the language test in the matriculation examination in the scales used in the core curriculum for general upper secondary schools]. Matriculation Examination Board. Downloaded in: https://www.ylioppilastutkinto.fi/images/sivuston_tiedostot/Raportit_tutkimukset/FI_2013_kielikokeet_taitotasot.pdf.

**Karlsson, F.** (2008). *Finnish: An Essential Grammar* (2nd ed.). London: Routledge.

**Lahtinen, S.** (1993). Om nominalfrasens struktur och feltyperna "en (gul) bilen" och "det gula bilen" i finska gymnasisters inlärarsvenska [On the structure of the NPs and error types "en (gul) bilen" and "det gula bilen" in the written Swedish by Finnish students in upper secondary school]. In: Muittari, V., & Rahkonen, M. (eds.), *Svenskan i Finland 2* [Swedish in Finland 2], 85–98. Jyväskylä: Jyväskylä universitet.

**Lieven, E.,** & **Tomasello, M.** (2008). Children's first language acquisition. In: Robinson, P., & Ellis, N. C. (eds.), *Handbook of cognitive linguistics and second language acquisition*, 168–196. New York: Routledge.

**Long, M. H.** (1990). The least a second language acquisition theory needs to explain. *TESOL Quarterly*, *24*(4), 649–666. DOI: https://doi.org/10.2307/3587113

**Nyqvist, E.-L.** (2013). *Species och artikelbruk i finskspråkiga grundskoleelevers inlärarsvenska. En longitudinell undersökning i* årskurserna *7–9.* [Definiteness and use of articles in Swedish of Finnish L2-learners. A longitudinal study from 7th to 9th grade in comprehensive school]. A doctoral dissertation published in electronic format. Turku: University of Turku. http://www.doria.fi/handle/10024/91519.

**Nyqvist, E.-L.** (2016). Swedish as a L3 for Finnish learners: The role of complexity and cross-linguistic influence in the case of definiteness and the use of articles. *Research in Language*, *3*, 297–327.

**Nyqvist, E.-L.** (2018). Definiteness and Use of Articles in Written Swedish by Finnish-speaking Immersion Pupils at the End of Immersion: A Comparison with Non-immersion Students. *Journal of Immersion and Content-based Language Education*, *1*, 57–84. DOI: https://doi.org/10.1075/jicb.17001.nyq

**Nyqvist, E.-L.** (in press). Species och artikelbruk hos finska språkbadselever i årskurs 6 [Definiteness and use of articles by 12-year-old Finnish-speaking immersion students]. To be published in *Folkmålsstudier, 56.*

**Nyqvist, E.-L.** (Unpublished manuscript). Komplexa svenska nominalfraser hos finskspråkiga språkbadselever [Complex Swedish NPs by Finnish-speaking immersion students].

**Odlin, T.** (2003). Cross-linguistic influence. In: Doughty, C. J., & Long, M. H. (eds.), *The Handbook of second language acquisition*, 436–486. Blackwell Publishing. DOI: https://doi.org/10.1002/9780470756492.ch15

**Philipsson, A.** (2004). Svenskans morfologi och syntax i ett andraspråksperspektiv [Swedish morphology and syntax from a L2 perspective]. In: Hyltenstam, K., & Lindberg, I. (eds.), *Svenska som andraspråk − i forskning, undervisning och samhälle* [Swedish as a L2 – in the research, instruction and society], 117–151. Lund: Studentlitteratur.

**Tarone, E.** (1988). *Variation in interlanguage.* London: Edward Arnold.

**Teleman, U., Hellberg, S.,** & **Andersson, E.** (1999a). *Svenska Akademiens grammatik.* [Grammar of the Swedish Academy], *2.* Stockholm: Nordstedts Ordbok.

**Teleman, U., Hellberg, S.,** & **Andersson, E.** (1999b). *Svenska Akademiens grammatik.* [Grammar of the Swedish Academy], *3.* Stockholm: Nordstedts Ordbok.