



# Swedish noun-phrase structure in Russian-speaking learners: An explorative study of L1 influence and input-frequency effects

ANDERS AGEBJÖRN 

RESEARCH

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## ABSTRACT

Articles pose a particular challenge to second-language learners whose first language does not have them. Variability in article production in these learners is often explained in terms of first-language influence, but there are also suggestions that frequency-biased regularities in the target language itself might play a role. While most second-language research on articles has focused on English, a language with a relatively simple article system, the present study explores first-language influence and input-frequency effects by focusing on Swedish. Swedish expresses definiteness using a complex noun-phrase structure including several free-standing and bound morphemes, some relatively frequent in input, others less frequent. An oral-production task elicited adjectivally modified and non-modified noun phrases in indefinite and definite contexts from 23 foreign-language learners of Swedish who were native speakers of Russian, an inflectional language without articles. The analysis revealed that the learners were more likely to supply high-frequency morphemes than low-frequency ones. Furthermore, while the learners were equally likely to supply bound and free-standing morphemes, only their suppliance of free-standing morphemes was negatively affected by adjectival modification; their suppliance of bound morphemes was not. While the role of cross-linguistic influence should not be neglected, these findings suggest that probabilistic regularities in the linguistic input are a key factor in second-language acquisition of functional morphology.

CORRESPONDING AUTHOR:

**Anders Agebjörn**

Lund University and University of Gothenburg, Centre for Languages and Literature, Lund University, Box 201, S-221 00 Lund, Sweden

[anders.agebjorn@nordlund.lu.se](mailto:anders.agebjorn@nordlund.lu.se)

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A major question in the field of second language acquisition is to what extent interlanguage variability stems from, on the one hand, first-language (L1) influence and, on the other hand, the nature of the second language (L2) itself. While variability in Bates and MacWhinney's (1981) Competition Model is the result of competition between L1 and L2 structures, Ellis (2002) emphasises the role of input frequency; he describes L2 acquisition as “the piecemeal learning of many thousands of constructions and *the frequency-biased abstraction of regularities within them*” (p. 143, emphasis added). When it comes to L2 acquisition of articles, patterns of omission have often been accounted for in terms of L1 influence but rarely in terms of input frequency (Ogawa, 2015). This is probably because “articles are the most frequent forms that are available to learners in input” (Young, 1996, p. 136). Nevertheless, Ogawa's corpus study on count and mass nouns revealed that typical patterns of article omission in learners of L2 English reflect to some extent patterns in the input. It is therefore worthwhile to consider the role of probabilistic regularities in the target language itself when seeking to explain patterns of article omission in L2 learners.

The two factors – L1 influence and input frequency – may interact, and disentangling them can be complicated. For example, L2 learners of English whose L1 does not have articles are more likely to omit an article in an adjectivally modified noun phrase (NP) than in a non-modified one (e.g., Pongpaioj, 2007; Snape, 2006; Trenkic, 2000, 2007). This could be for two reasons. One reason is that adjectivally modified NPs are more complex than non-modified ones and therefore require more attentional resources. Because these resources, which are limited, are also needed to inhibit selection of L1 structures, the article-less L1 structure has a greater chance to be selected when the NP includes an adjective than when it does not. The second reason is that adjectivally modified NPs are less frequent in input than non-modified ones, which results in stronger contingency between articles and nouns than between articles and adjectives. These two possibilities are not mutually exclusive (Austin et al., 2015; Trenkic, 2009).

While the majority of data that lies at heart of different explanations comes from research on L2 English, a language with a relatively simple article system, the present study investigates variability in L2 Swedish, a language that encodes definiteness using a more complex NP structure. Specifically, the study focuses on Russian-speaking learners' production of Swedish NPs. Russian does not have articles; indefiniteness and definiteness can be expressed indirectly by quantifiers and determiners, which are normally placed at the left edge of the NP, but in their absence, NPs are bare (Sussex & Cubberly, 2006). By contrast, Swedish obligatorily expresses definiteness using both free-standing morphemes at the left edge of the NP and suffixes – inflectional morphemes at the right edge of adjectives and nouns (Teleman et al., 1999). Some of these morphemes are relatively frequent in input while others are less frequent. By exploring this acquisitional challenge, the study aims to shed light on some mechanisms underpinning variability in L2 production of functional morphology.

## 2. BACKGROUND

### 2.1. ADJECTIVAL MODIFICATION AND ARTICLE PRODUCTION IN L2 LEARNERS

Numerous studies have reported that L2 learners from article-less L1 backgrounds are more likely to omit articles (ART) in NPs with an adjective (ADJ) (i.e., ART + ADJ + N) than in NPs without one (i.e., ART + N). For L2 English, this has been observed in learners with a range of different L1s (Goad & White, 2004; Jarvis, 2002; Pongpaioj, 2007; Sharma, 2005; Snape, 2006; Trenkic, 2000, 2007; Young, 1996; and see Jaensch, 2009, for L2 German). A negative effect of adjectival modification on article production has also been attested in L1 acquisition during a short period of time around the age of 2 years (Clahsen, 1994; Granfeldt, 2000). By contrast, the effect is typically not found in L2 learners whose L1 has articles (Granfeldt, 2000; Jarvis 2002; Nordanger, 2017; Pongpaioj, 2007).

The negative effect of adjectival modification on article production has been investigated in a number of studies (Austin et al., 2015; Trenkic, 2000, 2007, 2008, 2009). Austin et al. (2015) based their argument on the Competition Model (Bates & MacWhinney, 1981), according to which the L1 and the L2 are simultaneously active, competing for selection in language use. Evidence for structural competition between languages comes from experimental studies on cross-linguistic syntactic priming in bilinguals, demonstrating that activation of a syntactic

structure in one language increases the activation level of the corresponding structure in the other (Hartsuiker et al., 2016). When it comes to L2 learners, L1 structures typically rest at a higher activation level (i.e., they are more accessible) than L2 structures. As a consequence, L1 structures are likely to win the competition as long as the speaker does not inhibit their selection. Thus, when an L2 learner of English with an article-less L1 intends to refer to a count singular referent, the bare-noun structure must be suppressed for the L2 structure (ART + N) to be selected. This inhibition requires attentional resources, which are limited. Since adjectivally modified NPs require more attentional resources than non-modified ones (because they encode more pieces of information), fewer resources are left for inhibiting selection of the L1 structure, increasing the likelihood that the article is dropped.

In other words, the structural-competition model predicts that, everything else being equal, the more material the NP includes, the more likely it is that L2 functional morphology not provided by the L1 is omitted. Austin et al. (2015) tested this hypothesis on Thai-speaking learners of English. Because Thai lacks both articles and plural marking, the bare-noun structure competes for selection in both the singular and plural and in definite and indefinite contexts. In line with the predictions, the learners dropped the definite article more frequently in plural NPs (ART + N-s) than in singular ones (ART + N) and dropped the plural -s more frequently in definite NPs (ART + N-s) than in indefinite ones (N-s). The model thus seems correctly to account for variability in L2 production of functional morphology: Suppressing L1 structures is more difficult when the NP is more complex.

However, Austin et al. (2015) and Trenkic (2009) also considered regularities in the L2 itself to be a contributing factor in an explanation of why functional morphology is more likely omitted in more complex NPs. Regarding the effect of adjectival modification, it might be that articles are more strongly associated with nouns than with adjectives as non-modified NPs are more frequent in input than modified ones. In Ellis' (2002) frequency-based approach, the effect could then be seen as a consequence of adjectives intervening between articles and nouns and so breaking up a highly entrenched ART + N construction. Regarding the Thai-speaking learners of English, who omitted plural marking more frequently in NPs that also required an article, this strength-of-association explanation does not hold as the article does not intervene between the noun and the plural -s. Nevertheless, the finding may still be accounted for in terms of input frequency, given the fact that definite plural NPs are relatively infrequent compared to indefinite plural ones. Austin et al. (2015, p. 707) therefore put forward a model where language use is constrained by the interaction between a multitude of "highly disparate factors" – cues in the Competition Model. Such constraining factors can be competing L1 structures as well as probabilistic regularities in the L2 itself.

Austin et al. (2015, pp. 713–714) concluded their paper by suggesting that further research should "compare functional morphology production in L2 English with morphologically richer L2s, where additional options may need to be considered in production, looking at the frequency and consistency of the input available to learners for a specific piece of morphology". The present study exploited the complex Swedish NP structure, described in the next section, as a testing ground for such an endeavour.

## 2.2. RUSSIAN AND SWEDISH NP STRUCTURE

Russian does not have articles, meaning that the bare NPs in (1a) can be interpreted as either indefinite or definite, depending on a range of contextual and linguistic factors (Sussex & Cumberly, 2006). However, Russian has quantifiers and determiners, like the numeral *odin* 'one' and the demonstrative *èto* 'this'. As shown in (1b), they are normally placed at the left edge of the NP, before any adjective. They are not used obligatorily, but when used they inevitably render the NP indefinite/definite. Further, Russian nouns and their pre-posed modifiers – adjectives, quantifiers and determiners – obligatorily inflect for case, and case marking carries gender and number features, as shown in (1c).<sup>1</sup>

- (1) a. krasnaja mašina stoit na ulice  
red car stand on street  
'a/the red car stands on a/the street'
- b. odna/èta krasnaja mašina  
one/this red car  
'one/this red car'

- c. ona kupila odn-u krasn-uju mašin-u  
 she bought one-ACC.F.SG red-ACC.F.SG car-ACC.F.SG  
 'she bought one red car'

By contrast, Swedish obligatorily expresses whether NPs are indefinite or definite (Teleman et al., 1999). As shown in (2a–c), Swedish has a free-standing indefinite article at the left edge of the NP while the main definite marker is a bound morpheme suffixed to the noun. Moreover, as shown in (2d), in adjectivally pre-modified NPs, definiteness is expressed not only by this definite suffix, but also by a free-standing definite article at the left edge of the NP and an adjectival agreement marker (a bound morpheme). The four grammatical morphemes mentioned here are henceforth referred to as the indefinite article (*en*), the definite nominal suffix (*-en*), the definite adjectival suffix (*-a*) and the definite left-edge article (*den*). Since the indefinite article and the definite nominal suffix are used in both non-modified and modified NPs, they are more frequent in input than the definite adjectival suffix and the definite article, which are required in modified NPs only.

- (2) a. en bil  
 INDEF car  
 'a car'
- b. en vit bil  
 INDEF white car  
 'a white car'
- c. bil-en  
 car-DEF  
 'the car'
- d. den vit-a bil-en  
 DEF white -DEF car-DEF  
 'the white car'

There is much variability and syncretism in Swedish definiteness marking (Teleman et al., 1999). The indefinite article has two allomorphs (*en*, *ett*); the definite suffix has at least three allomorphs (*-(e)n*, *-(e)t*, *-na*); and the pronominal definite article has three allomorphs (*den*, *det*, *de*). Similar to Russian case marking, the choice between allomorphs depends on gender (common/neuter), number (singular/plural) and the noun's declension class. The definite adjectival suffix *-a* is optionally (but rarely) replaced with *-e* when the referent is singular, animate and male (e.g., *den gaml-e mann-en* 'the old man'). Further, while the adjectival suffix *-a* unambiguously encodes definiteness in singular NPs, it also functions as a plural agreement marker (e.g., *några gaml-a män* 'some old men'). Finally, the definite left-edge articles (*den*, *det* and *de*) also function as a personal pronoun (*det är bra* 'it is good') or demonstrative pronoun, in which case they are typically stressed (*DET är bra* 'that is good'). In other words, *den* in (2c) above may function as a demonstrative pronoun.

To complicate things further, the definite suffix (*-en*) does not co-occur with possessive determiners, as shown in (3a) and is, somewhat simplified, optional if the NP includes a restrictive relative clause and a demonstrative pronoun, as shown in (3b). The definite left-edge article (*den*) is not used in proper names like (3c) and is optional with inherently definite adjectives, like superlatives, as shown in (3d). In fact, the definite left-edge article is sometimes omitted even with ordinary adjectives if the referent is present in the immediate context and/or familiar to both the speaker and the hearer (i.e., when the adjective enables identification of the referent). In other words, omitting the definite left-edge article in (2d) above would not necessarily be ungrammatical. By contrast, the definite adjectival suffix (*-a*) is generally used consistently.

- (3) a. min vit-a bil(\*en)  
 my white-DEF car(\*-DEF)  
 'my white car'
- b. den bil(-en) som hon köpte  
 DEM car(-DEF) that she bought  
 'the car that she bought'

- c. (\*det) Vit-a hus-et  
(\*DEF) white-DEF house-DEF  
'The White House'
- d. (det) bäst-a/först-a hus-et  
(DEF) best-DEF/first-DEF house-DEF  
'the best/first house'

### 2.3. L2 ACQUISITION OF THE SWEDISH NP STRUCTURE

The definite modified NP structure poses a particular challenge to L2 learners of Swedish (and Norwegian, similar to Swedish), regardless of whether or not their L1 has articles, probably because of its complexity and low frequency in input (Axelsson, 1994; Nordanger, 2017; Nyqvist, 2018). Generally, L2 learners whose L1 lacks articles omit and substitute articles more frequently than learners whose L1 has them; this has been reported for L2 English (Jarvis, 2002; Pongpaiboj, 2007; Snape, 2006), as well as L2 Swedish and Norwegian (Axelsson; Eriksson & Wijk-Andersson, 1988; Nordanger). However, the story is more complicated when it comes to Swedish. In particular, L2-Swedish learners whose L1 is highly inflectional and shows adjectival agreement, like Finnish and Russian, generally have fewer problems with suffixes than with the free-standing articles. By contrast, learners whose L1 is less inflectional but has free-standing left-edge articles, like English and Spanish, have fewer difficulties with the free-standing articles than with the suffixes (Axelsson; Latomaa, 1992; Nordanger). It thus seems that cross-linguistic influence plays a role in L2 acquisition of the Swedish NP structure beyond the effect of presence versus absence of articles in the L1.

Regarding the negative effect of adjectival modification on article suppliance, discussed above, the same tendency has been noticed in Finnish-, Polish-, Russian- and Spanish-speaking learners of Swedish and Norwegian, although only for the indefinite article (Axelsson, 1994; Nordanger, 2017). Since adjectives intervene between the noun and the indefinite article (*en* + ADJ + N) but not between the noun and the definite suffix (ADJ + N-*en*), this observation might be taken as support for the idea that the negative effect of adjectival modification on article production owes to the strong contingency between articles and nouns.

## 3. THE CURRENT STUDY

The current study focuses on the production of adjectivally modified and non-modified NPs in indefinite and definite contexts – that is, the four structures exemplified in (2) above – by Russian-speaking learners of Swedish. These learners need to learn that Swedish obligatorily expresses indefiniteness using an article at the left edge of the NP (*en*) and definiteness using a nominal suffix (*-en*). They further need to acquire that a definite NP that includes an adjective requires not just the definite nominal suffix but also a free-standing definite article at the left edge of the NP (*den*) and a definite agreement marker suffixed to the adjective (*-a*). The study explores this acquisitional challenge by posing the following research question: What patterns of omission of functional morphology can be discerned in Russian-speaking learners' production of Swedish NPs?

Specifically, because previous research suggests that input frequency may affect L2 acquisition of functional morphology, the analysis first compares the suppliance of high- and low-frequency morphemes. Second, because previous research suggests that the presence of inflectional morphology in the L1 may facilitate the acquisition of L2 suffixes, the analysis compares the production of bound morphemes (suffixes) and free-standing ones (articles). Finally, because previous research discusses the possibility that the negative effect of adjectival modification on article suppliance may be due to strong contingency between articles and nouns, the analysis compares the effect of modification on the indefinite left-edge article – *en* (*vit*) *bil* – and the definite nominal suffix – (*den vit-a*) *bil-en*.

## 4. METHOD

### 4.1. PARTICIPANTS

Russian-speaking learners of Swedish were recruited via the Centre for Swedish Studies in Minsk, Belarus. Native speakers of Swedish were recruited to serve as a reference group. [Table 1](#) provides information about the number of participants per group and their age.

The learners had studied Swedish for at least two years prior to data collection. **Table 2** summarises their age of onset of acquisition, years of exposure, and proficiency level, estimated using the vocabulary and grammar subtests of Swedex A2 and Swedex B1 (Folkuniversitetet, 2018).

| GROUP | n  | AGE  |                 |     |       |
|-------|----|------|-----------------|-----|-------|
|       |    | M    | MD <sup>†</sup> | SD  | RANGE |
| L1    | 26 | 17.5 | 17              | 1.5 | 16–22 |
| L2    | 23 | 25.3 | 23              | 5.5 | 19–37 |

**Table 1** Number of participants and age by group.

<sup>†</sup>Here and henceforth, *Md* stands for median.

| AGE OF ACQUISITION |    |     |       | YEARS OF EXPOSURE |    |     |       | n / PROFICIENCY BAND |    |    |    |
|--------------------|----|-----|-------|-------------------|----|-----|-------|----------------------|----|----|----|
| M                  | MD | SD  | RANGE | M                 | MD | SD  | RANGE | A2                   | B1 | B2 | C1 |
| 20.7               | 19 | 4.8 | 17–33 | 4.7               | 4  | 2.5 | 2–13  | 5                    | 4  | 10 | 4  |

**Table 2** Age of acquisition, years of exposure and proficiency level by L2 group.

All learners were native speakers of Russian. Six of them reported Belarusian, and one of them Ukrainian, as additional L1s. Russian, Belarusian and Ukrainian are similar with respect to grammar; crucially, they do not have articles (Sussex & Cubberly, 2006). All learners had studied English before they learned Swedish. Their self-reported English proficiency, assessed using the Russian version of the Global scale of the Common European Framework of Reference (Council of Europe, 2001), ranged from B2 to C2 with a mean of C1. Further, 13 of the learners had also studied another article language (Germanic or Romance languages).

#### 4.2. THE ORAL-PRODUCTION TASK

L2 learners from article-less L1 backgrounds generally omit and substitute articles more with mass nouns than with count nouns, more in NPs that express the topic of a sentence than in NPs that express the focus, and more with NPs that refer to relatively concrete, activated and salient referents (Huebner, 1985; Jarvis, 2002; Robertson, 2000; Sharma, 2005; Trenkic, 2000, 2002; Trenkic & Pongpairoj, 2013; Young, 1996). The present study controlled for these patterns by utilising an oral-production task designed to elicit a very limited number of NP types, namely count singular NPs referring to concrete referents present in the immediate context.

The researcher met the participants individually, and their interaction was recorded. A board depicting a town and wooden building blocks depicting people and objects like cars and buses were placed between them. The participant had a map indicating where on the board these blocks should be placed and was instructed to hold the map so that the researcher could not see it and to explain to him how to place the blocks according to the map. Some of the blocks could be referred to with adjectivally non-modified NPs (e.g., *flicka* ‘girl’), while others could be referred to with adjectivally modified NPs only (e.g., *vit bil* ‘white car’). When all blocks were placed on the board, the procedure was repeated twice: The participant received new maps, and new sets of blocks had to be placed in relation to the ones that were already on the board. Hence, the task forced the participants to introduce referents using indefinite NPs (e.g., *en vit bil står i parken* ‘a white car is in the park’). Later they had to refer to the same referents using definite NPs as they were now identifiable owing to their positions on the board (e.g., *en pojke står vid den vita bilen i parken* ‘a boy is standing by the white car in the park’). The task was designed in this way in order to elicit the four target structures in (2).

#### 4.3. ANALYSIS

The recordings were transcribed, and all singular NPs were excerpted and coded for reference and morphosyntactic structure. Regarding reference, what counted as indefinite and definite reference was defined based on the L1 speakers’ behaviour. Specifically, first-time reference to non-unique blocks was clearly indefinite, while reference to blocks that were already placed on the board was clearly definite.

Regarding morphosyntactic structure, the NPs were coded for whether or not they included an adjective, the indefinite article (*en*), the definite nominal suffix (*-en*), the definite adjectival

suffix (-a) and the definite left-edge article (*den*). Gender was not considered: The task elicited only common-gender nouns (the Swedish default gender), but when a neuter form was sometimes used (e.g., *det* for *den*), it was still counted.

A number of NPs were excluded from the analysis. First, when it came to first-time reference to unique blocks, the L1 speakers did not choose consistently between indefinite and definite forms; therefore, these NPs were excluded. Second, NPs referring to the locations on the board were excluded because these locations had labels on them, like “Skola” (“School”), that might have primed bare nouns. Third, verbatim repetitions and self-corrections were excluded because these NPs may not be informative with regard to the learners’ knowledge of Swedish NP structure. Fourth, NPs where omission of functional morphology is required or expected were excluded; these were NPs without a noun, NPs with material from languages other than Swedish, as well as NPs with demonstrative pronouns (e.g., *den här*, *denna* ‘this’), possessive pronouns, relative clauses and inherently definite adjectives (e.g., *sista* ‘the last’). However, *den* was always counted as a definite article because there is no straightforward way to tell whether it actually functions as a demonstrative pronoun (see Section 2.2). Finally, because article-omission rates are claimed to increase with NP complexity (Austin et al., 2015; Trenkic, 2007, 2008, 2009), compound nouns like *skolflicka* ‘school girl’ and NPs including more than one adjective were also excluded from the analysis.

Afterwards, the NPs included were divided into four categories, representing the four target structures in (2): Non-modified and modified NPs in indefinite and definite contexts. **Table 3** provides the total number of NPs included in the analysis broken down by category and group, as well as descriptive statistics summarising the number of NPs elicited per participant and NP category. As can be seen, there is considerable variation with regard to the number of NPs included per participant. In order to not give participants who produced relatively many NPs an unproportionally large impact in the statistical analysis, proportions of NPs including the morphemes investigated were calculated for each participant separately. Specifically, for each participant and for each NP category, the proportions of NPs including (i) the indefinite article, (ii) the definite nominal suffix, (iii) the definite adjectival suffix and (iv) the definite left-edge article were calculated. The proportions of NPs including *den* and *-a* respectively were calculated for modified NPs only because these morphemes are required only in modified NPs.

| TARGET STRUCTURE                          | L1 GROUP |          |           |           |       | L2 GROUP |          |           |           |       |
|---|----------|----------|-----------|-----------|-------|----------|----------|-----------|-----------|-------|
|   | <i>n</i> | <i>M</i> | <i>MD</i> | <i>SD</i> | RANGE | <i>n</i> | <i>M</i> | <i>MD</i> | <i>SD</i> | RANGE |
| <i>en bil</i> (‘a car’)                   | 291      | 11.2     | 11        | 1.4       | 8–14  | 249      | 10.8     | 11        | 3.9       | 2–19  |
| <i>bil-en</i> (‘the car’)                 | 268      | 10.3     | 10        | 2.7       | 4–17  | 211      | 9.2      | 8         | 3.5       | 0–17  |
| <i>en vit bil</i> (‘a white car’)         | 330      | 12.7     | 12        | 2.4       | 9–19  | 197      | 8.6      | 9         | 2.4       | 4–12  |
| <i>den vit-a bil-en</i> (‘the white car’) | 174      | 6.7      | 6         | 2.0       | 3–13  | 128      | 5.6      | 5         | 2.1       | 0–10  |

**Table 3** Number of NPs by group and target structure included in the analysis.

The lowest number of NPs in definite contexts elicited from the learners was zero. This was because one learner misunderstood the task in such a way that she never referred to the blocks that were already placed on the board. Consequently, for this participant, no proportions could be calculated for NPs in definite contexts.

To explore patterns of omission of functional morphology, three comparisons were carried out with respect to the proportions calculated. First, in order to investigate whether low-frequency morphemes are more likely dropped than high-frequency ones, the two high-frequency morphemes (*-en* and *en*) were compared to the two low-frequency ones (*den* and *-a*) with respect to suppliance in obligatory contexts. This comparison was carried out for modified NPs only because the low-frequency morphemes are by definition required only in modified NPs.

Second, in order to investigate whether free-standing or bound morphemes are more likely dropped, the indefinite article (*en*) was compared to the definite nominal suffix (*-en*) with respect to suppliance in obligatory contexts (both are high-frequency). This comparison was carried out for both modified and non-modified NPs. For modified NPs only, the definite left-edge article (*den*) was compared to the definite adjectival suffix (*-a*) with respect to suppliance in obligatory contexts (both are low-frequency).

Finally, in order to investigate whether adjectival modification affects the production of free-standing, left-edge morphemes and bound morphemes differently, suppliance in obligatory contexts of the indefinite article (*en*) in non-modified NPs was compared to suppliance in obligatory contexts of the same article in modified NPs. The corresponding comparison was carried out for the definite nominal suffix (*-en*). The definite left-edge article (*den*) and the definite adjectival suffix (*-a*) were not considered here. Because they are required in modified NPs only, they cannot be affected by adjectival modification.

Since the groups were small and the proportions calculated were non-normally distributed, non-parametric statistics were used. The two groups were compared with Wilcoxon rank-sum tests, while differences within the groups were tested using paired Wilcoxon signed-rank tests. Just like the *t* test, the Wilcoxon test is used to decide whether or not two sets of distributed values are significantly different from each other. Data analysis was carried out in R (R Core Team, 2019).

## 5. RESULTS

Before comparing the proportions of NPs including the four morphemes, it is worthwhile to describe what the NPs looked like. **Tables 4** and **5** give the number of adjectivally non-modified and modified NPs broken down by group, context and structural pattern. When it comes to the L1 speakers, they primarily used the four structures in (2), as expected. Sometimes, however, they used *den* in non-modified NPs; it then functions as a demonstrative pronoun (e.g., *den bil-en* ‘that car’). Sometimes they also omitted the definite left-edge article in definite modified NPs (e.g., *?vit-a bil-en* ‘the white car’), which is not necessarily ungrammatical (see Section 2.2). A bare NP occurred only once in the L1 data. Moreover, the L1 speakers sometimes used indefinite forms in definite contexts and vice versa. When they overused definite forms, they appeared to conceptualise identical blocks as several instances of the same referent. For example, they might say: *Pojken är i parken, och pojken är i skolan också* ‘The boy is in the park, and the boy is in the school too’. When they overused indefinite forms, this was because they explained how to place the blocks in an almost over-explicit way. For example, they might say:

| STRUCTURAL PATTERN | EXAMPLE           | THE L1 GROUP   |      |              |      | THE L2 GROUP   |      |              |      |
|--------------------|-------------------|----------------|------|--------------|------|----------------|------|--------------|------|
|                    |                   | INDEF. CONTEXT |      | DEF. CONTEXT |      | INDEF. CONTEXT |      | DEF. CONTEXT |      |
|                    |                   | <i>n</i>       | %    | <i>n</i>     | %    | <i>n</i>       | %    | <i>n</i>     | %    |
| INDEF N            | <i>en bil</i>     | 286            | 98.3 | 6            | 2.2  | 225            | 90.4 | 19           | 9.0  |
| N-DEF              | <i>bil-en</i>     | 5              | 1.7  | 251          | 93.7 | 8              | 3.2  | 160          | 75.8 |
| DEF N-DEF          | <i>den bil-en</i> | 0              | –    | 10           | 3.7  | 0              | –    | 3            | 1.4  |
| N                  | <i>*bil</i>       | 0              | –    | 1            | 0.4  | 16             | 6.4  | 29           | 13.7 |

**Table 4** Number of adjectivally non-modified NPs by group, context and structural pattern.

| STRUCTURAL PATTERN | EXAMPLE                 | THE L1 GROUP   |       |              |      | THE L2 GROUP   |      |              |      |
|--------------------|-------------------------|----------------|-------|--------------|------|----------------|------|--------------|------|
|                    |                         | INDEF. CONTEXT |       | DEF. CONTEXT |      | INDEF. CONTEXT |      | DEF. CONTEXT |      |
|                    |                         | <i>n</i>       | %     | <i>n</i>     | %    | <i>n</i>       | %    | <i>n</i>     | %    |
| INDEF ADJ N        | <i>en vit bil</i>       | 330            | 100.0 | 8            | 4.6  | 122            | 61.9 | 11           | 8.6  |
| DEF ADJ-DEF N-DEF  | <i>den vit-a bil-en</i> | 0              | –     | 159          | 91.4 | 8              | 4.1  | 35           | 27.3 |
| ADJ-DEF N-DEF      | <i>?vit-a bil-en</i>    | 0              | –     | 7            | 4.0  | 1              | 0.5  | 23           | 18.0 |
| ADJ N              | <i>*vit bil</i>         | 0              | –     | 0            | –    | 42             | 21.3 | 20           | 15.6 |
| ADJ N-DEF          | <i>*vit bil-en</i>      | 0              | –     | 0            | –    | 15             | 7.6  | 34           | 26.6 |
| DEF ADJ N-DEF      | <i>*den vit bil-en</i>  | 0              | –     | 0            | –    | 0              | –    | 4            | 3.1  |
| ADJ-DEF N          | <i>*vit-a bil</i>       | 0              | –     | 0            | –    | 2              | 1.0  | 0            | –    |
| INDEF ADJ-DEF N    | <i>*en vit-a bil</i>    | 0              | –     | 0            | –    | 4              | 2.0  | 0            | –    |
| INDEF ADJ N-DEF    | <i>*en vit bil-en</i>   | 0              | –     | 0            | –    | 3              | 1.5  | 1            | 0.8  |

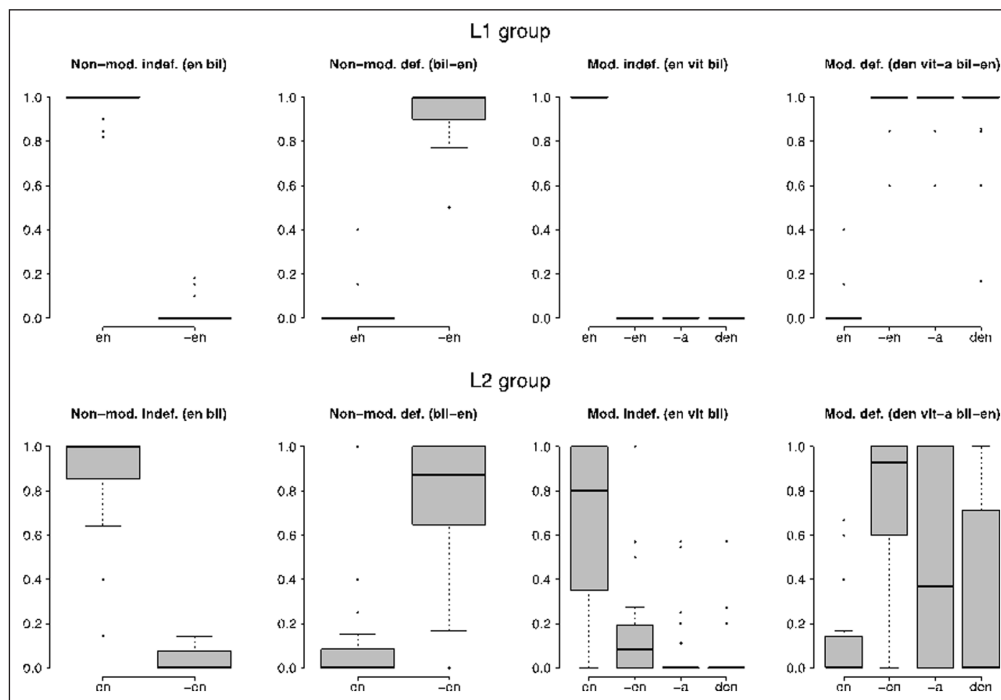
**Table 5** Number of adjectivally modified NPs by group, context and structural pattern.



*Du ser en vit bil i parken – sätt en svart katt på den* ‘You see a white car in the park – put a black cat on it’ instead of *Sätt en svart katt på den vita bilen i parken* ‘Put a black cat on the white car in the park’. Nevertheless, the data collected from the L1 speakers suggest that the task was overall successful in eliciting the four target structures in expected contexts.

When it comes to the L2 learners, modified NPs appeared to be more difficult than non-modified ones, and definite NPs appeared to be more difficult than indefinite ones. Indefinite, non-modified NPs were accurately produced in 90.4% of obligatory contexts, definite non-modified NPs in 77.4%, indefinite modified NPs in 61.9%, and definite modified NPs in 27.3% of obligatory contexts. The dominant patterns were, except for the target structures in (2), bare NPs (e.g., \**vit bil*), definite modified NPs with only the definite nominal suffix (e.g., \**vit bil-en*), and definite modified NPs without the definite left-edge article (e.g., ?*vit-a bil-en*). The definite adjectival suffix (-a) almost never occurred without the nominal suffix (-en), and the definite left-edge article (*den*) almost never occurred without the adjectival suffix (and never without the nominal suffix). In other words, the definite left-edge article implies the definite adjectival suffix, which implies the definite nominal suffix. Moreover, indefinite and definite morphemes rarely co-occurred.

The boxplots in **Figure 1** display the individual proportions of NPs that included the indefinite article (*en*), the definite nominal suffix (-en), the definite adjectival suffix (-a) and the definite left-edge article (*den*) broken down by group and NP category. A comparison between the two groups with respect to these proportions, summarised in **Table 6**, confirms that, for each of the four morphemes, the learners appeared to be somewhat more prone than the native speakers to omit it in obligatory contexts (although the difference was not significant for the definite left-edge article in non-modified NPs) and somewhat more likely to supply it in inaccurate contexts (although the difference was not significant for the indefinite article in non-modified NPs and for the definite nominal suffix in modified NPs).



**Figure 1** Proportions of NPs including the morphemes investigated ((i) the indefinite article *en*, (ii) the definite nominal suffix *-en*, (iii) the definite adjectival suffix *-a* and (iv) the definite left-edge article *den* in indefinite and definite contexts by L1 and L2 speakers. Thick horizontal lines represent medians; boxes represent the middle 50% of the participants; whiskers represent the range; and dots represent outliers).

**Table 6** Comparison between the L1 group and the L2 group with respect to morpheme production<sup>†</sup>.

<sup>†</sup> Positive Z values indicate that the proportion of NPs including the morpheme is generally higher in the L1 group than in the L2 group (and vice versa for negative values). Recall that the definite left-edge article (*den*) and the adjectival suffix (*-a*) are required only in modified NPs.

| MORPHEME   | INDEFINITE CONTEXTS |        |          |          | DEFINITE CONTEXTS |         |          |          |
|------------|---------------------|--------|----------|----------|-------------------|---------|----------|----------|
|            | NON-MOD. NPS        |        | MOD. NPS |          | NON-MOD. NPS      |         | MOD. NPS |          |
|            | Z                   | p      | Z        | p        | Z                 | p       | Z        | p        |
| <i>en</i>  | 2.55                | 0.011* | 4.57     | 0.000*** | -2.04             | 0.043*  | -1.46    | 0.149    |
| <i>-en</i> | -1.66               | 0.100  | -4.14    | 0.000*** | 2.71              | 0.007** | 2.95     | 0.003**  |
| <i>-a</i>  | -                   | -      | -2.48    | 0.014*   | -                 | -       | 4.24     | 0.000*** |
| <i>den</i> | -                   | -      | -1.88    | 0.064    | -                 | -       | 4.52     | 0.000*** |

**Table 7** shows that the L1 speakers did not generally supply high-frequency morphemes more consistently than low-frequency ones or vice versa, although they produced the high-frequency indefinite article (-en) more consistently in obligatory contexts than the low-frequency definite article (den). It will be recalled that omitting den is not necessarily ungrammatical. By contrast, there was a clear effect of frequency in the L2 group: The learners supplied the two high-frequency morphemes (en and -en) more consistently in obligatory contexts than the two low-frequency ones (den and -a).

| MORPHEMES  | L1 GROUP |        | L2 GROUP |         |
|------------|----------|--------|----------|---------|
|            | Z        | p      | Z        | p       |
| en vs -a   | 1.63     | 0.174  | 2.04     | 0.045*  |
| en vs den  | 2.21     | 0.035* | 3.20     | 0.002** |
| -en vs -a  | NA†      | NA†    | 2.81     | 0.006** |
| -en vs den | 1.63     | 0.174  | 3.31     | 0.001** |

**Table 8** shows that there were no significant differences between the suppliance of bound and free-standing morphemes in obligatory contexts, neither in the L1 group nor in the L2 group. It is important to note that comparisons were carried out only between the two high-frequency morphemes (en and -en) and between the two low-frequency morphemes (den and -a); low- and high-frequency morphemes were not compared with each other here.

| MORPHEMES | L1 GROUP         |       |              |       | L2 GROUP         |       |              |       |
|-----------|------------------|-------|--------------|-------|------------------|-------|--------------|-------|
|           | NON-MODIFIED NPS |       | MODIFIED NPS |       | NON-MODIFIED NPS |       | MODIFIED NPS |       |
|           | Z                | p     | Z            | p     | Z                | p     | Z            | p     |
| en vs -en | 1.63             | 0.114 | 1.63         | 0.174 | 1.53             | 0.132 | -0.67        | 0.518 |
| den vs -a | -                | -     | -1.63        | 0.174 | -                | -     | -1.72        | 0.096 |

Finally, **Table 9** shows that there was no significant effect of adjectival modification in the L1 group. By contrast, in the L2 group, there was a negative effect of modification on suppliance in obligatory contexts of the indefinite article (at the left edge of the NP) but no effect at all on suppliance in obligatory contexts of the definite nominal suffix.

| MORPHEME | L1 GROUP |       | L2 GROUP |         |
|----------|----------|-------|----------|---------|
|          | Z        | p     | Z        | p       |
| en       | -1.60    | 0.181 | -3.05    | 0.003** |
| -en      | -0.17    | 0.514 | 0.06     | 0.977   |

On a final note, it should be pointed out that the three comparisons reported – between high- and low-frequency morphemes, between bound and free-standing morphemes, and between non-modified and modified NPs – took into account suppliance in obligatory contexts only. Previous research has shown that L2 learners from article-less L1 backgrounds generally supply and overgeneralise definite articles to a higher extent than indefinite ones (Goad & White, 2004; Huebner, 1985; Snape 2006; Trenkic, 2000, 2002). Such a general preference for definite forms may admittedly be a confounding factor when comparing the indefinite left-edge article (en) to the definite nominal suffix (-en). In the present dataset, however, the indefinite article was not overused more than the definite nominal suffix or vice versa, neither by the L1 speakers (non-modified NPs: Z = 0.00; p = 1.000; modified NPs: Z = 1.63; p = 0.174) nor by the L2 learners (non-modified NPs: Z = 0.67; p = 0.530; modified NPs: Z = 0.54; p = 0.609). Thus, the learners investigated did not appear to prefer definite forms over indefinite ones in general.

**Table 7** Comparison between suppliance of high- and low-frequent morphemes in obligatory contexts†.

† Positive Z values indicate that the high-frequent morpheme (en and -en) is supplied more consistently than the low-frequent one (den and -a) (and vice versa for negative values). The comparison is carried out only for adjectivally modified NPs since the low-frequent morphemes are by definition required only in these NPs.

‡ In the L1 group, there was no difference at all between the suppliance of -en and -a. Therefore, Z and p values could not be calculated.

**Table 8** Comparison between suppliance of bound and free-standing morphemes in obligatory contexts†.

† Positive Z values indicate that the free-standing morpheme (en and den) is supplied more consistently in obligatory contexts than the bound one (-en and -a) (and vice versa for negative values). Recall that the definite left-edge article (den) and the adjectival suffix (-a) are required only in modified NPs.

**Table 9** Comparison between the suppliance of morphemes in obligatory contexts in adjectivally non-modified and modified NPs†.

† Positive Z values indicate that the proportion of NPs including the morpheme is higher in adjectivally non-modified than in modified ones. Since den and -a are required only in adjectivally modified NPs, they are disregarded here.

The study explored variability in definiteness marking in Russian-speaking learners of Swedish. Findings include that (i) high-frequency morphemes were supplied in obligatory contexts more consistently than low-frequency ones; (ii) bound morphemes were not supplied in obligatory contexts more consistently than free-standing ones or vice versa; and (iii) suppliance of the free-standing indefinite article (*en*) was negatively affected by adjectival modification while there was no such effect for the definite nominal suffix (*-en*). These observations are now discussed in terms of L1–L2 competition and input frequency.

First, regarding high- and low-frequency morphemes, the study corroborates findings from previous research showing that the Swedish definite modified NP, with its three definite morphemes (e.g., *den vit-a bil-en* ‘the white car’), poses a particular challenge to L2 learners (cf. Axelsson, 1994; Nordanger, 2017; Nyqvist, 2018). It was produced accurately far less often than the three other target structures, each of which requires only one grammatical morpheme (*bil-en* ‘the car’; *en bil* ‘a car’; and *en vit bil* ‘a white car’). In particular, the two morphemes that are required only in definite modified NPs and which are therefore relatively infrequent (*den* and *-a*) were supplied less consistently than the two morphemes that are required regardless of modification and that are therefore relatively frequent (*en* and *-en*). This finding is in line with what might be expected on a frequency-based account of L2 acquisition (cf. Ellis, 2002). It is also in line with Ogawa’s (2015) suggestion that patterns of article omission to some extent reflect frequency patterns in the input available to the learners.

Second, regarding bound and free-standing morphology, the learners were equally good at supplying the indefinite left-edge article (*en*) and the definite nominal suffix (*-en*), both of which are relatively frequent, in obligatory contexts. Further, the learners did not overuse any of these two morphemes more than the other. These results are unexpected for two reasons. First, previous research suggests that L2 learners of Swedish with a highly inflectional L1, like Russian, are more sensitive to bound than to free-standing morphology (cf. Latomaa, 1992; Nordanger, 2017). Second, previous research also reports that L2 learners from article-less L1 backgrounds generally overuse definite articles more than indefinite ones (Goat & White, 2004; Huebner, 1985; Snape 2006; Trenkic, 2000, 2002). Together, these observations arouse suspicion that the oral-production task utilised to elicit NPs somehow favoured the indefinite article. Further, it should be mentioned that the learners tended to supply the definite adjectival suffix (*-a*) more consistently than the definite left-edge article (*den*), although the difference was not statistically significant. Nevertheless, since the same tendency was observed in the native speakers too, the pattern may not necessarily be attributed to the distinction between bound and free-standing morphology but could just as well reflect regularities in the target language itself.

Third, regarding the effect of adjectival modification, only the indefinite article (*en*) was negatively affected by modification; there was no such effect for the definite nominal suffix (*-en*). This result may be accounted for with a frequency-based theory (Ellis, 2002; cf. Austin et al., 2015; Trenkic, 2009). In this view, the strong contingencies between the noun and the indefinite article and between the noun and its definite suffix result in the emergence of two deeply entrenched constructions: *en* N and N-*en*. However, the former construction is inapplicable when the noun is modified by an adjective, as the adjective intervenes between the article and the noun (*en* + ADJ + N), while the latter can easily be combined with an adjective (ADJ + N-*en*). Indeed, the learner data seem to support this idea: The definite nominal suffix (*-en*) frequently occurred without the definite adjectival suffix (*-a*) and the definite left-edge article (*den*), while the definite article and the adjectival suffix practically never occurred without the definite nominal suffix. It certainly appears as if the learners can merge an uninflected adjective with the high-frequent N-*en* construction, resulting in a structure like \**vit bil-en*, before a complete representation of the Swedish definite NP structure – *den vit-a bil-en* – can be constructed.

It is unclear what Austin et al.’s (2015) structural-competition model would predict with regard to Russian-speaking learners’ production of Swedish NPs. According to the model, the more complex the NP is, the more likely it is that functional morphology not provided by the L1 is omitted, everything else being equal. However, when comparing the suppliance of the definite nominal suffix (*-en*) in adjectivally modified and non-modified NPs respectively, everything else is not equal. On the one hand, it could be hypothesised that the effect of adjectival modification would be worse for the definite nominal suffix (*-en*) than for the indefinite article (*en*) because

there are three grammatical morphemes competing for attentional resources in definite modified NPs (i.e., *den*, *-a* and *-en*). However, this was not what the data looked like. On the other hand, as pointed out by Danijela Trenkic (personal communication, November 24, 2020), it might be that the three definite morphemes do not compete with each other but, quite the reverse, co-activate each other since they encode the same concept. If this is so, when a learner manages to suppress the L1 structure and selects the first definiteness marker (*den*), the likelihood that the second marker (*-a*) is also selected increases, and when this happens, the likelihood that the third marker (*-en*) is also selected increases even more. And this was indeed what was observed in the data: The definite nominal suffix was supplied more consistently than the definite adjectival suffix, which was supplied (slightly) more consistently than the definite left-edge article.

The question thus remains to what extent the negative effect of adjectival modification on article suppliance can be explained in terms of, on the one hand, L1–L2 competition and, on the other hand, frequency-biased regularities in the L2 itself. It is therefore interesting to discuss how well the two approaches elaborated on above account for findings from previous research. First, the frequency-based story, according to which the strong association between the article and the noun is the key factor, cannot explain why Austin et al.'s (2015) Thai-speaking learners of English were more prone to drop the plural *-s* in more complex NPs, as nothing intervenes between the noun and the plural marker. However, as pointed out by the authors, frequency might still be a contributing factor given the fact that definite plural NPs are less frequent than indefinite plural NPs. Second, an advantage of the frequency-based explanation is that it accounts for the negative effect of adjectival modification on article production observed in children acquiring their L1 (Clahsen, 1994; Granfeldt, 2000) – in this learning situation, there is no competing language to inhibit. Finally, an advantage of the L1–L2 competition explanation is that it accounts for the fact that the negative effect of adjectival modification on article production is typically not found in L2 learners whose L1 does have articles (Granfeldt, 2000; Nordanger, 2017; Pongpaioj, 2007).

In this context, it should be pointed out that Axelsson (1994) noticed a negative effect of adjectival modification on the production of indefinite articles in Spanish-speaking learners of Swedish. This is surprising as Spanish actually has articles (at the left edge of the NP). However, Spanish adjectives are by default post-nominal. Thus, Spanish-speaking learners of Swedish may in principle employ an L1 structure for producing an indefinite non-modified NP (ART + N) but not for producing an indefinite modified NP (Swedish: ART + ADJ + N; Spanish: ART + N + ADJ). Together, these observations suggest that frequency-biased regularities in the target language are crucial when it comes to establishing *new* constructions. For L1 acquisition, all constructions are new ones, while for L2 acquisition, constructions without direct counterparts in any previously learned language are new ones. This may explain why article production is negatively affected by adjectival modification both in children acquiring their L1 and in L2 learners whose L1 does not have articles. At the same time, it may also explain why the production of the indefinite article but not the definite nominal suffix is negatively by adjectival modification in L2 learners of Swedish, both learners whose L1 does not have articles and learners whose L1 is Spanish.

On a final note, a reason why it is complicated to disentangle L1–L2 competition from regularities in the L2 itself is that the key factors – complexity and frequency – are typically negatively correlated: Frequent phenomena tend to be simple and vice versa (e.g., Goldschneider & DeKeyser 2001: 58). Further research therefore needs to design studies that can tap into these two different but related mechanisms separately.

## 7. CONCLUSION

By exploring patterns of omission of L2 functional morphology in Russian-speaking learners' production of Swedish NPs, this study has contributed to the discussion about L1 influence and input-frequency effects in interlanguage variability. Some observations were readily accounted for in terms of input frequency. Simultaneously, the discussion showed that disentangling the two phenomena is complicated. It can be concluded that, while the effect of L1–L2 competition should by no means be neglected, input frequency is a crucial factor in the acquisition of new constructions.

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## NOTE

1. DEF = definite; DEM = demonstrative; COM = common gender; F = feminine; INDEF = indefinite; NOM = nominative; SG = singular; PL = plural; ACC = accusative.

## AUTHOR AFFILIATION

Anders Agebjörn  [orcid.org/0000-0002-0731-362X](https://orcid.org/0000-0002-0731-362X)

Lund University and University of Gothenburg, Centre for Languages and Literature, Lund University, Box 201, S-221 00 Lund, Sweden

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