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Development of the form and meaning of definiteness in Russian-speaking learners of Swedish

Anders Agebjörn
Lund University and University of Gothenburg

The study investigates the development of definiteness in two groups of Russian-speaking learners of Swedish, one beginner group and one more advanced group. While Russian does not have articles, Swedish expresses definiteness through a complex noun-phrase (NP) structure. Using an oral elicitation task, the study examines the learners' ability to produce morphemes that encode (in)definiteness, their ability to accurately choose between indefinite and definite forms, and the relationship between these two abilities. Findings include that the complex NP structure emerged gradually while there was no evident development with regard to meaning. Initially, however, learners who used the morphemes more also tended to overuse them, while later in development those who produced many morphemes were also more likely to use them accurately. The paper thus demonstrates that the acquisition of a morphosyntactic form and the association of this form with its meaning are two separate processes to some extent.

Keywords: second language acquisition; articles; noun phrase; morphosyntax; semantics

1 Introduction[1]

Articles and definiteness have received much interest in the field of Second Language Acquisition. Numerous studies, typically dealing with second-language (L2) English, have reported that L2 learners with an article-less first language (L1) persistently omit and substitute articles (e.g. Huebner 1985; Jarvis 2002; Ionin 2003; Trenkic 2000). However, disentangling the morphosyntactic and semantic/pragmatic aspects of definiteness in learner data poses a methodological challenge since, as pointed out by Kupisch (2006: 168), "the absence of a form may be due to the absence of the associated function, and vice versa". The present longitudinal and cross-sectional study investigates the development of definiteness in L2 Swedish by learners who are L1 speakers of Russian. While Russian does not have articles, Swedish expresses definiteness using several morphemes in a complex noun-phrase (NP) structure, as shown in (1).[2] Hence learners of Swedish must figure out both what indefinite and definite NPs look like (form) and when they are used (meaning). The morphosyntactic complexity of definite NPs opens up the possibility for learners to express definiteness before a target-like structure is acquired, and the study attempts to exploit this fact in order to track the development of the *form* and *meaning* of definiteness separately.

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2. Throughout the paper, N and A stand for Noun and Adjective, INDEF for the indefinite article, and DEF for any of the three definite morphemes: the nominal suffix, the adjectival suffix and the left-edge article.

(1) a. en katt
INDEF cat
'a cat'

b. en (vit) katt
INDEF (white) cat
'a (white) cat'

c. katt-en
cat-DEF
'the cat'

d. den vit-a katt-en
DEF white-DEF cat-DEF
'the white cat'

Both the form and the meaning of definiteness have been found to pose a challenge to learners of L2 Swedish (e.g. Axelsson 1994; Kołaczek 2018; Nyqvist 2013, 2015, 2018). However, previous research is inconclusive with regard to which of the grammatical morphemes in (1) are more difficult to acquire. Further, no study has investigated whether, and if so how, the two tasks involved – developing the form and associating it with its meaning – are related to each other. In other words, nobody has addressed the question whether, say, learners who are sensitive to the meaning of definiteness are more likely to express this meaning. The aim of the paper is to contribute to the general understanding of L2 acquisition of grammatical form and meaning by describing the development of a complex morphosyntactic structure and the association between this structure and its abstract meaning, and by exploring the relationship between these two processes.

2 Background

The present study is descriptive and explorative; patterns observed are discussed primarily in terms of their input frequency and difficulty. Ellis (2002: 143) describes L2 acquisition as "the piecemeal learning of many thousands of constructions and the frequency-biased abstraction of regularities within them". According to DeKeyser (2005), a grammatical phenomenon can be difficult because of its form, its meaning and the form–meaning mapping. Difficulty of form depends on "the number of choices involved in picking all the right morphemes and allomorphs […] and putting them in the right place" (pp. 5–6) while difficulty of meaning depends on novelty and abstractness – DeKeyser mentions

articles as an example of forms that express "highly abstract notions" (p. 5). Difficulty of form–meaning mapping depends on the transparency of this mapping, which can be obscured by redundancy, optionality and opacity, that is, different forms expressing the same meaning and different meanings being expressed by a single form. Input frequency as well as these different types of difficulty might explain why definiteness poses a challenge to learners of Swedish whose L1 lacks articles.

2.1 Definiteness and the learning task

The present study distinguishes between definiteness as a *category of meaning* and as a *grammatical category* (cf. Lyons 1999). Semantically, a definite NP signals that the referent is unique within a *pragmatic set* which is shared by, or mutually manifest to, the speaker and the hearer (Hawkins 1991: 409) and so is identifiable to the hearer.[3] The pragmatic set can be established anaphorically or deictically: the speaker can refer to *the* book if a unique, identifiable book was mentioned in previous discourse or is present in the real-world context. The pragmatic set can be narrow, as when a speaker refers to *the* kitchen of the present apartment, or wide, as when a speaker refers to *the* moon of the present planet. Further, the referent can be either directly or indirectly identifiable within the set. Indirect identifiability requires the hearer to make inferences based on knowledge about the world. For example, when the speaker and the hearer share a set that includes a book, the speaker can refer to *the* author on the assumption that the hearer knows that a book normally has a unique author.

Some languages, such as Swedish (Teleman et al. 1999), obligatorily express whether an NP has indefinite or definite reference, typically using articles. In these languages, bare nouns are often ungrammatical. As shown in (1a–b) above, Swedish has an indefinite article at the left edge of the NP. This article is used with singular count nouns. It has two allomorphs (*en* and *ett*); the choice between them depends on gender (common/neuter). Further, as shown in (1c), Swedish has a definite "article" suffixed to the noun. This nominal suffix has at least three allomorphs (*-(e)n*, *-(e)t* and *-na*); the choice depends on gender, number (singular/plural) and the noun's declension class. In addition, in adjectivally pre-modified NPs, definiteness is expressed not only by this suffix but also by an adjectival-agreement marker and a left-edge article. This structure, shown in (1d), is often referred to as *double definiteness* (Julien 2005: 26). The adjectival suffix has two allomorphs, one default (*-a*) and one used optionally

3. Teleman et al.'s (1999: 156) corresponding term is *frame of identification*.

(and rarely) with singular male referents (*-e*). The default allomorph is homonymous with the plural agreement marker used in both indefinite and definite NPs, but in singular-head NPs the *-a* inflection unambiguously encodes definiteness (Julien 2005: 45–47). Finally, the definite left-edge article has three allomorphs (*den*, *det* and *de*), the choice depending on gender and number. They are all homonymous with personal pronouns ('it', 'they') and demonstratives ('that', 'those').

There are several exceptions to the system exemplified in (1) (Julien 2005; Teleman et al. 1999). For example, the nominal suffix is not used in NPs including possessives and some definite quantifiers (e.g. *min katt(*-en)* 'my cat'; *samma katt(*-en)* 'the same cat'); it is omitted in certain expressions (e.g. *har inte den blekaste aning(*-en)* 'haven't the slightest idea') and is optional if the NP includes a restrictive relative clause *and* the definite left-edge article (e.g. *den katt(-en) som du såg* 'the cat that you saw'). Further, the definite left-edge article is not used in proper names (e.g. *(*det) Vita huset* 'the White House') and is optional with inherently definite modifiers such as ordinal numbers and superlatives (e.g. *(den) första dagen* 'the first day'). In fact, to some extent it is optional also with ordinary adjectives if the referent is known to the hearer and/or is present in the immediate contexts, that is, if the adjective enables identification of the referent.

Like most Slavic languages, Russian does not have articles. Hence bare nouns are grammatical and can be interpreted as either indefinite or definite, depending on a range of linguistic and contextual factors (Sussex & Cubberley 2006). However, importantly, this does not mean that definiteness as a category of meaning is absent in speakers of Russian, who have been found systematically to conceive of NPs as indefinite or definite even though their grammar does not encode this meaning with dedicated morphology (e.g. Brun 2001; Lyons 1999; Slabakova 2008; Trenkic 2000).

To sum up, Russian-speaking learners of Swedish thus have to acquire a morphosyntactic structure characterised by complexity, optionality and redundancy, and associate it with the abstract meaning of definiteness, which is not obligatorily expressed in their L1. This is no easy task. Indeed, as pointed out by DeKeyser (2005: 8), in cases where abstractness of meaning coincides with novelty and redundancy of form and with opacity of form–meaning mapping, "the learning problem is particularly severe".

2.2 Previous research

On a general level, research into articles and definiteness in L2 English has suggested that learners whose L1 does not have articles are prone both to omit articles and to ascribe non-target meanings to them (resulting in article-substitution errors). However, both omission and substitution rates tend to decrease with time and increasing proficiency (e.g. Ionin 2003; Trenkic 2000, 2009). When it comes more specifically to Swedish and Norwegian (which is structurally similar to Swedish), Table 1 provides an overview of relevant studies, indicating for each study what languages were involved, whether those languages have articles and what types of data were analysed.

L1 Norwegian and Swedish children have been reported to use a rather adult-like NP structure early in development, around the age of two years (Anderssen 2007; Bohnacker 1997). According to Bohnacker (1997), this cannot be explained in terms of unanalysed chunks or prosodic templates. Further, the definite nominal suffix is acquired before the indefinite article and the definite left-edge article. Indeed, children acquiring Scandinavian languages are younger when they start using this suffix than their peers acquiring other Germanic languages (German and English), with left-edge-articles, are when they start using definite articles (Kupisch et al. 2009). Interestingly, Anderssen and Bentzen (2013) reported that a Norwegian–English bilingual child used the definite left-edge article more than monolingual children did, suggesting cross-linguistic influence from English. When it comes to the meaning of articles, there are indications that children's earliest definite forms encode specificity – that is, whether the speaker intends to refer to a specific referent – rather than definiteness (Svartholm 1978; cf. Karmiloff-Smith 1981).

With regard to the form of definiteness in L2 Swedish, learners unsurprisingly tend to make more formal errors when producing more complex NPs (Axelsson 1994; Nyqvist 2013). In fact, Nyqvist (2013) reported the rate of formal errors to *increase* with time in L1 Finnish learners of L2 Swedish, probably owing to their production of increasingly more complex NPs. However, Nyqvist (2018) also argued that the frequency of NP types and the complexity of the form–meaning mapping may be more important factors than the complexity of the NP structure *per se*. When it comes to the indefinite article and the definite nominal suffix, which are used in both non-modified and modified NPs, development seems to be partly determined by the learner's L1: the suffix is less challenging for learners with highly inflectional L1s, such as Russian and Finnish, than for learners with less inflectional L1s, such as English and Spanish (Axelsson 1994; Latomaa 1992; Nordanger 2017). When it comes to double

definiteness, research is inconclusive with regard to whether the left-edge article is more likely to be omitted than the nominal suffix or vice versa: in Axelsson (1994), L1 Finnish, L1 Polish and L1 Spanish learners of Swedish all omitted the suffix more frequently than the left-edge article, whereas the L1 Finnish learners of Swedish in Lahtinen (1993) showed the opposite pattern. Nordanger (2017) found that L1 English learners of Norwegian were more likely to produce the definite left-edge article while L1 Russian learners preferred the nominal suffix, which again is indicative of cross-linguistic influence: the presence of a definite left-edge article in the L1 appears to trigger the use of the Scandinavian definite left-edge article (cf. Anderssen & Bentzen 2013). Finally, existing research on definiteness in L2 Norwegian and Swedish has little to say about adjectival agreement. Jin (2007), investigating sensitivity to agreement errors in end-state L1 Chinese, L1 English and L1 Italian/Spanish learners of Norwegian, found that the Chinese-speaking learners (lacking articles in their L1) were less sensitive to adjectival definiteness agreement than the others (having articles in their L1). By contrast, Lahtinen's (1993) Finnish-speaking learners of Swedish produced the adjectival suffix more consistently than the definite left-edge article.

With regard to the meaning of definiteness, often operationalised as article choice, it has been found that learners of L2 Norwegian and Swedish who have articles in their L1 generally substitute articles less frequently than learners with an article-less L1 (Eriksson & Wijk-Andersson 1988; Nordanger 2017), which is in line with what numerous studies have shown for L2 English (e.g. Jarvis 2002). Nordanger (2017) reported both English- and Russian-speaking learners of Norwegian to overuse definite forms initially, but the overuse was more persistent in the Russian group. Moreover, in the Russian group, the overuse of definite forms was triggered by specificity, just like in L1 children (see above) and in Ionin's (2003) Russian-speaking learners of English. According to Ionin (2003), L2 learners misinterpret articles as encoding specificity rather than definiteness, causing them to overuse definite articles in indefinite specific contexts (cf. Huebner 1985). Finally, Kołaczek (2018) and Nyqvist (2013), investigating Polish- and Finnish-speaking learners of Swedish, found that NPs with direct anaphoric reference were more frequently marked as definite than NPs with indirect anaphoric reference. These two studies also reported a development towards the target norm over time with regard to article choice.

In Nyqvist (2013), morphosyntactic errors were more frequent than article-choice errors. This may not seem particularly surprising, given the 50% chance of making the right choice between indefinitely and definitely marked NPs, but

Table 1. Previous research into L1 and L2 acquisition of definiteness and NP structure in Norwegian and Swedish ([+Art] and [–Art] indicate presence and absence, respectively, of articles in participants' L1s)

Study	Languages investigated	Participants	Method
Anderssen (2007)	L1 Norwegian	Two L1 acquirers.	Oral production. Longitudinal.
Anderssen & Bentzen (2013)	L1 English–Norwegian	One simultaneous bilingual child.	Oral production. Longitudinal.
Axelsson (1994)	L2 Swedish	L1 Finnish [–Art] (*n*=20), L1 Polish [–Art] (*n*=20) and L1 Spanish [+Art] (*n*=20) adult immigrants in Sweden.	Oral interviews. Longitudinal.
Bohnacker (1997)	L1 Swedish	One L1 acquirer.	Oral production. Longitudinal.
Eriksson & Wijk-Andersson (1988)	L2 Swedish	L1 German [+Art] and L1 Polish [–Art] exchange students in Sweden, and L1 Swedish controls (*n*=10/group).	Written essays. Longitudinal.
Jin (2007)	L2 Norwegian	L1 Chinese [–Art] (*n*=6), L1 English [+Art] (*n*=6) and L1 Spanish/Italian [+Art] (*n*=5) adult immigrants in Norway. L1 controls (*n*=14).	Production and perception. Experimental.
Kołaczek (2018)	L2 Swedish	L1 Polish [–Art] university students (*n*=16) in Poland.	Written essays. Longitudinal.
Kupisch et al. (2009)	L1 English; L1 German; L1 Norwegian; L1 Swedish	L1 acquirers of English [+Art], German [+Art], Norwegian [+Art] and Swedish [+Art].	Oral production. Longitudinal and cross-sectional.
Lahtinen (1993)	L2 Swedish	L1 Finnish [–Art] students (*n*=342) in Finland.	Written essays. Cross-sectional.
Nordanger (2017)	L2 Norwegian	L1 English [+Art] (*n*=4) and L1 Russian [–Art] (*n*=7) immigrants in Norway.	Written story retelling. Longitudinal.
Nyqvist (2013)	L2 Swedish	L1 Finnish [–Art] adolescents (*n*=67) in Finland.	Written essays, oral picture-description task, grammar test. Longitudinal.
Nyqvist (2015)	L2 Swedish	L1 Finnish [–Art] university students in Finland (*n*=159).	Longitudinal. Written essays.
Nyqvist (2018)	L2 Swedish	L1 Finnish [–Art] adolescents in Finland (*n*=130).	Grammaticality judgement.
Svartholm (1978)	L1 Swedish	One L1 acquirer.	Oral production. Longitudinal.

the opposite pattern was actually found in somewhat older L1 Finnish learners of Swedish (Nyqvist 2015). However, previous research has not investigated whether the development of the forms and that of the form–meaning association are related to each other. In sum, whether L2 learners have articles in their L1 affects their acquisition of the form and meaning of definiteness. For L2 Norwegian and Swedish, a further relevant factor may be whether the L1 has a rich inflectional morphology. In addition, the complexity of the NP structure also appears to play a role.

2.3 The present study

The present study investigates the developing use of the four structures exemplified in (1) above in native speakers of Russian studying Swedish. It poses three research questions:

- What does the development look like with respect to the morphosyntactic structure through which (in)definiteness is expressed?
- What does the development of the form–meaning association look like?
- What is the relationship between these two processes?

3 Method

3.1 Participants

L1 Russian learners of L2 Swedish were recruited in Minsk, Belarus. First, to track the early development of definiteness, a group of beginners was followed longitudinally during their first year of Swedish study. They attended Swedish lessons twice a week (3–4 hours a week) in two groups at the Belarusian State University and one group at the Centre for Swedish Studies. For this study, they were tested at the beginning of their first term after having received 14–24 hours of Swedish instruction (data point 1), after four months of study (data point 2) and after another three months of study (data point 3). Second, to investigate the potential long-term development of definiteness, another group of learners who had studied Swedish for at least two years and still used the language regularly was tested on one occasion; this group is referred to as the advanced group, meaning only that they were more advanced than the beginners. Finally, to confirm the validity of the oral-production task described below, a group of native speakers of Swedish, recruited from universities and upper-secondary schools in Sweden, were tested on one occasion.

Three beginners were excluded from the analysis for not participating throughout the study, and two beginners and one advanced learner were excluded because they partly misunderstood the elicitation task in such a way that their data could not contribute to answering the research questions. Summary information about the participants finally included, broken down by group, is given in Table 2: number of participants, their age, age at onset of acquisition and years of exposure.

Table 2. Number of participants and their age, age at onset and time of exposure[4]

Group	*n*	Age				Age at onset				Years of exposure			
		M	*Md.*	*SD*	Range	*M*	*Md.*	*SD*	Range	*M*	*Md.*	*SD*	Range
Beg. 1	21	18.8	17	4.8	17–39	18.8	17	4.8	17–39	0.0	0	0.0	0–0
Adv.	22	25.5	23	5.6	19–37	20.8	19	4.8	17–33	4.6	4	2.6	2–13
L1	26	17.5	17	1.5	16–22	0.0	0	0.0	0–0	17.5	17	1.5	16–22

According to a background questionnaire filled in by all participants, all members of both the beginner group and the advanced group were native speakers of Russian. Nine of the beginners and six of the advanced learners reported Belarusian as an additional L1, and one advanced learner reported Ukrainian as an additional L1. Russian, Belarusian and Ukrainian are similar grammatically; crucially for the present purposes, all three languages lack articles (Sussex & Cubberley 2006). Before learning Swedish, all had learned English (a language with articles) to varying degrees of proficiency; the average age of onset was 8 years for the beginner group (range=5–17) and 9 years for the advanced group (range=4–20). The beginners' 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 A2 to C1 with the mean located between B1 and B2, while that of the advanced learners' ranged from B2 to C2 with the mean at C1. The advanced learners higher proficiency in English may be due to the fact that they were also generally older than the beginners and had consequently used English for a longer period of time. In addition, 12 of the beginners and 15 of the advanced learners had studied other languages with articles – Germanic and Romance languages – to varying degrees of proficiency: generally A1–A2 for the beginners and B1–B2 for the advanced learn-

4. Here and henceforth, *n*, *M*, *Md* and *SD* stand for number, mean, median and standard deviation; Beg. 1, Beg. 2, Beg. 3 stand for the beginner group at data points 1, 2 and 3; Adv. stands for the advanced group; and L1 stand for the reference group.

ers. The present study does not control for the learners' previous knowledge of article languages.

After data collection, the learners completed the grammar and vocabulary sub-tests of two standardised Swedish-proficiency tests: Swedex A2 (maximum score: 10) and Swedex B1 (maximum score: 40) (Folkuniversitetet 2019). As shown in Table 3, the advanced group outperformed the beginners on both tests (A2: t=5.05; p<.001; B1: t=5.57; p<.001).

Table 3. L2 Swedish proficiency

Group	Swedex A2				Swedex B1			
	M	*Md.*	*SD*	Range	*M*	*Md.*	*SD*	Range
Beg. 3	6.9	7	2.3	2–10	18.5	19	7.7	2–34
Adv.	9.5	10	0.7	8–10	31.5	34	7.6	13–40

3.2 Task performed by participants

An oral-production task, a game loosely inspired by Trenkic (2000) and Jaensch (2009), elicited adjectivally modified and non-modified NPs in indefinite and definite contexts. The researcher met the participants individually and their interaction was audio recorded. Between them was a board depicting a town with a church, a park, a restaurant, etc., as well as wooden building blocks depicting sets of identical people, animals and objects such as chairs and cars. The participant was given a map showing where on the board different blocks should be located and was instructed to explain to the researcher where to put the blocks. The procedure was repeated three times, with new blocks that had to be placed in relation to the ones that had already been placed on the board. In this way, the task forced the participant both to introduce non-identifiable referents and to refer to referents that were identifiable owing to their position on the board. For example, the participant might say, "En pojke står på stolen i parken" ('A boy is standing on the chair in the park').

For the beginners, who completed this task on three different occasions, a few wooden blocks were added at data points 2 and 3. The idea was to give them the impression that there was a developmental aspect to the task so that they would abstain from trying to prepare for it. The L1 Swedish participants were randomly assigned one of the three sets of blocks. Because new blocks were added, the new versions elicited a slightly larger number of NPs, but a comparison of the three L1 groups using ANOVAs showed that there were no differences between the three versions with respect to the eight variables de-

scribed in Section 3.4 below. The advanced learners were assigned the first set of blocks.

The vocabulary needed to solve the task consisted of words included in the first chapters of the textbooks that the beginners had already worked through by data point 1 (Levy Scherrer & Lindemalm 2007; Nyborg, Pettersson & Holm 2001) as well as a few Russian–Swedish–English cognates such as *bank* and *park*. The beginners were instructed in English, the advanced learners and the L1 participants in Swedish. The beginners also received an instruction sheet, written in Russian and English, which included a list of words needed to solve the task. In that list, the nouns appeared with the indefinite article, which probably influenced the beginners' production of the indefinite article; this should be kept in mind when interpreting the results.

3.3 Transcription and coding

First, the recordings of the participants solving the task were transcribed and all singular count NPs referring to the wooden blocks were excerpted. Immediate, verbatim repetitions of NPs were not excerpted, as they were deemed to say little about the participants' actual usage. The NPs excerpted were then coded for reference and morphosyntactic structure. With regard to reference, based on the L1 participants' behaviour, NPs referring to non-unique blocks that had not yet been placed on the board were coded as indefinite, while NPs referring to blocks that were already on the board or to blocks that had been mentioned right before were coded as definite. With regard to morphosyntactic structure, NPs were coded in terms of whether or not they included an adjective, the definite adjectival suffix, the indefinite article, the definite nominal suffix and the definite left-edge article. Gender was not considered; for example, both *en* and *ett* counted as an indefinite article regardless of whether the correct allomorph was chosen in a given context. The demonstrative *den här* 'this', which was used a few times, was counted as a definite left-edge article.

Second, an inter-coder reliability test was carried out. Six randomly chosen recordings (two of L1 speakers, two of advanced learners and two of beginners at data point 1) were transcribed and coded by a second Swedish-speaking researcher. For the excerption of relevant NPs, they agreed in 96.5 % of cases, and for morphosyntactic structure, they agreed in 93.9 % of the cases (the second coder did not code the NPs for reference, as reference was defined by the design of the task). Where they did not agree, this was often due to the difficulty of hearing whether a common-gender noun ending in a vowel, such as *flicka* 'girl', is inflected (*flicka-n* 'the girl'). Afterwards, the first transcriber/coder

went through the recordings a second time and paid special attention to such cases.

Finally, before the analysis, all NPs with self-corrections (1.8 % of the data) were excluded. This was to avoid a discussion about which version of the NP should be included – the spontaneous one or the corrected one. Certain other NPs were also excluded: those containing relative clauses, inherently definite adjectives (see Section 2.1) and English words, as well as those without a noun (in all, another 3.7 % of the data). This was because omission of the morphemes investigated is grammatical and/or expected in such NPs; for example, learners who switched to English as a communicative strategy could of course not be expected to supply Swedish functional morphology.

The data analysed included a total of 5,075 NPs. However, since omission and substitution rates were calculated for each participant (at each data point) separately (as described in the next section), the number of NPs produced *per participant* is more relevant than the total number of included NPs. This information is summarised in Table 4, showing that the average number of NPs in indefinite contexts ranged from 20–27, the average number of NPs in definite contexts ranged from 17–24, and the average number of double-definiteness contexts (i.e., the number of adjectivally modified NPs in definite contexts, which is obviously a subset of all NPs in definite contexts) ranged from 8–10. As can also be seen, the lowest number of NPs produced by one single participant was 10 for indefinite contexts and 12 definite contexts, while the lowest number of adjectivally modified NPs in definite contexts was only 4, which is admittedly a rather low number for calculating a rate.

Table 4. Obligatory contexts per participant by group/data point

Group	NPs in indefinite contexts				NPs in definite contexts				Modified NPs in definite contexts			
	M	*Md.*	*SD*	Range	*M*	*Md.*	*SD*	Range	*M*	*Md.*	*SD*	Range
Beg. 1	24.3	23	2.8	19–31	18.6	17	3.6	15–30	10.5	10	3.1	4–16
Beg. 2	26.4	26	3.5	16–34	19.3	19	3.7	12–30	9.5	9	3.5	4–18
Beg. 3	26.6	27	2.5	20–31	22.6	22	3.7	17–34	9.4	9	1.7	6–13
Adv.	19.5	20	4.0	10–28	19.9	18	4.6	15–30	8.1	8	1.9	5–12
L1	26.3	26	2.9	21–32	24.3	24	6.0	16–43	10.1	10	2.6	5–17

3.4 Measuring the form and the meaning of definiteness

For each participant and data point, eight variables were calculated: five targeting the form of definiteness and three targeting its meaning. The first form variable, *general suppliance*, measures the extent to which a participant marked NPs as indefinite or definite. It was calculated by dividing the number of NPs

marked as indefinite or definite by the total number of NPs. In this context, NPs with the indefinite article and without any definite morphemes were considered indefinitely marked (e.g. *en katt*, *en vit katt*); NPs with at least one of the three definite morphemes and without the indefinite article were considered definitely marked, independently of accuracy (e.g. *den vit-a katt-en*, ?*vit-a katt-en*, **vit katt-en*, **den katt*). The value of this variable potentially ranges from 0 (indicating that no NPs were indefinitely or definitely marked) to 1 (indicating that all NPs were so marked).

The other form variables (*indefinite article*, *definite nominal suffix*, *definite adjectival suffix* and *definite left-edge article*) are morpheme-specific suppliance variables which were calculated for each of the four morphemes investigated by dividing the number of instances of the particular morpheme by the number of instances of obligatory contexts for that morpheme. In other words, these variables measure the extent to which the morphemes were produced in relation to how often one would expect them to be produced, which enables comparison across the four morphemes. Note that whether or not the morphemes were actually used in obligatory contexts was not considered here, as these variables did not target the participants' knowledge of the meaning of definiteness. Hence, simply, the number of indefinite articles was divided by the number of NPs in indefinite contexts, the number of definite nominal suffixes was divided by the number of NPs in definite contexts, and the number of adjectival suffixes and the number of definite left-edge articles were divided by the number of adjectivally modified NPs in definite contexts.

Regarding these four morpheme-specific variables, the highest possible value was set to 1, meaning that participants who produced a larger number of a certain morpheme than there were obligatory contexts for that morpheme did not score more than 1. This was because it would be complicated to handle variables for which the learners could deviate from the native speakers both "upwards" and "downwards", where downwards could indicate that the learner had not acquired the form and upwards could indicate that the learner had not acquired its meaning. Again, the variables described here were intended to measure only the extent to which the morphemes were used (form), not the extent to which they were used in accurate contexts (meaning); *over*use of morphemes is instead measured by the meaning variables, described right below. For this reason, the value of the morpheme-specific form variables potentially ranges from 0 (indicating that the morpheme was never used) to 1 (indicating that the morpheme was supplied *at least* as often as one would expect).

As mentioned above, in addition to the five form variables described, three meaning variables were also calculated. The first of them, *general NP choice*, measures the accuracy with which participants chose between indefinite or definite forms according to context. It was calculated by dividing the number of indefinitely or definitely marked NPs (as defined above) produced in pragmatically accurate contexts by the total number of indefinitely or definitely marked NPs. The second variable, *indefinite NP choice*, was calculated by dividing the number of indefinitely marked NPs produced in indefinite contexts by the total number of indefinitely marked NPs; the third variable, *definite NP choice*, was calculated in the corresponding way. Hence the value of the three meaning variables also potentially ranges from 0 (indicating that no indefinitely/definitely marked NPs were used in accurate contexts) to 1 (indicating that all indefinitely/definitely marked NPs were used in accurate contexts).

Finally, it should be mentioned that some beginners did not produce any indefinitely and/or definitely marked NPs at all, such that the meaning variables could not be calculated for them (as nothing can be divided by zero). Specifically, for this reason, the general-NP-choice and indefinite-NP-choice variables were impossible to calculate for 5 beginners (out of 21) at data point 1, while the definite-NP-choice variable was impossible to calculate for 16 beginners at data point 1, for 4 beginners at data point 2, and for 3 beginners at data point 3. In other words, as only 5 of 21 beginners produced any definite morphology at data point 1, the study does not reveal much about the learners' general knowledge of the meaning of definiteness at this early stage in development.

3.5 Statistical analysis

Since the groups were small and the variables were not normally distributed, non-parametric statistics were used. For each variable, tests were carried out with regard to the difference between the three groups (the L1 group and the advanced group were compared with the beginners at data point 3), the development between the three data points for the beginner group, and correlation with time of exposure for the advanced learners, who had studied Swedish for 2–13 years. In addition, comparison with regard to the production of the four morphemes was carried out for each group/data point. Finally, to explore the form–meaning relationship, correlations between the form variables and the meaning variables were tested. All analyses were carried out using the R language (R Core Team 2019; Kim 2015).

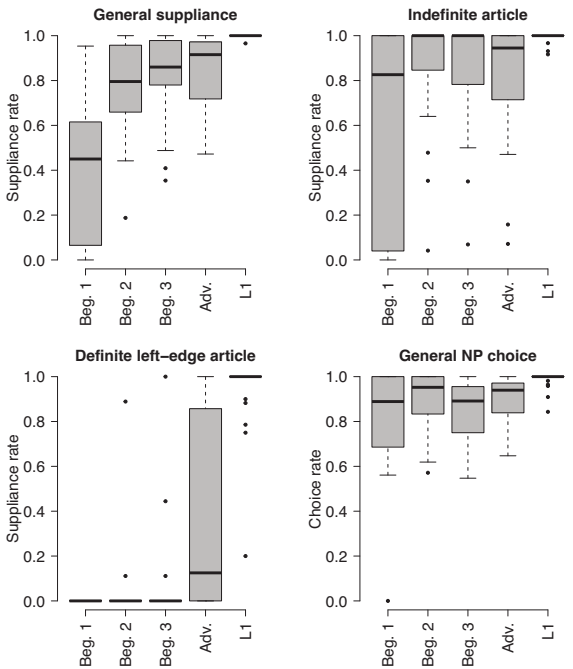
4 Results

Results for the eight variables are visualised in Figure 1. The form variables are investigated in Section 4.1, the meaning variables in Section 4.2 and the correlations between them in Section 4.3.

4.1 Development of form

To give a good idea about what the data actually looked like, Table 5 provides the number of NPs by group/data point and structural pattern. As expected, the L1 speakers primarily used the four structures given in (1) in the Introduction. Sometimes, however, they used the definite left-edge article as a demonstrative pronoun in non-modified NPs (e.g. *den katt-en*), and sometimes they omitted the left-edge article in definite modified NPs (e.g. ?*vit-a katt-en*). By contrast, the two groups of learners combined the four morphemes in practically all pos-

Figure 1 (below and right): The eight variables by group/data point. Thick horizontal lines represent medians, boxes represent the middle 50% of participants, whiskers represent the range and dots represent outliers.



sible ways. However, it was rare for indefinite and definite morphemes to co-occur, indicating that the morphemes were not used randomly. Besides the structures in (1), the patterns dominant among the learners were bare NPs (e.g. **katt*, **vit katt*), inflected nouns with uninflected adjectives (e.g. **vit katt-en*) and the double-definiteness structure with the left-edge article omitted (e.g. ?*vit-a katt-en*).

Regarding the five form variables, the L1 controls obtained high values for all of them (*Md*.=1), suggesting that those variables were valid. Kruskal–Wallis tests found significant differences between the three groups for each form variable: general suppliance ($\chi^2(2)=36.0$; $p<.001$), the indefinite article ($\chi^2(2)=12.9$; $p<.01$), the definite nominal suffix ($\chi^2(2)=26.9$; $p<.001$), the definite adjectival suffix ($\chi^2(2)=29.0$; $p<.001$) and the definite left-edge article ($\chi^2(2)=41.9$; $p<.001$). Post-hoc Wilcoxon tests showed that the L1 group outperformed both learner groups for each variable ($Z=2.97–5.98$; $p<.01–.001$). The advanced learners outperformed the beginners with respect to the definite nominal suffix ($Z=2.58$; $p<.05$) and the definite left-edge article ($Z=3.20$; $p<.01$) but not with respect to general suppliance, the indefinite article or the adjectival suffix. Fried-

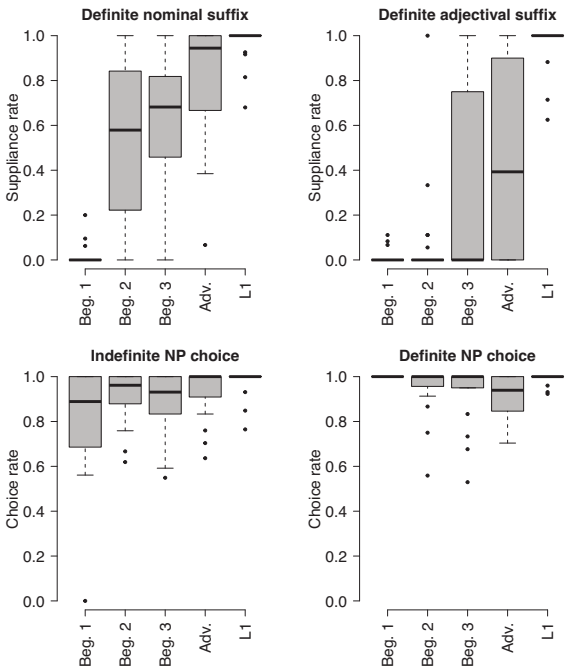


Table 5. Number of NPs by group and structural pattern. The four structures in bold correspond to the examples given in (1) in the Introduction.

Group	**INDEF N**	**INDEF A N**	**N-DEF**	**DEF A-DEF N-DEF**	DEF N-DEF	*N	*DEF N	*A N	*A N-DEF	?A-DEF N-DEF	*A-DEF N	*DEF A-DEF N	*INDEF A N-DEF	*INDEF A-DEF N	*INDEF N-DEF	*INDEF A-DEF N-DEF
Beg. 1	157	201	3	0	0	220	0	311	5	0	2	0	0	1	0	0
Beg. 2	253	252	131	5	1	76	0	137	92	2	0	3	4	4	0	1
Beg. 3	269	267	188	9	3	84	1	86	46	50	5	3	4	5	10	3
Adv.	230	134	192	56	19	54	1	71	62	29	1	0	7	3	0	0
L1	334	359	354	243	12	2	0	0	0	11	0	0	0	0	0	0

man tests found significant differences in the beginner group for general suppliance ($\chi^2(2)=23.4$; $p<.001$), the indefinite article ($\chi^2(2)=11.2$; $p<.01$), the nominal suffix ($\chi^2(2)=26.4$; $p<.001$) and the adjectival suffix ($\chi^2(2)=8.5$; $p<.05$). Post-hoc Wilcoxon tests showed that general suppliance as well as use of the indefinite article and the nominal suffix increased between data points 1 and 2 ($Z=2.91–3.91$; $p<.01–.001$), while use of the adjectival suffix increased between data points 2 and 3 ($Z=2.29$; $p<.05$). By contrast, use of the definite left-edge article did not increase significantly above zero during the beginners' first year of Swedish studiy.

The L1 participants produced the four morphemes equally often (relative to the number of obligatory contexts), as shown with Wilcoxon tests. The beginners used the indefinite article more than the definite morphemes at each data point ($Z=2.74–3.65$; $p<.05–.001$). At data point 1, they used the three definite morphemes equally often (i.e., almost never); at data points 2 and 3, they used the definite nominal suffix more frequently than the adjectival suffix and the definite left-edge article ($Z=3.38–3.54$; $p<.05–.001$); and at data point 3, they used the adjectival suffix more frequently than the definite left-edge article ($Z=2.69$; $p<.01$). The advanced learners used the indefinite article and the nominal suffix equally often, and they also used the adjectival suffix and the definite left-edge article equally often. However, the former two morphemes were supplied more consistently than the latter two ($Z=3.10–3.64$; $p<.01–.001$).

In sum, the two morphemes that are used in both modified and non-modified NPs (the indefinite article and the nominal suffix) were produced earlier in development and more frequently (relative to the number of obligatory contexts) than those that are used only in modified NPs (the adjectival suffix and the def-

inite left-edge article). Further, the adjectival suffix was used earlier than the definite left-edge article. This suggests an implicational order of acquisition for definite NPs: the nominal suffix is used earlier in development than the adjectival suffix, which is used before the left-edge article. The fact that the beginners used the indefinite article earlier and more consistently than the definite morphemes was probably because this article was presented to them in the instruction sheet. However, Spearman correlations between the five form variables and time of exposure in the advanced group, shown in Table 6, also suggest that the definite forms may actually develop more slowly than the indefinite article; only the use of definite morphemes correlated positively and significantly with years of exposure. (Recall that the advanced learners did not get the word list where nouns appeared with the indefinite article.)

Table 6. Correlations between the form variables and years of exposure in the advanced group[†]

	General suppliance	Indef. art.	Def. nom. suffix	Def. adj. suffix	Def. left-edge art.
Years of exposure	.26	-.11	.46*	.27	.53*

[†] Asterisks indicate that a correlation is significant at the $p<.05$ level.

4.2 Development of meaning

The L1 Swedish speakers' high values for the three meaning variables (*Md.*=1) suggest that the task was effective at eliciting NPs with unambiguously indefinite or definite reference. As for the learners, they performed well above chance level: their median values ranged from 0.89–1. Kruskal–Wallis tests found significant differences between the three groups for general NP choice ($\chi^2(2)=23.7$; $p<.001$), indefinite NP choice ($\chi^2(2)=13.1$; $p<.01$) and definite NP choice ($\chi^2(2)=13.9$; $p<.001$). Post-hoc Wilcoxon tests showed that the L1 participants outperformed both learner groups with respect to general NP choice and indefinite NP choice ($Z=2.54$–4.32; $p<.05$–$.001$), but they outperformed only the advanced group with respect to definite NP choice ($Z=3.85$; $p<.001$). The advanced learners did not outperform the beginners or vice versa on any meaning variable, and there were no significant differences between the three data points in the beginner group. A similar lack of development is also reflected in Table 7, which shows that the Spearman correlations between the three NP choice variables and time of exposure in the advanced group were not significant.

Table 7. Correlations between the meaning variables and time of exposure in the advanced group

	General NP choice	Indefinite NP choice	Definite NP choice
Exposure	.12	.21	–.20

4.3 Relationship between the two developments

Table 8 displays the correlations between the meaning and the form variables. Column 2 shows the correlations between the general-NP-choice and the general-suppliance variables; it answers the question whether those who were generally good at encoding NPs as indefinite or definite were also more (or less) accurate in choosing between indefinite and definite forms according to the context. Column 3 shows the correlations between the indefinite-NP-choice and the indefinite-article variables, answering the question whether those who supplied many indefinite articles were also more (or less) likely to produce them in accurate contexts. Finally, column 4–6 show the correlations between the definite-NP-choice and the three definite-morpheme variables, answering the question whether those who supplied these definite morphemes frequently were also more (or less) likely to use them in accurate contexts.

For the L1 participants, there were no significant correlations. For the beginners at data point 1, when they produced almost exclusively indefinite articles, general suppliance correlated negatively with general NP choice. In other words, the more they used the morphemes, the more they overused them. Later, at data point 3, when most beginners had begun to use the definite nominal suffix, also definite NP choice correlated negatively with the definite-nominal-suffix variable. By contrast, advanced learners who produced many indefinitely or definitely marked NPs were also more likely to produce them in accurate contexts, as shown by the positive correlation between general NP choice and general suppliance for the advanced group. Hence it would seem that morphemes tend to be overused at an early stage of development.

Table 8. Correlations between form and meaning variables[†]

	General	Indef. article	Def. nominal suffix	Def. adjectival suffix	Def. left-edge article
L1	-.11	-.13	-.15	-.13	.20
Adv.	.45*	-.26	.08	.28	.22
Beg. 3	-.02	-.33	-.52*	-.22	.05
Beg. 2	-.04	-.37	-.42	.12	.23
Beg. 1	-.52*	-.39	–	–	–

[†] Asterisks indicate that a correlation is significant at the $p<.05$ level. For the advanced group, correlations are partial, controlled for years of exposure. For the beginners at data point 1, correlations could not be tested for the nominal suffix as it was always produced in accurate contexts, for the adjectival suffix as it was always produced in inaccurate contexts, or for the definite left-edge article as it was never produced.

5 Concluding discussion

The present study investigated the development of the form and the meaning of definiteness in native speakers of Russian studying Swedish in Minsk, Belarus. While the analysis yielded evidence suggesting a gradual development of the morphosyntactic structure through which (in)definiteness is encoded, there was no evidence of such a development when it comes to associating the form with its meaning. Even so, it was found that, at early stages of development, the ability to produce the relevant morphemes correlated negatively with the ability to choose the right morpheme in context, while at later stages, learners who frequently produced the morphemes were also more likely to use them accurately. This might be indicative of a gradual development with regard to meaning as well.

Regarding the *form* of definiteness, three observations need to be discussed. First, the beginners used the indefinite article more frequently and earlier in development than the definite nominal suffix. This is contrary to findings from L1 research (Anderssen 2007; Bohnacker 1997) and both Scandinavian (e.g. Nordanger 2017; Nyqvist 2013) and international L2 research (e.g. Goad & White 2004; Huebner 1985; Trenkic 2000) showing that indefinite articles are generally acquired later and omitted more frequently than definite ones (but see Leung 2005). As mentioned above, the early and frequent use of the indefinite article in the beginner group was probably due in part to the fact that this article was presented to them in the instruction sheet for their task. However, as the data from the advanced learners also suggested that definite morphemes might develop more slowly than the indefinite article, further research should be carried out to explore other possible explanations. In this context it might be hypothesised, for example, that the general complexity and redundancy of Swedish definite modified NPs might play a role. It might also be of interest

that the Swedish indefinite article bears a resemblance – semantically, structurally and phonologically – to the Russian numeral *odin* 'one' (Sussex & Cubberley 2006) and the English indefinite article *a*/*an*; as pointed out above, all learners in the study had previously learned English to varying degrees of proficiency.

Second, the indefinite article and the definite nominal suffix, which are used in both adjectivally modified and non-modified NPs, were used more frequently (relative to the number of obligatory contexts) and earlier in development than the definite adjectival suffix and the definite left-edge article, which are used only in adjectivally modified NPs. For the beginners, this is readily explained by the fact that, according to their teachers, the double-definiteness structure was not explicitly taught until the second term of Swedish studies, that is, between data points 2 and 3. However, for the advanced learners, who had studied Swedish for at least two years, the lower suppliance rates for the adjectival suffix and the definite left-edge article may instead be explained in terms of input frequency (cf. Ellis 2002): as modified NPs are less frequent than non-modified ones, the modified NP structure was apparently less entrenched in the learners.

Third, the beginners used the definite adjectival suffix earlier in development than the definite left-edge article, despite the fact that these morphemes, according to their teachers, were taught simultaneously as part of the same structure. This suggests that the present study has identified an implicational order of acquisition for definite modified NPs: the nominal suffix emerges before the adjectival suffix, which emerges before the left-edge article. To some extent, the same pattern can be discerned in L1 Swedish children (Bohnacker 1997), as well as in L1 Finnish learners of Swedish (Lahtinen's 1993). Of all definitely marked, modified NPs produced by Lahtinen's (1993: 185–186) L1 Finnish learners of Swedish, 21.0 % included the adjectival suffix but not the left-edge article while only 3.8 % included the left-edge article but not the adjectival suffix; this would seem to confirm the above-mentioned implicational order of acquisition. It could be speculated that this is due to input frequency and the nature of the morphosyntactic structure (cf. Ellis 2002; DeKeyser 2005): while the adjectival suffix is a relatively reliable marker of definiteness (at least in singular-head NPs), the left-edge article has several allomorphs, is often optional, and is never used together with other definite determiners such as possessives. In addition, cross-linguistic influence might play a role: Finnish and Russian both have adjectival agreement (although not of definiteness), which may possibly have boosted the development of adjectival agreement in Lahtinen's L1 Finnish learners and in the L1 Russian learners in the present study.

A final note on the form of definiteness is also warranted. Contrary to the present study, other studies have reported learners of L2 Norwegian and Swedish to sometimes omit the nominal suffix in definite modified NPs, resulting in the "Danish" structure of *den vit-a katt* (DEF white-DEF cat) or the "English" structure of *den vit katt* (DEF white cat) (Axelsson 1994; Jin 2007; Nordanger 2017; cf. Anderssen & Bentzen 2013). As modified definite NPs are infrequent in input compared to non-modified ones, the definite left-edge article is unlikely acquired before the nominal suffix. Hence the reported omission of the nominal suffix in modified definite NPs may not be indicative of a syntactic deficit (even though, as pointed out above, the influence exerted by other languages previously learned by the participants, such as English, may play a role), but might rather be an effect of processing limitations that come into play at later stages of development, when the complexity of the interlanguage increases. This resonates well with Trenkic's (2009) suggestion that the more material an NP is supposed to include, the more likely it is that some of that material will be left out owing to competition for attentional resources.

Regarding the *meaning* of definiteness, the learners did not start from scratch even though, as expected, they were outperformed by the L1 Swedish participants when it came to choosing between indefinite and definite forms. Indeed, as soon as they began to produce the relevant morphemes, their choice between indefinite and definite form was accurate far more often than chance would predict. Surprisingly, however, there was no obvious improvement over time. It should be acknowledged that the production task elicited NPs with a limited number of reference types: the referents were always singular, countable, concrete objects present in the immediate context; the indefinite NPs always referred to one member of a set of identical possible referents, while the definite NPs always referred to a referent that was directly identifiable because of its position on the board. Other studies investigating a much wider range of indefinite and definite NP types have indeed reported a development towards the target norm with regard to article choice (Kołaczek 2018, Nyqvist 2013; Trenkic 2000). Further, the observation made in the present study to the effect that the general form variable correlated negatively with the general meaning variable in the beginner group but positively in the advanced group might indicate that there was in fact a development with regard to meaning: eventually, learners who actually produced the forms were more likely to use them in the proper contexts. Nevertheless, the lack of development seen for the form variables is striking.

As pointed out in the Introduction, disentangling the form of definiteness from its meaning in L2 data poses a methodological challenge. Given that the present study investigated the learners' knowledge of meaning through their production of forms, it cannot really tease apart the development of form from the association of this form with its meaning; in particular, this was made eminently clear by the fact that the meaning variables could not be calculated for the participants who never produced the relevant forms. It could be speculated that those learners who were keen to use the morphology did not pay much attention to meaning, while others who were more sensitive to meaning were also more restrictive when it came to producing the morphology. Indeed, studies using more sophisticated techniques, such as reaction-time tests, have found both that L2 learners may be sensitive to the meaning of definiteness despite non-target-like production (Trenkic et al. 2014) and that L2 learners may be insensitive to formal errors despite target-like production (Jin 2007).

Considering that the learners in the present study were studying Swedish as a foreign language, it could be that both the gradual, steady development of the forms and the lack of development with respect to the form–meaning association might be due to the instruction they received. The instruction provided was not investigated, but it has been noted in previous research that the meaning of definiteness tends not to be extensively discussed in L2 textbooks (Ionin 2003: 239–240; Kołaczek 2018: 138–159; Nyqvist 2013: 64–69; Trenkic 2000: 59–65). In particular, Kołaczek (2018) found that the L2 Swedish textbooks used by the learners in the present study (Levy Scherrer & Lindemalm 2007; Nyborg, Pettersson & Holm 2001) concentrated more on the form of definiteness than on its meaning. Moreover, the examples given in the textbooks to illustrate the meaning of definiteness were mainly NPs with direct anaphoric reference, that is, NPs referring back to a referent that has been mentioned previously. This is problematic given that demonstratives, which are found in all languages, can also typically be used in that context (Lyons 1999). In other words, the definite article in an NP with direct anaphoric reference could very well be interpreted as a demonstrative, that is, as encoding deixis rather than definiteness. Instead, to force learners to associate definite forms with the abstract meaning of definiteness – uniqueness within a shared set (Hawkins 1991) – they should be presented with a broader range of NPs with different types of definite reference. One obvious reason why textbooks tend to refrain from providing detailed descriptions of the meaning of definiteness is that this meaning is inherently abstract (cf. DeKeyser 2005). The form might be complex and redundant, but it can undeniably be concretised using diagrams and explicit rules. By contrast,

teachers discussing the meaning of definiteness probably have to resort to vague notions such as "intuition". Hence there is probably room for improvement when it comes to teaching the meaning of definiteness (and teaching teachers to do so). Indeed, Trenkic (2000: 109) suggested that the notion of a mutually manifestness within a shared set can be helpful for concretising the meaning of definiteness in L2 classrooms.

Needless to say, the present study is definitely not the last word on definiteness in L2 Swedish. Even so, by longitudinally and cross-sectionally describing the development of a limited set of NP structures with a limited set of reference types, it has contributed to the understanding of L2 acquisition of grammatical form and meaning. One obvious conclusion to be drawn is that the development of a morphosyntactic structure and the association of this formal structure with its abstract meaning constitute two separate processes. The morphosyntactic development does not appear to be driven by the learners' desire to communicate that meaning. This finding should have a bearing on L2 teaching practices as well as on Second Language Acquisition theory.

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Anders Agebjörn
Centre for Languages and Literature, Lund Univeristy
Box 201, S-221 00, Lund, Sweden
anders.agebjorn@nordlund.lu.se