The accelerating effect of multilingualism on learning a new language grammar: the case of grammatical gender agreement

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Abstract
Mounting evidence suggests that prior knowledge of multiple languages can enhance learning additional languages. Nevertheless, the effects of multilingualism on grammar learning among adults are yet to be unveiled. The present study investigates the effect of prior foreign language knowledge on the acquisition of pronominal gender agreement in a new language. Forty-three native speakers of Polish learning Swedish with and without prior knowledge of German completed a speeded acceptability judgment task that involved items with grammatical and ungrammatical pronominal gender agreement in Swedish. According to the results, learners who had learnt German achieved higher accuracy scores than learners who had not. The difference between them decreased with increasing Swedish proficiency. In addition, only learners who had learnt German judged ungrammatical items faster than grammatical items. Thus, the present study demonstrates that prior foreign language knowledge accelerates learning grammatical gender agreement and facilitates access to grammatical gender knowledge in a new language, thereby providing evidence for a multilingual advantage in learning grammar. Implications for language teaching in multilingual contexts are discussed.
Key words: grammatical gender agreement, possessive pronouns, additional language acquisition, multilingual advantage, Swedish

Introduction

In the past, it was assumed that learning a second foreign language did not differ from learning the first one. Even though cross-linguistic influence was one of the main topics in language acquisition research, the first language was seen as the sole source of influence, irrespective of the number of languages learnt. In the 1990s, researchers have increasingly acknowledged the presence of qualitative and quantitative differences between learning the first and second foreign language (Hufeisen 2004: 7; Hammarberg, 2009: 1), the crucial one being that the learner already knows (at least) two languages, which both can be the source of facilitative cross-linguistic influence. Besides cross-linguistic influence, knowledge of multiple languages is beneficial for additional language learning due to the multilingual's greater metalinguistic awareness (e.g., Jessner, 2014) and a broader spectrum of language learning strategies (e.g., Kemp, 2007). The multilingual advantage – as the positive effects of multilingualism on additional language learning will be referred to from here on – consists of higher accuracy across different linguistic domains and faster learning compared to monolinguals (e.g., Festman, 2021).

Against this background, the present study explores whether learning grammatical gender agreement in a new language can be facilitated by knowledge of a previous foreign language that similarly marks grammatical gender. More specifically, the study focuses on instructional learners of Swedish with and without prior knowledge of German. The main research question is whether knowledge of German confers an advantage for learning pronominal gender agreement in Swedish across proficiency levels.

Facilitative effects of multilingualism on additional language learning
In what follows, the terms "L1", "L2", and "L3" will be adopted as they are commonly used in language acquisition research to refer to the languages known by the learner according to the chronological order in which they are mastered (e.g., Hammarberg, 2014 for discussion). Accordingly, L1 refers to the native language, L2 to the first foreign language, and L3 to the second foreign language. Furthermore, the term "additional language" will be used to refer to any foreign language beyond L2 (e.g., De Angelis, 2007: 11). Finally, the terms "acquisition" and "learning" will be used interchangeably, following the established practice in the literature (e.g., Westergaard, 2021).

Strong evidence exists that bilinguals learn a new language more easily than monolinguals (e.g., Cenoz, 2013; Festman, 2021; Hirosh & Degani, 2018 for overviews). A multilingual advantage has been documented in learning vocabulary (e.g., Kaushanskaya et al., 2009), phonetics and phonology (e.g., Antoniou et al., 2015), and – to some extent – grammar (e.g., Klein, 1995). However, as highlighted by Hirosh and Degani (2018: 907), "There is very little research on differences between monolinguals and multilinguals in learning the grammar of a novel language, and, although suggestive of a multilingual advantage, systematic research in this domain is much needed".

Hufeisen and Jassner (2019: 80) argue that L3 learners differ from L2 learners due to "foreign/second language learning-specific factors", which refer to individual L2 learning experiences, L2 knowledge, and L2 learning strategies. It is widely acknowledged that these factors play a pivotal role in additional language learning because more languages translate into more knowledge that can be drawn upon in the learning process (Festman, 2021). A greater repertoire of languages offers more opportunities for facilitative cross-linguistic influence, particularly when previously learnt languages are typologically related to the target language (Witney & Dewaele, 2018). As Jarvis (2015: 69) put it, "[t]he more languages a learner knows, the more successful she will be in learning the current target language, and her success will be further enhanced if the target language is closely related to one or more of the languages she has previously learned".

It is widely recognized that cross-linguistic influence is one of the most important resources available to the L3 learner (e.g., Witney & Dewaele, 2018), especially when the target language and previously learnt languages reveal similarities (e.g., Schepens et al., 2016; Jensen & Westergaard, 2023). For example, it has been shown that the larger the linguistic distance between L3 and L2, the lower the degree of L3 acquirability (Schepens et al., 2016). The effects of cross-linguistic influence are generally expected to be stronger at lower proficiency levels in a new language (e.g., Sánchez, 2014). At lower proficiency levels, a receptive gain is more pronounced than a productive gain. Learners can use their prior linguistic knowledge to identify structures in a new language (e.g., Witney & Dewaele, 2018).

Cross-language similarity has been at the core of most theoretical accounts of L3 acquisition, including the Typological Primacy Model (Rothman, 2015), the Linguistic Proximity Model (Westergaard et al., 2017), the L2 Status Factor Model (Falk & Bardel, 2011), and the Cumulative Enhancement Model (Flynn et al., 2004).

The Typological Primacy Model (Rothman, 2015) contends that typological similarity between previously learnt languages and L3 is crucial for transfer in L3 acquisition. The basic claim of the model is that the acquisition of L3 grammar is affected by the language that is most similar to L3. Lexical similarities play the most important role, followed by phonological and morphosyntactic similarities. Once a decisive cue for similarity is found, the transfer occurs in one fell swoop. L3 learners make a copy of

the complete grammar of one of the previously learnt languages. The model is mainly focused on the initial stages of L3 acquisition.

According to the Linguistic Proximity Model (Westergaard et al., 2017), it is not the holistic similarity between L3 and previously learnt languages but rather their structural similarity that determines the source of cross-linguistic influence in L3 acquisition. The model rejects the idea of copying grammar and considers cross-linguistic influence to be the result of the co-activation of the grammatical structures of all previously learnt languages (e.g., Kolb et al., 2023). Therefore, both L1 and L2 can exert facilitative and non-facilitative influence on performance in L3. Facilitative cross-linguistic influence is driven by structural similarity. If an existing linguistic representation is found to be suitable for parsing the L3 input, it will be used and incorporated into L3 grammar (e.g., Westergaard et al., 2023).

The L2 Status Factor Model (Falk & Bardel 2011) is based on cognitive rather than linguistic similarity. Since L3 learning shares more similarities with L2 learning than with L1 learning (e.g., late age of onset and instructional settings), L3 and L2 show a higher cognitive similarity than L3 and L1. This makes L2 more easily accessible in L3 learning. The idea that L2 would play a more important role than L1 in L3 learning had been considered before the L2 Status Factor Model was developed (e.g., Williams & Hammarberg, 1998). De Angelis (2007: 29) pointed out two interacting constraints that concur in inhibiting L1 in favor of L2 influence, namely perception of correctness and association of foreignness. The former predicts that multilinguals resist using L1 in L3 as L1 is perceived to be incorrect from the start. The latter is related to the cognitive association that learners establish between foreign languages.

Finally, the Cumulative Enhancement Model (Flynn et al., 2004) assumes that the process of learning new languages is cumulative, which means that previous linguistic knowledge plays an important role, thus distinguishing between L2 and L3 learning. Previously learnt languages can enhance learning a new language or remain neutral. Non-facilitative cross-linguistic influence is not predicted by the model, which contrasts with accounts that characterize subsequent language learning in terms of a deficit model (e.g., "negative transfer").

Apart from the direct effects of cross-linguistic influence, multilingualism benefits additional language learning in other ways. Most of all, multilingual learners enjoy higher metalinguistic awareness, which refers to knowledge about how language works, i.e., about its structure and rules (e.g., Festman, 2021). Metalinguistic awareness enhances learners' sensitivity to relevant features in the language input (e.g., Sanz, 2012), which, in turn, facilitates learning a new language. Multilingual learners may also experience a catalytic effect when learning a new language. Prior linguistic knowledge and the ability to extend it can result in faster learning (e.g., Festman, 2021). Since multilingualism is not a uniform phenomenon, its effects on additional language learning should be explored, considering the particular characteristics of language learners and the languages in question. Learners of different ages, with different L2 and L3 proficiency, and with different language pairs may utilize their direct and indirect resources differently (e.g., Hirosch & Degani, 2018).

Grammatical gender agreement in L2 and L3
Grammatical gender agreement has been one of the main topics in L2 acquisition research. One line of research has been concerned with the question of whether learners whose L1 does not encode grammatical gender, such as English, can master grammatical gender agreement in L2 (e.g., White et al., 2004; Franceschina, 2005; Sabourin et al., 2006; Sagarra & Herschensohn, 2011; Gómez Carrero & Ogneva, 2023). Even if L2 learners with ungendered L1s show target-like knowledge, they are typically outperformed by L2 learners with gendered L1s (Sabourin et al., 2006; Ellis

et al., 2012). Another line of research has attempted to explain why L2 learners struggle with grammatical gender agreement, even after prolonged L2 exposure. Different explanations have been suggested, including the lack of the gender feature in L1 (e.g., Franceschina, 2005), resorting to a default gender (e.g., Dewaele & Véronique, 2001), computation limitations (White et al., 2004), or less stable gender representations (e.g., Grüter et al., 2012). Yet another line of research has explored the effect of L1-L2 similarities in gender marking on the acquisition of grammatical gender agreement in L2. To provide an example, Foucart and Frenck-Mestre (2011) asked L1 German advanced learners of L2 French and French native speakers to read sentences while event-related potentials (ERPs) were recorded. Different grammatical gender agreement violations were included: (1) between the definite article and the noun, (2) between the postposed adjective and the noun, and (3) between the preposed adjective and the noun. A comparable P600 effect, which is typically observed in response to morphosyntactic violations in native speakers, was reported among L2 learners and native speakers only for similar gender marking (experiment 1). Therefore, even advanced L2 learners did not master grammatical gender agreement if gender marking differed between L1 and L2.

Grammatical gender agreement beyond L2 has only recently begun to receive attention in the literature (Iverson, 2009; Brown, 2020; Krenca et al., 2020; Ecke, 2022). For example, Brown (2020) analyzed how accurately beginner L1 English/L2 Spanish and L1 Spanish/L2 English learners of L3 German identified gender agreement errors between the article and the noun. In an untimed grammaticality judgment task, L1 English/L2 Spanish learners performed better than L1 Spanish/L2 English learners. This finding suggests that it is the previously learnt foreign language rather than the native language that affects the acquisition of grammatical gender agreement in L3 (e.g., Falk & Bardel, 2011). More evidence for cross-linguistic influence at the level of grammatical gender agreement was provided by Krenca et al. (2020), who explored determiner–noun agreement by means of a narrative task in three child learner groups: L3 French learners with a gendered L1 (e.g., German), L3 French learners with an ungendered L1 (e.g., Hungarian), and L2 French learners with L1 English. The results showed a significant difference in the proportion of correctly marked feminine nouns in favor of L3 French learners with a gendered L1. Finally, Iverson (2009) observed that previous foreign-language knowledge can facilitate the acquisition of grammatical gender agreement in L3. In his study, L3 Portuguese learners with L1 English and L2 Spanish performed as well as native speakers on different types of grammatical gender agreement.

Linguistic background
In Swedish, German, and Polish, gender is an inherent lexical feature that is marked by virtue of agreement on modifiers related to the noun, such as possessive pronouns, demonstratives, or adjectives. Swedish has a two-way grammatical gender system with uter and neuter, while both German and Polish have a three-way grammatical gender system with masculine, feminine, and neuter.

In Swedish, uter nouns make up 70%–80% of all nouns and neuter ones 20%–30% (e.g. Bohnacker, 2003). Grammatical gender is expressed overtly in forms with congruent determiners, such as possessive pronouns (see examples 1 and 2).

1)   *Jag*   *tvättar*   *mi-n*   *bil.*
               1SG   wash   1SG-UTER   carUTER
               'I wash my car.'

2)   *Du*   *känner till*   *di-tt*   *lösenord.*
               2SG   know   2SG-NEUTER   passwordNEUTER
               'You know your password.'

Similar to Swedish, possessive pronouns in German and Polish agree in gender with the possessum noun. Since English does not have grammatical gender, possessive pronouns do not exhibit possessum agreement. Table 1 presents the possessive pronouns in all four languages (in the accusative case for Polish and German).

Table 1. Possessive pronouns in the languages under study

Singular	Swedish	German	English	Polish
1st	*min* (u), *mitt* (n)	*mein* (n), *-e* (f), *-en* (m)	*my*	*swój* (m), *-e* (n), *-q* (f)
2nd	*din* (u), *ditt* (n)	*dein* (n), *-e* (f), *-en* (m)	*your*	*swój* (m), *-e* (n), *-q* (f)
3rd	*sin* (u), *sitt* (n)	*sein/ihr* (n), *-e* (f), *-en* (m)	*his/her*	*swój* (m), *-e* (n), *-q* (f)

Note. u = uter, n = neuter, m = masculine, f = feminine

The study

The objective of the present study is to explore whether prior foreign language knowledge (German) may enhance learning a new language (Swedish). The specific property under study is grammatical gender agreement. The study employs a speeded acceptability judgment task that requires learners to construct a representation of the sentence in real-time, thus restricting the amount of time they have to reflect on their acceptability intuitions (Lago et al., 2018: 6). Therefore, the task offers an objective way to explore whether certain linguistic knowledge is an integrated part of learners' automatic competence. In this vein, the present paper addresses two research questions:

1. Does knowledge of German facilitate the acquisition of pronominal gender agreement in Swedish?

Since grammatical gender marking on possessive pronouns works similarly in Swedish and German, it is anticipated that learners of Swedish will experience facilitative influence from German. The second research question is concerned with the effect of proficiency in Swedish:

2. Is the facilitative effect of German, if any, dependent on proficiency in Swedish?

As already discussed, L3 learners are typically affected by their prior linguistic knowledge in the initial stages of L3 learning. Thus, the facilitative effect of German is anticipated at lower proficiency levels in Swedish.

Participants

The pool of participants consisted of 43 native speakers of Polish majoring in Swedish at a Polish university (M_{age} = 25.2, SD = 4.7). All of them learnt English as their L2, which can hardly be avoided in the Polish education system. The first group comprised 18 learners of L4 Swedish with prior knowledge of L3 German (henceforth, L4 learners), while the other group consisted of 25 learners of L3 Swedish without prior knowledge of German (henceforth, L3 learners). Participants had only started learning Swedish at university. At the time of testing, they had

completed at least one year of studies. Participants' proficiency in Swedish, English, and German (for L4 learners) was assessed using a language background questionnaire. Participants rated their proficiency level in these languages on a scale of 1–10, separately for writing, speaking, listening, reading, grammar, and vocabulary. Overall proficiency was determined by calculating an average score from all six self-ratings. Proficiency in Swedish ranged from 2.1 to 9.0, which means that the sample included Swedish learners across a broad proficiency spectrum (from beginners to advanced learners). Table 2 presents detailed information on both groups.

Table 2. Participant characteristics

	L3 learners	L4 learners
Age	26.1 (5.2)	24.1 (3.5)
Swedish proficiency	6.3 (1.6)	6.6 (1.8)
Age at first exposure to Swedish	21.8 (5.2)	19.9 (2.4)
English proficiency	8.6 (0.7)	7.0 (1.6)
German proficiency	n/a	6.1 (2.4)

Note. Standard deviations are given in brackets.

Care was taken to ensure that the two groups did not differ from each other in terms of the Swedish-related variables. Two-sample *t* tests showed that they were matched for age and age at first exposure to Swedish ($ps > .200$). Crucially, the two groups did not differ for Swedish proficiency ($p = .478$).

Materials
To answer the research questions guiding this study, a speeded acceptability judgment task was developed. Participants read 40 target items, half of which were grammatical and the other half ungrammatical. In each sentence, there was (1) a personal pronoun, (2) a verb, (3) a possessive pronoun, and (4) an inanimate possessum noun, respectively. Four personal pronouns in singular were equally distributed among the target items: "jag" (first-person singular), "du" (second-person singular), and "han/hon" (third-person singular). In the ungrammatical items, gender agreement between the possessive pronoun and the possessum noun was always violated (see example 3).

3) *Jag   känner till   min   lösenord.*
    I   know   myUTER   passwordNEUTER
    'I know my password.'

The majority of the items (30 out of 40) included nouns of uter gender to create more ecologically valid conditions (uter gender is more frequent than neuter gender). Each participant read both the grammatical and ungrammatical variant of the same sentence. By doing so, the potential influence of variables known to affect participants' performance, such as word length, frequency, and cognateness, was minimized. Target items were mixed up with ten unrelated grammatical sentences serving as distractors. The materials are available online at the Center for Open Science Framework website (https://osf.io).

Procedure
Participants read the items on the screen, one word at a time. Each item was followed by an acceptability judgment, which asked participants to decide whether the item they had just finished reading was acceptable in Swedish or not by pressing either "j(ag)" ("yes") or "n(ej)" ("no"). They were asked to do so as fast as possible. The task was preceded by an instruction in Swedish on a computer screen and a training

phase with five unrelated items. The task was carried out on the web-based platform Ibex Farm (Drummond, 2013). All participants provided written consent and received gift cards to a bookshop for their participation.

Analysis

The acceptability judgment task involved two dependent variables: accuracy and response time. To clean the response-time data, raw response times that deviated more than 3.0 SDs above from the participants' mean per group (L3 learners, L4 learners) and per condition (grammatical, ungrammatical) were removed from the analysis (2.6%). Also, erroneous responses were excluded from the analysis of the response-time data. The accuracy and response-time data were analyzed by means of generalized linear mixed-effects modelling using the GAMLj module (Gallucci, 2019) in Jamovi (version 2.4). An advantage of mixed modelling is that it makes it possible to account for the non-independence of observations by including random effects (Barr et al., 2013). Two models were created, one for accuracy and the other for the response-time data. The models included group and grammaticality as the fixed effects, proficiency as a covariate, and their interactions. Group and grammaticality were simple-coded, and proficiency was mean-centered. Participants and item were entered as random effects. In the model for response time, binomial distribution with logit link function was employed since the data were binary (1 = a correct judgment / 0 = an incorrect judgment). For response time, a model with gamma distribution and log link function was created, the reason being the non-normal distribution of the data ($W = 0.80$, $p < .001$). The data and scripts used in this study are available online at the Center for Open Science Framework website (https://osf.io).

Results

Table 3 presents the acceptability and response-time performance of both groups on grammatical and ungrammatical items, and Table 4 shows the results of the statistical analysis.

Table 3. Mean accuracy scores and response times

	Accuracy		Response time	
	grammatical	ungrammatical	grammatical	ungrammatical
L3 learners	89.2%	81.6%	758.3 ms	778.6 ms
L4 learners	94.1%	91.3%	746.3 ms	645.4 ms

Table 4. Model results

	Accuracy		Response time	
	χ^2	p	χ^2	p
Grammaticality	5.236	**0.022**	3.752	0.053
Group	2.062	0.151	0.411	0.522
Proficiency	32.701	**<.001**	0.605	0.437
Grammaticality × group	0.235	0.628	10.487	**0.001**
Proficiency × group	8.318	**0.004**	0.091	0.763
Grammaticality × proficiency	5.107	**0.024**	1.240	0.266

Note. Significant effects and interactions at the α = .05 level are bolded.

Accuracy. The model returned significant main effects of grammaticality and proficiency as well as two significant interactions: proficiency × group and grammaticality × proficiency. The effect of the group was not significant, nor was the interaction grammaticality × group. Accuracy scores for grammatical items were higher than for ungrammatical items (*estimate* = –0.45, *SE* = 0.19, *OR* = 0.64, *z* = –

2.29, $p = .022$). Accuracy was also higher with increasing proficiency (*estimate* = 0.48, *SE* = 0.08, *OR* = 1.61, $z = 5.72$, $p < .001$).

The analysis for simple effects of the interaction proficiency × group showed a significant difference between L3 and L4 learners with proficiency at the level of 1 *SD* below the mean, i.e. 4.7 out of 10 ($\chi^2(1) = 11.31$, $p < .001$). The difference was not significant with proficiency at mean level, i.e. 6.4 out of 10 ($\chi^2(1) = 2.06$, $p = .151$) and at the level of 1 *SD* above the mean, i.e. 8.1 out of 10 ($\chi^2(1) = 0.79$, $p = .375$). This indicates that L4 learners outperformed L3 learners, but only at lower proficiency levels. The interaction between proficiency and group is visualised in Figure 1.
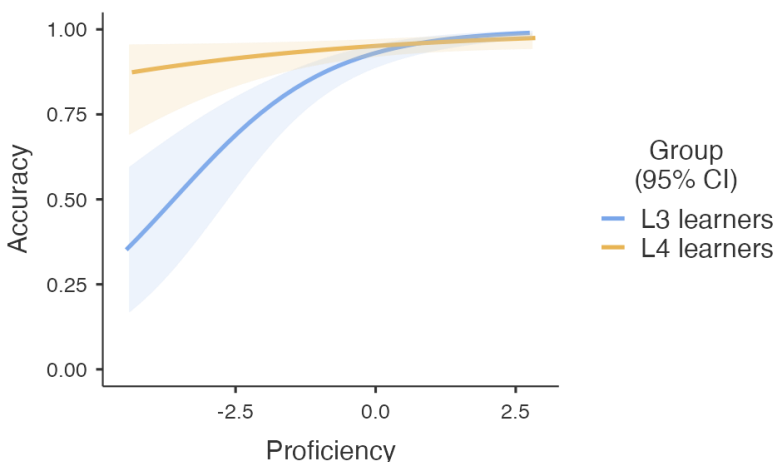

Figure 1. Interaction between proficiency and group for accuracy

The figure shows that while low-proficiency L3 learners performed below chance, the performance of low-proficiency L4 learners was much better. Thus, the advantage of L4 learners over L3 learners consisted of faster learning.

Finally, the analysis for simple effects of the interaction grammaticality × proficiency revealed higher accuracy scores for grammatical than for ungrammatical items with proficiency at the level of 1 *SD* below the mean, i.e. 4.7 out of 10 ($\chi^2(1) = 16.00$, $p < .001$) and at mean level, i.e. 6.4 out of 10 ($\chi^2(1) = 5.24$, $p = .022$), but not at the level of 1 *SD* above the mean, i.e. 8.1 out of 10 ($\chi^2(1) = 0.04$, $p = .848$). Participants performed worse on ungrammatical than grammatical items, but the difference disappeared with increasing proficiency. The interaction between grammaticality and proficiency is visualised in Figure 2.
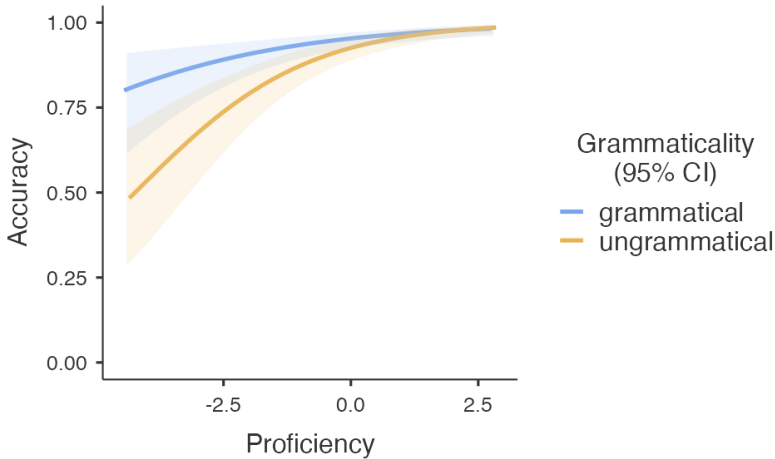
Figure 2. Interaction between grammaticality and proficiency for accuracy

Response time. In the model for response time, only the interaction grammaticality × group was significant. The post hoc Bonferroni test revealed that L4 learners responded faster to ungrammatical than to grammatical items ($p = .003$). Other differences were not significant (all ps = 1.000). The interaction between grammaticality and group is visualized in Figure 3.
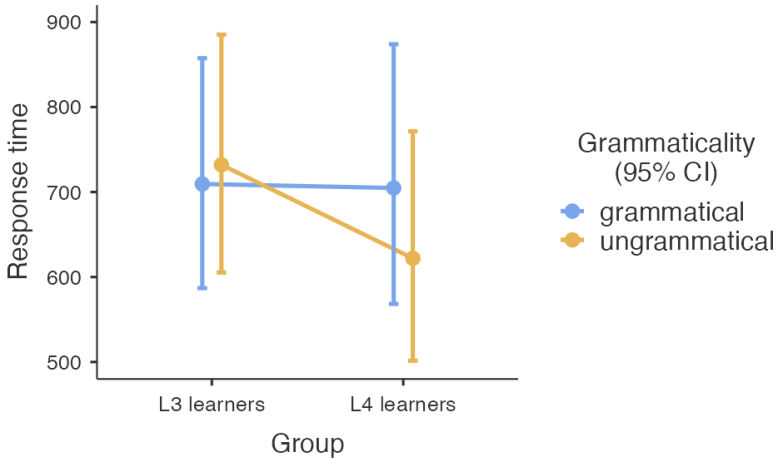

Figure 3. Interaction between grammaticality and group for response time

Discussion

The present study explored whether prior knowledge of German could facilitate the acquisition of grammatical gender agreement in Swedish as an additional language and whether the effect of German, if any, would depend on proficiency in Swedish. According to the results, L4 learners achieved a higher judgment accuracy than L3 learners. However, the advantage of L4 learners over L3 learners was contingent on Swedish proficiency. The two groups differed in proficiency between 2.3 (the lowest self-reported value) and 4.7 (the level of one standard deviation below the mean), but not at higher proficiency levels. As illustrated in Figure 1, the difference at the lowest proficiency level was striking. While L3 learners performed below chance, L4

learners achieved an accuracy higher than 80%. This means that L4 learners mastered pronominal gender agreement very early and much faster than L3 learners. This accelerating effect was most likely due to the fact that Swedish and German mark grammatical gender on possessive pronouns in a similar way. In both languages, the possessive pronoun has to agree with the possessum noun. Therefore, L4 learners could transfer the morphologically similar gender marking from German to Swedish, which speeded up the learning process. The results confirm previous studies that reported transfer of similar gender marking in L2 (Foucart & Frenck-Mestre, 2011) and extend them to multilingual contexts.

The outcomes are also in line with several models of L3 acquisition. Note that participants' first language, Polish, also marks grammatical gender on possessive pronouns in a similar way. Thus, L3 learners who had not learnt German could, in principle, transfer the similar gender marking from Polish. In other words, both German and Polish could provide facilitation to a similar extent. What distinguishes the two languages is the native versus non-native status and typological similarity to Swedish. The striking difference between L3 and L4 learners indicates a transfer from German (for L4 learners), but not from Polish (for L3 learners). Therefore, the results of the present study support both the L2 Status Factor Model (Falk & Bardel, 2011) and the Typological Primacy Model (Rothman, 2015). They are also in line with the Linguistic Proximity Model (Westergaard et al. 2017), which allows for hybrid cross-linguistic influence, i.e. an influence from many languages on the same linguistic property.

More broadly, the results demonstrate that the gender system in a foreign language, rather than the native language, might be more beneficial for learning grammatical gender agreement in a new language. Future studies should verify this assumption by exploring typologically distant language pairs.

The results also reveal that L4 learners, but not L3 learners, judged ungrammatical items faster than grammatical items. This may suggest that both L3 and L4 learners had knowledge of grammatical gender agreement, but L4 learners accessed it faster. Since response time is indicative of the degree of processing automatization (Segalowitz & Hulstijn, 2005), this finding may be interpreted in terms of more automatized gender agreement processes. Since L4 learners had been exposed to two gendered languages before learning Swedish, they had more opportunities to produce and comprehend grammatical gender than L3 learners. This accumulated experience with grammatical gender processing could very likely explain the facilitated access to gender agreement knowledge.

Although the advantage of L4 learners can plausibly be attributed to the direct effect of German, a more general effect of multilingualism cannot be ruled out as an explanation. L4 learners could have outperformed L3 learners as a result of increased metalinguistic awareness or a larger repertoire of language learning strategies. More research is needed to tease apart the direct effect of prior foreign language knowledge from the indirect effect of increased metalinguistic awareness on additional language learning. Another limitation of the study is related to sampling. The group of L4 learners was less numerous than L3 learners. This was due to the fact that learners of Swedish in Poland constitute a rare population, which renders the recruitment of a representative sample with prior knowledge of German difficult. Finally, the measurement of proficiency was based on participants' self-reports. Although self-ratings of proficiency correlate with performance scores on various speech and language tests (Kaushanskaya et al., 2020), they should be complemented or replaced by a more objective measure to model the effect of proficiency on participants' outcomes in a more rigorous way.

To summarise, the results of the present study provide novel evidence that learning grammatical gender agreement in a new language is affected by prior foreign language knowledge. Prior knowledge of a foreign language that encodes grammatical gender may facilitate the acquisition of grammatical gender agreement in the next foreign language. In effect, the learning process may be accelerated, and access to the relevant knowledge may become more automatized. Thus, the present study fills the existing research gap by providing evidence for a multilingual advantage in learning grammar.

Implications for language teaching in multilingual contexts

Despite high interest in multilingualism, pedagogical implications based on research on additional language acquisition are rarely considered in the literature. This is surprising, especially as a vast number of studies are concerned with language learning in instructional settings. However, the need for a dialogue between language learning and language education research has been emphasized by many scholars (e.g. Sopata, 2004; Spada, 2015). In the context of multilingualism, both learners and teachers can benefit from empirical studies on additional language learning. On the one hand, knowledge of how additional languages are learnt can be used by learners to optimize their learning strategies and metalinguistic abilities. On the other hand, teachers can use this knowledge to improve the process of foreign language instruction in order to promote facilitative cross-linguistic influence.

The present study has two vital implications for language teaching. First, the fact that some learners may be advantaged over others due to their prior foreign language knowledge has severe consequences for language assessment. If some learners can master some grammatical forms and rules faster, they may achieve higher scores on grammar tests than their peers who speak fewer languages. This fact should prompt teachers to rethink and reevaluate their teaching and assessment practices. While not appearing realistic at first glance, this postulate is, indeed, feasible given the educational settings involving specific combinations of foreign languages. For example, German is typically taught as an additional language after English across Polish schools, which makes a homogeneous grouping of learners according to their linguistic background possible. Knowledge of similarities and differences between the target language and previously learnt foreign languages may help teachers identify the areas in which multilingual advantages are expected and thus predict learners' performance. Yet, this requires reflective teaching that "involves instructors observing themselves, collecting data about their own classrooms and their roles within them, and using that data as a basis for self-evaluation, for change, and hence for professional growth" (Richards & Lockhart, 1994: ix).

Second, by showing the multilingual advantage in learning the grammar of a new language, the present study rejects a deficit view of multilingualism. Rather, knowledge of multiple languages should be seen as a valuable tool to ease the process of learning and teaching additional languages. To facilitate the use of this tool, teaching concepts that promote multilingualism should be incorporated into the curriculum. An example is the concept "German as a foreign language after English" that, capitalizing on the fact that English and German are typologically related, focuses on how learning and teaching German can benefit from and expand existing linguistic knowledge and language learning experience (Hufeisen, 2004).

To conclude, multilingualism offers an opportunity for easier learning and teaching of additional languages. It is important for teachers to take into account that prior foreign language knowledge enhances additional language learning.

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