Second language acquisition and language processing: Grammatical gender in Norwegian

The present study investigates a recent proposal that the effects of L1 in L2 gender production and predictive processing are fine-grained and that the degree of the overlap between the gender systems in the L1 and L2 (rather than the presence vs. absence of gender in the L1) determines the extent to which grammatical gender production and predictive processing in the L2 is nativelike (Hopp & Lemmerth, 2018; Dussias, Valdés Kroff, Guzzardo Tamargo & Gerfen, 2013). To address a granular perspective on the effects of lexical and structural similarities and differences between gender systems in SLA, we extend the scope of research to previously unstudied language pairs L1 Greek/L2 Norwegian and L1 Russian/L2 Norwegian, which exhibit a varying degree of overlap in gender properties. Although Norwegian, Greek and Russian categorize nouns into one of the three gender classes (masculine, feminine or neuter), they differ in lexical congruency, i.e. whether individual nouns are assigned the same (e.g., Russian: *jabloko*(N) 'apple'; Norwegian: *eple*(N) 'apple') or different gender (e.g., Russian: *dom*(M) 'house'; Norwegian: *hus*(N) 'house'). At the syntactic level, there is an overlap between Norwegian and Greek, which both mark gender on indefinite articles, while Russian does not. Speakers of L1 Turkish, a genderless language, are also included for comparison.

The study includes two experimental tasks. Experiment 1 was the noun-naming task which elicited indefinite noun phrases in Norwegian. Experiment 2 was an eye-tracking Visual World Paradigm experiment with a two-picture design. The auditory stimuli were phrases like *Jeg tenker på en/et avbilda* NOUN 'I am thinking of a(M/N) depicted NOUN'. The participants were 66 late L2 learners of Norwegian: L1 Greek (*n*=23, age 27-64), L1 Russian (*n*=23, age 28-64), and L1 Turkish (*n*=20, age 32-65). We also included a control group of L1 Norwegian speakers (*n*=19, age 25-55) in Experiment 2. The production and eye-tracking experiments had the same stimuli, which were 64 depicted nouns/objects: congruent neuter (16), incongruent neuter (16), congruent masculine (16) and incongruent masculine (16). Feminine gender was not tested, because it is disappearing from the dialects of Norwegian examined in the study. The materials were identical for the Greek and Turkish groups. However, it was impossible to match the nouns for gender and lexical congruency across all languages, therefore 20 out of 64 nouns were different in the experiments with L1 Russian speakers.

In Experiment 1, gender assignment was near target-like with the masculines and at approximately 65% accuracy rate with the neuters across all groups (Table 1). Thus, all participant groups, including the speakers of genderless Turkish, performed equally well. To check for language proficiency effects, the L2 participants were divided into an advanced-proficiency and intermediate-proficiency groups based on their gender assignment scores in Experiment 1 which also matched their general proficiency in Norwegian. Experiment 2 revealed a striking asymmetry between L1 Greek and L1 Russian vs. L1 Turkish (Figure 1). L1 Greek and L1 Russian showed nativelike gender processing, yet, only at advanced proficiency levels. L1 Turkish failed to use gender predictively even at advanced proficiency levels. This difference was significant and robust. Thus, while all L2 leaners showed similar knowledge of gender in production, only those who have gender in their L1 could access and use this knowledge during online gender processing in the L2. We also found no difference between the two gendered languages, i.e. no effect of syntactic similarity or lexical congruency. These results suggest that predictive gender processing in the L2 is determined by the presence vs. absence of gender in the L1, rather than by the degree of the overlap between the gender systems in the L1 and L2 (cf. Hopp & Lemmerth, 2018; Dussias et al., 2013). Furthermore, this effect was moderated by learner proficiency, but not by lexical congruency, as no congruency effects emerged in any of the groups. This result may be due to the fact that the overlap between the Norwegian and Greek or Russian gender systems is not sufficient to modulate predictive gender processing at intermediate proficiency levels and perhaps for lexical congruency to have an effect.

Table 1. Results of the Experiment 1: Noun naming and gender assignment.

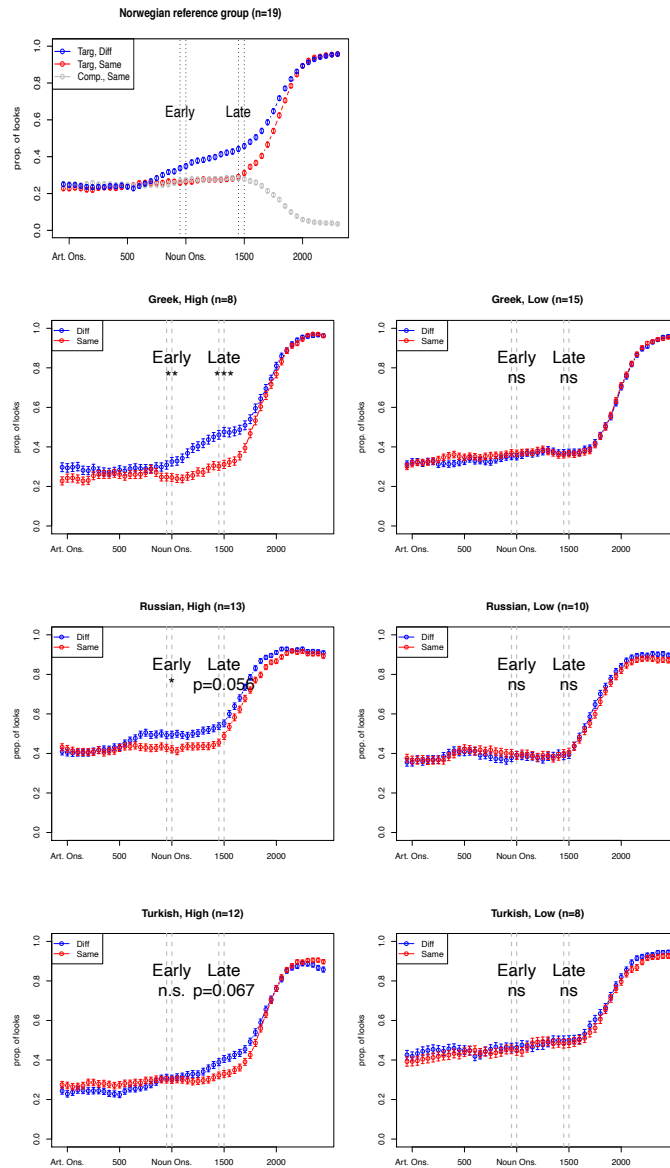|	Greek	Russian	Turkish
A. Nouns named	83%	83%	92%
B. Gender accuracy, all named nouns	63%	62%	71%
C. Gender accuracy, all correctly named nouns	74%	74%	77%
D. Gender accuracy, all correctly named nouns, Masculine vs. Neuter	M: 87% N: 63%	M: 82% N: 66%	M: 85% N: 70%

Figure 1. The eye-tracking gender prediction results of the Norwegian control group and the three L2 groups (proportion of looks to target per 50ms time slot)

References

Dussias, P. E., Valdés Kroff, J. R., Guzzardo Tamargo, R. E., & Gerfen, C. (2013). When gender and looking go hand in hand: Grammatical gender processing in L2 Spanish. *Studies in Second Language Acquisition* 35, 353-387. **Hopp, H., & Lemmerth, N. (2018).** Lexical and syntactic congruency in L2 predictive gender processing. *Studies in Second Language Acquisition*, 40(1), 171-199.