

Type frequency as a predictor of gender mismatch acceptability for French human nouns

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For human nouns, grammatical gender tends to be interpreted as social gender ([4]), with possible gender biases ([8]). Gender may be part of the noun's meaning, or, in the case of common gender nouns (*le juge* ≠ *la juge* 'the male/female judge'), be interpreted via agreement. To account for different gender features on human nouns, three noun classes have been proposed, using an ellipsis test, for Modern Greek ([7, 12]), Brazilian Portuguese ([1]), Spanish ([5]), and English ([11]). For these authors, with kinship and nobility nouns (KNNs) (Class 1) masculine and feminine forms are different lexemes, with a congruent social gender, and mismatches under ellipsis are impossible (1a). For other role nouns (RNs) (Class 2), only [fem] is interpreted as social gender, while [masc] is unmarked or semantically unspecified, hence an asymmetric mismatch under ellipsis (1b). Class 3 gathers RNs which inflect for gender like adjectives ([10]) and common gender nouns: gender is not part of the noun's meaning (interpreted via agreement), and symmetrical mismatches under ellipsis are possible (1c). Another hypothesis comes from the relative lexical (token) frequency of Masc. and Fem. forms: if the more frequent form is unmarked ([6]), it can be used for both social genders (as *actor*), but does not explain the KNNs' behaviour and was not confirmed for English RNs by [11]. To study how French human nouns' gender is interpreted, we tested 72 nouns across 3 acceptability experiments with ellipsis (cf. Table 1), with 24 KNNs, and 48 alternating RNs (24 with and 24 without gender bias, using norms from a previous study). Results show that the 3 classes proposed by the literature should be revised for French. While KNNs are more constrained, mismatches are possible for RNs in both orders, grouping classes 2 and 3.

Across all tested nouns, we found high inter-item variation, and 4 different patterns: symmetrical (high/low) and asymmetrical ratings (preference for Masc/Fem-First), all above ungrammatical controls. Using Bayesian ordinal logistic regression to test gender mismatch interaction with order, gender bias, noun class, lexical frequency, and morphology (suppletion/suffixation/inflection), we only found a small effect of morphology (suppletive pairs as *père/mère* 'father/mother', are rated lower than alternating ones as 'prince/esse' or *avocat/e* 'lawyer.M/F'). We thus turn to another type of measure, alternation type frequency (ATF) ([3]), a predictor of productivity and iconicity, using Démonette 2 ([9]) to identify gender-contrasting noun pairs and deriving alternations from phonemic representations in Flexique ([2]). We find that $\text{œ} \sim \text{ø}$ pairs (*chanteur/euse* 'singer.M/F') are much more frequent than $\text{œ} \sim \text{bis}$ pairs (*acteur/rice* 'actor/actress') in the lexicon, and should be more easily accessible in case of mismatch. We ran a new model and found an effect of mismatch and ATF, and 3 interactions: mismatch*ATF ($\beta=0.24, 95\% \text{CrI}=[0.02;0.45], P(\beta>0)=98\%$), mismatch*kinship ($\beta=-1.29, 95\% \text{CrI}=[-2.66;0.18], P(\beta<0)=96\%$), mismatch*ATF*kinship ($\beta=0.53, 95\% \text{CrI}=[0.05;0.98], P(\beta<0)=99\%$).

Regarding the frequency hypothesis, given our results, we propose that ATF is more relevant than token lexical frequency. As for the semantic class hypothesis, we suggest that differences between kinship and nobility nouns are due to a high prevalence of suppletion in the former, leading to low ATF. Other alternating RNs seems to belong to the same class as common gender nouns (with possible gender mismatch under ellipsis in both orders). ¹

¹All data, including experimental materials, scripts, models parameters and results, are available on the project's OSF

1. a) *John is a prince, Mary is too. *Mary is a princess, John is too.
- b) John is an actor, Mary is too. *Mary is an actress, John is too.
- c) John is a teacher, Mary is too. Mary is a teacher, John is too.

Table 1: Experimental protocols. 3 Online Acceptability Judgment tasks (1-10 Likert scale, Ibex-Farm), 2x2 Latin Square designs, $\pm$ MISMATCH $\pm$ MASC-FIRST for 24 target items each, 12 controls testing sensitivity to gender agreement, and 24 fillers on number agreement in coordination and extraction from clefts.

N	Target	Participants	Example of items
1	KNNs	N=37 (Prolific)	<i>Thomas est un frère sage, Ambroise/Ambre aussi.</i> <i>Alice est une sœur sage, Ambroise/Ambre too.'</i> 'Thomas/Alice is a behaved brother/sister, Ambre/Ambroise too.'
2	Non-biased RNs	N=32 (Prolific)	<i>Jacqueline est une comédienne, Bernard/Claudine aussi.</i> <i>Jacques est un comédien, Bernard/Claudine aussi.</i> 'Jacques/Jacqueline is a.M/F comic.M/F, Bernard/Claudine too.
3	Biased RNs	N=32 (Prolific)	<i>Pierre est un plombier, Paul/Pauline aussi.</i> <i>Lucie est une plombière, Paul/Pauline aussi.</i> 'Pierre/Lucie is a.M/F plumber.M/F, Paul/Pauline too.'

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