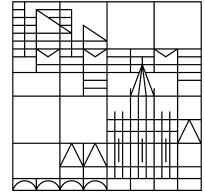# Gender agreement processing in Italian heritage speakers: Effect of markedness and proficiency

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Grammatical gender acquisition

Grammatical gender = a way to classify nouns and to form agreement dependencies between articles and adjectives

(Corbett, 1991)

Italian: *masculine, feminine* (il, la)

German: *masculine, feminine, neuter* (der, die, das)

In most languages, grammatical gender is acquired early by **monolingual children**

o Production in Italian: 75% correct by age 3 and almost 100% by age 6

(Belletti & Guasti, 2015; Leonard, Caselli & Devescovi, 2002; Chini, 1995)

Grammatical gender acquisition

In **L2 learners** grammatical gender is often observed to be a source of errors

(Franceschina, 2005; Calleri et al., 2003)

Gender acquisition in L2 speakers is influenced by:

- Language proficiency

- Linguistic difference between L1 and L2

    - More difficult when L1 does not have grammatical gender

    - Interference when both languages have grammatical gender

(e.g., Dussias et al., 2013)

Grammatical gender acquisition in HSs

Heritage speakers' (HSs) studies showed controversial results :

- higher error rates for HSs compared to monolinguals

  (e.g., Montrul, Foote & Perpiñán, 2008; Polinsky, 2008)

- HSs showed native-like acquisition of grammatical gender

  (e.g., Bianchi, 2013; Kupisch, Akpinar & Stöhr, 2013)

Grammatical gender acquisition is prone to variability in HSs

- **Low proficient HSs vs. high proficient HSs**

- **Most studies**: with majority language without grammatical gender (i.e., English)
- **Few studies**: both languages with grammatical gender, but different gender systems (i.e., **Italian** and **German)**

Gender in Italian

Table 1. *Declension classes in Italian (based on Chini, 1995, p. 81).*

Class	Final sound in sg.	Final sound in pl.	Gender	Example	Translation
I	-o	-i	M	libro/libri	book/books
II	-a	-e	F	carta/carte	paper/papers
III	-e	-i	M	cane/cani	dog/dogs
			F	ape/api	bee/bees
IV	[various]	[= sg.]	M	re/re	king/kings
			F	città/città	city/cities
V	-a	-i	M	problema/problemi	problem/problems
VI	-o M	-i M/-a F	M/F	uovo/uova	egg/eggs
VII	-o	-i	F	mano/mani	hand/hands

Frequency
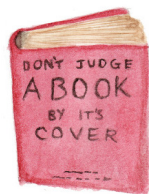
71.5% Transparent

20.6% Opaque

5.4%

the ending makes them transparent

IT = **la** mel**a** (f.) ross**a**

ENG = *the red apple*

IT = **il** libr**o** (m.) ross**o**

ENG = *the red book*

Table 2. Suffixes and associated gender in Italian

Suffix	Associated gender	Examples
- ore	masculine	colore 'colour'
- one	masculine	maglione 'jumper'
- ente	masculine	incidente 'car crash'
- ale	masculine	pugnale 'dagger'
- ione	feminine	stazione 'station'
- trice	feminine	lavatrice 'washing machine'
- udine	feminine	abitudine 'habit'
- ie	feminine	carie 'caries'

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Gender in German

- **Three genders**: masculine, feminine and neuter

- **Gender assignment** is **less transparent** than in Italian

- Gender agreement:

  = **gender is marked on determiners and adjectives**

Morphological markedness

Current morphological theory assumes that feature values, masculine and feminine for gender, singular and plural for number, are asymmetrically represented:

UNMARKED form   **default** / general form

                           MASCULINE and SINGULAR

MARKED form   **specific** form

                           FEMININE and PLURAL

(Battistella, 1990)

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Morphological markedness

Native speakers → are sensitive to markedness asymmetries

= violations on marked features (feminine and plural) are detected earlier

pesci-MASC-unmarked **rosse*-FEM-**marked** = **Easier to detect = more disruptive**

torri-FEM-marked **antichi*-MASC-**unmarked** = **Harder to detect**

L2 learners → over use of the default forms during processing of agreement

= more accurate and shorter reaction times with unmarked / default forms (masculine and singular)

(e.g., McCarthy, 2008; Alemán Bañón & Rothman, 2016; Alemán Bañón, Miller & Rothman, 2017)

Gaps in the current literature

o **Controversial results on the acquisition of grammatical gender in HSs**

o **Lack of studies investigating Italian as heritage language**

o **No studies investigating morphological markedness in HSs**

Aim of my PhD project:

to investigate how markedness impacts gender agreement in adult Italian HSs using both offline (explicit knowledge) and online (implicit knowledge) methodologies

Experimental tasks

Tasks	Description
Reading comprehension test	To assess the ability to read and comprehend a written text
Language and social background questionnaire	To address individual differences and extra-linguistic factors (language input and use for Italian and German)
Language vocabulary test DIALANG	To test language abilities in Italian and German
Self-paced reading task = implicit knowledge	Sentence reading task presented word-by-word with comprehension questions
Working memory tasks	2-back and 3-back tasks: sequential letters
Gender assignment task	To measure knowledge of lexical gender
Grammaticality judgment task = explicit knowledge	To assess accuracy in the detection of ungrammaticalities
Gender agreement production task	To measure accuracy in the agreement of noun and adjective

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Participants

1) **Italian HSs (n=54)**

   Adult 2nd generation immigrants of Italian + German as majority language (35 females; *M age* = 28.15; *SD* = 6.20; *range* = 18-41)

   - Italian from birth and AoA for German between 3-6 years old
   - Selection criteria: being able to read sentences in Italian and answer comprehension questions

2) **Italian native speakers living in Italy (n=40)**

   All born and living in Italy (29 females; *M age* = 25.65; *SD* = 3.99; *range* = 18-39)

   They all acquired Italian from birth

Stimuli

❖ 8 experimental conditions

grammatical	*ungrammatical
Masculine	

	grammatical	*ungrammatical
Singular	pesce$_{-MASC-SG-}$**unmarked** ross**o**$_{-MASC-SG-}$**unmarked**	pesce$_{-MASC-SG-}$**unmarked** *ross**a**$_{-FEM-SG-}$**marked**
Plural	pesci$_{-MASC-PL-}$**unmarked** ross**i**$_{-MASC-PL-}$**unmarked**	pesci$_{-MASC-PL-}$**unmarked** *ross**e**$_{-FEM-PL-}$**marked**
	… red fish …	*… red fish …*
Feminine		
Singular	torre$_{-FEM-SG-}$**marked** antic**a**$_{-FEM-SG-}$**marked**	torre$_{-FEM-SG-}$**marked** *antic**o**$_{-MASC-SG-}$**unmarked**
Plural	torri$_{-FEM-PL-}$**marked** antich**e**$_{-FEM-PL-}$**marked**	torri$_{-FEM-PL-}$**marked** *antich**i**$_{-MASC-PL-}$**unmarked**
	… old tower …	*… old tower …*

❖ 160 sentences
❖ 80 experimental sentences (10 items x condition)
❖ 80 fillers
❖ 80 critical nouns (40 masculine - 40 feminine) ending in -***e***

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Additional manipulations

❖ **Morphological ending [opaque / transparent]**

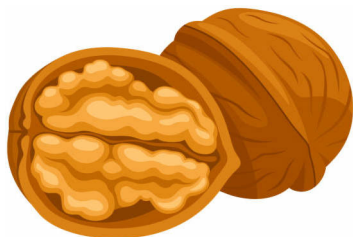　　*La torr**e*** *[the tower]*　　　　　　　　= <u>opaque</u> = no morphological ending

　　*La lava**trice*** *[the washing machine]* = <u>transparent</u> = *-trice is* always feminine

❖ **Gender matching in Italian and German [matched / unmatched]**

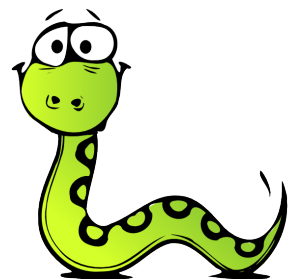<u>matched</u>

La noce (**fem**. in Italian)

Die Walnuss (**fem**. in German)

<u>unmatched</u>

Il serpente (**masc**. in Italian)

Die Schlange (**fem**. in German)

Research questions and hypotheses

RQ1. *Do HSs benefit from morphological endings and gender matching in grammatical gender assignment and agreement?*

Morphological ending = transparent > opaque

Gender matching = same gender > different gender

RQ2. *Are HSs sensitive to morphological markedness and if yes, how is markedness affecting gender agreement in HSs?*

Markedness = gender = masculine > feminine

                number = singular > plural

                violations realised on marked adjectives > unmarked adjectives

RQ3. *Do language history and proficiency play a role in grammatical gender assignment and agreement in HSs?*

Language history = more input and use > performance

Proficiency = higher proficiency > performance

DIALANG Vocabulary test

bunire

SI

F

NO

J

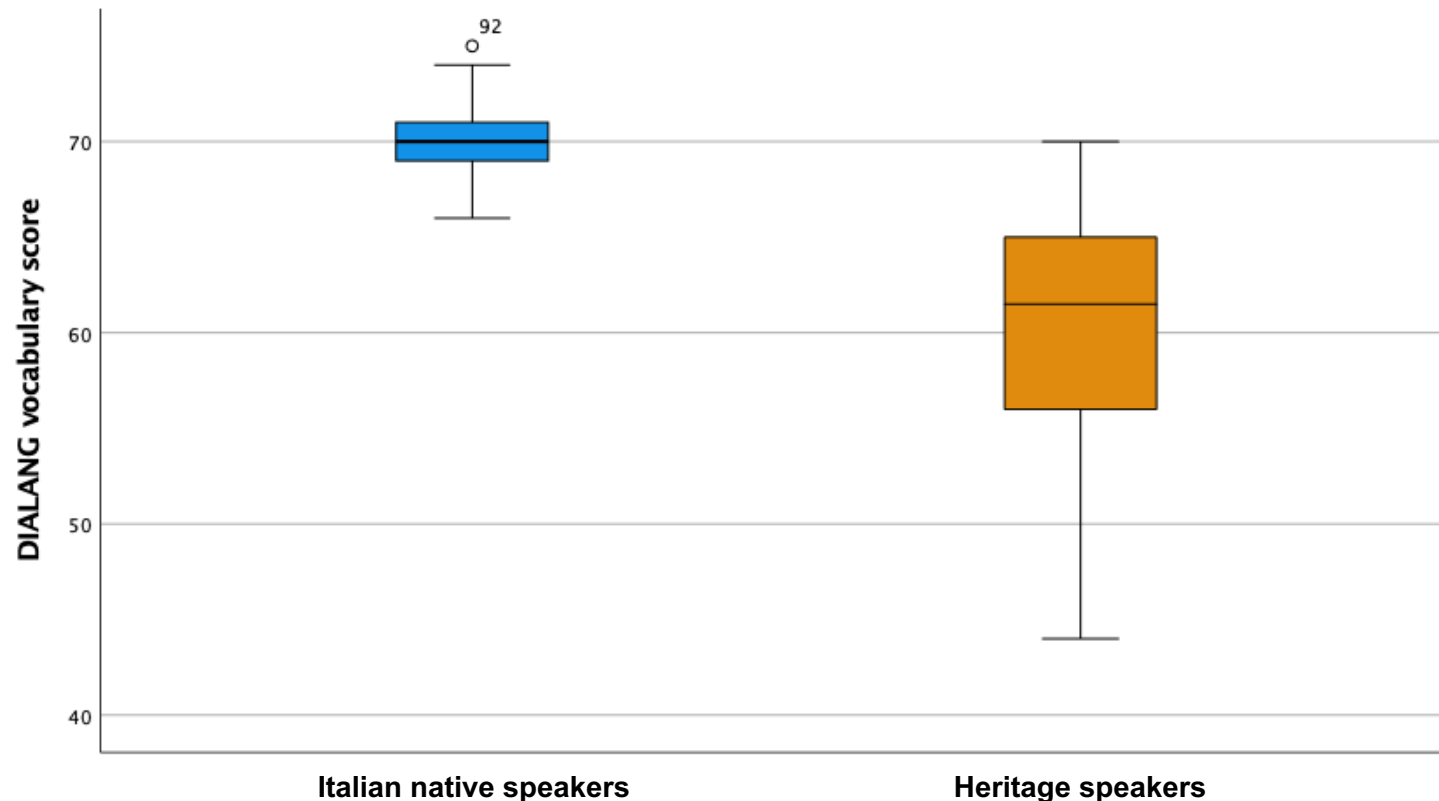**Gender agreement processing in HSs**
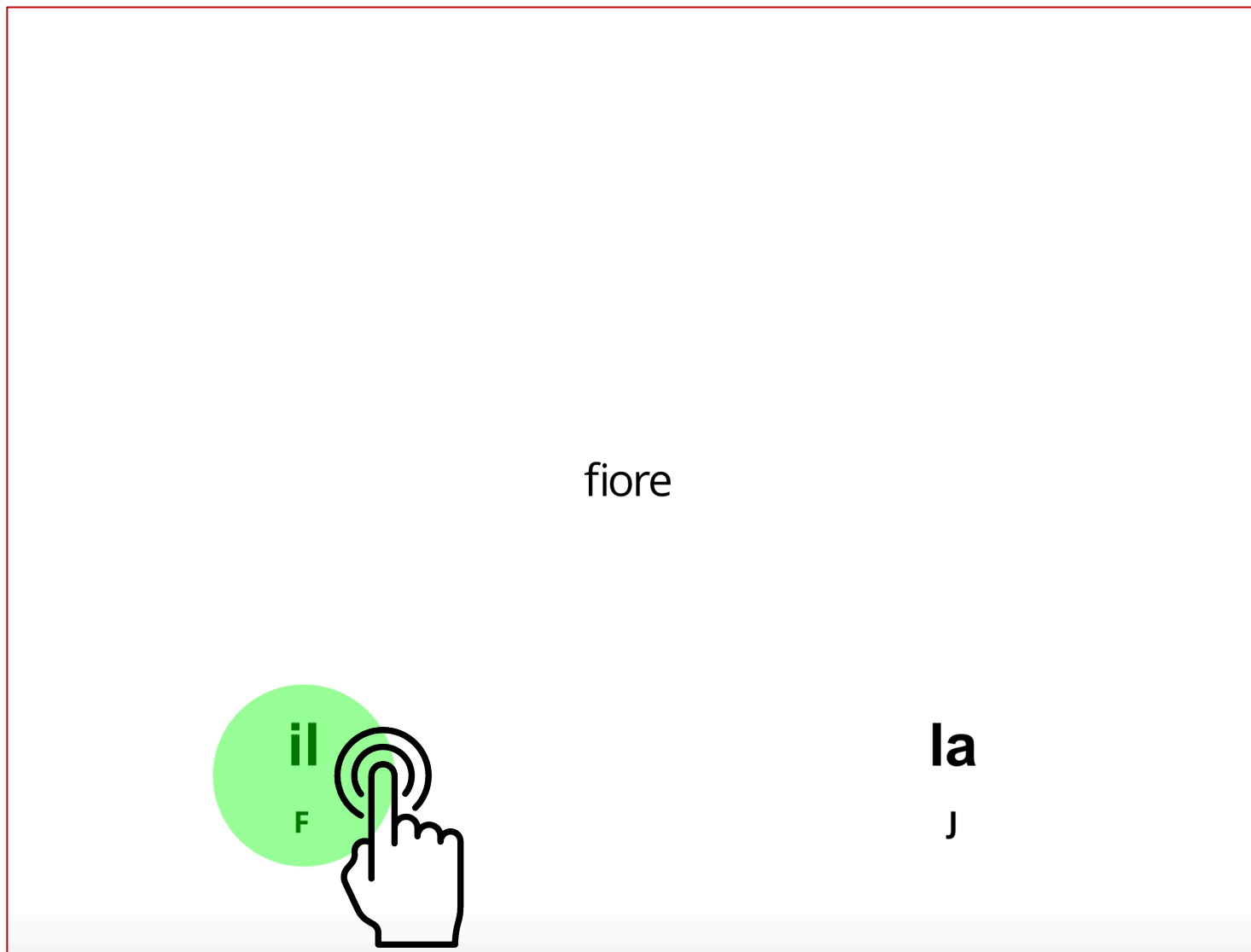
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Results – DIALANG

HSs have lower proficiency and larger degree of variation (M = 60.33; SD = 6.49; *range* = 44-70), most fall outside the range of the Italian native speakers living in Italy (M = 69.90; SD = 2.28; *range* = 66-75)
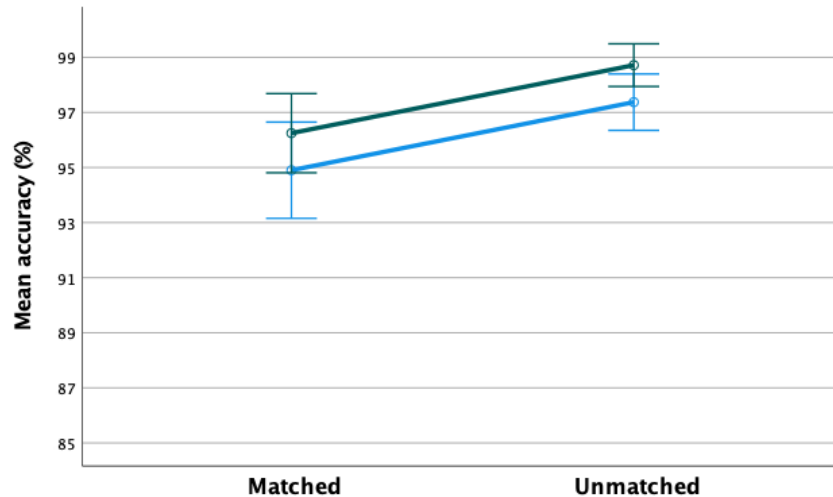
Gender Assignment task

fiore

il

F

la

J

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Results – GA task

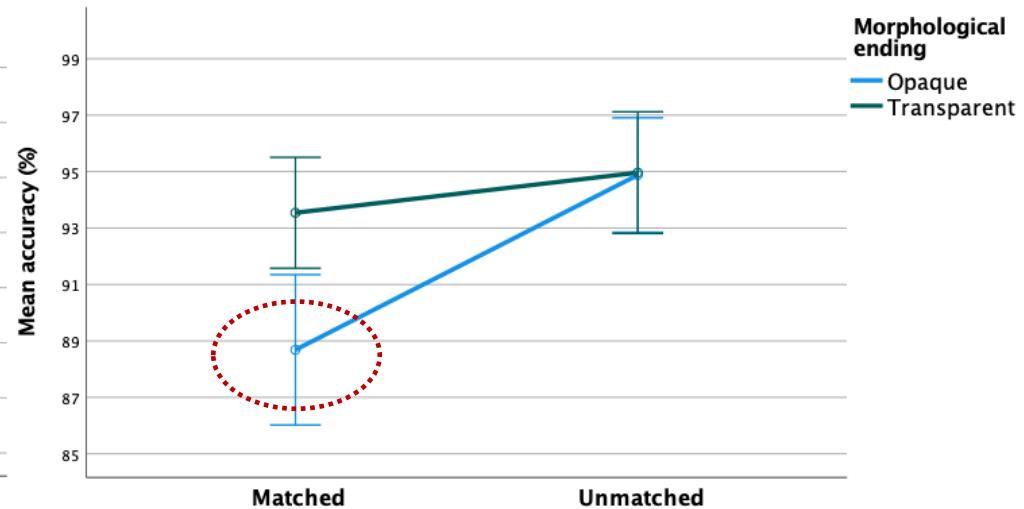Overall **accuracy was high** (over 85% in all conditions) and no effect of Grammatical gender

Italian native speakers

Heritage speakers

Morphological ending
— Opaque
— Transparent

Error bars: 95% CI

Error bars: 95% CI

❖ 2-way interaction between Morphological ending*Gender matching for the HSs

❖ **nouns opaque matched < transparent matched**

Grammaticality Judgement task

Roberto ha adottato un cane affettuoso al canile.

SI
F

NO
J

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A-prime scores

The accuracy rate in the GJT was conducted using a-prime scores that correct for a potential bias towards a "yes" response.

A-prime scores were calculated on the basis of the proportion of hits (correct acceptances) and false alarms (incorrect rejections).

If hit>fa,

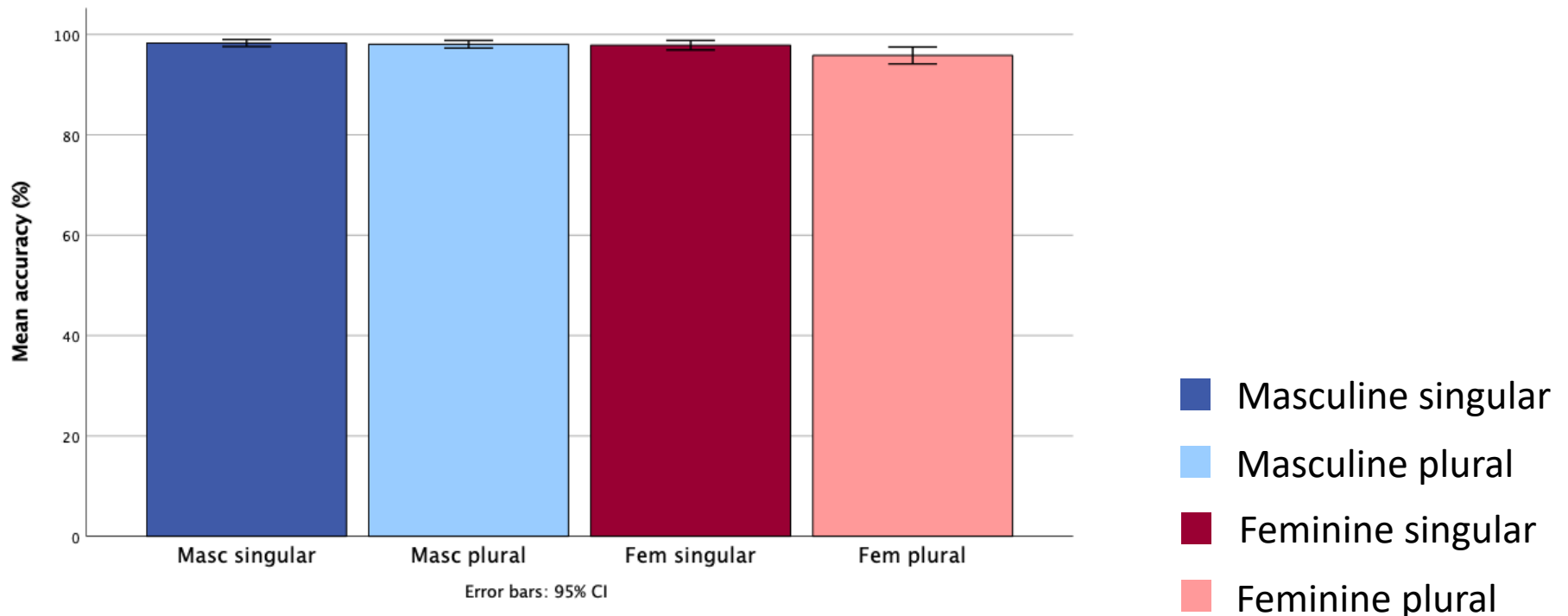$$A' = 1/2 + \frac{(hit - fa) * (1 + hit - fa)}{4 * hit * (1 - fa)}$$

If fa>hit,

$$A' = 1/2 - \frac{(fa - hit) * (1 + fa - hit)}{4 * fa * (1 - hit)}$$

(Grier, 1971; Pallier, 2002)

Results – GJT

❖ Performance was at ceiling

❖ No effect of morphological ending, gender matching and markedness
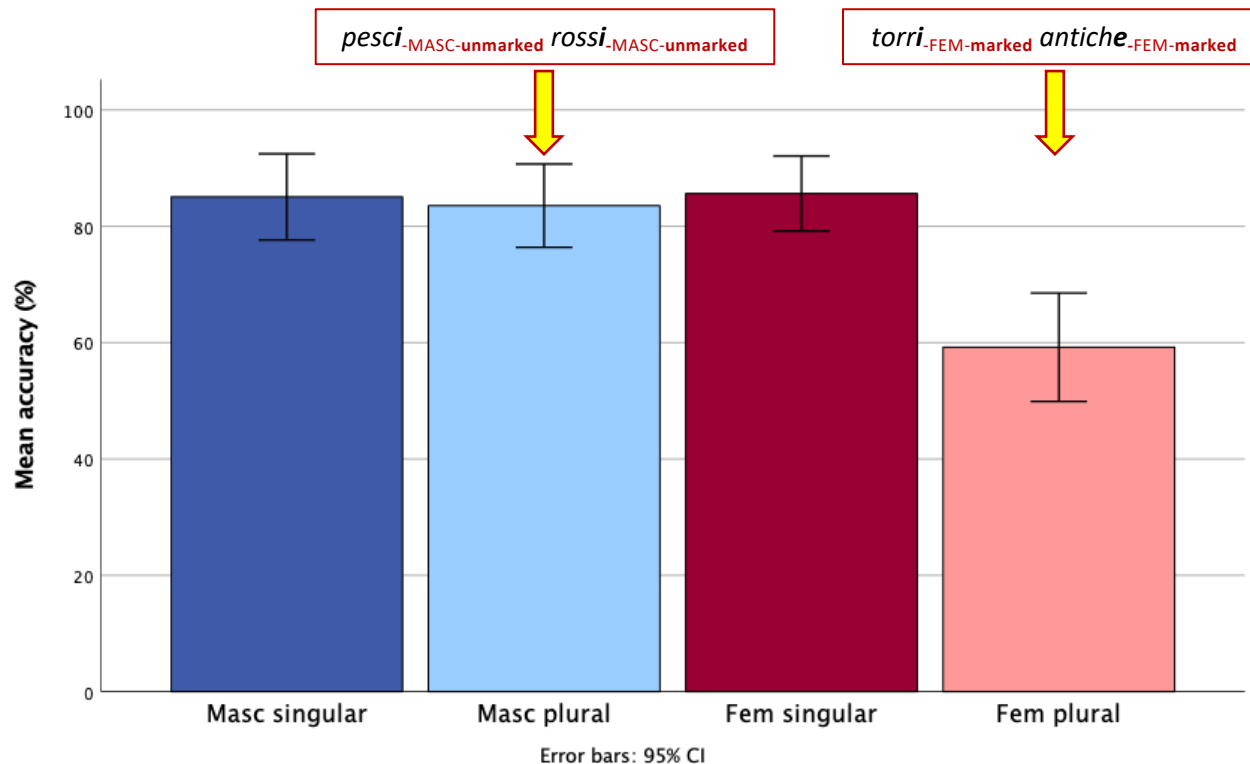
Italian native speakers living in Italy

Error bars: 95% CI

Legend:
- Masculine singular
- Masculine plural
- Feminine singular
- Feminine plural

Results – GJT

❖ No effect of Morphological ending and Gender matching

❖ Effect of markedness

Heritage speakers

pesci-MASC-**unmarked** *rossi*-MASC-**unmarked**

torri-FEM-**marked** *antiche*-FEM-**marked**

[Bar chart: Mean accuracy (%) on y-axis from 0 to 100. Four bars: Masc singular ~85%, Masc plural ~83%, Fem singular ~86%, Fem plural ~59%. Error bars: 95% CI]

for number
sing **>** plural only in the feminine

for gender
masc **>** fem only in the plural

sensitive to violations on marked adjectives

Easier to detect
pesci-MASC-unmarked **rosse*-FEM-**marked**

Results – Correlations

Language and social background questionnaire:

- Quantity / quality of Italian input and use in the past and now

- Time spent in Italy (visits, living in Italy)

- Self-rated proficiency (speaking-listening-reading-writing)

Input, use and time spent in Italy **did not correlate** with GA and GJT

DIALANG and self-rated proficiency correlated positively with both tasks

	DIALANG Italian	Self-rated Proficiency	Gender assignment
Self-rated Proficiency	.519(**)		
Gender assignment	.563(**)	.316(**)	
Grammaticality Judgement	.464(**)	.359(**)	.487(**)

Research questions

RQ1. *Do HSs benefit from morphological endings and gender matching in grammatical gender assignment and agreement?*

No – no effect of facilitation due to morphological ending and gender matching

RQ2. *Are HSs sensitive to morphological markedness and if yes, how is markedness affecting gender agreement in HSs?*

Yes – effect of markedness → gender = masculine > feminine only in plural

number = singular > plural only in the fem

sensitive to violations realised on marked adjectives

RQ3. *Do language history and proficiency play a role in grammatical gender assignment and agreement in HSs?*

No – no effect of language history

Yes – effect of proficiency

Discussion

Previous studies (e.g., Bianchi, 2013) showed that high/ intermediate proficient HSs with a majority language with gender performed native-like in gender assignment and agreement, while others (e.g., Polinsky, 2008) showed higher error rate for low proficient HSs with a majority language without gender

Our results are in line with Bianchi (2013), suggesting that:

- **proficiency** and having a **majority language with grammatical gender** play a role in the acquisition of gender
- **adult HSs** can have **similar performance** as Italian native speakers living in Italy but that is **modulated by markedness** - this is important to consider for future research

Discussion

A positive correlation between the tasks and proficiency suggests that in adult HSs:

- **language history** plays a role in grammatical gender assignment and agreement at an early age and it **contributes to the effect of proficiency** we see now in both tasks.

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Next steps

- **To analyse online data from the self-paced reading task to tap into implicit knowledge and compare behavioural offline data with online data (*offline data vs. online data*)**

- **To analyse the production task and compare task modalities (*comprehension vs. production*)**
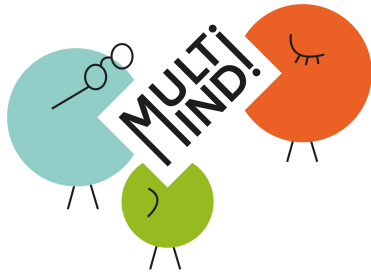
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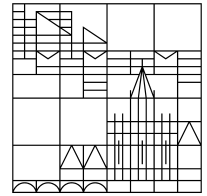
Thank you!

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