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The Gendered Language (R)Evolution: Introduction to the Special Topic

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Gender is a construct in constant evolution. Socio-cultural gender norms, gender stereotypes, as well as the way gender is perceived, interpreted, and conceptualized by people, are constantly changing. At the same time, the way we talk about gender, both as a whole and about specific genders mimics these societal changes. Existing language is shifting to include women and gender minorities in roles that were previously reserved for men: take, for example, the case of gendered languages developing feminine forms for job titles that were previously only masculine, such as the word *ministro* (Italian translation of “secretary of State”, masculine) acquiring the form *ministra* (feminine). These feminine forms are more common in more egalitarian countries (Hodel et al., 2017), suggesting that gender and language go hand in hand. At the same time, new linguistic neutralization strategies are being developed to describe previously invisible and unrecognized identities, such as non-binary individuals, who are often confronted not only with highly gendered societies, but also highly gendered languages. One example of this is instances of gender-neutral neo-pronouns making up for binary language forms, such as the English *ze* or the Swedish *hen* (e.g., Renström et al., 2024), which were shown to reduce the androcentric bias more than traditional neutral words (e.g., singular *they*; Lindqvist et al., 2019). Another example is the utilization of written neutralization forms such as the “gender star” (i.e., -*), which has been shown to elicit inclusive gender



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representations in German (Körner et al., 2022; Kurz & De Mulder, 2023; Zacharski & Ferstl, 2023).

In this context, psychology and linguistics are called to rise to the challenge of exploring how gender and language interact and evolve in response to one another. To do so involves furthering our understanding of both the obstacles and opportunities language presents to increase gender inclusivity and diversity.

On the one hand, language can maintain and reinforce stereotypes (Beukeboom & Burgers, 2019). In this sense, it can pose a barrier to gender equality, to the recognition of gender minorities and individuals who do not align with gender stereotypes, and can even serve as a tool of repression. For example, as stated, androcentric language (see Formanowicz & Hansen, 2022) perpetuates the invisibility of both women and gender minorities through the masculine generic, and their discrimination through word order and asymmetric meaning of gendered words (e.g., Hegarty, 2015). Even when feminine forms are introduced or promoted to address this, research reveals a further inequality—that feminine forms are often associated with status loss (see Merkel et al., 2012 for Italian, Szczesny et al., 2016 for German, and Koniuszaniec & Blaszkowa, 2003 for Slavic languages such as Polish). Similarly, individuals who object to a non-binary vision of gender often demonstrate this through their refusal to accept or use non-binary gender labels (Hekanaho, 2020). On the other hand, language research can offer the means to examine how people perceive and understand gender, manifest and maintain stereotypes, and process or react to gender information. The focus of this Special Topic on the interaction between language, gender, and cognition reflects not only their explicit interplay, but also their *implicit* relationship. Following the Whorfian hypothesis, language and linguistic features may not simply just reflect, but also shape thought (for a review see Maass et al., 2022), and, in doing so, ultimately shape societies. For example, a study of 111 countries found that gender equality was lower in countries in which gendered languages are spoken compared to neutral gender or genderless languages (Prewitt-Freilino et al., 2012). Language can then also be used as a tool—wielded strategically in both explicit and implicit ways to overcome certain barriers and promote inclusion of gender minorities in society. A more recent example is the case of the Swedish pronoun *hen*, which although initially met with resistance has since become an established feature of the Swedish language (Gustafsson Sendén et al., 2015). Researchers can, perhaps, be thought of as having a responsibility to provide individuals with the best strategies to successfully employ such a tool and to investigate the attitudes of the public concerning this evolution and to overcome their specific resistances (e.g., Morgenroth et al., 2021).

On the back of this, a key goal of this Special Topic was to bring together scientists from different scientific backgrounds and geographical areas, who address similar questions with distinct methodologies across a diverse range of languages. The breadth of contributions was intended not only to bridge disciplines, but additionally to illustrate the utility of investigating the same phenomena from different theoretical angles and

with complementary research tools. As such, the research reported here includes work on five languages and one unique language variety (Spanish, Italian, Polish, Greek, German, and Namibian German), all of which are grammatical gender languages that distinguish two (masculine-feminine) or three (masculine-feminine-neuter) noun genders. Keeping with prior research on the psychological aspects of grammatical gender, all of these languages belong to the Indo-European language family, but cover different branches of its language tree (Germanic, Italic, Hellenic, and Balto-Slavic). Thus, the present Special Topic covers a variety of Indo-European languages, but only future research will be able to establish whether the findings reported here, and in the literature at large, generalize to grammatical gender languages belonging to other language families (e.g., Hamito-Semitic languages such as Arabic, Hebrew, Amharic, Oromo, Somali, and Tuareg).

The linguistic diversity of this Special Topic is important not only to capture and explore grammatical variation, but also for distinct phonetic features that may allow speakers to uniquely express their social identities. Prior research suggests that speakers do have the capacity to use their voice strategically to communicate a certain social identity (such as gender and sexual orientation, e.g., [Daniele et al., 2020](#)), but that speakers of different languages use distinct acoustic cues to achieve this. Likewise, listeners are sensitive to distinct, language-specific cues when interpreting a speaker's social identity (e.g., [Sulpizio et al., 2015](#)). Thus, voice-based gender expression and its effect on listeners is best investigated across multiple languages.

In the present Special Topic, male bias created by grammatical gender, its role in the job market, and ways to overcome this bias through gender-inclusive language forms are investigated in studies conducted in Greek, German, Spanish, Polish, and German. Furthermore, the question of how speakers express gender and sexual orientation through voice, and how this affects listeners, is investigated in two distinct contributions on German and Italian speakers. Thus, the current Special Topic suggests that gender and language are linked according to broader principles that go beyond the specific characteristics of any single language.

Turning to the question of methodological diversity, the research included in this Special Topic employs a wide variety of methods, tasks, and measures, including the analysis of existing archives and of speech production, self-reported impression formation, priming and lexical decision tasks (relying primarily on response time), and eye-tracking measures. This nicely illustrates the different levels at which language effects can and ought to be analyzed. Gender is embedded in language at different levels (across both content—i.e., words and grammar, and production—i.e., syntax, phonetics and voice) and finds expression at different layers, ranging from basic cognitive processes (such as word recognition) to more complex expression of social identity (i.e., voice and perception), with far reaching effects at the societal level. In the present collection of articles, three contributions use implicit measures (priming, lexical decision making, and

eye tracking) to identify male bias and to answer the controversial question of whether gender-inclusive, non-orthographic language forms (such as *or X) can offer a feasible alternative to canonical language forms. In a further three articles, lexical, grammatical, and/or phonetic features are analyzed in language production in order to understand the display of gender identities, and one article analyzes existing national corpora to investigate grammatical gender bias in job titles. Clearly, each research tool provides distinct insights into the effects of gendered language and, at the same time, in combination they provide information about the breadth and robustness of the phenomena under investigation.

Finally, one central aim of the Special Topic was to bridge the fields of psycholinguistics, social psychology, and linguistics, bringing together innovative research that explores questions of language and gender from different, yet complementary theoretical and methodological angles. In line with this aim, this Special Topic covers work from Linguistics, Psycholinguistics, Cognitive Psychology, and Social Psychology. Despite their disparate training, our authors share a common interest in the interface between language and cognition, and ask similar questions (for instance, *are non-binary language forms more difficult to process than canonical forms?* or *how do listeners perceive speakers with more feminine vs. masculine voices?*). Yet, they use distinct theoretical frameworks and methods to address these questions. A frequent problem in crossing academic fields is the lack of a common language and shared scientific terminology. Overcoming these difficulties often required a remarkable effort, perhaps most notably from authors with a background in linguistics, to adapt their work to accommodate for an equally diverse readership. As editors, we very much appreciated the time dedicated by authors to elucidating concepts and theories, enabling the Special Topic to bring together work spanning distinct disciplines based on a common research interest.

Contributions to This Special Topic

Although the contributions in this Special Topic span a variety of academic fields, methodologies, and linguistic contexts, they collectively reflect three key underlying themes. The first of these themes reflects investigations into the processing implications of gender-inclusive language forms. Varying emergent cultural formations of gender-inclusive language have developed over the past few decades, reflecting an epistemic shift in Western gender identity and broader societal changes in our understanding of gender. Nonetheless, these language forms, such as the Θ in Italian and the non-binary gender * in German, have increasingly been met with criticism or even outright prohibition. One of the main arguments against the use of gender-inclusive symbols is that such language forms disrupt reading and comprehension. In the face of such claims, it is therefore essential to empirically investigate whether these symbols do, indeed, inhibit comprehension or impede readability. In this Special Topic, the processing of two instances of

non-binary language—the German gender star and Spanish morpheme *-x* is investigated in the contributions of Zacharski, Kruppa, & Ferstl, and Irizarry & Tamargo, respectively.

The gender star (e.g., Autor*in - author) is a novel neutral gender form that intends to address all genders (including men, women, and non-binary people). In two experiments using a lexical decision task, Zacharski *et al.* report results that are promising for proponents of the star form. Their findings show, first of all, that practically all participants identified role nouns with the * denomination as words rather than non-words. Second, exploring the role of individual traits and experience in determining readability, the authors show that younger, student participants seem to demonstrate no disadvantage in response speed to star forms (as compared to feminine and masculine forms). In contrast, although an older, non-student participant group accepted star nouns more slowly and less often, initial difficulties were overcome during the course of the experiment. Thus, whilst the claims of opponents of non-orthographical gender-neutral forms do not seem implausible, Zacharski *et al.*'s findings suggest a rapid facilitatory effect of familiarity and practice in the acceptance and readability of neutral gender forms.

Employing eye-tracking to further elucidate the influence of neutral gender forms on the *stage* of reading, Irizarry and Tamargo approach a similar question in the context of the Spanish *-x*. Whilst testing university students in Puerto Rico on a sentence reading task, the authors additionally collected information pertaining to four extralinguistic factors: gender identity, sexual orientation, experience with gender studies, and attitudes towards gender-inclusive morphemes (GIMs). Whilst differences in the processing costs of *-x* as compared to the masculine and feminine forms arose, individual factors appeared to again act as a moderator, particularly when taken together with attitude and sexual orientation. Specifically, fixation duration was reduced for heterosexual participants if they had positive attitudes towards gender-inclusive morphemes. Combined, the findings of Zacharski *et al.* and Irizarry & Tamargo highlight the importance of a host of individual factors, suggesting that the broad objection to gender-inclusive language as unreadable represents a vast oversimplification of the nuances of integrating these new language forms.

A second theme that arose in the collation of papers for this Special Topic pertains to gender, sexuality, and speech. Gender and sexuality have long been established to influence both speech production and linguistic choices. Whilst certain voice differences between individuals assigned male or female at birth are biological inevitabilities (e.g., lower fundamental frequency in those assigned male at birth due to longer vocal folds), inter-gender differences point to an equally important behavioral and learned component (Weirich *et al.*, 2019; Weirich & Simpson, 2023). This variation as a marker of social identity can serve as a means of self-expression, signaling group belonging, agency (or lack thereof), and more. In two papers on this theme, Weirich and Fasoli & Teasdale consider the downstream outcomes of socially-meaningful speech variation in the context of occupational stereotypes and—in the case of the former—the role of identity in forming

voice perception. Across two studies, Weirich investigates the influence of having a gender-atypical profession on voice production (i.e., *does a woman working as a soldier speak in a more masculine manner?*) and presumed profession on voice perception (i.e., *does being told a man is a kindergarten teacher make him 'sound' more feminine?*). Whilst their findings point towards no fundamental frequency differences between occupational groups, a significant positive correlation was found between fundamental frequency and self-reported femininity. In regards to perception, stimuli assumed to come from kindergarten teachers were rated significantly more friendly and more emotional than the same stimuli assumed to come from soldiers by *younger* listeners, while *older* listeners rated the assumed kindergarten teachers as less warm than the assumed soldiers, potentially pointing to a generational change in attitude towards these occupations.

Switching the focus to sexuality, Fasoli & Teasdale explore perceptions of gay vs. straight voices in regards to suitability for promotion, and the traits associated with these decisions (i.e., communality). Results show that perceiving men as gay can lead to a positive bias in hiring: gay-sounding men were believed to be more suitable for stereotypically feminine senior roles than straight-sounding men, due to gender stereotypes attributing greater communion to them. Such positive bias was stronger among those participants who reported the lowest level of negative attitudes toward gay men. These findings contribute to the current literature on voice-based discrimination as one of the few studies showing positive stereotyping and biases in certain contexts toward gay-sounding men.

Beyond voice quality, gender can also influence vocabulary. Research investigating distinct linguistic styles of men and women has mostly focused on linguistic and paralinguistic features within the same language (e.g., Plug et al., 2021). Deviating from this tradition, Schulte investigates gender differences in the use of two language variants that have distinct lexical and grammatical features, namely Standard German and Namibian German. Crucial to their research are the assumptions that 1. Men are less affected by the prestige of linguistic features than women, 2. Formal social situations may demand speakers, irrespective of their gender, to rely on a formal linguistic register, and 3. Mirroring social psychological approaches to implicit vs. explicit thought processes, lexical choices should occur in a more explicit and intentional way, whereas grammatical choices may reflect spontaneous, implicit processes. Their findings show that, as predicted, male speakers produce more Namibian German variants than female speakers to a greater extent in informal communicative contexts and produce significantly more lexical (explicit) features than females (but not grammatical, implicit features). Schulte's results contribute a novel understanding of the roles of register, gender, and linguistics features in the context of language variants.

The final theme within this Special Topic addresses the conflict, across many languages, between grammatical and stereotypical gender in the context of occupation. Languages, of course, differ in their use of grammatical gender. English, for example,

has little to no grammatical gender, while languages like Dutch or Swedish have partial gender systems for certain nouns. In fully gendered languages like French or Greek, gender applies broadly across nouns, pronouns, and adjectives, affecting grammatical agreement. In their contribution to this Special Topic, Chalyvidou & Weber examine the interaction of grammatical gender and gender stereotypes in Modern Greek. The authors primed Native Greek speakers with common-gender occupation nouns with masculine endings, but a stereotypically feminine or masculine bias (e.g., *iðravlikós* ‘plumber’ vs *esθitikós* ‘beautician’). Subsequently, participants saw masculine or feminine pronouns (aftós ‘he’ or aftí ‘she’), and indicated the gender of the pronoun while response times were measured. Slower response times were found only for masculine pronouns primed with a stereotypically feminine role noun (*esθitikós* ‘beautician’ - aftós ‘he’). The findings suggest that apparent morphosyntactic cues, albeit uninformative about referential gender, seemingly mitigated the impact of gender stereotypes associated with female-biased role nouns in prime-target pairs involving a feminine pronoun, reflecting an interaction between grammatical form and stereotype.

The final contribution on this theme comes from Hodel, Formanowicz and Szczesny, who investigate the interaction between class and the use of gender-inclusive language. Past research suggests that gender-fair language is more commonly used in egalitarian cultures, possibly stemming from middle-class communities’ endorsement of egalitarian values alongside stronger beliefs that social change is possible, as compared to working-class communities. In two studies, Hodel *et al.* investigate whether—as a result—gender-fair terminology might be demanded more actively (and therefore also used more often) for middle-class professions than working class professions. To explore this, the authors examine the use of feminine and gender-fair job titles for working vs. middle class professions in two grammatical gender languages, namely feminine job titles in Polish corpus texts (Study 1) and gender-inclusive job titles in Swiss German job advertisements (Study 2). Results showed that feminine and gender-inclusive job titles were indeed used more often for middle- than for working-class professions in both countries, findings that highlight – cross-culturally – the need to consider social class in future language research as well as in the implementation of language reforms.

In bringing together research from different scientific fields, with a diverse representation of countries, cultures, and methods, this Special Topic illustrates how gender (conceptualized as identity, norms, and stereotypes) and language mirror and shape each other. Contributions on gender fair language collectively highlight the nuances of an increasingly politicized issue that is perhaps often over-simplistically framed. The findings herein highlight just some of the complex cultural, societal and individual variation underpinning the influence of gender-inclusive language on comprehension, social identity, and societal dynamics. Moving on to the bidirectional influence of voice on stereotypes, alongside gender on spoken language style, voice, and linguistic choices, contributions to this Special Topic emphasize the profound influence of voice and language on percep-

tions of identity and competence. They underscore the need for greater awareness of these biases in everyday communication, hiring practices, and efforts to promote gender equality. Finally, in the most applied theme of the Special Topic, the contributions on the interaction between speakers, situation and language emphasize how language choices—whether shaped by grammar, stereotypes, or class—affect social perceptions and access to opportunities, calling for more nuanced approaches in promoting linguistic equality and combating gender bias in various settings.

Collectively, these contributions emphasize the multifaceted variables influencing language processing, the role of gender and social identity in communication, and the potential for evolving language forms to reshape social norms.

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