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Comprehensibility and appreciation of two gender-neutral neopronouns in French: *iel* and *al*

Chloé B. Vincent ^a, Sarah Van Hoof ^a, Pascal M. Gyga ^b, Ute Gabriel ^c,
and Sofie Decock ^d

^aDepartment of Translation, Interpreting and Communication, Ghent University, Gent, Belgium; ^bDepartment of Psychology, University of Fribourg, Fribourg, Switzerland; ^cDepartment of Psychology, Norwegian University of Science and Technology, Trondheim, Norway; ^dDepartment of Professional and Intercultural Communication, Norwegian School of Economics, Bergen, Norway

ABSTRACT

Gender-neutral pronouns are often criticized for diminishing text quality, yet little empirical research has addressed this issue in grammatical gender languages such as French. This study presents the first investigation into the comprehensibility and appreciation of two French gender-neutral neopronouns, *iel* and *al*. Using a between-subjects experimental design, 400 participants read a text containing one of four referential strategies: binary pronouns, *iel*, *al*, or name repetition. They then responded to measures assessing word difficulty, sentence difficulty, subjective comprehensibility, text appreciation, content question accuracy, and other control variables. Results indicated that texts with *iel* and *al* were partially perceived as less comprehensible than those using name repetition and texts with *iel* were less appreciated than texts with binary pronouns. However, only *al* negatively impacted content question accuracy. These findings, in line with studies from other languages, suggest that the linguistic system may influence the evaluation of gender-neutral pronouns, while providing little evidence that they impair performance on content questions.

Introduction

Historically and across many languages, efforts to make language more gender-inclusive have mostly aimed at countering the dominance of masculine forms and at making women linguistically visible, for instance, by introducing feminine forms for professions traditionally dominated by men. While these initiatives marked significant progress in addressing gender inequality in language, they did not encompass individuals who identify outside the traditional gender binary (Abbou et al., 2018). The recent societal visibility of nonbinary individuals has thus renewed interest in gender-inclusive language reforms and has brought new dimensions to the debate on linguistic inclusivity (e.g., Beaumont, 2023; Spiegelman, 2022; Swamy & Mackenzie, 2019, 2022).

One central aspect of this debate concerns the adoption of gender-neutral, third-person pronouns, such as singular *they* in English. These pronouns may be used for specific nonbinary reference, that is, referring to a person who does not identify with the binary genders woman or man, as in example (1), and they may also be useful for generic reference, in contexts where the referent's gender is irrelevant or unknown, as in example (2).

- (1) Sasha is nonbinary. *They* are a student at the university.
- (2) If a reader likes this book, *they* may want to read other books by this author.

These reforms aim not only to counter the male bias invoked by the generic use of masculine pronouns, as in example (3), but also to include individuals of all genders, thus reflecting broader societal shifts toward greater gender inclusivity (Greco, 2019).

(3) If a reader likes this book, *he* may want to read other books by this author.

Activists and linguists have proposed two primary strategies for adopting gender-neutral pronouns: (1) introducing neopronouns, such as *hen* in Swedish, or (2) expanding the meaning of existing pronouns, such as singular *they* in English or *die* in Dutch. For French, the focal language of this study, after some initial proposals, such as *ille* (Abbou, 2011), the neopronoun *iel* has become particularly prominent (Knisely, 2020; Provitola, 2019; Swamy & Mackenzie, 2022). *Iel* gained significant public attention following its inclusion in the online dictionary *Le Robert* in 2021, sparking widespread political and media controversy (Carrier & Chicoine, 2022; Collet, 2022). Despite resistance, the use of *iel* has increased, particularly in progressive and LGBTQ+ communities (Swamy & Mackenzie, 2019). Another, less prominent proposal is *al*, which was introduced by Alpheratz (2018). Unlike *iel*, *al* has not entered mainstream discourse and remains primarily known within LGBTQ+ circles. Some prefer *al* because, unlike *iel*, it is not derived from combining the binary pronouns *il* and *elle*, making it distinct from existing gendered forms (Knisely, 2020). The letter “a” in *al* also suggests *without* (i.e., without gender), as in *aphone* (“without voice”).

Common arguments against such pronouns are that they are too difficult or awkward to use and that change would be too difficult (Vergoossen, Renström et al., 2020), spurring research interest into their potential effects on *text quality*, *readability* and overall *appreciation* of the text (Decock et al., 2024). Existing research on the comprehensibility and appreciation of gender-neutral pronouns has almost exclusively focused on natural gender languages, such as English, or languages in which the importance of grammatical gender is in decline, such as Swedish and Dutch (Gygax et al., 2019). Studies have shown that in these languages, gender-neutral pronouns do not substantially impair text comprehensibility, and only a few pronouns were found to negatively affect text appreciation (e.g., Decock et al., 2024; Vergoossen, Pärnamets et al., 2020). However, these findings may not directly apply to grammatical gender languages. For instance, additional issues may arise for French regarding the agreement of past participles, adjectives, and nouns. As Renström (2025) notes, more research on gender-neutral pronouns in such languages is therefore warranted. Despite widespread media debate, academic research specifically on French gender-neutral neopronouns remains sparse (but see, e.g., Swamy & Mackenzie, 2019), and no experimental studies to date have tested claims about their potential to affect the comprehensibility and/or appreciation of a text.

To address this gap, the present preregistered¹ study investigates two French neopronouns, *iel* and *al*, focusing on the impact of their use for nonbinary reference on the comprehensibility and appreciation of texts. Conducted in a Swiss French context, this study adapts the methodology of Decock et al.’s (2024) study on Flemish Dutch. The present study addresses the following questions:

- (1) Do gender-neutral pronouns used for nonbinary reference impact the comprehensibility and appreciation of a text in French?
- (2) Are there differences in the comprehensibility and appreciation of *iel* and *al*?
- (3) Are the possible effects of referential strategy on comprehensibility and appreciation of the text mediated by the perceived awkwardness of the gender-neutral pronouns?
- (4) Does *cueing* (i.e., informing readers that the person referred to is nonbinary and prefers gender-neutral pronouns) moderate the mediation effect considered in question 3?

This study is novel in that it represents the first experimental investigation into the comprehensibility and appreciation of texts including the French gender-neutral pronouns among the general population. The study contributes to the growing body of research on gender-neutral pronouns across various languages and facilitates future cross-linguistic comparisons.

In the following sections, we first define comprehensibility and appreciation and review the literature on gender-neutral pronouns, leading to our current hypotheses for the French language context. We then describe our study’s methodology. Finally, we present our results and discuss our findings.

Comprehensibility and appreciation

Friedrich (2017) defined *comprehensibility* (in German: *Verständlichkeit*) as the ease with which a text can be understood by a specific reader in a specific context and conceptualized it as a multidimensional construct comprising, among other dimensions, *subjective comprehensibility*, *word difficulty*, *sentence difficulty*, and *variety of language use*. *Subjective comprehensibility* refers to participants' overall perceived ease of understanding, whereas *word difficulty* and *sentence difficulty* capture more specific semantic and syntactic aspects of this perception. The dimension *variety of language use* reflects how varied or diverse readers perceive the language of a text to be and is considered an indicator of the text's aesthetic appeal. Linguistic variation is argued to influence reader motivation by preventing boredom and encouraging deeper engagement with the content of a text.

Building on this framework, Decock et al. (2024) extended Friedrich's (2017) dimension *variety of language use* by adding two questionnaire items inspired by Pöschko and Prieler (2018) and Bradley et al. (2019). These additional items capture aesthetic aspects of texts more broadly and were grouped, together with Friedrich's original items for *variety of language use*, under a separate construct labeled *text appreciation*. This shift in emphasis reflects the specific focus of Decock et al.'s (2024) study on gender-neutral pronouns, which are frequently rejected on the basis of their perceived infelicity or because they are seen as violating readers' aesthetic norms. Although, as explained above, aesthetic appeal can be considered part of *text comprehensibility* from a theoretical perspective, treating *text appreciation* as a distinct construct allows for a more detailed analysis of such evaluative responses. Given the similar focus of the present study, we adopt the same terminology and analytical distinction.

In addition, Decock et al. (2024) included *performance on content questions* as a means of assessing the extent to which the use of gender-neutral pronouns affected participants' understanding of a text. Consistent with Pöschko and Prieler (2018), and the notion that genuine comprehension involves the integration of textual information and is closely linked to successful memorization (Kintsch, 1998), we treat content question performance as a proxy for basic text comprehension. Stricto sensu, *comprehension* is distinct from *comprehensibility*: Whereas *text comprehensibility* refers to a property of the interaction between the text and the reader, *comprehension* is achieved when a reader has constructed an adequate and coherent mental representation of the text's content (Friedrich, 2017). In our analyses, *content question accuracy* is therefore treated as a separate variable. However, to avoid terminological overload, we include this measure under the broader label *text comprehensibility* when using this label in more general descriptions of this study's focus (e.g., in the title and the research questions).

Nonbinary pronouns, comprehensibility, and text appreciation

In general, research on the comprehensibility and appreciation of texts containing gender-neutral pronouns remains limited and focuses mostly on English, Swedish, and Dutch. English has a long historical presence of singular *they* for generic reference (Paterson, 2014). The gender-neutral pronoun *hen* was officially introduced in Swedish in 2015 (SAOL, 2015), prompting a growing body of research. In Dutch, the pronouns *die* and *hen* were repurposed and codified as gender-neutral pronouns by the widely used Dutch dictionary Van Dale in 2021 and the Dutch Language Union (Taalunie, 2022).

As for comprehensibility, Speyer and Schlee (2019), based on Foertsch and Gernsbacher (1997), examined, in a self-paced reading study, the processing of three pronouns (*he*, *she*, and singular *they*) used for generic reference and following an indefinite pronoun or a personal noun with a masculine, feminine or neutral connotation as four possible antecedents among advanced English L2 learners. Their within-subject analyses revealed that for highly proficient English L2 learners, similar to English L1 speakers, no processing cost was associated with singular *they* when used in reference to these four types of antecedents. Arnold et al. (2021) examined the comprehensibility of gender-neutral pronouns for nonbinary reference. They

found that adding a short introductory phrase to a text, specifying that the described person is nonbinary and uses gender-neutral pronouns, guided readers' interpretation of singular *they* and increased comprehensibility. In their eye-tracking study, Vergoossen, Pärnamets, et al. (2020) found no substantial effect of gender-neutral pronouns on comprehensibility, with only a minor processing cost associated with the use of *hen* in Swedish. In Dutch, Decock et al. (2024) found no evidence that *hen* or *die* affected text comprehensibility. Finally, both Renström et al. (2022) for Swedish and Decock et al. (2025) for Dutch found that compared to binary pronouns, sentences with gender-neutral pronouns scored lower on comprehensibility. Nevertheless, overall comprehensibility remained high, leading the authors to conclude that there was no substantial threat to its comprehensibility.

For pronoun appreciation, Bradley et al. (2019) conducted a grammatical acceptability task (i.e., participants had to judge whether sentences were grammatically acceptable) and found that singular *they* was largely considered acceptable when used for generic reference, referring to a hypothetical individual of unknown gender. However, it was less accepted when used to refer to a specific individual. Neopronouns, such as *ze/zir*, were even less accepted, which suggested that participants found invented pronouns in reference to a nonbinary individual more difficult to envision. Similarly, Gustafsson Sendén et al. (2021) observed an increasing acceptance and use of the neopronoun *hen* in Swedish. However, Renström et al. (2022) found that its use for generic reference was preferred to its specific use. Consistent with these findings, Decock et al. (2025) found that the use of the gender-neutral pronoun *die* in Dutch was evaluated better for generic than for specific reference.

In Dutch, other nonbinary pronouns are possible as well, such as *hen*. Decock et al. (2024) demonstrated that this pronoun negatively impacted text appreciation, which was linked to the *perceived awkwardness* of the referential strategies. Decock et al. (2024) measured the latter by means of five items: "I thought the words used in the article to refer to the [profession] were well chosen/appropriate" and "I thought some words used in the article to refer to the [profession] were irritating/strange/surprising." Consistent with Arnold et al. (2021), they also showed that adding a cueing sentence explaining that the person referred to was nonbinary and used gender-neutral pronouns moderated this effect. Cueing made nonbinary *hen* appear less awkward, which led to higher text appreciation.

Individual differences

Several individual differences have been shown to impact the appreciation of gender-neutral pronouns. For instance, younger participants and individuals who do not identify as a man tend to be more accepting of these pronouns (Gustafsson Sendén et al., 2021; Hekanaho, 2020). Higher education levels are also associated with increased acceptance of gender-neutral pronouns (Hekanaho, 2020), as are lower sexist attitudes levels (Bradley et al., 2019; Hekanaho, 2020; Renström et al., 2022). Recent experimental studies (Tavits & Pérez, 2019) and correlational findings on familiarity (Hekanaho, 2020) have also shown that greater exposure to these pronouns is linked to higher acceptance of their use.

Overall findings on gender-neutral pronouns in English, Swedish, and Dutch

Taken together, the findings on gender-neutral pronouns in English, Swedish, and Dutch suggest that while there is no evidence that they substantially hinder text comprehensibility, specific pronouns may still have an impact on text comprehensibility and/or text appreciation, especially when referring to a specific individual. These effects may vary depending on individual differences among readers or speakers.

Empirical studies on nonbinary pronouns in French

In contrast to English, Swedish, and Dutch, research on gender-neutral pronouns in French has mainly been theoretical and nonexperimental. For example, Alpheratz (2019) proposed a system

for referring to nonbinary individuals and suggested ways to expand it. Elmiger (2022) further argued that gender-neutral pronouns such as *iel* enhance the existing grammatical system and provide an interesting alternative to binary pronouns for nonbinary individuals. He also argued that issues of grammatical agreement related to the pronoun *iel* predate its appearance, because nonbinary individuals have always experienced problems with feminine or masculine agreement, regardless of the emergence of neopronouns. Swamy and Mackenzie (2019, 2022) provided an overview of exploratory research on gender-inclusive French. They outlined linguistic possibilities for nonbinary individuals, including the gender-neutral pronoun *iel* and others, such as *al* (see also Ashley, 2019).

In an empirical study, Knisely (2020) conducted a survey among nonbinary French speakers to examine the use and perception of linguistic forms, including pronouns, within the nonbinary community. The results mainly revealed a lack of consensus on pronoun usage, partly due to challenging agreement issues in French. Importantly for the present study, however, the majority of participants found *iel* to be an acceptable pronoun for self-reference. Alternatives included *ael*, *ol*, *øl*, *al*, and alternating between binary pronouns. Overall, these findings on French gender-neutral pronouns suggest that *iel* is the best-known neopronoun in French, though other pronouns exist and are important for self-identification, albeit less frequent.

Present study

The present study represents a conceptual replication of the study by Decock et al. (2024). It uses a similar procedure but focuses on French gender-neutral pronouns in the French-speaking part of Switzerland.

French gender-neutral pronouns *iel* and *al*, and avoidance strategies

The first gender-neutral pronoun we focus on is *iel*, since it is by far the most commonly used nonbinary pronoun (Knisely, 2020). We add to our focus the pronoun *al*, which has been proposed by Alpheratz in their *Grammar of Inclusive French* (Abbou et al., 2018). *Al* is not a commonly chosen option within the nonbinary community, where pronouns like *ael* or *yel* are more frequent. However, we wanted to explore whether this rarely discussed neopronoun is evaluated similarly to *iel*, which has been at the heart of heated public debates.

Specifically, we focus on the gender-neutral pronoun in the subject position, as in example (4).²

(4) *Sasha est non-binaire, iel/al habite à Lausanne.*

Sasha is nonbinary, they live in Lausanne.

Using binary pronouns to refer to a nonbinary person can constitute an act of *misgendering* (i.e., attributing the wrong gender to a person). To respect a person's nonbinary identity, one can either use the preferred gender-neutral pronouns of that person or avoid pronouns altogether and instead repeat the person's name. The latter strategy is currently used in most texts in French, such as newspaper articles. It enables authors to respect the nonbinary person's gender identity while adhering to formal writing rules in French. This strategy is sometimes referred to as "*le consensus réside dans l'évitement*" ["the consensus lies in avoidance"].³ In addition to the pronouns tested in the study, we also examine the strategy of avoiding pronouns by repeating the name, to evaluate whether its comprehensibility and appreciation differ from those of gender-neutral pronouns.

Hypotheses

Drawing on the existing research, we propose the following hypotheses:

H1: Text comprehensibility and appreciation will be influenced by the choice of referential strategy, namely the use of *gender-neutral pronouns*, *binary pronouns*, or *first and last name repetition*. Prior research has suggested that gender-neutral pronouns, especially when referring to a specific individual, may trigger lower comprehensibility and appreciation (e.g., Decock et al., 2025; Renström et al., 2022). To evaluate this claim from two complementary reference perspectives, gender-neutral pronouns are compared first to binary pronouns and subsequently to name repetition.

H1a: We expect a text containing gender-neutral pronouns to receive higher ratings on word difficulty than a text containing binary pronouns.

H1b: We expect a text containing gender-neutral pronouns to receive higher ratings on sentence difficulty than a text containing binary pronouns.

H1c: We expect a text containing gender-neutral pronouns to receive lower ratings on subjective comprehensibility than a text containing binary pronouns.

H1d: We expect a text containing gender-neutral pronouns to receive lower ratings on text appreciation than a text containing binary pronouns.

H1e: We expect a text containing gender-neutral pronouns to receive lower ratings on content question accuracy than a text containing binary pronouns.

Because prior research does not provide clear directional predictions concerning name repetition, comparisons involving this strategy are exploratory.

H1f: We expect a text containing gender-neutral pronouns to differ from a text repeating the person’s name with respect to word difficulty, sentence difficulty, subjective comprehensibility, text appreciation, and content question accuracy (non-directional).

H2: We expect texts containing the two gender-neutral pronouns, *iel* and *al*, to differ in their ratings of comprehensibility and appreciation. This hypothesis is nondirectional, as several potential outcomes are possible. First, Hekanaho (2020) demonstrated that familiarity with gender-neutral neopronouns increases the odds of viewing these pronouns as acceptable. Since *iel* is used more frequently than *al*, participants are likely to be more familiar with *iel* than *al*. Familiarity with the two gender-neutral pronouns was measured (see below). This familiarity may improve the comprehensibility and appreciation of *iel* compared to *al*. However, *iel* is also more polarizing (Elmiger, 2022) and the subject of public debate, which may negatively affect its perception and thus have a more negative impact on comprehensibility and appreciation (Hekanaho, 2020).

H3: As in Decock et al. (2024), we expect the perceived awkwardness of the referential strategy to play a mediating role between the referential strategy and subsequent evaluations of text comprehensibility and appreciation, such that awkwardness may statistically account for part of this relationship (Figure 1). Although the study relies on self-report measures in a cross-sectional design, the constructs differ in scope: perceived awkwardness targets the referential strategy specifically, whereas

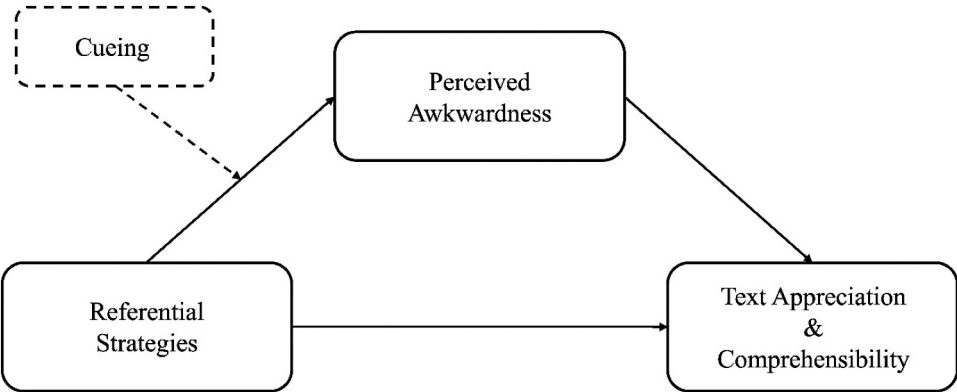


Figure 1. The hypothesized mediation model (solid lines), and moderation model (dashed lines).

comprehensibility and appreciation items pertain to the whole text. From a theoretical perspective, it is therefore more plausible that impressions of referential awkwardness inform broader text-level evaluations than that overall text evaluation shapes judgments of a particular referential choice.

H4: When the gender and preferred pronouns of the individual described are explicitly provided through a cueing statement, the effect of referential strategy—mediated by perceived awkwardness—will differ compared to when no such cueing is present. Specifically, we expect that cueing will improve the comprehensibility and appreciation of a text containing gender-neutral pronouns, as prior work has shown that providing explicit pronoun clarification can guide readers' interpretation and enhance their understanding (Arnold et al., 2021; Decock et al., 2024). Conversely, we anticipate that using binary pronouns will lead to reduced comprehensibility and appreciation in the cueing condition, due to the misgendering act. As with H1, we have no specific expectations regarding the effect of name repetition.

Methods

Participants

The dataset for our study consisted of 400 participants who were recruited by the market research agency Bilendi. The sample size was determined based on Decock et al. (2024), who included 50 participants per condition. With eight experimental conditions, this resulted in a total sample of 400 participants. Bilendi typically recruits diverse panelists from a large participant pool to which they distribute the surveys. From the original 626 participants, we excluded those who did not meet participation criteria (informed consent, age of 18 or older, and French as their first language; $n = 43$), those who answered at least one of the two awareness questions incorrectly ($n = 143$), and those who completed the questionnaire in one-third of the median time needed to complete the survey (15 minutes; $n = 1$). Additionally, one participant who commented in German and one who stated they did not read the article were excluded. From this pool of 437 participants, Bilendi selected a sample of 400 and allocated a different *weight* to each participant to ensure the sample would be representative of the population of French-speaking regions of Switzerland in terms of age, gender, and education. Participants were recruited from the seven cantons of Switzerland (out of 26) where French is an official language. The mean age was 44.8 years ($SD = 16.1$, range = 18–81 years). Of the participants, 174 (43.5%) identified as men, 220 (55%) as women, 3 as nonbinary, 1 as “gender fluid,” and 2 chose not to disclose their gender. Of the participants, 165 (41.3%) attended higher education and 235 (58.8%) did not.

The project was approved by the Ethics Committee of the Faculty of Arts and Philosophy at Ghent University (reference 2024–23), and all participants provided informed consent. They were compensated for their time with a point system from Bilendi (75 points) corresponding to the median time spent on the survey (15 minutes).

Design and materials

All materials, as well as a more detailed description of the pretest procedure, are available via the OSF project anonymized link.⁴ The experiment used a 2 (no cueing vs. cueing) $\times$ 4 (referential strategy: binary pronouns vs. nonbinary pronoun *iel* vs. nonbinary pronoun *al* vs. repetition of the name) between-subjects design. This design prevented readers from directly comparing traditional versus innovative referential strategies.

Text stimulus

The text stimulus was a newspaper article about someone who won a prize. The choice of a longer text was in line with Pozniak et al. (2024), who recommend using longer, more ecologically valid stimuli in

experimental research. The text did not contain any references to gender apart from the pronouns used (if any) and the cueing sentence (if any), and introduced the person by their name (Sasha Favre) and by their profession (photographer). The name and profession were chosen based on a pretest (see endnote 4), which showed that they were equally associated with women and men and could easily be associated with a nonbinary individual. The last name “Favre” was chosen because it is one of the most common surnames in French-speaking Switzerland and is not associated with non-French-speaking communities.

The text was created with the help of ChatGPT 4 (OpenAI, 2024; prompt: *Write a newspaper article in French about a photographer who just won a prize*) and was subsequently modified to avoid gendered stereotypes and all traces of grammatical gender when referring to the photographer. The final text was approximately 300 words long and contained five possible placeholders for the manipulated referential strategies referring to the photographer, all appearing in subject position.

A second pretest was conducted to ensure that the text did not contain information that had a gendered connotation. Eleven participants read the text, in which names and pronouns were simply replaced with “X,” and rated how gendered they thought the text was on a scale from 1 (fully agree) to 4 (fully disagree). In addition, we invited them to comment on the sentences they thought were gendered. Based on these responses, we made a few changes, and five subsequent participants all found the text to be ungendered.

We then prepared the 10 variants of the text, replacing the pronoun placeholders with gender-neutral pronouns (*iel* or *al*), binary pronouns (*il* or *elle*, which were analyzed together), or the name “Sasha Favre,” as well as adding or omitting the cueing sentence (see below). Note that, although there are 10 versions, the binary versions were analyzed as one condition, resulting in eight conditions in total.

Cueing

Cueing consisted of adding a short phrase at the beginning of the text to specify that the person described was nonbinary and used gender-neutral pronouns. The exact phrasing in French was “jeune photographe suisse *non-binaire utilisant des pronoms non-genrés*” [“young nonbinary Swiss photographer using nongendered pronouns”]. Since the cueing sentence did not specify the person’s preferred pronoun, the same cueing sentence could be added for all referential strategies.

Instruments

Word difficulty, sentence difficulty, and subjective comprehensibility were measured using three items each. Participants were asked to rate their agreement with statements such as “There were many words I did not know,” “Many sentences were very long,” and “I thought the text was comprehensible” on a five-point Likert scale (the full list of items is available in the OSF folder; see endnote 4). *Text appreciation* was assessed using five items for which the participants rated their level of agreement on a five-point Likert scale (e.g., “The text was monotonous,” “The text was pleasant to read”). *Perceived awkwardness* was assessed with a separate set of five 5-point Likert items focusing on the words used to refer to the photographer (e.g., “The words used in the article to refer to the Sasha Favre were well-chosen,” “The words [...] were irritating.”). All the items were based on existing scales (i.e., Bradley et al., 2019; Friedrich & Heise, 2019; Pöschko & Prieler, 2018) and were translated from Decock et al.’s (2024) materials.

In addition, participants were asked to answer four multiple-choice questions about the content of the article. Each question included one correct answer, two incorrect alternatives, and a “I don’t remember” option. Responses were coded as true for correct answers and false for all other responses. This type of measure, labeled *content question accuracy*, was also used by Pöschko and Prieler (2018) and Decock et al. (2024) and is intended as a proxy of basic text comprehension.

We also assessed participants’ attitudes toward gender-inclusive language, their familiarity with and attitudes toward gender-neutral pronouns in French and genderism (i.e., participants’ belief that gender is only binary). Participants with high genderism do not accept nonbinary gender. The scale

attitudes toward gender-inclusive language was based on Tibblin et al.'s (2023) eight-item questionnaire, which we modified slightly to include all gender identities, including nonbinary gender identities. *Familiarity* was evaluated through questions on participants' exposure and usage of gender-neutral pronouns. *Attitudes toward gender-neutral pronouns in French* was based on two items from Decock et al. (2024). The nine-item *genderism* scale was based on Decock et al. (2024), who adapted it from Van Ditzhuijzen and Motmans (2020).

All scales showed good internal consistency, with Cronbach's alpha scores that were higher than .70. Table 1 reports the Cronbach's alpha, means and standard deviations for all multi-item scales. Cronbach's alpha was not computed for content question accuracy because these questions were coded as a binary outcome (correct vs. incorrect) and refer to different passages of the text rather than to multiple indicators of a single latent construct. Instead, the proportion of correct responses (i.e., item difficulty) was computed for each content question and amounted to 85.0%, 85.0%, 67.5% and 77.5% for questions 1 to 4, respectively. In addition to incorrect response options, participants could select "I don't remember." These responses were treated as incorrect in the analyses. The percentages of "I don't remember" responses for the four content questions were 9.8%, 7.5%, 24.3%, and 14.3%, respectively.

Participants' profiles were completed with a few sociodemographic questions (*age, gender, education level, and first languages*). Finally, participants' familiarity with the topic of photography and with the name Sasha was assessed, to control for a possible bias in participants' evaluation of the text.

Procedure

At the start of the survey, which was built with Qualtrics, participants provided their informed consent after reading about the research purpose, which was framed as "the evaluation of text quality in professional written communication." Participants were assigned to one of the eight conditions via block randomization to achieve equal sample sizes.⁵ Additionally, participants assigned to the binary pronouns condition were randomly assigned a text with either masculine (*il*) or feminine (*elle*) pronouns. The participants did not have the option to go back to the previous pages when filling out the survey.

After reading the stimulus text, which was presented on a single page, participants were instructed to describe the individual depicted in the text.⁶ On the following pages, they answered the content questions about the text and evaluated the items about the comprehensibility and appreciation of the text on the next page. These items were presented together in a single matrix. Participants were asked to explain their evaluation of the newspaper article in a text box labeled "*Justifiez votre évaluation de l'article*" ["Justify your evaluation of the article"]. They then

Table 1. Cronbach's alpha scores, means, and standard deviations for all scales

Scale	Cronbach's α	<i>M</i>	<i>SD</i>
Word difficulty	.73	1.90	0.82
Sentence difficulty	.82	2.02	0.85
Subjective comprehensibility	.71	4.02	0.72
Text appreciation	.83	3.72	0.69
Content question accuracy	/	3.15	0.97
Attitudes toward gender-inclusive language	.86	2.71	0.86
Genderism	.87	2.85	0.87
Perceived awkwardness	.85	2.26	0.85

Note. All scales but *content question accuracy* are from 1 to 5 (1 = "I completely disagree with the statement", 5 = "I completely agree with the statement"). Higher scores indicate stronger endorsement of each construct, that is, greater perceived *word difficulty* and *sentence difficulty*, higher *subjective comprehensibility* of the text, greater *text appreciation*, higher accuracy on *content questions*, stronger support for gender-inclusive language (*attitudes*), stronger endorsement of gender-binary beliefs (*genderism*), and greater *perceived awkwardness* of the referential strategy. *Content question accuracy* scores are from 0 (no correct answer) to 4 (all correct answers).

evaluated the perceived awkwardness of the referential strategies and answered questions about their attitudes toward gender-inclusive language and genderism, each in separate matrices. Participants then reported their familiarity with and attitudes toward nonbinary gender identities and pronouns, followed by demographic information. The questionnaire concluded with manipulation checks, where participants answered a multiple-choice question indicating whether they remembered the referential strategy used in the text and the presence of the cueing sentence.

Data analysis

All statistical analyses were conducted using R (R Core Team, 2024). The following section provides the descriptive statistics on familiarity with and attitudes toward the use of gender-neutral pronouns in French to refer to nonbinary individuals as well as on genderism and attitudes toward gender-inclusive language. This allows us to evaluate the sample more effectively.

Next, we turn to the manipulation checks, which assessed the success of the experimental manipulations and the extent to which respondents were aware of and remembered the referential strategy used in the newspaper article. To confirm that participants had accurately remembered the referential strategy, we conducted an initial chi-square test of independence between the different conditions and their expected values.

We replicated the inferential statistical analysis by Decock et al. (2024) by running univariate one-way analyses of covariance to test the main effects of referential strategy on text comprehensibility and text appreciation. The dependent variables were word difficulty, sentence difficulty, subjective comprehensibility, text appreciation, and content question accuracy. The following variables were included as covariates: genderism (average of nine items), attitudes toward gender-inclusive language⁷ (average of eight items), age, education (two levels: has attended higher education or not), gender (two levels: identifies as a man and does not identify as a man), and familiarity (two levels: knows at least one gender-neutral pronoun or not). The manipulated variables referential strategy and cueing and their interaction were included in the models as predictors.⁸ Analyses were conducted with the *lm* function of the *stats* package. For content question accuracy, the dependent variable was the total number of correct answers. For all other measures, the dependent variables were participant-level scale means.⁹ Analyses of deviance were performed using the *Anova* function from the *car* package (Fox & Weisberg, 2019).

Two sets of planned comparisons using Dunnett contrasts were conducted with the function *emmeans* from the *emmeans* package (Lenth, 2025). In each set, three experimental conditions were compared against a single reference condition, with the Dunnett contrast family adjusted accordingly. The first set used the binary pronoun condition as the reference (H1a-H1e, confirmatory). The second set used the name repetition condition as the reference (H1f, exploratory). No additional alpha adjustment was applied beyond the Dunnett correction. Comparisons between *iel* and *al* (H2) were conducted using *emmeans* with the *pairwise* contrast family with no multiplicity adjustment as this comparison was specified a priori. A sensitivity analysis was conducted with the software G*Power (Faul et al., 2007) using the test linear multiple regression: fixed model, R² increase. Given the sample size of 400, $\alpha = .05$, and 13 predictors (6 representing referential strategy and its interaction with cueing), the study had 80% power to detect a main effect of referential strategy (three tested predictors) of $f^2 = 0.028$ ($\Delta R^2 \approx 2.7\%$) and to detect a pairwise comparison (one tested predictor) of $f^2 = 0.019$ ($\Delta R^2 \approx 1.9\%$).

We tested the potential mediating role of perceived awkwardness (H3) as well as its moderation by cueing (H4; see Figure 1) using the *mediation* package (Tingley et al., 2014).¹⁰ Cueing was added as a moderator in the mediation model. Although the analytical model reflects a distinction between referential strategy level evaluation (perceived awkwardness) and global text level evaluations (comprehensibility and appreciation), both variables were assessed via self-report in a cross-sectional design. Consequentially, the analysis does not permit strong causal claims about mediating processes (Maxwell et al., 2011). We therefore frame the results in terms of association rather than causality in Results, below.

Finally, to enhance our understanding of the results, we conducted two additional exploratory analyses. First, we examined whether genderism and attitudes toward inclusive language moderated the effects of referential strategy and cueing on perceived text quality. To this end, we extended our initial model by considering these two variables as moderators, resulting in two separate models including three-way interactions with referential strategy and cueing. Second, we examined the comments that participants provided in the comment fields. Although the question asking to explain their evaluation of the text was compulsory, 27 participants avoided replying by saying so (e.g., “*Aucune justification*” [“No justification”]) or by filling the box with spaces or nonsense characters. The remaining 373 comments were categorized by the first author through a manual sentiment analysis into positive comments (e.g., “*très bien*” [“very good”]), negative comments (e.g., “*article compliqué, pas assez concis*” [“complicated article, not concise enough”]), and neutral comments (either mixed feelings, e.g., “*Article long mais pas désagréable à lire*” [“Long article but not unpleasant to read”] or neutral feelings, e.g., “*texte ‘normal’*” [“‘normal’ text”]). While this categorization was subjective, it provides a useful indication of overall trends in sentiment. The comments were additionally categorized according to whether they made a reference to the referential strategy, or gender in general, for example, comments including “*novlangue*” [“newspeak”], “*non-binaire*” [“nonbinary”], “*pronoms*” [“pronouns”], “*répétitions du nom*” [“name repetition”]. Ten percent of the comments were double-coded by a coauthor. Intercode agreement for valence was assessed using weighted Cohen’s kappa resulting in $\kappa = .77$ (CI = [.59-.94], percent agreement was 82.5%), which is considered acceptable for exploratory analyses (Lombard et al., 2002). Complete agreement was reached on the coding of mentions of the referential strategy or gender. All comments are reported in this article with their original spelling, followed by an English translation.

Results

Description of the sample

Regarding participants’ familiarity with gender-neutral pronouns, 285 participants (71.3%) knew *iel*, 23 (5.8%) knew *al*, and 112 (28%) knew neither. Of those familiar with at least one gender-neutral pronoun (288, 72%), 34 (11.8%) had used them, 136 (47.2%) had heard them used by others, and 117 (40.6%) had heard of them.

Participants had relatively negative attitudes toward having a gender-neutral pronoun in French to refer to nonbinary individuals ($M = 2.5$, $SD = 1.2$; scale from 1 = fully disagree to 5 = fully agree). Participants with neutral to positive attitudes (184, 46%) preferred *iel* ($M = 3.5$, $SD = 1.0$) as a gender-neutral pronoun for nonbinary individuals over the lesser-known *al* ($M = 2.7$, $SD = 1.0$). Interestingly, even among those who believed there was no need for gender-neutral pronouns in French, *iel* was rated as a more favorable option ($M = 2.1$, $SD = 1.2$) than *al* ($M = 1.7$, $SD = 1.0$).

Participants exhibited neutral levels of genderism ($M = 2.9$, $SD = 0.9$; scale ranging from 1 = fully disagree to 5 = fully agree), that is, they were neither fully accepting (low genderism) nor fully rejecting the existence of gender beyond the traditional male-female binary (high genderism). They also held neutral to negative attitudes toward gender-inclusive language ($M = 2.7$, $SD = 0.9$; scale ranging from 1 = fully disagree to 5 = fully agree). Table 2 provides the breakdown of familiarity, usage, and attitudes toward gender-neutral pronouns, genderism, and attitudes toward gender-inclusive language within the French-speaking Swiss population, categorized by gender, age, and education.

Manipulation checks

Participants in the binary condition mostly failed to remember the referential strategy assigned to them (only 30% success). Those in the name repetition condition remembered better (56%), while those in the gender-neutral pronoun condition remembered best (*al*: 72%, *iel*: 88%). The gender-

Table 2. Familiarity, usage, and attitudes toward gender-neutral pronouns, genderism, and attitudes toward gender-inclusive language in the Swiss population by gender, age, and education

Variable	Familiar with at least one pronoun	Used a gender-neutral pronoun	Attitudes toward having a gender-neutral pronoun in French ^a	Genderism ^a	Attitudes toward gender-inclusive language ^a
	<i>n</i> (%)	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Gender					
Men (<i>n</i> = 174)	114 (66)	13 (7)	2.21 (1.15)	3.07 (0.84)	2.54 (0.83)
Women (<i>n</i> = 220)	168 (76)	18 (8)	2.7 (1.16)	2.68 (0.84)	2.82 (0.85)
Other genders (<i>n</i> = 6)	6 (100)	3 (50)	3.3 (1.51)	2.35 (1.36)	3.4 (1.15)
Age					
Younger [18–43] (<i>n</i> = 203)	172 (85)	21 (10)	2.53 (1.24)	2.89 (0.93)	2.75 (0.90)
Older [44–81] (<i>n</i> = 197)	116 (59)	13 (7)	2.45 (1.13)	2.81 (0.81)	2.67 (0.81)
Education					
Higher education (<i>n</i> = 165)	126 (76)	19 (12)	2.49 (1.26)	2.82 (0.93)	2.73 (0.93)
Lower education (<i>n</i> = 235)	162 (69)	15 (6)	2.50 (1.13)	2.87 (0.82)	2.69 (0.81)

^aOn a scale from 1 to 5.

neutral pronouns thus seem to be much more salient than the other strategies. Participants remembered better when they had read the sentence indicating that the photographer was nonbinary and used gender-neutral pronouns than when they were assigned to the no-cueing condition (54.5% and 44.5%, respectively). The two chi-square tests of the manipulation checks confirmed that these differences in percentages were significant (χ^2 (12) = 544.76, $p < .001$ and χ^2 (2) = 64.54, $p < .001$ for referential strategy and cueing, respectively).

Effects of referential strategy

Before running the analysis, we checked for collinearity among the variables in the models. The variance inflation factors from the *car* package (Fox & Weisberg, 2019) ranged from 1.02 to 1.51, indicating that multicollinearity was not a concern in our models. Table 3 shows the results of the Type III ANOVA. The estimated means and standard errors of the measures for each dependent variable are presented in Figure 2.

Table 3. Results of ANOVA for text comprehensibility, text appreciation and content question accuracy

Variable		Text comprehensibility								Content question accuracy	
		Word difficulty			Sentence difficulty		Subjective comprehensibility				
		df	SS	p	SS	p	SS	p	SS	p	SS
Referential strategy	3	1.99	.38	8.58	.01	5.75	.01	7.14	.001	7.68	0.04
Cueing	1	0.61	.33	0.00	.95	0.52	.30	0.51	.28	2.65	0.08
Genderism	1	11.82	<.001	9.45	<.001	6.49	<.001	2.71	.01	4.73	0.02
Attitudes toward gender-inclusive language	1	1.73	.10	1.06	.21	0.00	.95	0.64	.22	6.37	0.01
Age	1	0.75	.28	0.77	.29	1.26	.10	3.04	.01	0.91	0.31
Education	1	1.74	.10	0.20	.59	0.71	.22	0.01	.86	0.01	0.92
Gender	1	0.00	.98	0.34	.48	0.90	.17	1.31	.08	6.76	0.01
Familiarity	1	2.48	.05	0.75	.29	1.14	.12	0.20	.50	0.05	0.81
Interaction cueing × referential strategy	3	0.36	0.91	0.35	0.92	0.8	0.64	0.99	0.52	2.00	0.52

Note: Bold values indicate $p < .05$. *SS* = sum of squares.

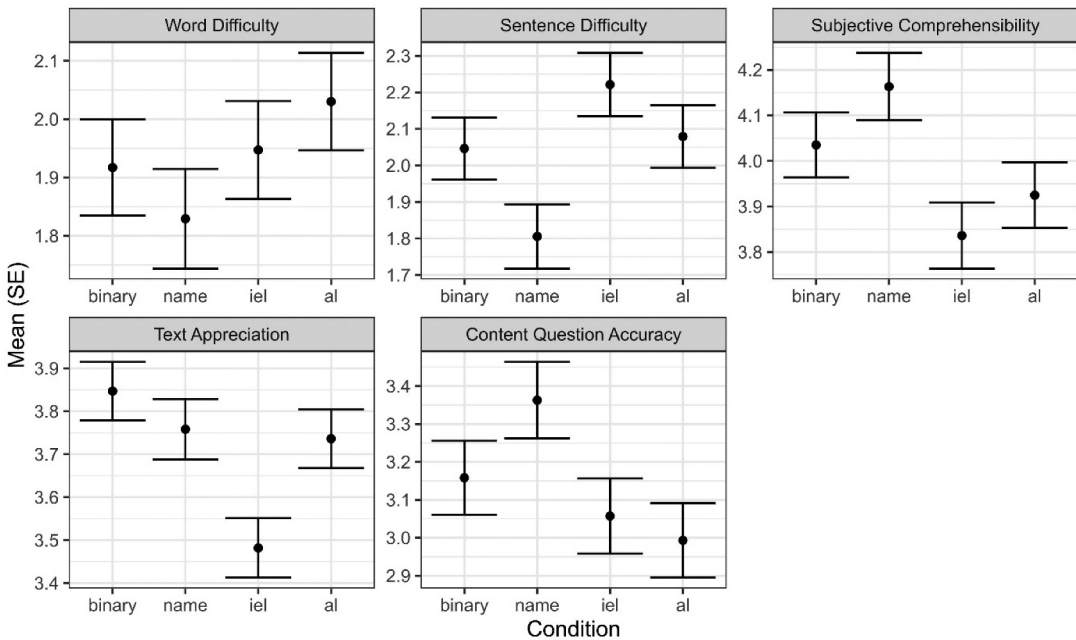


Figure 2. Estimated means and standard errors of referential strategy on the five dependent variables.

Omnibus analyses revealed small effect sizes of referential strategy across outcomes (partial η^2 is .01 for word difficulty, .03 for sentence difficulty and subjective comprehensibility, .04 for text appreciation, and .02 for content question accuracy) with statistically significant overall effects of referential strategies on sentence difficulty, subjective comprehensibility, text appreciation, and content question accuracy. While these findings suggest interesting systematic differences between referential strategies, the small magnitude of the effects and the standard errors associated with the estimated means indicate uncertainty regarding the precise size of these small effects. Consequently, the findings should be interpreted with caution with respect to their practical significance in the Swiss French context.

To test the directional hypotheses H1a to H1e, planned Dunnett contrasts using binary pronouns as the reference, indicated that only texts containing *iel* were significantly less appreciated ($B = -0.37$, $SE = 0.09$, $p < .001$). In the separate exploratory analysis using name repetition as the reference (H1f), Dunnett contrasts showed that texts with name repetition were associated with lower sentence difficulty ($B = -0.41$, $SE = 0.12$, $p = .002$), higher subjective comprehensibility ($B = 0.33$, $SE = 0.10$, $p = .003$), and higher appreciation ($B = 0.28$, $SE = 0.09$, $p = .01$) compared to texts containing *iel* and higher subjective comprehensibility ($B = 0.24$, $SE = 0.10$, $p = .05$) compared to texts containing *al*. These exploratory analyses also showed that participants who read the text with *al* performed worse on the content questions than those who read the text with name repetition ($B = -0.36$, $SE = 0.14$, $p = .02$).

Hypothesis H1, which predicted that binary pronouns would receive higher ratings for comprehensibility and appreciation than gender-neutral pronouns, was only partially confirmed. Hypothesis H2, which predicted that *iel* and *al* would differ in their ratings of comprehensibility and appreciation, was only partially confirmed. *Iel* was found to be significantly less appreciated than *al* ($B = -0.25$, $SE = 0.09$, $p = .007$). There were no other significant differences between the two gender-neutral pronouns on word difficulty, sentence difficulty, subjective comprehensibility, and content question accuracy.

Mediation analysis of perceived awkwardness

Based on the results of the Dunnett tests, we focused on the referential strategy contrasts that proved significant for sentence difficulty, subjective comprehensibility, text appreciation, and content question accuracy, that is, *iel*-name for sentence difficulty; *iel*-name and *al*-name for subjective comprehensibility; *iel*-name, *iel*-binary, and *iel*-*al* for text appreciation; and *al*-name for content question accuracy. The control variables were the same as those used in the regression models: participants' genderism, age, education, gender, and familiarity with gender-neutral pronouns. Perceived awkwardness was included as mediator. The results are summarized in Table 4.

The results showed an indirect effect of referential strategy via perceived awkwardness that was associated with all the significant effects from the ANOVA. Perceived awkwardness thus partly accounted for the link between referential strategy and sentence difficulty (*iel*-name proportion mediated = 35.6%, $p < .001$), subjective comprehensibility (*iel*-name: 48.6%, $p = .002$, *al*-name: 34.3%, $p = .06$), text appreciation (*iel*-name: 69.6%, $p = .005$, *iel*-binary: 45.8%, $p < .001$, *iel*-*al*: 36.4%, $p = .08$), and content question accuracy (*al*-name: 13.0%, $p = .05$), as expected by H3. Note that part of the link between referential strategy and sentence difficulty, subjective comprehensibility, text appreciation, and content question accuracy was still direct. Overall, however, *iel* was considered more awkward than name repetition ($B = 0.45$, $SE = 0.11$, $p < .001$) or binary pronouns ($B = 0.39$, $SE = 0.11$, $p < .001$), resulting in lower ratings for sentence difficulty, subjective comprehensibility, and text appreciation, and *al* was considered more awkward than the name repetition ($B = 0.23$, $SE = 0.11$, $p = .04$) resulting in lower content question accuracy.

Moderated mediation analysis

We found that the referential strategy was evaluated as significantly more awkward ($B = 0.24$, $SE = 0.08$, $p = .002$) in the presence of the cueing sentence than in its absence. However, cueing did not significantly moderate the association between referential strategy and perceived awkwardness (partial $\eta^2 = 0.003$, $p = .77$) and no significant effects of cueing were observed for the comprehensibility and appreciation scales (Table 3). Accordingly, H4, which predicted that cueing would moderate the mediation effect, was not supported.

Exploratory analysis of genderism and attitudes toward inclusive language as moderators

Given the exploratory nature of these analyses, we focus on general tendencies based on ANOVA p -values and linear predictions of the statistically significant interactions provided on OSF (see endnote 4). First, we observed a significant interaction between referential strategy and genderism for word difficulty ($p = .05$), subjective comprehensibility ($p = .03$), and text appreciation ($p = .006$). Specifically, higher levels of genderism were associated with increased perceived word difficulty and decreased subjective comprehensibility and text appreciation when *iel* was used, whereas this effect was attenuated or no longer present when other strategies were used. Although not reaching

Table 4. Results of the mediation analysis

Variable	Pair	Direct effect				Indirect effect			
		Estimate	LLCI	ULCI	p	Estimate	LLCI	ULCI	p
Sentence difficulty	<i>iel</i> -name	−0.27	−0.50	−0.03	.03	−0.15	−0.24	−0.07	<.001
Subjective comprehensibility	<i>iel</i> -name	0.17	−0.02	0.36	.10	0.16	0.08	0.25	<.001
	<i>al</i> -name	0.16	−0.03	0.34	.10	0.08	0.00	0.17	.05
Text appreciation	<i>iel</i> -name	0.08	−0.08	0.25	.31	0.19	0.10	0.29	<.001
	<i>iel</i> -binary	0.20	0.04	0.35	.01	0.17	0.07	0.27	<.001
	<i>iel</i> - <i>al</i>	0.16	−0.01	0.32	.06	0.09	−0.01	0.20	.07
Content question accuracy	<i>al</i> -name	0.32	0.04	0.59	.03	0.05	0.00	0.11	.04

LLCI, 95% lower level confidence interval; ULCI, 95% upper level confidence interval.

conventional levels of statistical significance, similar patterns emerged for sentence difficulty ($p = .09$) and content question accuracy ($p = .07$). In addition, the interaction between cueing and genderism was significant for text appreciation ($p = .04$). Specifically, higher levels of genderism were associated with lower text appreciation in the presence of cueing, whereas this negative effect was reduced when cueing was absent. Finally, we found no evidence of an interaction effect between attitudes toward inclusive language and referential strategy.

Exploratory analysis of comments

To further contextualize the findings, we analyzed the open comments that participants provided on their evaluations. Overall, the analysis showed that the vast majority of comments expressed a positive sentiment regarding both the comprehensibility and appreciation of the text, with no mention of gender or pronouns (e.g., “easy to understand, well written”). Table 5 provides details on the categorization.

Focusing on the negative comments, some participants evaluated the text as too complex, although they did not explicitly mention the pronouns (e.g., “*certain terme technique devrait être expliquer*” [“some technical terms should be explained”]). Across all conditions, 47 comments were categorized as negative, of which 16 specifically invoked the referential strategy or gender. These comments were analyzed in detail in Vincent (unpublished data).

Although the cueing sentence did not have a significant effect on the evaluation of the text, qualitative patterns suggest that participants were more likely to explicitly identify gender-neutral pronouns as the basis for their critique when the cueing sentence was present. Texts containing gender-neutral pronouns elicited a comparable number of negative comments when the cueing sentence was present (14) and absent (17), suggesting similar levels of negativity overall. However, the presence of the cueing sentence was associated with a shift in attribution: when cueing was present, a greater proportion of negative comments explicitly referenced gender and/or pronouns (nine comments; 64%) than when it was absent (five comments; 29%). Examples include remarks such as “*c’est insupportable à lire ce langage non genre*” [“It’s unbearable to read this gender-neutral language”], “*trop de nov langue*” [“too much newspeak”], and “*trop progressiste*” [“too progressive”]. This pattern may reflect increased topical salience of gender identity introduced by the cueing sentence rather than a change in the intensity of participants’ reactions. It remains unclear whether the effect comes from the salience of gender identity more generally or from specific terms used in the cueing sentence, such as “*non-binaire*” [“nonbinary”], which might be more irritating to some participants.

Some participants mentioned that they did not know the pronoun and even asked whether it was a mistake: “*je n’ai pas compris ceci ‘iel’ faute d’orthographe ?*” [“I didn’t understand this ‘iel’ spelling mistake?”]. Especially the pronoun *iel* seemed to have caused some comprehensibility problems, as some participants did not understand it as a pronoun when cueing was not present (e.g., “*Un mot ‘Al’ est apparu et n’avait pas de sens explicite*” [“A word ‘Al’ appeared and had no explicit meaning”]). Some other participants understood its function as a pronoun but did not realize it was a neopronoun when cueing was not present, for example, “*on aurait dit qu’il y avait une faute de frappe: tous les IL*

Table 5. Number of comments for each referential strategy categorized by sentiment

Cueing	Positive (n = 262)		Neutral (n = 56)		Negative (n = 47)		Avoid comment (n = 27)	
	Yes	No	Yes	No	Yes	No	Yes	No
<i>Iel</i>	28 (1)	22 (1)	10 (3)	16 (4)	9 (6)	9 (2)	3	3
<i>Al</i>	36 (1)	34 (0)	6 (2)	6 (3)	5 (3)	8 (3)	3	2
Binary pronouns	36 (1)	34 (0)	5 (1)	11 (0)	2 (0)	3 (0)	7	2
Name repetition	37 (0)	35(1)	6 (0)	4 (0)	6 (2)	5 (0)	1	6

Note. Number of participants = 400 (50 for each condition referential strategy $\times$ cueing). The numbers in parentheses indicate how many comments mention gender and/or referential strategy.

étaient écrits AL” [“it looked like there was a typo: all the ILs were written AL”], *“Le seul point qui m’a troublé est le remplacement du pronom elle par un article inconnu.”* [“The only thing that confused me was the replacement of the pronoun *elle* by an unknown article”].

Discussion

This study aimed to understand how gender-neutral pronouns affect text comprehensibility and text appreciation in French. We expected that in comparison to binary pronouns, gender-neutral pronouns would negatively affect the comprehensibility and appreciation of a newspaper article in French (H1). This hypothesis was partially confirmed. Specifically, *iel* received lower scores than binary pronouns on text appreciation. *Iel* also received lower scores than name repetition on sentence difficulty, subjective comprehensibility, and text appreciation, and *al* received lower scores than name repetition on subjective comprehensibility. When considering content question accuracy, the only difference was between the neopronoun *al* and name repetition, the former showing lower accuracy scores. These results suggest that actual comprehension of a text, as measured by content question accuracy, is not significantly affected by the pronoun *iel*. Although the hypothesis is partially confirmed, the effect sizes were small. Consequently, replication is important to assess the robustness of these effects, even though sensitivity analyses indicated that the present study had adequate power to detect effects of this magnitude. Moreover, such subtle differences may have limited impact in everyday language use, which cautions against strong claims regarding their practical significance. Finally, the exploratory moderation analysis involving genderism further supports the need for caution in interpreting these findings. Specifically, the effect of referential strategy on text evaluations was stronger among participants with higher levels of genderism, with *iel* being evaluated more negatively in this group. This suggests that negative evaluations of gender-neutral pronouns may, at least in part, be driven by genderist beliefs.

Regarding our second hypothesis (H2), we found that *iel* was significantly less appreciated than *al*, but we found no other (significant) difference between *iel* and *al* on both comprehensibility and content question accuracy. Surprisingly, *iel* globally seemed to have lower comprehensibility and appreciation scores than *al*, while at the same time being associated with fewer negative attitudes than *al*, although still not positive overall. Several elements help to better understand why *iel* and *al* differed in their effects. Specifically, *iel* had lower scores than *al* on text appreciation. Moreover *iel* had higher scores on sentence difficulty (compared to name repetition), whereas *al* had lower scores on content question accuracy (compared to name repetition). The analysis of participants’ comments showed that in the absence of cueing, some participants misread *al* as a binary pronoun or thought it was a typo, which potentially distracted them. This could explain the lower content question accuracy when *al* was used. The manipulation checks showed that participants remembered both pronouns well, but this may have been for different reasons: Some participants remembered *al* well because it stood out as a spelling mistake, whereas *iel* was truly remembered as a nonbinary pronoun. This aligns with the finding that participants were more familiar with *iel* (71,3%) than *al* (only 5.8%) as gender-neutral pronouns and that they found *iel* more awkward than the other strategies. Taken together, these findings, along with the results of the exploratory analysis of genderism as a moderator, suggest that prior knowledge of *iel* and its nonbinary reference may have negatively affected participants’ subjective evaluations. In other words, participants may have already formed an opinion about the use of *iel* before participating in the survey, leading them to evaluate the text negatively. By contrast, even if *al* was rejected more strongly as an acceptable pronoun, its unfamiliarity did not influence participants’ subjective evaluations of the text to the same extent and only affected content question accuracy.

Moreover, following Decock et al. (2024), we expected that the perceived awkwardness of the referential strategy would be associated with both the referential strategy and subsequent evaluations of text comprehensibility and appreciation, such that awkwardness may statistically account for part of this relationship (H3). Our findings revealed that differences in perceived awkwardness were associated with differences in sentence difficulty, subjective

comprehensibility, text appreciation, and content question accuracy between referential strategies. Hypothesis H3 was therefore confirmed. These findings are consistent with the interpretation that perceiving the referential strategy in a text as awkward could explain, or at least be associated with, lower comprehensibility and appreciation.

Finally, we expected cueing to moderate the mediation effect, in that cueing would have a positive effect on the perceived awkwardness of gender-neutral pronouns and, in turn, on text comprehensibility and appreciation, by providing an explanation for the use of these pronouns (H4). However, we found no interaction effect of cueing with the referential strategy on any of the outcome variables. Hypothesis H4 was therefore not supported. The exploratory analysis of the comments may help explain why this was the case. It suggests that the cueing sentence increased the likelihood that participants explicitly attributed their negative reactions to the photographer's gender-neutral pronouns and references to nonbinary identity. Additionally, the moderation analysis showed that cueing had a significant negative impact on perceived awkwardness. This suggests that a potential positive effect of cueing, as we hypothesized, may have been counterbalanced by the simultaneous perceived awkwardness effect that cueing provoked. In other words, negative reactions to gender-neutral pronouns appear to be linked to participants' responses to the framing of gender as nonbinary rather than to linguistic comprehensibility alone.

In conclusion, *iel* is gaining traction in both usage and recognition, and it does not appear to significantly hinder comprehension, as measured by content question accuracy. The resistance it faces may therefore not stem from reading difficulties but from attitudinal factors related to lack of openness toward the concept of nonbinary gender. Future research could integrate measures that complement genderism, such as openness toward nonbinary gender (e.g., Molin et al., 2021), and focus on ways to improve such openness. Any gender-neutral pronoun other than *iel* might be similarly evaluated negatively once it reaches a broader audience because it would likely be found irritating, ultimately because the issue probably lies with the concept of nonbinarity itself. Similarly, a less familiar pronoun, such as *al*, may slightly reduce readability, yet its impact may remain minimal. Still, overall, our findings highlight the absence of objective barriers to respecting and using individuals' chosen pronouns—even those that are not yet widely familiar—and underscore the potential for fostering greater inclusivity in public and media discourse. Encouragingly, previous research on languages other than French suggests that attitudes toward nonbinary pronouns can improve over time, which may also be the case for French.

Decock et al. (2024) reported similar levels of genderism and attitudes toward gender-neutral pronouns in their Flemish-Dutch sample as in the present study. Although French *iel* received higher familiarity ratings than Dutch *hen* or *die*, these ratings were consistent with those reported by Hekanaho (2020, p. 106), who found that 71% of her study participants were familiar with English neopronouns. However, most of our results differed from those of Decock et al. (2024). In Dutch, no significant difference was observed between gender-neutral and binary pronouns in terms of text comprehensibility. Similar results were found for singular *they* in English and *hen* in Swedish (Speyer & Schlee, 2019; Vergoossen, Pärnamets et al., 2020). In contrast, French *iel* impacted both text comprehensibility and text appreciation. This could be due to the rather complex grammatical gender agreement rules in French. Languages with rigid grammatical gender agreement systems, such as French, are likely to face greater challenges when adopting gender-neutral pronouns than languages with less extensive gender marking, such as English, Dutch, and Swedish (Jäggi et al., 2025). Although agreement was not specifically tested here, the mere existence of these agreement issues may negatively impact how these pronouns are perceived in texts. We also argue that openness to the concept of nonbinary gender, and the polarization of the discussions, may explain some of the results of the present study.

Further research

Several of our findings suggest that nonbinary gender identities are not widely accepted yet, as Molin et al. (2021) found for a similar sample. In our study, we did not initially include genderism and openness toward

nonbinary gender as predictors or as moderators, since we were mainly focused on the conceptual replication of Decock et al. (2024). However, as the exploratory analysis showed, both merit further investigation to better understand how these concepts impact the effect of referential strategy and cueing on perceived text quality. Additionally, it may be worthwhile to explore whether the overall effect of cueing is neutralized by competing cognitive mechanisms. For example, the irritation it may provoke might outweigh the clarity it offers. One possible approach could involve using participants' responses to a supplementary question, such as "Do you understand why *iel/al* is used in the text?" as a mediator in the analysis. Another potential explanation for the absence of an effect of cueing on text quality could lie in the phrasing of the cueing sentence, as it did not specify the actual preferred pronoun. A more specific cueing phrase, such as "XY utilise le pronom (non-genré/non-binaire) *iel*" ["XY is using the [gender-neutral/nonbinary] pronoun *iel*"] might better guide readers than the more general phrase we included: "utilisant des pronoms non-genrés" ["who uses gender-neutral pronouns"]. Furthermore, since the negative evaluation of *iel* may derive from its status as a nonbinary pronoun, comparing the effects of the French gender-neutral pronouns in generic and specific contexts could offer valuable insights into their potential acceptability (cf., Bradley et al., 2019; Decock et al., 2025; Hekanaho, 2020; Renström et al., 2022). Finally, another promising research avenue involves exploring the mental representations, or mental models, associated with the gender-neutral pronouns, both in specific and generic reference, to assess whether these pronouns could help achieve better representations for all genders.

Several limitations of the present study should be acknowledged. First, although the dependent variables were measured using ordinal Likert-scale items, the main analyses were conducted on averaged scale scores using linear models, with the exception of the content question accuracy measure. This analytic choice was motivated by the high internal consistency of the scales, the need for consistency across analyses, particularly for the mediation analyses, and the limited availability of mediation tools for ordinal mixed-effects models. While averaging ordinal items may result in some loss of information and reduced statistical power compared to fully disaggregated ordinal models, supplementary analyses using cumulative link mixed models yielded similar results and are reported on OSF (see endnote 4). Second, the mediation analyses should be interpreted with caution. All measures were collected within a short time frame in a single experimental session, which limits the ability to draw strong causal inferences about mediation pathways, particularly with respect to temporal ordering (Maxwell et al., 2011). Although the analytical model distinguishes between evaluations targeting a specific textual feature (perceived awkwardness) and broader evaluations of the whole text (comprehensibility and appreciation), this distinction should be understood as a theoretically motivated and analytically useful framing rather than as evidence of a demonstrated causal sequence. Accordingly, the mediation results reflect structured associations rather than demonstrated causal mediation. Third, although the sample size was sufficient to detect small effects, effects smaller than the sensitivity threshold may have gone undetected or may be imprecisely estimated. Replication of the study, particularly beyond the Swiss French context, is therefore important to assess the robustness and practical relevance of the present findings. Finally, replications with different texts would be important to strengthen the generalizability of the present findings beyond a single stimulus text.

Still, in all, our study constitutes a first step toward understanding how French gender-neutral pronouns affect text comprehensibility and appreciation, and it encourages further cross-linguistic research on gender-inclusive language use, especially between languages that differ in how easily neopronouns can be implemented (considering, for example, agreement rules).

Notes

1. The preregistration can be consulted at the following link: https://osf.io/wqbk4/overview?view_only=01088288935e48cc9e6243c6e3bf8202.
2. There are as yet no codified options for the object forms of gender-neutral pronouns in French, and, contrary to the subject form *iel*, they are not discussed in the public debate. Therefore, nonsubject forms, such as *ellui* (*elle/ lui*), *lae* (*la/le*), or *celleux* (*celle/ceux*), were not tested in the current study.
3. https://fr.wikipedia.org/wiki/Wikip%C3%A9dia:Conventions_de_style_sur_la_transidentit%C3%A9#Pronoms_et_accords, consulted on December 20, 2024.

4. See materials on OSF: https://osf.io/cauyt/?view_only=4aaaf2dce72f40639e7233e2282c630d.
5. To evaluate the effectiveness of the randomization procedure, we examined the demographics of the eight experimental groups, including gender, educational level, and the means and variances of age. All p -values were greater than .20, except for gender ($p = .10$). Notably, each condition included at least 15 participants of each gender, ensuring balanced representation.
6. Compared to Decock et al. (2024), this is an additional task that was not included in their procedure. It consisted in asking the participants to describe the person they just read about in a few words or sentences, including physical characteristics, personality traits, hobbies, and so on. These qualitative data are used for an exploratory analysis of the mental gender representation of gender-neutral pronouns and will be analyzed in a subsequent article.
7. The attitudes toward gender-inclusive language covariate was not tested in Decock et al. (2024). The preregistration stated that we would conduct two analyses: one including attitudes and one without. Since incorporating attitudes significantly improved the content question accuracy model ($\chi^2(1) = 6.53$, $p = .007$) and did not substantially affect the models for the other scales, we present only the models that include attitudes here.
8. Cueing and its interaction with referential strategy were not included in the initial model, as stated in the preregistration (see endnote 1). However, given that cueing constitutes a central element of the experimental design and that its inclusion yielded a slight (albeit non-significant) improvement in model fit, we report the results of the full model.
9. Originally, to account for the type of data collected, the *glmer* function of the *lme4* and *lmerTest* packages (Bates et al., 2015, 2023; Kuznetsova et al., 2017) was used for content question accuracy and the *clmm* function of the *ordinal* package (Christensen, 2023) was used for all other scales, with *item* and *participant* as random effects. Given the high Cronbach alpha, the approximation of the linear model was adopted to be able to perform a sensitivity analysis on the model, and to allow for consistency with the mediation analysis which was not available for ordinal models. The original analysis of the data with the ordinal models is available on OSF, see endnote 4, and does not show major differences in the results compared with the approximated linear models.
10. And not Hayes (2022) PROCESS as stated in the preregistration.

Disclosure statement

No potential conflict of interest was reported by the author(s).
ChatGPT 4 and DeepL Write have been used for language improvement.

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ORCID

Chloé B. Vincent  <http://orcid.org/0009-0004-6622-4303>
 Sarah Van Hoof  <http://orcid.org/0000-0001-6678-6059>
 Pascal M. Gyga  <http://orcid.org/0000-0003-4151-8255>
 Ute Gabriel  <http://orcid.org/0000-0001-6360-4969>
 Sofie Decock  <http://orcid.org/0000-0002-5147-9336>

Data availability statement

The study was preregistered in OSF at https://osf.io/wqbk4/overview?view_only=01088288935e48cc9e6243c6e3bf8202. The materials used in this study, the data supporting the results, and the scripts used for the analysis are available in the OSF files of the associated project https://osf.io/cauyt/?view_only=4aaaf2dce72f40639e7233e2282c630d.

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