

Dutch audience perceptions of human and machine-translated pronouns for non-binary referent in subtitles

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Abstract

The increased representation of non-binary characters in audiovisual media is socially crucial, yet non-binary language (e.g., pronouns) offers new challenges for translators. In Dutch, the acceptability of pronoun strategies for non-binary reference is debated and evolving. Machine translation (MT) is increasingly being used in audiovisual translation, yet its potential for translation in gender-sensitive contexts is understudied. In this paper, we compare three pronoun translation strategies (two human-produced, one MT) for rendering the English non-binary pronoun *they* into Dutch in an audiovisual context, using a fragment from the Netflix show *Sex Education*. We explore general acceptability of these strategies and compare this to audience perceptions after viewing subtitled fragments employing a specific strategy. The results support findings from earlier work on non-binary pronouns in Dutch and indicate that the MT-generated translations were perceived as the least suitable.

1 Introduction

Contemporary linguistic and social developments reflect a growing visibility and recognition of gender diversity, including non-binary and genderqueer identities. Large-scale surveys indicate that gender identities different from the male/female binary are increasingly prevalent, especially among younger generations, with on average 9% of adults (over 26 countries) identifying

as LGBT+¹, rising to 14% among Gen Z (Ipsos, 2025). Similar patterns are observed in Belgium (10%). According to an EU-wide survey, 20% of LGBT+ respondents identify as non-binary (for Fundamental Rights, 2024). These figures reflect a growing population for whom linguistic and cultural representation is important.

In parallel, LGBT+ visibility in media has expanded over the past years, driven by both audience demand and shifts in media production. Surveys show that 29% of respondents across 26 countries are in favor of more LGBT+ characters on TV, in films and in advertising (Ipsos, 2025). Beyond representation, such visibility has been associated with reduced prejudice and increased cultural exchange, particularly through globally distributed streaming content (Yuan et al., 2025). As a consequence, accurate and sensitive representation of genderqueer characters has become increasingly relevant, not only for visibility but also for viewer identification and social recognition.

This goal of sensitive gender representation is seemingly at odds with the increased use of automated subtitling and machine translation for audiovisual translation (AVT) (Karakanta, 2022), as gender bias is still an important bottleneck for MT systems (Savoldi et al., 2025). Despite growing attention to both LGBT+ representation and machine translation in AVT, the intersection of the two domains remains underexplored, especially in the Dutch context. The one study to explore MT gender bias for Dutch revealed that non-binary pronouns like *their* are often mistranslated by MT

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¹Including people who identify as lesbian, gay, homosexual, bisexual, pansexual, omnisexual, asexual, transgender, non-binary, gender nonconforming, gender-fluid, other than male or female.

systems (Hackenbuchner et al., 2025). To date, reception studies on non-binary pronouns in Dutch have been limited to newspaper articles (Decock et al., 2024; Vriesendorp, 2024) and literary texts (Vos and Nutters, 2022), and empirical research on audience perception in AVT in general remains scarce (Karakanta, 2022; Guerberofo-Arenas et al., 2024).

Accordingly, this study aims to investigate how non-binary pronouns in the Netflix series *Sex Education* (Laurie Nunn, 2019) are rendered in English-to-Dutch subtitles and what the impact is of human and machine-translated pronouns on viewer reception. To this end, this paper aims to answer the following main research questions:

- Which pronouns are seen as acceptable non-binary pronouns in Dutch? (**RQ1**)
- What is the impact of different non-binary pronoun translation strategies (human and MT) on audience perceptions of Dutch subtitles? (**RQ2 & RQ3**)

In the first analysis, we explore whether demographic variables have an impact on the perceived acceptability of pronoun strategies. In the second analysis, we focus on three aspects (comprehensibility, acceptability and overall quality) of the subtitles as a whole (RQ2), as well as the perceived suitability of each strategy for non-binary reference (RQ3).

Bias Statement We focus on the potential representational harm (Blodgett et al., 2020) caused by MT output in audiovisual translation. Specifically, we focus on the MT mistranslation of the English non-binary pronoun *they* into a plural pronoun in Dutch. This is a form of “linguistic erasure of non-binary and transgender identities who might choose the singular pronoun *they*” (Ghosh and Caliskan, 2023, p. 906), at a time when affirmation of gender-diversity is key, especially for audiovisual translation (Lardelli et al., 2025).

2 Related Research

2.1 Gender-inclusive audiovisual translation

GLAAD’s annual *Where We Are on TV* report documents 489 LGBT+ characters across U.S. television in 2024–2025 (GLAAD, 2024), marking a substantial increase from the 46 characters

recorded in the first edition (2006), with streaming platforms identified as the primary driver of this growth. The expansion of global streaming has fundamentally transformed audiovisual translation practices. Commercial streaming platforms distribute content simultaneously across multiple territories, which requires fast and large-scale localization workflows that increasingly rely on machine translation and automated subtitling systems (Karakanta, 2022). While these technologies improve efficiency, they also introduce risks for linguistic and sociocultural fidelity. This is particularly evident in the translation of genderqueer language, where target languages may present linguistic constraints or lack established conventions for gender-sensitive pronoun usage. Moreover, perception studies suggest that fully automated subtitles without human intervention can negatively affect viewer comprehension, engagement and perceived quality (Guerberofo-Arenas et al., 2024).

While singular *they* has been used in English since the 13th - 14th century as a gender-indefinite form, its more recent adoption as a marker of non-binary identity reflects evolving usage within queer communities (Konnolly and Cowper, 2020; Nabila et al., 2021). Researchers have argued that accurately representing the linguistic choices made by a character in another language is a form of social justice in translation, and that translators should be members of the queer community to portray such characters accurately in other languages (Attig, 2023). Translators have two main strategies to handle non-binarity: the use of Indirect Non-binary Language (INL), where gendered terms are avoided by using existing linguistic strategies (e.g., a specific word like *girl* can be replaced by the more general *child*, passives can be used to avoid gender marking), and Direct Non-binary Language (DNL), where innovative linguistic strategies and pronouns are used to make non-binary gender identities explicitly visible (López, 2022). While INL may be less controversial for mainstream audiences, it can obscure or erase non-binary identities, which runs against the goal of increasing the visibility of diverse identities (López, 2022). Research explored the representations of non-binary gender identities in audiovisual translation² and concluded that translation strategies are language-

²Both subtitles and dubbing were analyzed for *One Day at a Time*, *Sex Education*, *Heartbreak High*, and *Degrassi: Next Class*.

dependent and inconsistent. The analysis showed that non-binary representation in AVT often defaults to avoidance strategies or masculine generics, highlighting the “need for cross-linguistic collaboration and documentation of community-preferred terms” (Lardelli et al., 2025, p. 59).

These sociolinguistic complexities involved in gender-inclusive translation make it a particularly challenging task for machine translation (Lardelli and Gromann, 2025). The limited work on machine translation of non-binary and/or gender-neutral pronouns in general (not limited to AVT) shows that MT does not handle this task well. When translating the English pronoun *they/their* into languages with binary gendered pronouns, commercial MT systems were shown to mistranslate 35% of instances into binary masculine or feminine pronouns in French, German, Italian and Danish (Lauscher et al., 2023), and to mistranslate into plural and other grammatically inconsistent ways for Greek (Gkovedarou et al., 2025). Even when translating from English into Bengali, a language with gender-neutral pronouns, ChatGPT was shown to consistently mistranslate *they* into plural pronouns (Ghosh and Caliskan, 2023).

2.2 Gender-inclusive pronouns in Dutch

Dutch is a West Germanic language which originally had three grammatical genders (masculine/feminine/neuter), but is currently evolving to a common/neuter gender system. Research suggests that younger people are more likely to embrace this language change: there is evidence of an age effect in pronominal gender shift in Netherlandic Dutch (Doreleijers et al., 2025), and younger people are generally more aware of the existence of and the need of gender-neutral pronouns (Verhaegen et al., 2025). In contrast with English, where the pronoun *they* is now a familiar gender-inclusive pronoun, gender-neutral pronouns (for generic reference as well as for non-binary reference) are emerging in Dutch, but these are not formally standardized (Van Hoof and Decock, 2026). While Dutch as used in the Netherlands and in Flanders (Belgium) is largely mutually intelligible, regional variation exists in terminology related to gender identity (Audring, 2006; De Vos et al., 2021).

The gender-neutral pronouns currently most in use are *die/hen* (subject form), *die/hen* (non-subject form) and *diens/hun* (possessive form). These pronouns were not newly coined but al-

ready occurred naturally in the Dutch language as demonstrative or relative pronouns, or as the non-subject form of the plural pronoun *ze/zij*. Not all available pronouns for non-binary reference are equally accepted or used by Dutch-speaking people. Studies have shown regional variations as well as age and gender effects in terms of acceptability and ease of use (Doreleijers et al., 2025; De Vos et al., 2021). Most research to date suggests that people prefer to use the pronouns in the grammatical positions they already naturally occur in (e.g., *die* instead of *hen* in subject position), both for non-binary reference (Vriesendorp, 2024) and generic reference (Verhaegen et al., 2025). Although neither the combination *die/hen/hun* or *hen/hen/hun* when used to refer to a non-binary person was shown to impact text comprehensibility, *hen* in subject position was perceived as more awkward and led to a lower text appreciation, unless readers were made explicitly aware of the fact that the person was non-binary and used non-binary pronouns (Decock et al., 2024).

3 Methodology

This case study focuses on the pronouns used in reference to the non-binary character Cal in the Netflix show *Sex Education* and how these pronouns are translated to Dutch. The character appears in Seasons 3 and 4 and uses *they/them* pronouns in English. The series was selected for its inclusion of non-binary characters and the resulting frequent use of non-binary pronouns in naturalistic dialogue. Its popularity and critical recognition further motivated this choice, as the series’ wide distribution ensures the availability of professional subtitles, which enables comparison between human translations and machine-generated output.

3.1 Pronoun Identification

To determine the pronoun forms included in the audience perception study, we first identified the range of non-binary English *they* forms in the source material and their corresponding Dutch translations in Netflix subtitles and produced by an MT system. We focused on instances of non-binary *they* in subject, object/prepositional, possessive and reflexive positions across both seasons (see Figure 1 for the overall distribution). Subsequently, we annotated the translation strategies used by the Dutch human translators. For subject position *they* (N = 19), two strategies were identi-

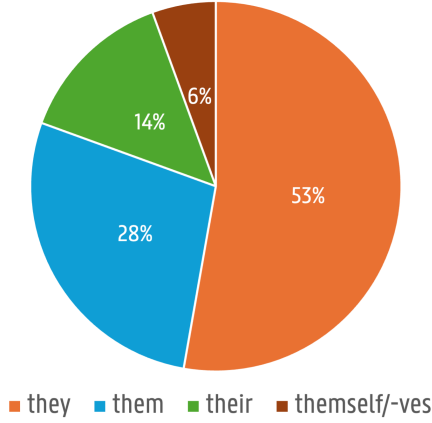


Figure 1: Distribution of English non-binary *they* forms in the source material across both seasons, distinguishing subject (*they*), object/prepositional (*them*), possessive (*their*) and reflexive (*themselves*) occurrences.

fied: *die* and *hen*. For object/prepositional *them* (N = 10), the predominant translation was *hen*, with *hun* occurring in two instances. The possessive form *their* (N = 5) was consistently translated as *hun* and the reflexive form *themselves* (N = 2) was rendered as *zichzelf*.

As a next step, the subtitles were translated using ModernMT Lite as integrated within Matecat³. Matecat was chosen over automatic subtitling tools (e.g., MateSub), as time coding and line segmentation were not central to our analysis and ASR-related issues were not within the scope of this study.

The results of the human translations (HT) of non-binary pronouns and their MT counterparts are presented in Table 1. The MT system predominantly translates the English non-binary pronouns *they*, *them* and *their* into plural forms in Dutch. This is reflected in the frequent rendering of subject (*they*) and object/prepositional (*them*) pronouns as the Dutch plural forms *ze* or *zij*, accompanied by plural verb forms. Of the ten object pronoun instances identified, three were translated as *hen*, which has been documented as a non-binary pronoun for Dutch, but is also the object form of the plural pronoun. Similarly, the possessive pronoun *their* was translated as *hun*, which - in Dutch - functions as the possessive form of the plural pronoun as well as a potential non-binary pronoun.

In sum, while the human translations of non-binary *they* predominantly (81%) result in Direct Non-binary Language (DNL), seven instances

	<i>they</i>	<i>them</i>	<i>their</i>	<i>themselves</i>	Strat.
NL - human translation					
<i>hen</i>	12	4	0	0	DNL
<i>hun</i>	0	4	3	0	
<i>die</i>	4	2	0	0	
<i>zich(zelf)</i>	0	0	0	2	INL
∅	3	0	2	0	
NL - machine translation					
<i>hen</i>	0	3	0	0	DNL
<i>hun</i>	0	0	4	0	
<i>die</i>	0	0	0	0	
<i>zich(zelf)</i>	0	0	0	2	INL
∅	0	1	0	0	
<i>ze (plural)</i>	19	6	1	0	MIS

Table 1: Distribution of Dutch renderings of English non-binary singular *they* in human and machine translations, categorized by translation strategy: direct non-binary language (DNL), indirect non-binary language (INL) and mistranslation (MIS).

(19%) can be classified as Indirect Non-binary Language (INL). This category includes the reflexive pronoun *zich(zelf)*, which can refer to both singular and plural antecedents, as well as cases of rephrasing and pronoun omission. Our qualitative analysis of the MT output shows that the system systematically renders non-binary *they* as a plural pronoun - even in object and possessive forms, which is not appropriate in this context.

3.2 Audience Perception Study

The present study is guided by research questions focused primarily on audience reactions to subtitles containing non-binary references, without participants being aware of the translation modality (human versus MT). For this audience perception study, a fragment of approximately 90 seconds (54:38-56:04) was selected from *Sex Education* season 4, episode 6, during which Nicky, mother of the non-binary character (Cal), calls a radio show to explicitly ask for advice on their relationship.

This specific fragment was chosen as it is relatively stand-alone (even someone unfamiliar with the show can understand what is going on) and it contains ten instances of the non-binary pronoun in English (six in the subject position, three in the object/prepositional position, and one reflexive pronoun), making it suitable to observe audience responses to specific pronoun strategies. The fragment does not contain any possessive pronouns, but given that these were found to always be translated as *hun* (cf. Section 3.1), regardless of the origin (HT versus MT), we do not believe this im-

³MT output generated in April, 2025

pacts the results.

We created three subtitled versions of this fragment with different pronoun translation strategies: two based on the different potential human translation strategies (*hen/hen/hun* and *die/hen/hun*) and one based on the machine translation output (*ze/hen/hun* as plural pronouns with plural verbs). All other text was kept constant across conditions.

An online survey was created and distributed via Qualtrics (Provo, UT). The survey consisted of three main sections: one to collect relevant background information on participants (age, gender, language background, queerness, familiarity with non-binary people, attitude towards non-binary people), a second containing the video fragment and questions related to the subtitles (participants were randomly assigned one of the three subtitle versions and were asked to judge the overall comprehensibility and quality of the subtitles as well as the appropriateness and clarity of the specific pronoun strategy used to refer to the non-binary character), and a third to collect information on participants' overall familiarity with and attitude towards the different non-binary pronoun strategies for Dutch, as well as their attitude towards gender-inclusive language in general. The survey design was inspired by previous work on Dutch (Decock et al., 2024), with minor adjustments based on the specifics of the present study - see Appendix A for the relevant questions.

Participants were reached via convenience sampling: the survey was shared with the professional and personal network of the authors via social media channels (LinkedIn, BlueSky, Instagram, Facebook and WhatsApp). The survey ran from the 8th until the 16th of May, 2025.

4 Analysis

4.1 Participants and demographics

The survey received 124 individual responses, which were manually reviewed before inclusion in the experimental corpus. After filtering (i.e., removing incomplete submissions and responses with incorrect answers to the sanity check question), 77 responses were retained for further analysis. We mostly reached younger people: 28 participants were aged 18–24, 26 were aged 25–35, and 23 were aged 36 and above. Within the latter group, two participants were aged 36–45, nine were aged 46–55, ten were aged 56–65 and two were aged 65+.

Women were more strongly represented ($N = 46$) than other gender groups (23 men, six 'other', and two who preferred not to disclose their gender). Most participants (87%), regardless of gender or age group, were familiar with non-binary people, either through personal connections or media exposure. The majority were also aware of the existing Dutch pronoun strategies for gender-inclusive language: only five participants indicated that they did not know any such pronouns, while 61 were familiar with *die*, 60 with *hen*, and 22 with *ze*. In total, 27 participants identified as queer and two indicated that they were unsure. Queer participants in the sample were mostly younger (24 were aged 18–35) and were less likely to identify as male. Specifically, 18 queer participants identified as women, two as men, and seven as non-binary or preferred not to disclose their gender.

4.2 Acceptability of non-binary pronouns for Dutch (RQ1)

To address the first research question (*which pronouns are seen as acceptable non-binary pronouns in Dutch?*), two types of analyses were conducted. First, a Friedman test was used to assess the overall differences in ranking of *die*, *hen* and *zij*. Second, three Wilcoxon signed-rank tests were performed to examine pairwise differences between the pronouns. To investigate whether acceptability scores were influenced by additional factors, we subsequently built a series of linear mixed-effects models using the `lme4` (Bates et al., 2015) and `lmerTest` (Kuznetsova et al., 2017) packages in RStudio (R Core Team, 2024). In all models, acceptability score was included as the dependent variable, with participant ID specified as a random intercept. The main fixed effect was *strategy* (*die*, *hen*, *zij*). We then fitted separate models that each included one additional predictor (age, gender, queerness, familiarity with non-binary people, attitude towards non-binary people, and attitude towards gender-fair language), with and without an interaction effect, using the `anova()` function to compare nested models via likelihood ratio tests.

4.3 Audience perception (RQ2-3)

For the analyses addressing RQ2 and RQ3, which focus on audience responses to the subtitled fragment, additional corpus quality checks were performed. Responses were excluded if participants had indicated that they had not read the subtitles or if they had been unable to recall the English

and Dutch pronoun strategies used in the fragment they viewed. Of the 60 participants who correctly remembered the English strategy, only 46 also accurately recalled the Dutch pronoun strategy; only these responses were retained for further analysis. Of the 24 participants who viewed the *hen* subtitles, 23 correctly remembered this strategy, compared to 13 out of 19 for *die*, and 10 out of 17 for *ze*.

The analysis covers questions in which respondents evaluated (i) the overall quality of the subtitles in the fragment they viewed (RQ2) and (ii) the suitability of the translation of non-binary *they* (and its variants) in the subtitles (RQ3). These measures are hereafter referred to as *subtitle quality* and *translation strategy score*, respectively.

To enable statistical analysis and generalization of the responses, a series of one-way ANOVA tests was conducted. These analyses compared the mean scores assigned to the three Dutch variants - *die*, *hen* and *ze* - across three dimensions: **comprehensibility** (i.e., whether the subtitles are easy to understand and support comprehension of the dialogue), **acceptability** (i.e., whether the subtitles are perceived as appropriate and natural) and **quality** (i.e., whether the subtitles are considered high-quality translations, including how adequately non-binary identity is conveyed).

5 Results

5.1 Acceptability of non-binary pronouns for Dutch (RQ1)

Comparison	Friedman	Wilcoxon
Overall	$\chi^2 = 30.155$	n/a
(<i>die</i> / <i>hen</i> / <i>zij</i>)*	$df = 2$	n/a
	$p = 2.83 \times 10^{-7}$	n/a
<i>die</i> - <i>hen</i>	n/a	$T_+ = 543.5$
	n/a	$T_- = 359.5$
	n/a	$Z = -1.163$
	n/a	$p = 0.24$
<i>die</i> - <i>zij</i> *	n/a	$T_+ = 1271$
	n/a	$T_- = 269$
	n/a	$Z = -4.22$
	n/a	$p = 2.45 \times 10^{-5}$
<i>zij</i> - <i>hen</i> *	n/a	$T_+ = 176.5$
	n/a	$T_- = 1048.5$
	n/a	$Z = -4.369$
	n/a	$p = 1.25 \times 10^{-5}$

Table 2: Friedman test with post-hoc Wilcoxon comparisons. Comparisons showing highly significant ($p < 0.001$) differences are indicated with an asterisk (*).

Table 2 shows the results of both the Friedman test and the post-hoc Wilcoxon comparisons. The

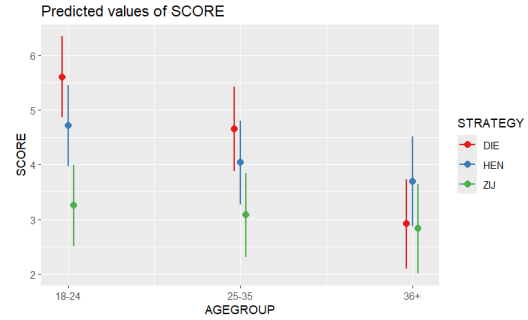


Figure 2: Interaction effect between translation strategy and age group for overall acceptability score.

Friedman test was based on 77 observations ($N = 77$). In 53 cases ($\approx 69\%$), at least two pronouns received identical rank scores, indicating limited variability in some responses. Despite this, the test revealed a statistically significant difference among *die*, *hen*, and *zij* ($p < 0.001$), suggesting that the pronouns were not ranked equally across conditions and that participants showed systematic preferences.

Three post-hoc Wilcoxon signed-rank tests further clarified these differences. Significant differences were found for the comparisons *die* - *zij* and *zij* - *hen*. The direction of the effects can be inferred from the T values: T_+ indicates that the first pronoun in the comparison tends to receive higher scores than the second. Based on this, *die* is ranked higher than both *hen* and *zij*, with a more pronounced difference for the *die*-*zij* comparison. In addition, *hen* is generally ranked higher than *zij*, a difference that is relatively strong ($Z = -4.37$).

The ranking results were confirmed and further supplemented by linear mixed-effects models. Compared to an intercept-only model, *strategy* was a significant predictor of the score ($\chi^2 = 29.94$, $p < .001$), with the *zij* strategy receiving significantly lower scores than *die* (an estimated reduction in score of 1.41 ± 0.26 standard errors). Individually adding any of the other potential predictors (age, gender, queerness, awareness of non-binary people, attitude towards non-binary people, attitude towards gender-fair language) significantly improved the model fit. Additionally, significant interaction effects were found between translation strategy and age group (Figure 2), between translation strategy and awareness of non-binary people (Figure 3), and between translation strategy and attitudes towards gender-fair language. For an overview of all model comparisons, see Table 6 in Appendix B.

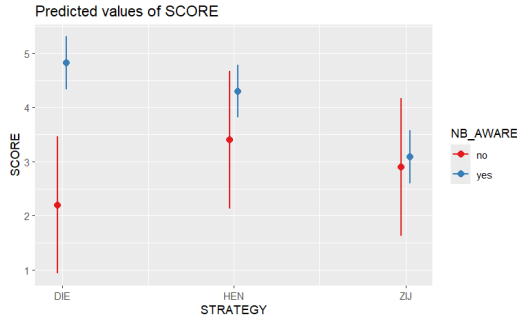


Figure 3: Interaction effect between translation strategy and awareness of non-binary people for overall acceptability score.

As can be derived from the model summary in Table 7, *zij* and, to a lesser extent, *hen* received significantly lower acceptability scores than *die*. Participants aged 36 and above gave significantly lower scores overall. However, the model also indicates an interaction between age group and strategy: compared to younger participants (18–24), participants in the 36+ group showed higher ratings for *hen* and *zij*.

The model summaries in Table 8 and Table 9 confirm that *zij* is the least preferred strategy, receiving significantly lower scores than *die*, and additionally shows that men give significantly lower scores than women, whereas queer participants give significantly higher scores than non-queer participants. When taking the interaction effect with awareness of non-binary people into account, however (see Table 10 and Figure 3), the main effect of strategy is no longer significant. Participants who are aware of non-binary people give higher scores overall, but they rate both the *hen* and the *zij* strategy significantly lower than the *die* strategy compared to participants who are unaware of non-binary people.

The best performing model overall consisted of strategy, attitude towards gender-fair language, and attitude towards non-binary people as main predictors, with interaction effect between strategy and attitude towards gender-fair language. This suggests that the scores people assign to specific strategies depend more strongly on their attitudes towards gender-fair language than on demographic variables. An alternative explanation could be that attitudes towards gender-fair language are already partially dependent on demographic variables: participants in the 18–24 age group had a slightly more positive attitude on average (5.73) than participants in the 25–35 age group (5.66)

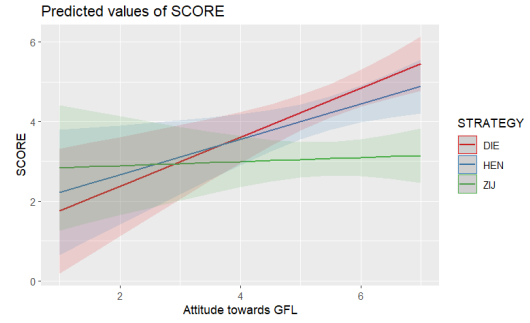


Figure 4: Interaction effect between strategy and attitude towards gender-fair language.

	Estimate	Std.Error	df	t value	Pr(> t)
(Intercept)	-0.818	0.887	175.28	-0.922	0.358
STRATEGYHEN	0.639	0.998	150	0.641	0.523
STRATEGYZIJ	1.656	0.998	150	1.659	0.099
LANGUAGE_ATT	0.617	0.174	153.05	3.552	<0.001
NB_ATT	0.318	0.130	74	2.437	0.017
STRATEGYHEN:LANGUAGE_ATT	-0.173	0.178	150	-0.972	0.332
STRATEGYZIJ:LANGUAGE_ATT	-0.566	0.178	150	-3.183	0.002

Table 3: Model summary with strategy, GFL attitude, and attitude towards non-binary people with interaction effect for strategy and GFL as predictors. Reference point (intercept) is the estimate for ‘die’ at hypothetical GFL score 0.

and participants in the 36+ group (4.78); gender-diverse participants had more positive attitudes on average (6.8) than did female (5.6) or male participants (4.7); Queer participants had more positive attitudes on average (6.5) than did non-queer participants (4.8); participants aware of the existence of non-binary people also had more positive attitudes on average (5.7) than did unaware participants (3.7). The complete model summary can be seen in Table 3. This shows that people with a more positive attitude towards gender-fair language and a more positive attitude towards non-binary people provided significantly higher scores overall, but that people with more positive attitudes towards gender-fair language rated the *zij* strategy significantly lower than *die* compared to people with more negative attitudes towards gender-fair language (see Figure 4 for a visualisation of the interaction effect).

5.2 Audience perception (RQ2-3)

A strong positive correlation was found between overall subtitle quality scores and acceptability ratings for non-binary reference ($r(44) = 0.73$, $p < 0.001$), indicating that viewers’ evaluation of the pronoun strategy is closely associated with their overall viewing experience. However, this relation is not observed across the experimental conditions (*infra*).

Tables 4 and 5 present the mean scores for *die*,

hen, and *zij*, showing that *die* consistently received the highest ratings for both overall subtitle quality and strategy evaluations. Additionally, its variance is lowest for most measures (except *acceptability*), which suggests greater agreement among participants.

	<i>die</i>	<i>hen</i>	<i>zij</i>
Comprehens.	4.795 (0.121)	4.449 (0.622)	4.267 (0.662)
Acceptability	4.385 (0.376)	3.609 (1.22)	3.7 (1.718)
Quality	4.538 (0.436)	3.652 (1.6)	3.9 (1.433)

Table 4: Subtitle quality scores for the pronouns *die*, *hen* and *zij* (averages with variance in parentheses).

	<i>die</i>	<i>hen</i>	<i>zij</i>
Comprehens.	4.462 (0.603)	4.304 (1.13)	4.1 (0.767)
Acceptability	4.103 (1.229)	3.768 (1.004)	3.533 (1.19)
Quality	4.442 (0.793)	3.815 (0.842)	3.6 (1.142)

Table 5: Translation strategy scores for the pronouns *die*, *hen* and *zij* (averages with variance in parentheses).

A one-way ANOVA showed no statistically significant differences in overall subtitle quality scores between the three conditions ($F(2, 43) = 2.81, p = 0.07$), although the result suggests a possible trend. Similarly, no statistically significant differences were found in translation strategy ratings across conditions ($F(2, 43) = 2.03, p = 0.14$).

These findings suggest that while individual evaluations of pronoun strategies are strongly linked to perceived subtitle quality, the specific strategy presented in the experiments (*die*, *hen* or *zij*) did not show clear differences in participants’ overall viewing experience, which contrasts with earlier analyses showing a general preference for *die* and *hen* over *zij* in Dutch. While this could indicate that there is a difference between people’s explicit attitudes and their actual viewing experience, it must be noted that the analysis is based on a limited number of data points ($N = 13$ for *die*, $N = 23$ for *hen*, $N = 10$ for *zij*).

6 Discussion & Conclusion

With the increased availability of LGBT+ content via streaming services (Yuan et al., 2025) comes increased translator responsibility to accurately portray the social and linguistic diversity of all characters (Attig, 2023; Lardelli et al., 2025). While there is an industry push towards increased automation (Karakanta, 2022), machine translation might not be suitable to accurately translate

non-binary language (Savoldi et al., 2025; Hackenbuchner et al., 2025).

In this study, we focused on the translation of the pronouns *they/them/their* as used by a non-binary character, Cal, in the Netflix series *Sex Education*. We studied the audience perceptions of different pronoun strategies: those used by Dutch human translators (*die/hen/hun* and *hen/hen/hun*), and those generated by MT (plural *ze/hen/hun* with plural verb forms).

When exploring participant attitudes towards those three different strategies in general, our findings confirm earlier findings for Dutch (Van Hoof and Decock, 2026) that the *die* strategy was considered the best strategy, followed by *hen*. We additionally empirically verified that MT mistranslation into the plural *zij*, as recently documented for Dutch (Hackenbuchner et al., 2025), is seen as the least acceptable referential strategy, despite plural translations being a documented acceptable strategy for gender-inclusive Dutch in a generic reference context (Verhaegen et al., 2025). This difference in acceptability was most outspoken for younger participants (18-24 year olds), participants who were familiar with non-binary people, and participants who had a more positive attitude towards gender-fair language in general. Participants older than 36 actually rated *hen* somewhat higher than both *die* and *zij*.

When examining participants’ attitudes towards specific pronoun strategies after exposure in subtitles, no statistically significant differences were found between the three strategies (*die*, *hen*, *zij*), although this is likely due to limited number of valid observations (as quite a few participants either indicated they did not read the subtitles or did not recall the Dutch pronoun strategy used). As more participants could remember seeing the *hen* strategy than any of the other strategies, our findings support the claim that *hen* is a more salient strategy than *die* (Decock et al., 2024). Looking at the data descriptively, we found that *die* received highest scores across all dimensions (comprehensibility, quality and acceptability), both when judging the subtitle quality in general and when judging the suitability of reference to the non-binary character. Differences between *hen* and *zij* were less outspoken, although *zij* scored lowest in terms of suitability. Given that the perceived suitability of the pronoun strategy and the overall subtitle quality were found to be strongly correlated,

we suggest caution in relying on ‘classic’ MT for this task, adding our voice to previously made calls for community-informed approaches in audiovisual translation (Attig, 2023; Lardelli et al., 2025) and gender-fair MT (Lardelli and Gromann, 2025). Contributing to the limited body of Dutch reception studies (of non-binary pronouns) (Decock et al., 2024; Vriesendorp, 2024; Vos and Nutters, 2022), our study found *die* to be the least controversial strategy for non-binary reference, even in an audiovisual context.

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Appendix

A) Survey questions

Familiarity with non-binary people

Q: Ken je één of meer non-binaire personen? (Je mag meerdere opties aanduiden) - *EN: Do you know one or more non-binary people? (More than one answer possible)*

A:

- Ja, in mijn directe omgeving (familie/vrienden). - *EN: Yes, in my direct environment (family/friends).*
- Ja, via werk/school, of via kennissen, via vrienden van vrienden. - *EN: Yes, via work/school or via acquaintances, via friends of friends.*
- Ja, via de media (tv, krant, sociale media,...). - *EN: Yes, via media (tv, newspapers, social media, etc.).*
- Nee, niet dat ik weet. - *EN: Not as far as I'm aware.*

Attitude towards non-binary people

For this score, an average was made of three Likert-scale items from 1 (strongly disagree) to 7 (strongly agree).

- Onze maatschappij zou er goed aan doen om non-binaire personen als normaal te beschouwen. - *EN: Non-binary people should be seen as normal in our society.*
- Non-binaire personen zouden volledig aanvaard moeten worden in onze maatschappij. - *EN: Non-binary people should be completely accepted in our society.*
- Er is niets mis met het hebben van een non-binaire genderidentiteit. - *EN: There is nothing wrong with having a non-binary gender identity.*

Overall subtitle evaluation

Q: Geef aan in hoeverre je akkoord gaat met de volgende stellingen over het fragment dat je net bekeken hebt, op een schaal van 1 (niet akkoord) tot 5 (akkoord). Er zijn geen goede of foute antwoorden: het gaat alleen om jouw inschatting. - *EN: Indicate to what extent you agree with the following statements about the fragment you just watched, on a scale from 1 (disagree) to 5 (agree). There are no right or wrong answers: your personal intuition is what matters.*

- Comprehensibility
 - Ik begreep meteen alles wat er in de ondertitels stond. - *EN: I immediately understood everything in the subtitles.*
 - Ik vind dat de ondertitels de boodschap goed hebben overgebracht. - *EN: The subtitles accurately conveyed the message.*
 - Al bij al was de vertaling gemakkelijk te begrijpen. - *EN: All in all, the translation was easy to comprehend.*
- Acceptability
 - Niet alle ondertitels vond ik meteen duidelijk. - *EN: Not all subtitles were clear right away.* - reverse-coded in analysis
 - De ondertitels waren aangenaam om te lezen. - *EN: The subtitles were pleasant to read.*

- De taal die werd gebruikt, voelde natuurlijk aan. - *EN: The language used felt natural.*
- Sommige uitdrukkingen in de ondertitels kwamen omslachtig of verwarrend over. - *EN: Some expressions used in the subtitles felt vague or confusing.* - reverse-coded in analysis
- Ik vind de ondertiteling geschikt voor een breed publiek. - *EN: The subtitles are suitable for the general public.*

- Quality

- Er leken geen fouten in de ondertitels te staan. - *EN: The subtitles seemed to be free of errors.*

Translation strategy evaluation

Q: Geef aan in hoeverre je akkoord gaat met de volgende stellingen over het fragment dat je net bekeken hebt, op een schaal van 1 (niet akkoord) tot 5 (akkoord). Er zijn geen goede of foute antwoorden: het gaat alleen om jouw inschatting. - *EN: Indicate to what extent you agree with the following statements about the fragment you just watched, on a scale from 1 (disagree) to 5 (agree). There are no right or wrong answers: your personal intuition is what matters.*

- Comprehensibility

- De woorden die in de ondertitels gebruikt worden om naar Cal te verwijzen, hadden geen invloed op mijn begrip. - *EN: The words used in the subtitles to refer to Cal did not impact my understanding.*

- Acceptability (all items reverse-coded for analysis)

- Sommige woorden die in de ondertitels gebruikt worden om naar Cal te verwijzen, wekten irritatie bij me op. - *EN: Some words used in the subtitles to refer to Cal were irritating.*
- Sommige woorden die in de ondertitels gebruikt worden om naar Cal te verwijzen, vond ik vreemd. - *EN: Some words used in the subtitles to refer to Cal were strange.*

- Sommige woorden die in de ondertitels gebruikt worden om naar Cal te verwijzen vond ik verrassend. - *EN: Some words used in the subtitles to refer to Cal were surprising.*

- Quality

- De woorden die in de ondertitels gebruikt worden om naar Cal te verwijzen vond ik goed gekozen. - *EN: The words used in the subtitles to refer to Cal were well-chosen.*
- De woorden die in de ondertiteling gebruikt worden om naar Cal te verwijzen, vond ik gepast. - *EN: The words used in the subtitles to refer to Cal were suitable.*
- De ondertitels hielpen me om de identiteit van Cal te kunnen schetsen. - *EN: The subtitles helped me get an idea of Cal's identity.*
- Ik vind dat de vertaalkeuze in de ondertiteling de identiteit van Cal respecteert. - *EN: The translation choices in the subtitles respect Cal's identity.*

Familiarity with non-binary pronoun strategies

Q: Welk Nederlandstalig genderneutraal voornaamwoord van de derde persoon enkelvoud kende je al voor je aan dit onderzoek deelnam? (Je mag meerdere opties aanduiden) - *EN: Which Dutch gender-neutral third-person singular pronoun were you familiar with before participating in this study? (Multiple options possible)*

A:

- Ik kende het genderneutrale voornaamwoord 'hen' (met bezitsvorm 'hun'). - *EN: I was familiar with the gender-neutral pronoun 'hen' (with possessive form 'hun').*
- Ik kende het genderneutrale voornaamwoord 'die' (met bezitsvorm 'hun'). - *EN: I was familiar with the gender-neutral pronoun 'die' (with possessive form 'hun').*
- Ik kende het genderneutrale voornaamwoord 'ze/zij' (met bezitsvorm 'hun'). - *EN: I was familiar with the gender-neutral pronoun 'ze/zij' (with possessive form 'hun').*
- Ik kende geen van deze genderneutrale voornaamwoorden. - *EN: I was not familiar with any of these gender-neutral pronouns.*

- Ander, namelijk... - *EN: Other, please specify.*

Attitude towards non-binary pronoun strategies

Participants had to indicate to what extent they agreed with the following statements, on a Likert scale from 1 (strongly disagree) to 7 (strongly agree):

- Ik vind 'hen' (met bezitsvorm 'hun') een geschikt voornaamwoord van de derde persoon enkelvoud om specifiek naar non-binaire personen te verwijzen. - *EN: I think 'hen' (with possessive form 'hun') is a suitable third-person singular pronoun for specific reference to non-binary people.*
- Ik vind 'die' (met bezitsvorm 'hun') een geschikt voornaamwoord van de derde persoon enkelvoud om specifiek naar non-binaire personen te verwijzen. - *EN: I think 'die' (with possessive form 'hun') is a suitable third-person singular pronoun for specific reference to non-binary people.*
- Ik vind 'ze/zij' (met bezitsvorm 'hun') een geschikt voornaamwoord van de derde persoon enkelvoud om specifiek naar non-binaire personen te verwijzen. - *EN: I think 'ze/zij' (with possessive form 'hun') is a suitable third-person singular pronoun for specific reference to non-binary people.*

Attitude towards gender-fair language

For the score used in the analysis, the average score was taken across the 11 statements.

Q: Hieronder volgen enkele stellingen. Het begrip 'seksistische taal' dat in sommige stellingen gebruikt wordt, verwijst naar uitdrukkingen die mensen uitsluiten, als minder belangrijk zien of kleineren op basis van gender. Het begrip 'gender-inclusieve taal' dat in sommige stellingen gebruikt wordt, verwijst naar taalgebruik dat als doel heeft om alle genderidentiteiten zichtbaar te maken of alle genderidentiteiten op gelijke voet met elkaar te behandelen. Geef aan in hoeverre je akkoord gaat met de volgende stellingen op een schaal van 1 (helemaal niet akkoord) tot 7 (helemaal akkoord). - *EN: You will read a few statements. 'Sexist language' in this context refers to using gendered expressions that exclude, trivialize or diminish a group of people based on gender. 'Gender-*

inclusive language' in this context refers to language aimed at making all gender identities visible or treated equally. Please indicate to what extent you agree or disagree for each of the following statements (1 = strongly disagree, 7 = strongly agree).

- We moeten de manier waarop de Nederlandse taal traditioneel geschreven en gesproken werd niet veranderen. - *EN: We should not change the way the Dutch language has traditionally been written and spoken.* - reverse-coded for analysis
- Er bestaat niet zoiets als seksistische taal. - *EN: There is no such thing as sexist language use.* - reverse-coded for analysis
- Zich zorgen maken over seksistische taal is een triviale bezigheid. - *EN: Worrying about sexist language is a trivial activity.* - reverse-coded for analysis
- Het is belangrijk om komaf te maken met seksistische taal. - *EN: The elimination of sexist language is an important goal.*
- Seksistische taal houdt verband met de seksistische behandeling van mensen in de maatschappij. - *EN: Sexist language is related to sexist treatment of people in society.*
- Hoewel verandering moeilijk is, zouden we toch moeten proberen om seksistische taal te bestrijden. - *EN: Although change is difficult, we still should try to eliminate sexist language.*
- Genderinclusieve taal gebruiken is belangrijk. - *EN: Using gender-inclusive language is important.*
- Door genderinclusieve taal te gebruiken ondersteunen we gendergelijkheid. - *EN: Using gender-inclusive language supports gender equality.*
- Ik sta positief tegenover genderinclusief taalgebruik. - *EN: I have a positive attitude towards gender-inclusive language.*
- Via genderinclusieve taal bestrijden we discriminatie op basis van gender. - *EN: Using gender-inclusive language counters gender-based discrimination*

- Genderinclusieve taal (bv. via ondertitels) maakt audiovisuele inhoud toegankelijker. - *EN: Gender-inclusive language (e.g., in subtitles) makes audiovisual content more accessible.*

B) Model comparison, interaction effects and model summaries

MODEL	AIC	Df	X ²	p-value
Null	995.87	n/a	n/a	n/a
Strategy	969.93	2	29.936	<0.001
Strategy + age group	964.01	2	9.925	0.007
Strategy * age group	957.06	4	14.949	0.005
Strategy + gender	967.39	3	8.539	0.036
Strategy * gender	967.50	6	11.898	0.064
Strategy + queerness	962.79	2	11.145	0.004
Strategy * queerness	962.51	4	8.279	0.082
Strategy + nb awareness	966.59	1	5.338	0.021
Strategy * nb awareness	959.73	2	10.86	0.004
Strategy + nb attitude	947.97	1	23.964	<0.001
Strategy * nb attitude	950.31	2	1.656	0.437
Strategy + GFL attitude	946.96	1	24.976	<0.001
Strategy * GFL attitude	940.40	2	10.559	0.005
Strategy * GFL attitude + NB attitude	936.45	1	5.943	0.015

Table 6: Model comparison for potential predictors of overall acceptability score. Likelihood ratio tests were always performed between minimally nested models: the model with 1 predictor (strategy) compared to a null model, models with 2 predictors compared to the model with only 1 predictor (strategy), models with interaction effect (*) compared to the corresponding model without interaction effect (+).

	Estimate	Std.Error	df	t value	Pr(> t)
(Intercept)	5.607	0.378	171	14.849	<0.001
STRATEGYHEN	-0.893	0.418	148	-2.134	0.034
STRATEGYZIJ	-2.357	0.418	148	-5.634	<0.001
AGEGROUP25-35	-0.953	0.544	171	-1.752	0.082
AGEGROUP36+	-2.694	0.562	171	-4.791	<0.001
STRATEGYHEN:AGEGROUP25-35	0.278	0.603	148	0.46	0.646
STRATEGYZIJ:AGEGROUP25-35	0.780	0.603	148	1.294	0.198
STRATEGYHEN:AGEGROUP36+	1.676	0.623	148	2.69	0.008
STRATEGYZIJ:AGEGROUP36+	2.270	0.623	148	3.644	<0.001

Table 7: Model summary of model with strategy and age with interaction effect as predictors. Reference point (intercept) is the estimate for 'die' for age group 18-24.

	Estimate	Std.Error	df	t value	Pr(> t)
(Intercept)	4.637	0.275	137.105	16.853	<0.001
STRATEGYHEN	-0.299	0.261	152	-1.143	0.25
STRATEGYZIJ	-1.416	0.261	152	-5.417	<0.001
GENDERmale	-0.819	0.399	73	-2.055	0.04
GENDERother	1.101	0.677	73	1.626	0.11
GENDERprefer-not-to-say	0.101	1.127	73	0.09	0.93

Table 8: Model summary of model with strategy and gender as predictors. Reference point (intercept) is the estimate for 'die' for gender=female.

	Estimate	Std.Error	df	t value	Pr(> t)
(Intercept)	4.022	0.267	144.450	15.083	<0.001
STRATEGYHEN	-0.299	0.261	152	-1.143	0.255
STRATEGYZIJ	-1.416	0.261	152	-5.417	<0.001
QUEERnot-sure	1.382	1.1	74	1.257	0.213
QUEERyes	1.203	0.367	74	3.282	0.002

Table 9: Model summary of model with strategy and queerness as predictors. Reference point (intercept) is the estimate for 'die' for queer=no.

	Estimate	Std.Error	df	t value	Pr(> t)
(Intercept)	2.2	0.642	170.818	3.425	<0.001
STRATEGYHEN	1.2	0.705	150	1.703	0.091
STRATEGYZIJ	0.7	0.705	150	0.993	0.322
NB_AWAREyes	2.621	0.689	170.818	3.806	<0.001
STRATEGYHEN:Nb_AWAREyes	-1.722	0.755	150	-2.28	0.024
STRATEGYZIJ:Nb_AWAREyes	-2.431	0.755	150	-3.219	0.002

Table 10: Model summary of model with strategy and awareness of non-binary people plus interaction effect as predictors. Reference point (intercept) is the estimate for 'die' for nb-aware=no.