

# The Linguistic Lifecycle of Neopronouns: Grammaticalization, Social Resistance, and Institutional Adaptation



دورة الحياة اللغوية للضمائر الجديدة: التطور النحوي، المقاومة الاجتماعية والتكيف  
المؤسسي

شال محمد صالح شعبان  
قسم اللغة الانكليزية وآدابها ، كلية  
اللغات ، جامعة دهوك  
[Shal.shaban@uod.ac](mailto:Shal.shaban@uod.ac)

علا عارف جعفر  
مركز الحاسبة ، جامعة بغداد  
[ola.arif@cc.uobaghdad.edu.iq](mailto:ola.arif@cc.uobaghdad.edu.iq)

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**Ola Arif Jaafar**  
Computer Center,  
University of Baghdad

**Shal Mohammed Salih Shaban**,  
Department of English  
Language and Literature, college of  
languages, University of Duhok

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#### الخلاصة

تتناول هذه الدراسة الدورة اللغوية للضمائر الانكليزية المستحدثة (مثل xe/xem و ze/zir) مع التركيز على كيفية تعامل هذه الضمائر مع القيود البنوية والمقاوة الاجتماعية والترويج المؤسسي. وعلى خلاف المفردات المنتمية الى الفئات المفتوحة، تنتمي الضمائر الى فئة مغلقة ومنتقرة تاريخيا ونتيجة لذلك تواجه الضمائر الجديدة تحديات صرفية نحوية كبيرة مما يستلزم تكيفها مع القواعد الذهنية للمتحدثين لاسيما في توافق السمات النحوية المتعلقة بالشخص والعدد والجنس (φ-) كما انها تشكل صعوبات لأنظمة معالجة اللغة الطبيعية التي تعتمد على قواعد التجزئة ونمذجة اللغة الراسخة. ومن منظور لغوي اجتماعي تتقاطع هذه الصرامة البنوية مع المقاومة المجتمعية وايدولوجية اوسع. حيث ان المعرضة العلنية لهذه الضمائر والتي غالبا ماتبرر بالنزعة المعيارية المحافظة في اللغة او بصعوبة المعالجة الادراكية والتي ترتبط ارتباط

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وثيق بالمواقف الاجتماعية والسياسية تجاه الهوية الجندرية. تستخدم هذه الدراسة منهجية بحثية تجمع بين تحليل انماط التكرار اللغوي وتحليل الخطاب النقدي للوثائق المؤسسية لدراسة التوتر القائم بين التطبيق الالزامي والاستخدام اللغوي التلقائي. وفي النهاية تقدم هذه الدراسة اطارا مهما لفهم كيفية محاولة الابتكارات اللغوية غير القياسية الى تحقيق التأسيس النحوي ضمن نظام مغلق شديد المقاومة.

### Abstract

This paper analyzes the linguistic lifecycle of English neopronouns (e.g., xe/xem, ze/zir), exploring how these forms navigate structural barriers, social resistance, and top-down institutional mandates. Unlike open-class items, pronouns occupy a historically rigid closed class, and consequently, neopronouns face severe morphosyntactic hurdles requiring adaptations in human mental grammar—specifically  $\phi$ -feature agreement—while disrupting tokenization baselines in computational natural language processing (NLP) models. Sociolinguistically, this structural rigidity intersects with public resistance, and overt opposition often framed as prescriptive linguistic purism or cognitive processing load is deeply tethered to socio-political ideologies regarding gender identity. Crucially, while traditional language change operates via organic, bottom-up community adoption, neopronouns are concurrently driven by top-down institutional intervention through corporate and academic style guides. Employing a mixed-methods approach—combining corpus linguistics to track lexical frequency with critical discourse analysis of institutional handbooks—this paper evaluates the tension between mandated implementation and organic spoken discourse, and ultimately, this study provides a vital framework for understanding how ideological, non-standard innovations attempt to force grammaticalization within a highly resistant closed system.

### 1. Introduction: The Closed-Class Problem and Pronominal Innovation

The English pronominal paradigm represents one of the most conservative domains of the grammar, a fact that has been extensively documented within grammaticalization theory. Heine and Song [1] demonstrate that personal pronouns belong to the most diachronically stable parts of language, and they can frequently be traced back etymologically to or beyond the earliest stages of reconstructable language history [1]. This stability arises because pronouns form a closed class—a finite set of grammatical items that resist the admission of new members, and unlike open-class items such as nouns and verbs, which readily accept neologisms, pronouns are functional categories organized





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in tightly structured paradigmatic systems [1]. The English third-person singular system has historically consisted of he/him/his (masculine), she/her/hers (feminine), and it/its (neuter/inanimate), and this tripartite structure has remained remarkably stable since the Early Modern English period despite numerous proposals for reform [5]. Consequently, any attempt to introduce novel pronominal forms faces structural resistance at multiple levels, including the morphosyntactic, the sociolinguistic, and the cognitive.

The absence of a widely-accepted gender-neutral third-person singular pronoun in English has been characterized as a "gap" in the pronominal paradigm, and scholars have documented various strategies employed to fill this gap over centuries. Paterson [5] traces the use of combined pronouns (he or she, s/he, him/her) through the LOB and Brown families of corpora, revealing that these forms saw a dramatic increase between the 1960s and 1990s before declining in the early 2000s [5]. This rise corresponded with second-wave feminist language reform efforts that aimed to increase the visibility of women in discourse, but the subsequent decline suggests a shift toward alternative strategies such as singular they [5]. The singular they, although possessing a long history dating back to the 14th century, remains contested in prescriptive contexts, and Bradley [2] demonstrates that grammaticality judgments of singular they are influenced by both linguistic prescriptivism and social attitudes about gender [2]. This finding underscores the fundamental interconnection between grammatical structure and social ideology in the domain of pronoun use.

Neopronouns such as xe/xem, ze/zir, and ey/em represent a more radical departure from existing pronominal resources than singular they because they constitute entirely novel lexical items. Lindqvist, Renström, and Gustafsson Sendén [6] experimentally compared the processing of different gender-fair language strategies, and they found that actively created gender-neutral pronouns (Swedish hen and English ze) eliminated the male bias in language comprehension, whereas traditional neutral words such as "the applicant" still contained a male bias [6]. However, the same study revealed that familiarity with neopronouns among English speakers remains low—only 39.2% of U.S. participants were familiar with ze, compared to 96.6% familiarity with singular they [6]. This disparity in awareness reflects the different sociolinguistic trajectories of singular they (which already exists within the pronoun system) versus neopronouns (which must be introduced as entirely new forms), and it highlights the formidable barriers facing neopronoun adoption.

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The Swedish gender-neutral pronoun *hen* provides a uniquely informative case study of successful neopronoun implementation, as Gustafsson Sendén, Bäck, and Lindqvist [6] demonstrate in their longitudinal analysis of attitudes toward *hen* from 2012 to 2015 [3]. Their research revealed that in 2012, the majority of the Swedish population was negative toward the word, but by 2014, there was a significant shift to more positive attitudes, and importantly, time was one of the strongest predictors of attitude change even when controlling for other relevant factors such as sexism and political orientation [3]. The Swedish case demonstrates that neopronoun adoption follows a pattern of initial hostile resistance followed by gradual normalization, and this trajectory has implications for understanding the potential lifecycle of English neopronouns. However, significant differences exist between the Swedish and English contexts: Swedish *hen* benefits from its phonetic and orthographic similarity to the existing pronouns *han* (he) and *hon* (she), whereas English neopronouns like *xe/xem* must overcome greater structural distance from the existing paradigm [3,6].

### 2. The Grammaticalization Framework: Pronouns as a Resistant Class

The grammaticalization of personal pronouns differs fundamentally from the grammaticalization of other linguistic categories because pronouns belong to a closed class of functional items that resist innovation. Heine and Song [1] argue that personal pronouns present a challenge to grammaticalization theory because they differ in diachronic behavior from most other grammatical categories, and they propose an extended understanding of grammaticalization is needed to account for pronominal development [1]. Their crosslinguistic survey identifies four main conceptual sources for new personal pronouns: nominal concepts (e.g., nouns meaning "person" or "man"), spatial deixis (demonstratives), intensifiers (reflexives), and shift in deixis (from third to second person) [1]. These sources typically undergo the four parameters of grammaticalization—extension to new contexts, desemanticization (loss of meaning content), decategorialization (loss of morphosyntactic properties), and erosion (phonetic reduction)—but pronouns differ in that they remain referential even after grammaticalization, unlike tense or case markers [1].

The extension parameter is particularly relevant for understanding how neopronouns might undergo grammaticalization, and Heine and Song [1] identify three components of extension: a sociolinguistic component (innovation by an individual or small group, followed by propagation through a speech community), a text-pragmatic component (extension





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from a usual context to a new context), and a semantic component (development of new meanings supported by the new context) [1]. For neopronouns like *xe/xem*, the sociolinguistic component is clearly visible in their origins within communities, and the text-pragmatic component manifests as these forms extend from in-group usage to broader contexts such as academic writing and institutional communications. However, the semantic component presents difficulties because neopronouns are introduced as already-grammaticalized forms with schematic, deictic meaning, and they thus lack the lexical content that typically undergoes desemantization during grammaticalization.

The closed-class nature of pronouns imposes specific structural constraints on innovation, and Paterson [5] notes that pronouns are organized in a grammatical system where adding a new word challenges the entire paradigmatic structure [5]. This is fundamentally different from adding new nouns or verbs to a language's lexicon, and it explains why neopronouns face greater resistance than lexical neologisms. The English pronominal paradigm is organized around distinctions of person (first, second, third), number (singular, plural), gender (masculine, feminine, neuter), and case (nominative, accusative, genitive, reflexive), and any new pronoun must be inserted into this multidimensional matrix [5]. Neopronouns like *xe/xem* typically propose a full paradigm (*xe/xem/xyr/xyrs/xyrself* or *ze/zir/zir/zirs/zirself*), and this paradigmatic completeness is both a strength (providing systematic coverage) and a weakness (requiring acquisition of multiple forms simultaneously).

Decategorialization, which typically involves loss of morphosyntactic properties during grammaticalization, operates differently when neopronouns are introduced into an existing paradigm, as Heine and Song [1] observe that pronouns are already highly decategorialized compared to lexical items [1]. English personal pronouns cannot take modifiers, do not inflect for case in the same way as nouns (they retain a distinct accusative form), and lack derivational morphology, and neopronouns must conform to these same restrictions. The erosion parameter, involving phonetic reduction, has not yet affected neopronouns like *xe/xem* because they are too recent, but if they were to become fully integrated, we might expect phonetic reduction over time [1]. Crosslinguistic evidence suggests that established pronouns are typically short forms (compare English *I, you, he, she, it*), and the relatively longer forms of neopronouns may present an initial barrier to their integration.

The case of the Swedish pronoun *hen* illustrates how a neopronoun can achieve grammaticalization through institutional endorsement and increased usage, and Gustafsson Sendén, Bäck, and Lindqvist [6]

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document how *hen* was included in the Swedish Academy Glossary (SAOL) in 2014, just two years after the debate began [3]. This rapid institutionalization contrasts with the typical slow pace of grammaticalization, and it suggests that top-down language planning can accelerate processes that would otherwise take generations. The Swedish Language Council's shift from recommending against *hen* in 2012 to including it as an acceptable alternative in 2014 demonstrates how institutional authority can influence the grammaticalization trajectory [3]. However, the Swedish case also reveals limitations: even as attitudes became more positive, actual use of *hen* increased more slowly, suggesting a gap between acceptance and production [3].

### 3. Social Resistance and Ideological Opposition

The introduction of neopronouns has been met with substantial social resistance, and this opposition is deeply intertwined with ideological positions regarding gender identity and linguistic prescriptivism. Bradley [2] directly investigated the contributions of linguistic prescriptivism and sexism to grammaticality judgments of singular *they*, and the results demonstrated that both factors independently contribute to resistance [2]. Specifically, benevolent sexism—attitudes that appear positive toward women but reinforce essentialist, binary conceptions of gender—was a significant predictor of negative judgments for definite uses of singular *they*, while hostile sexism was not [2]. This finding suggests that opposition to gender-neutral pronouns is not primarily driven by overt hostility but by more subtle ideologies that treat binary gender as natural and immutable, and importantly, these ideological positions affect not only attitudes toward neopronouns but also basic grammaticality judgments [2].

The polarized nature of public debates about gender-neutral pronouns has been extensively documented, and Gustafsson Sendén, Bäck, and Lindqvist [6] describe how the introduction of Swedish *hen* was met with hostile reactions and offensive attacks on proponents [3]. Their analysis reveals that attitudes toward *hen* were strongly polarized in 2012, with respondents being either very negative or very positive, but over time, the proportion of very negative responses decreased substantially [3]. This polarization reflects the symbolic significance of pronouns as markers of social identity and ideological commitment, and it suggests that neopronoun debates are not merely about linguistic forms but about fundamental conceptions of gender and social order. The predictors of negative attitudes toward *hen* included modern sexism, right-wing political orientation, older age, and strong gender identity, while interest in gender issues predicted positive attitudes [3].





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Arguments against gender-neutral language typically fall into several categories, and these have been remarkably consistent across languages and historical periods. Lindqvist, Renström, and Gustafsson Sendén [6] summarize the common criticisms: claims that new forms are linguistically wrong or awkward, arguments that they are unnecessary because existing forms are sufficient, and assertions that they create confusion or processing difficulty [6]. The "awkwardness" argument has been applied to combined pronouns (he or she), to singular they, and to neopronouns alike, and it reflects a deeper prescriptivist orientation that treats established usage as inherently superior. However, experimental evidence does not support the claim that gender-neutral pronouns cause processing difficulty: Lindqvist et al. [6] found that both paired forms (he/she) and actively created pronouns (hen, ze) eliminated the male bias without causing processing disruptions, and for Swedish hen, even participants who were unfamiliar with the word processed it without difficulty [6].

The role of cognitive processing load in resistance to neopronouns has been investigated through experimental methods, and the findings challenge claims that these forms are inherently difficult to process. Sanford and Filik [12] used eye-tracking to investigate whether singular they carries a processing cost, and while they found evidence of a number-mismatch effect in total reading times, this cost was rapidly accommodated by readers [12]. Importantly, the mismatch effect for plural pronouns following singular antecedents appeared only in later processing measures rather than in early measures, suggesting that readers quickly adjust their interpretation [12]. For L2 learners, Speyer and Schleef [13] demonstrated that advanced non-native speakers process singular they with equal facility to native speakers across most antecedent types, and they found developmental progression in how he, she, and they are processed as proficiency increases [13]. These findings collectively indicate that processing difficulty is not a valid justification for opposing gender-neutral pronouns.

The intersection of linguistic prescriptivism and gender ideology creates a powerful resistance to neopronoun adoption, and Bradley [2] argues that these two factors may index an underlying general conservatism or resistance to unfamiliar ideas [2]. The correlation between prescriptivism and sexism suggests that opposition to linguistic innovation and opposition to gender equality are manifestations of a broader disposition toward maintaining established hierarchies. Monro [9] situates this resistance within the context of gender binarism, which is intertwined with institutionalized heterosexism and operates at cultural, institutional,



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policy, and legal levels to perpetuate narrow models of sex and gender [9]. The social erasure of third-person pronouns such as "ze" is identified as a practice of binarism, and this erasure is compounded by transnormativity—the belief that there is only one way for trans people to practice their gender [9].

#### 4. Institutional Adaptation: Top-Down Language Planning

The adoption of neopronouns and gender-neutral language has been significantly driven by top-down institutional interventions, and this represents a departure from traditional models of language change that operate through organic, bottom-up community adoption. Paterson [5] documents how combined pronouns were promoted through institutional style guides and grammar books, with organizations such as the United Nations and Microsoft officially endorsing these forms [5]. However, despite institutional endorsement, combined pronouns remain relatively rare in actual usage, and their frequency peaked in the 1990s before declining in the 2000s [5]. This discrepancy between policy and practice highlights the limitations of top-down language planning, and it suggests that institutional mandates alone are insufficient to effect widespread language change, particularly when they conflict with natural patterns of language use.

Academic institutions and style guides have played a particularly important role in promoting gender-neutral language, and Stormbom [4] examined the use of epicene pronouns in open access research articles to determine the correspondence between journal policies and actual usage [4]. The analysis revealed that while specific guidelines for gender-fair language were generally uncommon in journal author guidelines, there was no immediate correspondence between policy and practice in cases where journals did provide guidelines [4]. Singular they was the most common epicene pronoun overall, closely followed by he or she forms, and generic he also occurred with some frequency [4]. This heterogeneity in pronoun use suggests that authors navigate multiple competing considerations—prescriptive norms, awareness of gender-fair language debates, institutional policies, and their own linguistic habits—and the resulting patterns reflect this complex negotiation.

The role of institutional handbooks in shaping pronoun use has been examined diachronically, and Paterson [5] notes that Microsoft's style guide and the United Nations' guidelines continue to endorse combined pronouns as appropriate for referring to both women and men [5]. However, these institutional endorsements are themselves evolving: the American Psychological Association's Publication Manual now recommends singular they as the preferred epicene pronoun, and the





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Associated Press Stylebook has accepted singular they "in limited cases" [4,5]. The Chicago Manual of Style has endorsed singular they for referring specifically to non-binary individuals but has been less enthusiastic about its use for generic reference [5]. These variations across institutional guidelines reflect ongoing debates about the most appropriate gender-neutral strategies, and they create a complex landscape for writers who must navigate disparate recommendations. Corporate language policies have increasingly addressed pronoun use, and this represents a significant extension of institutional intervention into linguistic practices. Sun et al. [8] propose a framework for addressing gender in natural language generation that includes three approaches: adhering (removing or hiding gender attributes), steering (amplifying gender differences away from the norm), and queering (troubling gender stereotypes) [8]. Their analysis of job advertisements, newspaper headlines, and chatbots demonstrates that different scenarios require different approaches, and they argue that a "one size fits all" approach to addressing gender equity is insufficient [8]. The implementation of pronoun policies in corporate contexts raises questions about the relationship between policy and practice, and Sun et al. [8] caution that NLG may not always be the best way to pursue gender equity outcomes, as it risks losing the nuance and contextually-specific details that shape gender in diverse cultural contexts [8].

The tension between mandated implementation and organic usage is particularly evident in educational settings, and Brutt-Griffler and Kim [10] examine how Asian female international students at US universities contribute to the development of English as a gender-neutral language through their investment in English learning [10]. These students perceive English as a more gender-neutral medium compared to their first languages, and they actively construct English as a language that allows them to exit from restrictive gender roles [10]. This macroacquisition perspective emphasizes that language change is not merely a top-down process but also emerges from the collective goals and identities of language learners, and it suggests that the development of gender-neutral language is driven by the aspirations of diverse speakers who use English to express identities that their native languages may not accommodate [10].

### 5. Corpus Evidence: Tracking Frequency and Acceptability

Corpus linguistic research provides essential empirical evidence for tracking the frequency and distribution of gender-neutral pronouns over time, and Paterson [5] conducted a comprehensive analysis of combined pronouns in the LOB and Brown families of corpora, spanning British

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and American English from the 1930s to the early 2000s [5]. The results revealed that combined pronouns were extremely rare in the 1930s (5.21 per million words in AmE and 9.46 in BrE) and remained low through the 1960s, but they increased dramatically by the 1990s (59.78 pmw in AmE and 49 pmw in BrE), representing a seven-fold increase in AmE and a five-fold increase in BrE [5]. However, the 2000s saw a decline, with BrE dropping more drastically than AmE, and this trajectory suggests that combined pronouns may have been a transitional strategy that is now being supplanted by singular they [5].

The diachronic analysis of epicene pronouns in academic writing reveals significant changes in pronoun preferences over time, and Adami and Nunan [11] examined research articles in social science journals from 2010 to 2019 to track shifts in pronoun usage [11]. Their corpus of one million words showed that singular they was used 175 times (1.73 per 10,000 words), while s/he appeared 118 times (1.17 per 10,000 words), and this difference was statistically significant [11]. The distribution across the decade revealed important trends: while generic he decreased from the first half to the second half of the decade (279 instances in 2010-2014 vs. 157 in 2015-2019), generic she increased dramatically (61 instances vs. 431), and singular they also increased (61 instances vs. 124) [11]. These findings indicate a language change in progress, with authors increasingly avoiding masculine generics and adopting a range of alternative strategies.

The processing of singular they in corpus data must be distinguished from the processing of neopronouns, and the available evidence suggests that singular they has gained significant ground in both spoken and written English. Sanford and Filik [12] note that singular they is commonly used in vernacular English with antecedents where gender cannot be recovered, and their eye-tracking study found that while there is an initial processing cost for number mismatch, this is rapidly accommodated [12]. Foertsch and Gernsbacher (1997), as cited by Speyer and Schlee [13], found that with gender-neutral antecedents like "someone" or "a runner," singular they was processed as quickly as he or she, and it was actually the preferred pronoun for indefinite pronouns [13]. This processing evidence supports the view that singular they functions as an effective gender-neutral pronoun, and its increasing frequency in corpus data reflects its growing acceptance among speakers and writers. The Swedish *hen* provides a valuable comparative case for understanding how neopronouns can gain frequency in corpus data, and Gustafsson Sendén, Bäck, and Lindqvist [6] documented the rapid increase in *hen*'s usage following its introduction [3]. In one of Sweden's major newspapers,





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occurrences of *hen* increased from 1 in 2010 to 9 in 2011 and 113 in 2012, and this growth continued as the word gained institutional acceptance [3]. Crucially, the majority of early uses (85%) were for generic reference when gender was unknown or irrelevant, while only 15% were specifically for transgender reference [3]. This distribution suggests that the generic function provides a "bridge" context that facilitates the adoption of neopronouns, and it implies that English neopronouns might similarly gain traction first in contexts where gender is unknown or irrelevant before extending to specific reference to non-binary individuals.

The democratization framework provides a broader context for understanding changes in person reference over time, and Palander-Collin, Nevala, and Salonen [14] used keyword analysis of the ARCHER corpus combined with big data sources to track shifts in people words [14]. Their findings revealed that words indexing individual social status (gentleman, sir, lady, captain) decreased significantly from the 18th to the 20th centuries, while words referring to collective groups (workers, leaders, patients) increased, particularly from the early 20th century onwards [14]. This shift from hierarchical individual reference to collective group reference is interpreted within the framework of democratization—the phasing out of overt markers of power asymmetry—and it provides a broader context for understanding the current shift toward gender-neutral pronouns [14]. The decline of gendered titles (Mr., Mrs., Miss) and the rise of gender-neutral alternatives (Ms., Mx.) can be seen as part of this same democratizing trajectory.

### 6. Computational Challenges: NLP and Neopronouns

Natural language processing (NLP) systems face significant challenges in handling neopronouns, and these challenges stem from the same closed-class rigidity that affects human grammatical processing. Costa-jussà (2019) provides an overview of gender bias in NLP, noting that word embeddings trained on large corpora encode and amplify existing societal biases, including gender stereotypes [7]. The standard approach to debiasing NLP systems involves minimizing information within the gender subspace of embeddings, but Costa-jussà (2019) notes that current debiasing techniques may only obfuscate rather than remove gender bias [7]. For neopronouns specifically, the challenge is compounded by their rarity in training data: most NLP systems have limited or no exposure to forms like *xe/xem* or *ze/zir*, and this leads to systematic misgendering or failure to recognize these pronouns during tasks such as coreference resolution and machine translation [7].

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The treatment of gender in natural language generation (NLG) has received increasing attention, and Sun et al. [8] propose a framework that moves beyond simple bias removal toward more nuanced approaches [8]. Their "adhering" approach corresponds to current state-of-the-art debiasing techniques that remove or hide sensitive gender attributes, but they argue that this approach may be insufficient for achieving gender equity [8]. The "steering" approach involves deliberately amplifying particular gendered characteristics to promote minority genders, while the "queering" approach involves troubling gender stereotypes through creative and playful language generation [8]. Each approach has different implications for how neopronouns might be handled in NLG systems: adhering would involve substituting neopronouns with gender-neutral alternatives, steering might involve deliberately using neopronouns to normalize them, and queering could involve creative exploration of non-binary pronominal possibilities.

Tokenization and morphological analysis present particular challenges for neopronouns, and these challenges reflect the fact that NLP systems are typically trained on texts that use the standard pronoun paradigm. Most NLP pipelines include a tokenizer that segments text into words, and neopronouns like *xe/xem* or *ze/zir* may be treated as unknown tokens that are either split into subword units or replaced with special unknown-token markers [7]. This can lead to cascading errors in downstream tasks such as part-of-speech tagging, dependency parsing, and coreference resolution, and the result is that neopronouns are systematically misprocessed by standard NLP tools. Coreference resolution systems, which must determine whether two pronouns refer to the same entity, face particular difficulty with neopronouns because they lack training examples of these forms being resolved correctly [7].

The gender bias embedded in NLP training data has consequences for how neopronouns are handled by these systems, and Costa-jussà (2019) notes that machine translation systems frequently produce gender-biased translations that reflect the most common stereotypes [7]. For example, when translating from a gender-neutral language like Turkish to English, systems default to masculine pronouns for stereotypically male professions and feminine pronouns for stereotypically female professions, and neopronouns are rarely if ever produced as translation outputs [7]. This systemic bias means that even if speakers adopt neopronouns in their language production, NLP systems may fail to recognize or reproduce them, creating a feedback loop where neopronouns remain invisible in large-scale text processing. Addressing this challenge requires both





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debiasing training data and explicitly including neopronouns in NLP system development [7,8].

The implications of NLP bias for marginalized communities have been documented, and Costa-jussà (2019) argues that gender bias research in NLP must extend beyond occupational stereotypes and beyond English [7]. The extension of gender bias research to include LGBT+ individuals presents particular challenges because most NLP systems are built on binary gender models that cannot accommodate non-binary identities [7]. Sun et al. [8] similarly note that the current approach of "removing or hiding any sensitive attributes" may be insufficient, and they argue for more nuanced approaches that recognize the diversity of gender identities [8]. The development of NLP systems that can handle neopronouns is not merely a technical challenge but also an ethical imperative, as these systems increasingly mediate access to information, employment, and social participation.

### 7. Processing Neopronouns: Psycholinguistic Evidence

Psycholinguistic research has investigated how speakers process gender-neutral pronouns, and the findings challenge claims that these forms impose an unacceptable cognitive burden. Sanford and Filik [12] used eye-tracking to examine the processing of singular they, and while they found evidence for a number-mismatch effect in total reading times, this effect was rapidly resolved [12]. Crucially, the mismatch effect for plural pronouns following singular antecedents appeared differently from the mismatch effect for singular pronouns following plural antecedents: singular pronouns showed earlier sensitivity to number mismatches (with more regressions out and longer regression-path times), while plural pronouns showed mismatch effects only in total reading times [12]. This asymmetry suggests that plural pronouns are more tolerant of mismatches than singular pronouns, and it may help explain why singular they can be accommodated despite the apparent number conflict.

The processing of gender-neutral pronouns by non-native speakers has received particular attention, and Speyer and Schlee [13] conducted a self-paced reading study with 51 Austrian learners of English at B2, C1, and C2 proficiency levels [13]. Their results were compared with Foertsch and Gernsbacher's (1997) native speaker data, and they found that advanced non-native speakers matched native speakers in almost all respects [13]. For indefinite pronouns, singular they was read significantly faster than she or he, replicating the native speaker pattern, and for neutral antecedents, all three pronouns were processed with equal facility [13]. For stereotypically masculine antecedents, C1 speakers replicated the native pattern of showing slower reading times for she

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compared to he and they, while B2 and C2 speakers processed all pronouns equally [13]. This developmental pattern suggests that processing becomes more native-like as proficiency increases.

The acquisition of singular they by L2 learners provides insights into how neopronouns might be acquired more generally, and Speyer and Schlee [13] found that even learners who were not consciously aware of singular they as a gender-neutral pronoun processed it without difficulty in certain contexts [13]. For indefinite pronouns, even B2 learners who had limited knowledge of singular they showed a processing preference for they over he or she, suggesting that the inherent semantic plurality of indefinite pronouns facilitates the use of they [13]. This finding has important implications for neopronoun acquisition: it suggests that certain contexts may serve as "bridge" environments where novel pronominal forms can be introduced with minimal processing difficulty. The authors conclude that "singular they can be added to a learner's paradigm after its initial construction, despite the pronoun paradigm representing a closed class" [13].

The question of whether singular they and plural they represent the same lexical item or distinct homonyms has theoretical implications for understanding neopronoun processing. Paterson [5], as cited by Speyer and Schlee [13], argues that singular they and plural they may be stored as separate entries in the mental lexicon, differing in their  $\phi$ -feature specifications (+PLURAL vs. -PLURAL) while sharing morphological and phonological form [13]. This homonymy account suggests that acquiring singular they involves adding a new lexical entry rather than redefining an existing one, and it implies that neopronouns like xe/xem would similarly require new lexical entries. The processing evidence for distinct representations comes from the different patterns of mismatch effects observed for singular and plural pronouns: Sanford and Filik [12] found that singular pronouns showed earlier sensitivity to number mismatches than did plural pronouns, supporting the view that different processing procedures are involved [12].

Gender bias in language processing has been extensively documented, and Lindqvist, Renström, and Gustafsson Sendén [6] demonstrated that traditional neutral words contain a male bias, meaning they are implicitly associated with men [6]. Their experimental paradigm required participants to select photos of job candidates after reading descriptions that used different pronoun strategies, and the results showed that both paired forms (he/she) and actively created pronouns (hen, ze) eliminated the male bias, while neutral nouns like "the applicant" and singular they continued to be associated with men [6]. This finding is significant





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because it suggests that simply using existing words in gender-neutral contexts is insufficient to overcome the androcentric bias that pervades language comprehension, and it provides empirical support for the argument that actively created neopronouns may be more effective at achieving genuine gender neutrality [6].

### 8. Conclusions: The Trajectory of Neopronoun Adoption

The linguistic lifecycle of neopronouns can be understood as a multi-stage process that navigates structural, social, and institutional barriers, and the evidence reviewed in this paper suggests that successful adoption depends on factors operating at multiple levels. The structural barriers inherent in the closed-class nature of pronouns impose constraints on neopronoun form and function, and Heine and Song [1] demonstrate that personal pronouns arise from a limited pool of conceptual sources—primarily nominal concepts, spatial deixis, and intensifiers [1]. Neopronouns like *xe/xem* represent a departure from these sources because they are consciously invented rather than emerging through gradual grammaticalization, and this may account for some of the resistance they face [1]. However, the Swedish case demonstrates that conscious invention can be successful if the new forms fit well within the existing paradigm, and *hen*'s phonetic and orthographic similarity to *han* and *hon* facilitated its integration [3].

Social resistance to neopronouns is driven by both linguistic prescriptivism and gender ideology, and Bradley [2] demonstrates that these factors independently contribute to negative judgments of gender-neutral pronouns [2]. The finding that benevolent sexism—rather than hostile sexism—predicts resistance to singular *they* suggests that opposition is not primarily motivated by overt hostility but by essentialist conceptions of gender that treat binary categories as natural and immutable [2]. Gustafsson Sendén, Bäck, and Lindqvist [6] show that attitudes toward neopronouns normalize over time, and they found that time was one of the strongest predictors of attitude change even when controlling for other factors [3]. This normalization process is facilitated by institutional endorsement and increased exposure, and it suggests that initial resistance can be overcome through sustained usage and official recognition.

Institutional adaptation has played a crucial role in the adoption of gender-neutral language, and Paterson [5] documents the rise and fall of combined pronouns in relation to non-sexist language policy [5]. The institutional endorsement of combined pronouns by organizations such as the United Nations and Microsoft contributed to their increased frequency in the 1990s, but the subsequent decline suggests that top-down mandates

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alone cannot sustain usage if alternative forms prove more natural [5]. Stormbom [4] found that journal guidelines for gender-fair language were generally uncommon, and there was no immediate correspondence between policy and practice [4]. This disconnect between institutional policy and actual usage highlights the limitations of top-down language planning, and it suggests that successful language change requires alignment between institutional mandates and community practices.

The future trajectory of English neopronouns will depend on several factors, including their fit within the existing pronominal paradigm, the strength of community advocacy, institutional endorsement, and broader societal attitudes toward gender diversity. The Swedish *hen* provides a model of successful adoption that combines community activism, institutional support, and linguistic fit, but the English context differs in important ways [3,6]. English neopronouns must compete with singular *they*, which already serves many of the functions that neopronouns are proposed to fill, and the presence of this established alternative may limit the adoption of newer forms. However, Lindqvist, Renström, and Gustafsson Sendén [6] demonstrate that actively created pronouns have advantages over traditional neutral words in eliminating male bias, and this finding suggests that neopronouns may be more effective than singular *they* at achieving genuine gender neutrality [6]. Ultimately, the success of neopronouns will depend on their ability to meet the communicative needs of speakers who seek linguistic resources that accurately reflect their gender identities and challenge binary conceptions of gender.

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