

# Text Analysis Methods for Identifying and Recognizing Gender Bias, Inequality, and Violence in Language: An Overview

## Metode analize teksta za identifikaciju i prepoznavanje rodne pristranosti, nejednakosti i nasilja u jeziku: Pregled

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**Abstract.** *This paper provides an overview of text analysis methods used to identify and uncover gender bias, inequality and violence in language. By examining text analysis methods and techniques such as corpus linguistics, sentiment analysis, content analysis, discourse analysis, network analysis and machine translation, the study shows how these methods can uncover patterns and tendencies in texts that perpetuate gender bias, stereotypes and violence. The findings highlight the importance of using text analysis tools to promote gender equality and develop more inclusive language practices.*

**Keywords.** Gender bias, gender inequality, gender violence, text analysis methods

### 1 Introduction

Gender equality refers to the idea that people, regardless of their gender, should have the same rights, opportunities and access to resources (United Nations, 2020). This means that men and women, as well as nonbinary individuals, should have equal opportunities for education, employment, participation in the political process, healthcare, access to resources and other aspects of society (World Economic Forum, 2023). The concept of gender equality assumes that gender differences should not affect the rights and opportunities of individuals in society (European Commission, 2021). Gender equality is important to create a fairer and more inclusive society that enables everyone to reach their full potential (UN Women, 2019). There are various ways in which individuals and society as a whole can contribute to gender equality, including supporting gender equality in policy, eliminating

**Sažetak.** *U ovom radu dan je pregled metoda analize teksta koje se koriste za identificiranje i otkrivanje rodne pristranosti, nejednakosti i nasilja u jeziku. Korištenje metoda i tehnika analize teksta kao što su korpusna lingvistika, analiza sentimenta, analiza sadržaja, analiza diskursa, analiza mreža i strojno prevođenje, može otkriti obrasce i tendencije u tekstovima koje perpetuiraju rodnu pristranost, stereotipe i nasilje. Naglašava se važnost korištenja alata za analizu teksta za promicanje rodne jednakosti i razvoj inkluzivnijih jezičnih praksi.*

**Ključne riječi.** Rodna pristranost, rodna nejednakost, rodno nasilje, metode analize teksta

### 1 Uvod

Rodna jednakost odnosi se na ideju da bi ljudi, bez obzira na njihov spol, trebali imati ista prava, mogućnosti i pristup resursima (United Nations, 2020). To znači da bi muškarci i žene, kao i nebinarne osobe, trebali imati jednake mogućnosti za obrazovanje, zapošljavanje, sudjelovanje u političkom procesu, zdravstvenu skrb, pristup resursima i drugim aspektima društva (World Economic Forum, 2023). Koncept rodne jednakosti pretpostavlja da rodne razlike ne bi trebale utjecati na prava i mogućnosti pojedinaca u društvu (European Commission, 2021). Rodna jednakost je važna za stvaranje pravednijeg i inkluzivnijeg društva koje omogućuje svima da ostvare svoj puni potencijal (UN Women, 2019). Postoje različiti načini na koje pojedinci i društvo u cjelini mogu doprinijeti rodnoj jednakosti, uključujući podržavanje rodne jednakosti u politici, eliminiranje rodno uvjetovanih stereotipa

gender-based stereotypes and promoting and supporting women in leadership and decision-making positions (Kabeer, 2015).

Language is an important cultural factor that shapes our social norms and values (Lakoff, 2004). Gendered language can contribute to inequality and discrimination based on gender (Cameron, 2005). Analysing language from a gender equality perspective can help combat gender discrimination and inequality (Holmes, 2006). In many languages, including Croatian, there are gender-specific word forms that often reflect traditional gender roles and stereotypes. In Croatian, for example, the masculine gender is often used to describe jobs and professions such as "doctor" and "driver", while the feminine gender is used to describe care roles, such as "nurse" and "housewife".

Language analysis from an equality perspective is about recognizing and weakening such gender-specific word forms in order to achieve gender equality in language. In addition, language analysis can help to identify and eliminate gender-based stereotypes in the language (Mills, 1995). In the Croatian language, for example, the word "weak" is often used as a synonym for femininity, while the word "strong" is used as a synonym for masculinity. Such word usage can perpetuate and support traditional gender roles and stereotypes. Language analysis can help to identify these stereotypes and replace them with more neutral expressions that do not support gender-specific roles and stereotypes.

Analysing violence in texts from a gender equality perspective can also be useful in the fight against gender-based violence. Violence in language can manifest itself in various ways, including the use of words that insult and discriminate against individuals based on their gender (Kimmel, 2000). This type of analysis can help identify forms of violence that often occur silently, such as emotional and verbal abuse. For example, derogatory terms towards women are often used in certain text categories, and their use contributes to a culture of tolerance towards violence against women (European Parliament, 2018).

The main goal of this paper is to provide an overview of text analysis methods used to identify and recognize gender bias, inequality, and violence in language. By exploring different text analysis methods and their applications, this paper aims to highlight the importance of addressing gender issues in language and offer insights into the ways in which these methods can be used to promote gender equality and mitigate discrimination and violence.

The next section discusses the socio-economic context of gender equality in Croatia and Europe, highlighting relevant policy documents and initiatives to promote gender equality. The literature review section provides an overview of the main literature on the relationship between language and gender, including foundational works and recent

te promicanje i podržavanje žena na vodećim pozicijama (Kabeer, 2015).

Jezik je važan kulturni faktor koji oblikuje naše društvene norme i vrijednosti (Lakoff, 2004). Rodno obilježen jezik može pridonijeti nejednakosti i diskriminaciji na temelju spola (Cameron, 2005). Analiziranje jezika iz perspektive rodne jednakosti može pomoći u borbi protiv rodne diskriminacije i nejednakosti (Holmes, 2006). U mnogim jezicima, uključujući hrvatski, postoje rodno specifični oblici riječi koji često odražavaju tradicionalne rodne uloge i stereotipe. U hrvatskom jeziku, na primjer, muški rod se često koristi za opisivanje poslova i profesija kao što su "doktor" i "vozač", dok se ženski rod koristi za opisivanje uloga koje uključuju pružanje njege, kao što su "medicinska sestra" i "domaćica".

Analiza jezika iz perspektive jednakosti odnosi se na prepoznavanje i slabljenje takvih rodno specifičnih oblika riječi kako bi se postigla rodna jednakost u jeziku. Osim toga, analiza jezika može pomoći u identificiranju i eliminiranju rodno uvjetovanih stereotipa u jeziku (Mills, 1995). U hrvatskom jeziku, na primjer, riječ "slab" često se koristi kao sinonim za ženstvenost, dok se riječ "jak" koristi kao sinonim za muškost. Takva upotreba riječi može perpetuirati i podržavati tradicionalne rodne uloge i stereotipe. Analiza jezika može pomoći u prepoznavanju tih stereotipa i njihovoj zamjeni neutralnijim izrazima koji ne podržavaju rodno specifične uloge i stereotipe.

Analiziranje nasilja u tekstovima iz perspektive rodne jednakosti može također biti korisno u borbi protiv rodno uvjetovanog nasilja. Nasilje u jeziku može se manifestirati na različite načine, uključujući upotrebu riječi koje vrijeđaju i diskriminiraju pojedince na temelju njihovog spola (Kimmel, 2000). Ova vrsta analize može pomoći u prepoznavanju oblika nasilja koji se često događaju neprimjetno, poput emocionalnog i verbalnog zlostavljanja. Na primjer, pogrđni izrazi prema ženama često se koriste u određenim kategorijama tekstova, a njihova upotreba doprinosi kulturi tolerancije prema nasilju nad ženama (European Parliament, 2018).

Glavni cilj ovog rada je pružiti pregled metoda analize teksta koje se koriste za identificiranje i prepoznavanje rodne pristranosti, nejednakosti i nasilja u jeziku. Proučavanjem različitih metoda analize teksta i njihove primjene, ovaj rad ima za cilj istaknuti važnost rješavanja rodnih pitanja u jeziku te ponuditi uvide u načine na koje se te metode mogu koristiti za promicanje rodne jednakosti i smanjenje diskriminacije i nasilja.

U sljedećoj se sekciji raspravlja o društveno-ekonomskom kontekstu rodne jednakosti u Hrvatskoj i Europi, naglašavajući relevantne političke dokumente i inicijative za promicanje rodne jednakosti. Sekcija s pregledom literature pruža pregled glavne literature o odnosu između jezika i roda, uključujući temeljna djela i nedavne studije

studies that examine gender stereotypes, prejudice and violence in language. The next section introduces and explains different text analysis methods used to examine gender inequality, bias and violence in language. Each method is described with its applications, tools, examples and related research. Finally, the main findings are summarized, the importance of text analysis for the promotion of gender equality is highlighted and suggestions for future research and practical applications are made.

## 2 Socio-economic Framework

In Croatia, gender equality is regulated by law and there are a number of laws promoting gender equality in all areas of life. In practice, however, there are still numerous challenges and problems, such as discrimination against women in the labour market, underrepresentation of women in leadership positions and violence against women. For example, a survey "Women in Business" (Croatian Employers' Association & Deloitte, 2024) showed that women in Croatia still face discrimination in the labour market and are paid less than their male colleagues for the same work.

Although gender equality is recognized as a fundamental human right in Europe, there are significant differences between countries in the realization of this right. According to EU research, women are still paid less than men for the same work and are less represented in leadership positions. For example, according to the 2022 EU Gender Equality Report (European Commission, 2022), women in the EU earn on average 14.1% less than men; in EU national parliaments, women hold an average of 34% of seats, meaning they are underrepresented in politics; women make up only 29.6% of board members of large companies in the EU, and the number of women in leadership positions in companies has stagnated for years.

Similar problems exist in other countries around the world, regardless of the level of development and the social climate. Gender inequality is widespread in many areas and women are often neglected or discriminated against.

### 2.1 Relevant European and National Strategic Documents

At EU level, the EU Gender Equality Strategy (2020-2025) (European Commission, 2020) emphasises the importance of reducing gender inequalities and gender discrimination in all areas of society, including language. This strategy places particular emphasis on the need to ensure equal participation of women and men in education and research. In addition, The Action Plan for Gender Equality under the European Social Fund for the period 2021-2027

koje ispituju rodne stereotipe, predrasude i nasilje u jeziku. Zatim slijedi sekcija koja uvodi i objašnjava različite metode analize teksta koje se koriste za ispitivanje rodne nejednakosti, pristranosti i nasilja u jeziku. Svaka metoda je opisana sa svojim primjenama, alatima, primjerima i relevantnim povezanim istraživanjima. Na kraju su u zaključku sažeti glavni nalazi, istaknuta je važnost analize teksta za promicanje rodne jednakosti te su dane sugestije za buduća istraživanja i praktične primjene.

## 2 Društveno-ekonomski okvir

U Hrvatskoj je rodna jednakost regulirana zakonom i postoji niz zakona koji promiču rodnu jednakost u svim područjima života. U praksi, međutim, još uvijek postoje brojni izazovi i problemi, poput diskriminacije žena na tržištu rada, nedovoljne zastupljenosti žena na rukovodećim pozicijama i nasilja nad ženama. Na primjer, istraživanje "Women in Business" (Croatian Employers' Association & Deloitte, 2024) pokazalo je da se žene u Hrvatskoj još uvijek suočavaju s diskriminacijom na tržištu rada i da su manje plaćene od svojih muških kolega za isti posao.

Iako je rodna jednakost prepoznata kao temeljno ljudsko pravo u Europi, postoje značajne razlike među zemljama u ostvarivanju ovog prava. Prema istraživanjima EU, žene su i dalje manje plaćene od muškaraca za isti posao i manje su zastupljene na rukovodećim pozicijama. Na primjer, prema istraživanju iz 2022. koje je opisano u EU Gender Equality Report (European Commission, 2022), žene u EU zarađuju u prosjeku 14,1% manje od muškaraca; u EU nacionalnim parlamentima žene drže prosječno 34% mjesta, što znači da su nedovoljno zastupljene u politici; žene čine samo 29,6% članova upravnih odbora velikih tvrtki u EU, a broj žena na rukovodećim pozicijama u tvrtkama stagnira godinama.

Slični problemi postoje i u drugim zemljama svijeta, bez obzira na razinu razvoja i društvenu klimu. Rodna nejednakost je raširena u mnogim područjima i žene su često zanemarene ili diskriminirane.

### 2.1 Relevantni europski i nacionalni strateški dokumenti

Na razini EU, EU Gender Equality Strategy (2020-2025) (European Commission, 2020) naglašava važnost smanjenja rodni nejednakosti i rodne diskriminacije u svim područjima društva, uključujući jezik. Ova strategija stavlja poseban naglasak na potrebu osiguravanja ravnopravnog sudjelovanja žena i muškaraca u obrazovanju i istraživanju. Zatim, Action Plan for Gender Equality under the European Social Fund za razdoblje 2021-2027 (European Commission, 2021) ima za cilj

(European Commission, 2021), aims to ensure greater gender equality in the labour market and in society in general.

At the national level, Croatia has a National Strategy for Gender Equality for the period 2023-2027 (Government of Croatia, 2023), which aims to improve gender equality in all areas of society, including education and research. Analysing language with the aim of identifying sexist and gender-specific language and creating guidelines for the use of gender-sensitive language in academic and scientific communication can contribute to these strategies. It also supports the National Curriculum Reform Strategy for Education for the period 2022-2027 (Government of Croatia, 2022), which focuses on creating an inclusive and gender-sensitive education system.

The University of Rijeka has adopted a Gender Equality Plan 2021-2025 (University of Rijeka, 2021), which aims to promote gender equality at the university. The plan consists of a series of activities and measures aimed at various areas, including the introduction of gender-sensitive language in everyday language use at the university, the promotion of research in the field of gender equality and the integration of a gender perspective into teaching programmes, as well as the promotion of gender equality and the prevention of gender-based violence among students and university staff.

### 3 Literature Review

Text analysis is used in numerous applications, often in combination with machine learning and deep learning techniques. These combinations have led to significant advances in areas such as emotion recognition and mental health, as recent studies show. For example, the work (Jonnalagadda et al., 2023) shows how machine learning can be used effectively to assess emotional states from text. Similarly, the study (Rustagi et al., 2022) explores the use of deep learning methods to improve the detection of sarcasm in online reviews by incorporating contextual cues such as emojis and ratings.

When it comes to analysing texts and language in the context of gender equality, there are numerous studies that show how language can be a powerful tool to perpetuate existing gender stereotypes and inequalities.

Key publications in the field of language and gender equality research include: "Language and Woman's Place" by Robin Lakoff (1973). This book is considered one of the most influential publications on the relationship between language and gender. Lakoff argues that there are certain language patterns that contribute to the unequal position of women in society. "Language and Gender: An Introduction" by Mary Talbot (1998) is a book that provides a detailed

osigurati veću rodnu ravnopravnost na tržištu rada i u društvu općenito.

Na nacionalnoj razini, Hrvatska ima Nacionalnu strategiju za ravnopravnost spolova za razdoblje 2023-2027 (Government of Croatia, 2023), koja ima za cilj poboljšati rodnu ravnopravnost u svim područjima društva, uključujući obrazovanje i istraživanje. Analiza jezika s ciljem identificiranja seksističkog i rodno specifičnog jezika te stvaranja smjernica za upotrebu rodno osjetljivog jezika u akademskoj i znanstvenoj komunikaciji može doprinijeti ovim strategijama. Također podržava Strategiju kurikularne reforme za obrazovanje za razdoblje 2022-2027 (Government of Croatia, 2022), koja se fokusira na stvaranje uključivog i rodno osjetljivog obrazovnog sustava.

Sveučilište u Rijeci usvojilo je Plan rodne ravnopravnosti 2021-2025 (University of Rijeka, 2021), koji ima za cilj promicanje rodne ravnopravnosti na sveučilištu. Plan se sastoji od niza aktivnosti i mjera usmjerenih na različita područja, uključujući uvođenje rodno osjetljivog jezika u svakodnevnu upotrebu na sveučilištu, promicanje istraživanja u području rodne ravnopravnosti i integraciju rodne perspektive u nastavne programe, kao i promicanje rodne ravnopravnosti i sprječavanje rodno uvjetovanog nasilja među studentima i osobljem sveučilišta.

### 3 Pregled literature

Analiza teksta koristi se u brojnim aplikacijama, često u kombinaciji sa strojnim učenjem i tehnikama dubokog učenja. Ove su kombinacije dovele do značajnog napretka u područjima kao što su prepoznavanje emocija i mentalnog zdravlja, što pokazuju nedavne studije. Na primjer, rad (Jonnalagadda et al., 2023.) pokazuje kako se strojno učenje može učinkovito koristiti za procjenu emocionalnih stanja iz teksta. Slično tome, studija (Rustagi et al., 2022.) istražuje upotrebu metoda dubinskog učenja za poboljšanje otkrivanja sarkazma u online recenzijama uključivanjem kontekstualnih znakova kao što su emoji i ocjene.

Kada je riječ o analizi tekstova i jezika u kontekstu rodne jednakosti, postoji mnoštvo studija koje pokazuju da jezik može biti moćan alat za perpetuiranje postojećih rodni stereotipa i nejednakosti.

Ključne publikacije u području istraživanja jezika i rodne jednakosti uključuju knjigu "Language and Woman's Place" Robin Lakoff (1973). Ova knjiga smatra se jednom od najutjecajnijih publikacija o odnosu između jezika i roda. Lakoff tvrdi da postoje određeni jezični obrasci koji doprinose nejednakom položaju žena u društvu. "Language and Gender: An Introduction" Mary Talbot (1998) je knjiga koja pruža detaljan pregled odnosa između jezika i roda, uključujući pregled različitih teoretskih perspektiva i

overview of the relationship between language and gender, including an overview of different theoretical perspectives and examples from research. In the book "Language and Sexism" by Sara Mills (2008), the author examines various examples of sexism in language, including an analysis of the differences in the use of feminine and masculine words and the stereotypical roles associated with gender. "The Gendering of Language: A Comparison of Gender Equality in Countries with Gendered, Natural Gender, and Genderless Languages" by Jennifer L. et. al (2012) is a study that compares the level of gender equality in countries with gendered and genderless languages. The collection of essays "The Handbook of Language, Gender, and Sexuality" by Susan Ehrlich and colleagues (2014) provides an interdisciplinary overview of language and gender studies with a focus on sexuality and queer theory. The authors cover topics such as linguistic identities, gender, sexuality and language policies. The book "Language and Gender: An Advanced Resource Book" by Jane Sunderland (2006) provides an overview of the most important topics in language and gender studies, including the analysis of gender stereotypes, linguistic variation and gender identities. The author emphasizes the importance of a critical understanding of language and gender in today's society. "Doing Gender in Media, Art and Culture" by Rosemarie Buikema, Liedeke Plate, Kathrin Thiele (2018) is a book that provides an overview of the role of language in the construction of gender in media, art and culture, with a particular focus on critically analyzing and reflecting on the role of women and LGBTQ (lesbian, gay, bisexual, transgender, queer) individuals. The paper "Introduction to Gender in Language Education" by Widodo and Elyas (2020) introduces approaches and strategies for incorporating gender issues into language education. The authors emphasize the importance of including gender equality in language education, arguing that this contributes to the development of various critical language skills and improves social justice and equality.

In addition, there are numerous studies that point to the presence of gendered language stereotypes and stereotypes in relation to job roles and job advertisements. Some of these studies are: "An Exploratory Study on Linguistic Gender Stereotypes and their Effects on Perception" by Mattias Lindvall-Östling, et. al (2020), which examines linguistic gender stereotypes and their effects on people's perceptions. The results point to the existence of certain linguistic stereotypes that affect how people perceive social situations and the potential negative impact of these stereotypes on gender equality. Milica Mihaljević (2021) analyses the use of male and female gender in the Croatian language and highlights stereotypes and prejudices that are conveyed and perpetuated through language. The author highlights the problem of discrimination and

primjere istraživanja. U knjizi "Language and Sexism" Sara Mills (2008), autorica istražuje različite primjere seksizma u jeziku, uključujući analizu razlika u upotrebi ženskih i muških riječi i stereotipne uloge povezane s rodom. "The Gendering of Language: A Comparison of Gender Equality in Countries with Gendered, Natural Gender, and Genderless Languages" Jennifer L. i sur. (2012) je studija koja uspoređuje razinu rodne jednakosti u zemljama s rodnim i bezrodnim jezicima. Zbirka eseja "The Handbook of Language, Gender, and Sexuality" Susan Ehrlich i sur. (2014) pruža interdisciplinarni pregled studija jezika i roda s fokusom na seksualnost i „teoriju neobičnosti“ (eng. queer theory). Autori pokrivaju teme poput jezičnih identiteta, roda, seksualnosti i jezičnih politika. Knjiga "Language and Gender: An Advanced Resource Book" Jane Sunderland (2006) pruža pregled najvažnijih tema u studijama jezika i roda, uključujući analizu rodnih stereotipa, jezičnu varijaciju i rodne identitete. Autorica naglašava važnost kritičkog razumijevanja jezika i roda u današnjem društvu. "Doing Gender in Media, Art and Culture" Rosemarie Buikema, Liedeke Plate i Kathrin Thiele (2018) je knjiga koja pruža pregled uloge jezika u konstrukciji roda u medijima, umjetnosti i kulturi, s posebnim fokusom na kritičku analizu i refleksiju uloge žena i LGBTQ (lezbijskih, gej, biseksualnih, transrodnih, queer) osoba. Rad "Introduction to Gender in Language Education" Widodo i Elyas (2020) pruža uvod u pristupe i strategije za uključivanje rodnih pitanja u obrazovanje jezika. Autori naglašavaju važnost uključivanja rodne jednakosti u učenje jezika, tvrdeći da to doprinosi razvoju različitih kritičkih jezičnih vještina i poboljšava socijalnu pravdu i jednakost.

Osim toga, postoje brojna istraživanja koja upućuju na prisutnost rodnih jezičnih stereotipa i stereotipa u vezi s radnim ulogama i oglasima za posao. Neka od tih istraživanja su: "An Exploratory Study on Linguistic Gender Stereotypes and their Effects on Perception" Mattias Lindvall-Östlinga i sur. (2020), koje proučava jezične rodne stereotipe i njihove učinke na percepciju ljudi. Rezultati ukazuju na postojanje određenih jezičnih stereotipa koji utječu na to kako ljudi percipiraju socijalne situacije i potencijalni negativni utjecaj tih stereotipa na rodnu jednakost. "Muško i žensko u hrvatskome jeziku i leksikografiji – stereotipi i jezična diskriminacija" Milice Mihaljević (2021) je djelo koje analizira upotrebu muškog i ženskog roda u hrvatskom jeziku i ističe stereotipe i predrasude koje se prenose i perpetuiraju kroz jezik. Autorica ističe problem diskriminacije i nejednakosti koja se odražava u jeziku i poziva na promjene u jezičnom izrazu kako bi se postigla rodna jednakost. U članku "Gender Stereotypes and Their Impact on Women's Career Progressions from a Managerial Perspective" Tabassuma i Nayaka (2021), autori tvrde da su rodni stereotipi prisutni u današnjem društvu i da utječu na

inequality reflected in language and calls for changes in linguistic expression in order to achieve gender equality. In the article "Gender Stereotypes and Their Impact on Women's Career Progressions from a Managerial Perspective" by Tabassum and Nayak (2021), the authors argue that gender stereotypes are present in today's society and influence women's career progression from a managerial perspective. They propose the development of a gender-neutral and affirmative managerial perspective based on critical gender theory. The study "Gender Stereotypes and Peer Selection in STEM Domains Among Children and Adolescents" by Luke McGuire et al. (2022) examines how gender stereotypes influence peer selection in STEM fields among children and adolescents and how these patterns can be changed.

The study "Gender Stereotyping in Newspaper Advertisements: A Cross-Cultural Study" by Tartaglia and Rollero (2015) examined the presence of gender stereotypes in relation to occupations and sexualization in newspaper advertisements in two European countries that differ in terms of language, cultural values and gender equality - Italy and the Netherlands. The results showed that men were most often portrayed in professional roles, while women were more often depicted as decorative objects. Compared to men, female roles were also more sexualized, and this phenomenon was particularly pronounced in Italy. The paper "Balancing Gender Bias in Job Advertisements with Text-Level Bias Mitigation" by Shenggang Hu et al. (2022) examines the problem of gender bias in job advertisements, which can selectively attract applicants of a particular gender and reinforce gender segregation in the labour market. The authors propose an algorithm that assesses gender bias in job advertisements and provides guidance on how the text should be modified to eliminate gender bias and discrimination. This method has potential applications in the field of human resources, including the development of job advertisements and the screening of job applications using algorithms.

There are also studies that address the issue of gendered language and bias in translation, such as: "Gender Bias in Machine Translation" by Beatrice Savoldi et al. (2021). This study provides a critical review of the current literature on gender bias in machine translation, including the conceptualization of bias, previous analyses, and proposed strategies for mitigation. The authors also suggest possible directions for future research in this area.

Due to the increasing popularity of natural language processing (NLP) and machine learning (ML) tools, it is becoming increasingly important to recognise their role in the formation of social biases and stereotypes. Below are examples of research applying artificial intelligence algorithms in natural language processing to improve gender equality and mitigate gender bias in language. "Mitigating Gender

napredovanje žena u karijeri iz menadžerske perspektive. Predlažu razvoj rodno neutralne i afirmativne menadžerske perspektive koja se temelji na kritičkoj rodnoj teoriji. Studija "Gender Stereotypes and Peer Selection in STEM Domains Among Children and Adolescents" Lukea McGuirea i sur. (2022) proučava kako rodni stereotipi utječu na odabir vršnjaka u STEM područjima među djecom i adolescentima te kako se ti obrasci mogu promijeniti.

Studija "Gender Stereotyping in Newspaper Advertisements: A Cross-Cultural Study" Tartaglia i Rollero (2015) ispitala je prisutnost rodnih stereotipa u vezi sa zanimanjima i seksualizacijom u oglasima u novinama u dvjema europskim zemljama koje se razlikuju u pogledu jezika, kulturnih vrijednosti i rodne jednakosti - Italiji i Nizozemskoj. Rezultati su pokazali da su muškarci najčešće prikazivani u profesionalnim ulogama, dok su žene češće prikazivane kao dekorativni objekti. U usporedbi s muškarcima, ženske uloge bile su također više seksualizirane, a ovaj fenomen bio je posebno izražen u Italiji. Rad "Balancing Gender Bias in Job Advertisements with Text-Level Bias Mitigation" Shenggang Hua i sur. (2022) istražuje problem rodne pristranosti u oglasima za posao, koja može selektivno privući kandidate određenog spola i ojačati rodnu segregaciju na tržištu rada. Autori predlažu algoritam koji procjenjuje rodnu pristranost u oglasima za posao i pruža smjernice o tome kako bi tekst trebao biti izmijenjen kako bi se uklonila rodna pristranost i diskriminacija. Ova metoda ima potencijalne primjene u području ljudskih resursa, uključujući razvoj oglasa za posao i pregled prijava za posao koristeći algoritme.

Također postoje studije koje se bave problemom rodno specifičnog jezika i pristranosti u prevođenju, poput: "Gender Bias in Machine Translation" Beatrice Savoldi i sur. (2021). Ova studija pruža kritički pregled trenutne literature o rodnoj pristranosti u strojnom prevođenju, uključujući konceptualizaciju pristranosti, prethodne analize i predložene strategije za ublažavanje. Autori također sugeriraju moguće smjernice za buduća istraživanja u ovom području.

S obzirom na sve veću popularnost alata za obradu prirodnog jezika (NLP) i strojnog učenja (ML), sve je važnije prepoznati njihovu ulogu u oblikovanju društvenih pristranosti i stereotipa. Ispod su primjeri istraživanja koja primjenjuju algoritme umjetne inteligencije u obradi prirodnog jezika kako bi poboljšala rodnu jednakost i ublažila rodnu pristranost u jeziku. "Mitigating Gender Bias in Natural Language Processing: Literature Review" Sun i sur. (2019) je rad koji pregledava trenutne studije koje se bave identificiranjem i ublažavanjem rodne pristranosti u NLP-u, uzimajući u obzir oblike pristranosti zbog rodne nejednakosti i analizirajući metode za identificiranje i ublažavanje rodne pristranosti, kao i moguće smjernice za buduća istraživanja u ovom području. Istraživački rad

Bias in Natural Language Processing: Literature Review" by Sun et al. (2019) is a paper that reviews current studies that address the identification and mitigation of gender bias in NLP, considering forms of bias due to gender inequality and analysing methods for identifying and mitigating gender bias, as well as potential guidelines for future research in this area. The research paper "Gender Bias in Coreference Resolution: Evaluation and Debiasing Methods" by Jieyu Zhao et al. (2018) presents a method for evaluating gender bias in coreference systems and develops techniques for reducing such bias.

In addition to traditional methods, the emergence of generative artificial intelligence is changing the landscape of text and language analysis. Large-scale language models such as GPT-3 and its successors have been trained with human feedback to detect and mitigate biases. For example, Ouyang et al. (2022) describe how models such as InstructGPT utilize user feedback to compensate for gender bias and prevent the prevalence of violence in generated text. Similarly, Dobša (2023) demonstrates how ChatGPT, based on the GPT-4 model, exhibits both human-like reasoning and distinctive AI behavior, highlighting the nuanced capabilities and limitations of these models. These advances represent an important addition to the more traditional text analysis techniques discussed previously and emphasize the importance of incorporating modern AI methods into our understanding of language-related inequalities.

All of the above research and papers demonstrate the importance of working towards gender equality in different areas of society, including text and language analysis. Such research is of great importance because it highlights problems and inadequacies in the way gender identity is discussed in the media and in language in general. Furthermore, this research can contribute to the development of tools and algorithms that help to identify and mitigate gender discrimination, bias and violence in texts.

## 4 Text Analysis Methods

Text analysis has proven to be a powerful tool for examining social issues, including gender inequality and violence in language. By analysing texts, patterns, tendencies and prejudices that are not immediately apparent can be uncovered. It also allows large volumes of texts to be analysed quickly. This section introduces the main methods of text analysis for the study of gender inequality, bias and violence in language and presents their applications, tools, examples and related research.

"Gender Bias in Coreference Resolution: Evaluation and Debiasing Methods" Jieyu Zhao i sur. (2018) predstavlja metodu za evaluaciju rodne pristranosti u sustavima za koreferenciranje i razvija tehnike za smanjenje takve pristranosti.

Uz tradicionalne metode, pojava generativne umjetne inteligencije mijenja područje analize teksta i jezika. Jezični modeli velikih razmjera kao što je GPT-3 i njegovi nasljednici trenirani su s ljudskim povratnim informacijama za otkrivanje i ublažavanje pristranosti. Na primjer, Ouyang i sur. (2022) opisuju kako modeli poput InstructGPT koriste povratne informacije korisnika kako bi kompenzirali rodnu pristranost i spriječili prevalenciju nasilja u generiranom tekstu. Slično tome, Dobša (2023) pokazuje kako ChatGPT, temeljen na GPT-4 modelu, pokazuje i ljudsko razmišljanje i karakteristično ponašanje umjetne inteligencije, ističući nijansirane mogućnosti i ograničenja ovih modela. Ovaj napredak predstavlja važan dodatak tradicionalnijim tehnikama analize teksta o kojima smo prethodno govorili i naglašava važnost uključivanja modernih metoda umjetne inteligencije u naše razumijevanje nejednakosti povezanih s jezikom.

Sva navedena istraživanja i radovi pokazuju važnost rada na rodnoj jednakosti u različitim područjima društva, uključujući analizu teksta i jezika. Takva istraživanja su od velike važnosti jer ističu probleme i neadekvatnosti u načinu na koji se o rodnom identitetu raspravlja u medijima i jeziku općenito. Nadalje, takva istraživanja mogu doprinijeti i razvoju alata i algoritama koji pomažu u identifikaciji i ublažavanju rodne diskriminacije, pristranosti i nasilja u tekstovima.

## 4 Metode analize teksta

Analiza teksta pokazala se kao moćan alat za ispitivanje socijalnih problema, uključujući rodnu nejednakost i nasilje u jeziku. Analizom tekstova mogu se otkriti obrasci, tendencije i predrasude koje nisu očite na prvi pogled. Također, korištenje alata za analizu tekstova omogućava se brzo analiziranje velikih količina teksta. Ova sekcija uvodi glavne metode analize teksta za proučavanje rodne nejednakosti, pristranosti i nasilja u jeziku te prikazuje njihove primjene, alate, primjere i povezana istraživanja.

### 4.1 Korpusna lingvistika

Korpusna lingvistika uključuje proučavanje jezika koristeći velike zbirke tekstova poznate kao korpusi. Korpusi se mogu analizirati kako bi se identificirali obrasci i trendovi u upotrebi jezika (McEnery i Hardie, 2011).

Korpusna lingvistika koristi tehnike kao što su analiza konkordanci i analiza ključnih riječi kako bi

## 4.1 Corpus Linguistics

Corpus linguistics involves the study of language using large collections of texts known as corpora. These corpora can be analysed to identify patterns and trends in language use (McEnery & Hardie, 2011).

Corpus linguistics uses techniques such as concordance analysis and keyword analysis to identify patterns in language use in relation to gender-specific terms and violence. For example, corpus linguistics can be used to study gender bias by analysing the frequency and context of gendered pronouns, terms and titles. Researchers could also investigate shifts in language use from "chairman" to "chairperson" or from "fireman" to "firefighter". In addition, corpus linguistics can be used to examine the occurrence and context of words related to violence such as "abuse", "assault" and "victim", particularly in court transcripts and media reports. Researchers could also compile a corpus of newspaper articles from different time periods and analyse the frequency and context of gendered terms to determine changes in societal attitudes toward gender neutrality. Or a corpus of court transcripts can be analysed to examine the language used to describe victims and perpetrators of domestic violence and to identify differences in representation by gender.

For this purpose, AntConc (Anthony, 2024) - a free corpus analysis toolkit for concordance and text analysis or Sketch Engine (Kilgarriff et al., 2014) - a tool for building and analysing corpora - can be used.

Relevant research in this area includes the work of Santoniccolo et al. (2023) and Davis, Mavisakalyan & Weber (2022).

## 4.2 Sentiment Analysis

Sentiment analysis or opinion analysis is about determining the emotional tone behind words. It can reveal the attitudes, opinions and emotions expressed in texts (Liu, 2012).

It uses machine learning algorithms, such as logistic regression or neural networks, to determine the emotional tone of texts. This process can uncover biases in public sentiment towards gender-specific topics. Real-time applications could include analysing social media sentiment during major events, such as protests for gender equality, so that researchers can capture immediate public reactions.

Sentiment analysis can also reveal negative sentiments in texts that could indicate hostility or aggression, especially towards a particular gender. It can also compare the sentiment scores of texts written by or about different genders to reveal potential inequalities. For example, sentiment analysis can be applied to a large dataset of tweets to assess public sentiment towards female political candidates compared to their male counterparts to

se identificirali obrasci u korištenju jezika u odnosu na rodno specifične izraze i nasilje. Na primjer, korpusna lingvistika može se koristiti za proučavanje rodne pristranosti analizom učestalosti i konteksta rodni zamjenica, pojmova i naslova. Istraživači bi također mogli istražiti promjene u upotrebi izraza "chairman" sa "chairperson" ili "fireman" s "firefighter". Osim toga, korpusna lingvistika može se koristiti za ispitivanje pojavljivanja i konteksta riječi vezanih uz nasilje kao što su "abuse", "assault" i "victim", posebno u zapisima sa suđenja i medijskim izvještajima. Istraživači bi također mogli sastaviti korpus novinskih članaka iz različitih vremenskih razdoblja i analizirati učestalost i kontekst rodni termina kako bi odredili promjene u društvenim stavovima prema rodnoj neutralnosti. Ili, korpus zapisa sa suđenja koji se može analizirati kako bi se ispitao jezik koji se koristi za opisivanje žrtava i počinitelja obiteljskog nasilja i identificirali razlike u prikazu prema rodu.

Za ovu svrhu mogu se koristiti alati poput AntConc (Anthony, 2024) - besplatni alat za analizu korpusa za konkordanciju i analizu teksta ili Sketch Engine (Kilgarriff i sur. 2014) - alat za izgradnju i analizu korpusa.

Relevantna istraživanja u ovom području uključuju radove Santoniccolo et al. (2023) i Davis, Mavisakalyan i Weber (2022).

## 4.2 Analiza sentimenta

Analiza sentimenta ili analiza mišljenja odnosi se na određivanje emocionalnog tona iza riječi. Može otkriti stavove, mišljenja i emocije izražene u tekstovima (Liu, 2012).

Koristi algoritme strojnog učenja, poput logističke regresije ili neuronskih mreža, za određivanje emocionalnog tona tekstova. Na taj se način mogu otkriti predrasude u stavovima javnosti prema rodno specifičnim temama. Aplikacije u stvarnom vremenu mogu uključivati analizu raspoloženja na društvenim mrežama tijekom velikih događaja, kao što su prosvjedi za ravnopravnost spolova, tako da istraživači mogu prikupiti trenutne reakcije javnosti.

Analizom sentimenta mogu se također otkriti negativni osjećaji u tekstovima koji bi mogli ukazivati na neprijateljstvo ili agresiju, posebno prema određenom spolu. Također, mogu se usporediti rezultati sentimenta tekstova koje su napisali autori različitih spolova ili u kojima se piše o likovima različitih spolova kako bi se otkrile moguće nejednakosti. Na primjer, analiza sentimenta može se primijeniti na veliki skup podataka s tvitovima kako bi se procijenio javni sentiment prema ženama političkim kandidatkinjama u usporedbi s njihovim muškim kolegama i kako bi se na taj način otkrila potencijalna rodna pristranost. Analiza sentimenta se može također koristiti za analizu komentara na mrežnim forumima ili u



uncover potential gender bias. It can also be used to analyse comments in online forums or news articles to identify and quantify hostile or supportive sentiments towards victims of gender-based violence.

Tools that can be used for this purpose include: VADER (Valence Aware Dictionary and sEntiment Reasoner) (Hutto & Gilbert, 2014) - a lexicon and rule-based sentiment analysis tool and TextBlob (Loria, 2018) - a Python library for processing text data.

Research in this area includes the work of Thelwall (2018) and Davidson et al. (2017).

### 4.3 Content Analysis

Content analysis is a method for systematically coding and categorising texts in order to identify themes and patterns (Kleinheksel et al., 2020).

Content analysis can be used for thematic analysis to identify recurring themes related to gender inequality, such as stereotypes, discrimination and power dynamics. It can also analyse the representation and frequency of violent acts in various texts, including media and literature. For example, researchers could conduct a content analysis of television programmes to identify recurring themes of gender stereotypes, such as the portrayal of women primarily in caregiving roles or of men as authority figures. Similarly, novels or films can be examined for themes of violence against women to identify the frequency and context of such violence.

NVivo (Jackson & Bazeley, 2019) – a qualitative data analysis (QDA) software or QDA Miner (Provalis Research, 2021) - a tool for coding and analysing textual data can be used for this purpose.

Relevant research in this area includes works by Dines and Humez (2003) and Organization for Security and Co-operation in Europe [OSCE] (2023).

### 4.4 Discourse Analysis

Discourse analysis focuses on how language is used in texts and contexts and examines the social and cultural contexts that influence language use (Gee, 2014).

Discourse analysis can examine how language reflects and maintains power relations between genders. It can also analyse the narratives and language structures that contribute to gender inequality and the normalisation of violence. Techniques include analyzing the structure and function of political speeches or news articles to reveal biases in reporting on gender and violence. Researchers can analyse political speech to determine how language reflects and perpetuates power dynamics between genders. Similarly, news articles can be examined to understand how the media reports incidents of domestic violence and to

novinskim člancima kako bi se identificirali i kvantificirali neprijateljski ili podržavajući sentiment prema žrtvama nasilja temeljenog na rodu.

Alati koji se mogu koristiti u tu svrhu uključuju: VADER (Valence Aware Dictionary and sEntiment Reasoner) (Hutto & Gilbert, 2014) - leksikon i alat za analizu sentimenta temeljen na pravilima i TextBlob (Loria, 2018) - Python biblioteka za obradu tekstualnih podataka.

Istraživanja u ovom području uključuju radove Thelwall (2018) i Davidson i sur. (2017).

### 4.3 Analiza sadržaja

Analiza sadržaja je metoda sustavnog kodiranja i kategoriziranja tekstova s ciljem identifikacije tema i obrazaca (Kleinheksel et al., 2020).

Analiza sadržaja može se koristiti za tematsku analizu kako bi se identificirale ponavljajuće teme povezane s rodnom nejednakošću, kao što su stereotipi, diskriminacija i dinamika moći. Također mogu se analizirati prikaz i učestalost nasilnih činova u različitim tekstovima, uključujući medije i književnost. Na primjer, istraživači bi mogli provesti analizu sadržaja televizijskih programa kako bi identificirali ponavljajuće teme rodnih stereotipa, kao što je prikaz žena prvenstveno u ulogama njege ili muškaraca kao autoritativnih figura. Slično tome, romani ili filmovi mogu se ispitati zbog tema nasilja nad ženama kako bi se identificirala učestalost i kontekst takvog nasilja.

NVivo (Jackson & Bazeley, 2019) - softver za kvalitativnu analizu podataka (QDA) ili QDA Miner (Provalis Research, 2021) - alat za kodiranje i analizu tekstualnih podataka mogu se koristiti u te svrhe.

Relevantna istraživanja u ovom području uključuju radove Dines i Humez (2003) i Organization for Security and Co-operation in Europe [OSCE] (2023).

### 4.4 Analiza diskursa

Analiza diskursa usredotočuje se na analizu korištenja jezika u tekstovima i kontekstima te ispituje socijalne i kulturne kontekste koji utječu na upotrebu jezika (Gee, 2014).

Analiza diskursa može ispitati kako jezik odražava i održava odnose moći između spolova. Također može analizirati narative i jezične strukture koje doprinose rodnoj nejednakosti i normalizaciji nasilja. Tehnike uključuju analizu strukture i funkcije političkih govora ili novinskih članaka kako bi se otkrile pristranosti u izvještavanju o rodu i nasilju. Istraživači mogu analizirati političke govore kako bi utvrdili na koji način jezik odražava i perpetuira dinamiku moći između spolova. Slično tome, novinski članci mogu se ispitati kako bi se razumjelo kako mediji izvještavaju o incidentima obiteljskog nasilja i identificirali bilo kakvu

identify any biases in the language used. They can also analyse newspaper reports of rape cases, examining the language used to describe the victim and the accused and identifying patterns that indicate societal attitudes towards gender and violence.

Tools that may be useful in this area include Atlas.ti (ATLAS.ti Scientific Software Development GmbH, 2024) - a qualitative data analysis software, MAXQDA (VERBI Software, 2024) - a qualitative and mixed methods research software or Linguistic Inquiry and Word Count (LIWC) (Boyd, Ashokkumar, Seraj, & Pennebaker, 2022) - a text analysis software that counts words in psychologically meaningful categories.

Relevant research includes work by Cuklanz (2019), Zubrzycka-Czarnecka (2021) and Wodak (2015).

#### 4.5 Network Analysis

Network analysis examines the relationships between entities in a text, such as characters in a story or people in social media interactions (Scott, 2017).

Network analysis can examine social networks and interactions depicted in texts to understand gender dynamics and instances of violence. It can also map the influence and power structures in texts to see how gender roles and violence are portrayed. Researchers can conduct a network analysis of novels to map the interactions between male and female characters to uncover the gender dynamics and power structures within the narrative. They can also analyse social media interactions to understand how information about gender violence spreads and identify key influencers.

Relevant tools in this area include Gephi (Bastian, Heymann, & Jacomy, 2009) – an open-source network analysis and visualisation software and NodeXL (Smith & Starke, 2019) - an Excel plugin for network analysis.

Relevant research in this field includes the work of Leone, Lapucci, De Sario and colleagues (2019) and Sánchez-Rodríguez, Moreno-Bella and García-Sánchez (2023).

#### 4.6 Machine Translation

In machine translation, software is used to automatically translate text or speech from one language into another. Computational linguistics and artificial intelligence are used to perform these translations (Hutchins & Somers, 1992).

Gender bias in translation includes the study of how gender biases that are present in a language may be maintained or altered in translation. Machine translation systems may inadvertently introduce or reinforce gender biases that are present in the source language or training data. It is also important to recognise where gender-neutral words in the source language may be translated into gender-specific

pristranosti u korištenom jeziku. Također mogu analizirati novinske izvještaje o slučajevima silovanja, ispitujući jezik korišten za opisivanje žrtve i optuženika te identificirati obrasce koji ukazuju na društvene stavove prema rodu i nasilju.

Alati koji mogu biti korisni u ovom području uključuju Atlas.ti (ATLAS.ti Scientific Software Development GmbH, 2024) - softver za kvalitativnu analizu podataka, MAXQDA (VERBI Software, 2024) - softver za kvalitativna i mješovita istraživanja ili Linguistic Inquiry and Word Count (LIWC) (Boyd, Ashokkumar, Seraj, & Pennebaker, 2022) - softver za analizu teksta koji broji riječi unutar pojedinih psihološki značajnih kategorija.

Relevantna istraživanja uključuju radove Cuklanz (2019), Zubrzycka-Czarnecka (2021) i Wodak (2015).

#### 4.5 Analiza mreža

Analizom mreža ispituju se odnosi između entiteta u tekstu, kao što su likovi u priči ili ljudi u interakcijama na društvenim mrežama (Scott, 2017).

Analizom mreža mogu se proučavati društvene mreže i interakcije prikazane u tekstovima na društvenim mrežama kako bi se bolje razumjela rodna dinamika i slučajevi nasilja. Također, mogu se mapirati utjecaji i strukture moći u tekstovima kako bi se vidjelo na koji su način prikazane rodne uloge i nasilje. Istraživači mogu, primjerice, provesti i analizu mreža romana kako bi mapirali interakcije između muških i ženskih likova i na taj način otkrili rodne dinamike i strukture moći unutar narativa. Također, mogu analizirati interakcije na društvenim mrežama kako bi razumjeli na koji način informacije o rodnom nasilju cirkuliraju i identificirali ključne influencere.

Relevantni alati u ovom području uključuju Gephi (Bastian, Heymann, & Jacomy, 2009) – softver otvorenog koda za analizu mreža i vizualizaciju i NodeXL (Smith & Starke, 2019) - Excel dodatak za analizu mreža.

Relevantna istraživanja u ovom području uključuju radove Leone, Lapucci, De Sario i sur. (2019) i Sánchez-Rodríguez, Moreno-Bella i García-Sánchez (2023).

#### 4.6 Strojno prevođenje

U strojnom prevođenju koristi se softver za automatsko prevođenje teksta ili govora s jednog jezika na drugi. Za izvođenje tih prijevoda koriste se računalna lingvistika i umjetna inteligencija (Hutchins & Somers, 1992).

Rodna pristranost u prevođenju uključuje proučavanje načina na koji rodne pristranosti prisutne u jeziku mogu biti odražene ili izmijenjene u prevođenju. Sustavi za strojno prevođenje mogu nenamjerno uvesti ili pojačati rodne pristranosti prisutne u izvornom jeziku ili podacima za treniranje

words in the target language. New techniques can be developed to reduce gender bias in machine translation.

Another aspect is to compare the translation of violent language in different languages to examine consistency and bias. Differences in translation can shed light on how different cultures and languages deal with or interpret violence.

Additionally, the field includes the analysis of translating gender-neutral sentences and the resulting gender bias of machine translation systems such as Google Translate (Google LLC, 2023) or Microsoft Translator (Microsoft Corporation, 2023).

Research that has analysed machine translation systems in this way includes the works of Prates, Avelar & Lamb (2020) and Savoldi et al. (2021). Research that addresses reducing gender bias in machine translations includes the works of Vanmassenhove, Hardmeier & Way (2018) and Escudé Font and Costa-jussà (2019).

Table 1 presents an overview of the described text analysis methods, their applications, tools that can be used for their implementation, examples of their application, and relevant research in each method.

modela. Također je važno prepoznati gdje se rodno-neutralne riječi u izvornom jeziku mogu prevesti u rodno-specifične riječi u ciljanom jeziku. Moguće je razviti nove tehnike za smanjenje rodne pristranosti u strojnim prijevodima.

Drugi aspekt je uspoređivanje prijevoda nasilnog jezika na različitim jezicima kako bi se ispitala dosljednost i pristranost. Razlike u prevođenju mogu osvijetliti kako različite kulture i jezici tretiraju ili interpretiraju nasilje.

Također, područje obuhvaća i analizu prevođenja rodno-neutralnih rečenica i rezultirajuće rodne pristranosti sustava za strojno prevođenje poput Google prevoditelja (Google LLC, 2023) ili Microsoft prevoditelja (Microsoft Corporation, 2023).

Istraživanja u kojima su na taj način analizirali prijevode sustava za strojno prevođenje uključuju radove Prates, Avelar & Lamb (2020) i Savoldi et al. (2021). Istraživanja koja se bave smanjenjem rodne pristranosti u strojnim prijevodima uključuju radove Vanmassenhove, Hardmeier & Way (2018) i Escudé Font i Costa-jussà (2019).

U Tablici 1 prikazan je pregled opisanih metoda analize teksta, njihova primjena, alati koji se mogu koristiti za njihovu implementaciju, primjeri primjene i relevantna istraživanja u pojedinim metodama.

**Table 1.** Overview of text analysis methods for identifying gender bias, inequality and violence in language  
**Tablica 1.** Pregled metoda analize teksta za identifikaciju rodne pristranosti, nejednakosti i nasilja u jeziku

Method	Applications	Tools	Examples	Related Research
<b>Corpus Linguistics</b>	Analyzing language patterns and trends in large collections of texts.	AntConc (Anthony, 2024), Sketch Engine (Kilgarriff et al., 2014)	Examining shifts in gendered terms, analyzing violence-related words.	Santoniccolo et al. (2023), Davis, Mavisakalyan & Weber (2022), Mihaljević (2021)
<b>Sentiment Analysis</b>	Determining the emotional tone and attitudes in texts.	VADER (Hutto & Gilbert, 2014), TextBlob (Loria, 2018)	Assessment of sentiment towards female candidates, analysis of comments on gender violence.	Thelwall (2018), Davidson et al. (2017)
<b>Content Analysis</b>	Coding and categorizing texts to find themes and patterns.	NVivo (Jackson & Bazeley, 2019), QDA Miner (Provalis Research, 2021)	Identifying gender stereotypes in media, analyzing themes of violence in literature.	Dines and Humez (2003), OSCE (2023), Mills (2008), Talbot (1998), Sunderland (2006)
<b>Discourse Analysis</b>	Examining the use of language in its social and cultural context.	Atlas.ti (ATLAS.ti Scientific Software Development GmbH, 2024), MAXQDA (VERBI Software, 2024), LIWC (Boyd et al., 2022)	Analyzing political speeches and media reports for bias.	Cuklanz (2019), Zubrzycka-Czarnecka (2021), Lakoff (1973), Buikema et al. (2018)
<b>Network Analysis</b>	Investigating relationships between entities in texts.	Gephi (Bastian et al., 2009), NodeXL (Smith & Starke, 2019)	Mapping gender dynamics in novels, analyzing social media interactions on violence.	Leone et al. (2019), Sánchez-Rodríguez et al. (2023)
<b>Machine Translation</b>	Studying gender bias in translation and exploring cultural differences.	Google Translate (Google LLC, 2023), Microsoft Translator (Microsoft Corporation, 2023)	Analyzing gender-neutral and gender-specific translations, comparison of translations of violent language.	Prates et al. (2020), Savoldi et al. (2021), Vanmassenhove et al. (2018), Escudé Font & Costa-jussà (2019)

## 5 Conclusion

This paper provides an overview of text analysis methods used to identify and recognize gender bias, inequality and violence in language. Gender equality is fundamental to creating a fair and inclusive society, and language plays an important role in shaping social norms and values. Various text analysis methods, including corpus linguistics, sentiment analysis, content analysis, discourse analysis, network analysis and machine translation, provide powerful tools for detecting, eliminating and mitigating gender bias in language.

These methods have been applied in various fields, including media, literature, social media, job advertisements and political speeches, to uncover

## 5 Zaključak

Ovaj rad pruža pregled metoda analize teksta koje se koriste za identificiranje i prepoznavanje rodne pristranosti, nejednakosti i nasilja u jeziku. Rodna ravnopravnost je temelj za stvaranje pravednog i uključivog društva, a jezik igra važnu ulogu u oblikovanju društvenih normi i vrijednosti. Različite metode analize teksta, uključujući korpusnu lingvistiku, analizu sentimenta, analizu sadržaja, analizu diskursa, analizu mreža i strojno prevođenje, predstavljaju snažne alate za otkrivanje, uklanjanje i ublažavanje rodne pristranosti u jeziku.

Te su metode primijenjene u raznim područjima, uključujući medije, književnost, društvene mreže, oglase za posao i političke govore, kako bi se otkrila

and mitigate gender bias. The results of studies highlight the prevalence of gender bias in language and the importance of using text analysis to promote gender equality. In addition, advances in natural language processing (NLP) and machine learning offer new opportunities to develop tools and algorithms that can automatically detect and correct gender bias. By integrating these technologies into everyday applications, such as machine translation systems and sentiment analysis tools, we can promote a gender-neutral and inclusive linguistic environment.

Future research will further refine these methods and explore their applications in different linguistic and cultural contexts. Generative AI and large language models (LLMs) have shown promise in reducing language-based inequalities, demonstrating the need for further research and application of these technologies to further reduce bias. Furthermore, interdisciplinary collaboration is needed to ensure that the results of text analysis are effectively translated into practical strategies to promote gender equality. By harnessing the power of text analysis, we can contribute to a fairer society in which language serves as a tool for inclusion rather than discrimination.

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i ublažila rodna pristranost. Rezultati istraživanja ističu prisutnost rodne pristranosti u jeziku i važnost korištenja analize teksta za promicanje rodne ravnopravnosti. Osim toga, napredak u obradi prirodnog jezika (NLP) i strojnog učenja nudi nove mogućnosti za razvoj alata i algoritama koji mogu automatski otkriti i ispraviti rodnu pristranost. Integriranjem ovih tehnologija u svakodnevne aplikacije, kao što su sustavi za strojno prevođenje i alati za analizu sentimenta, možemo promicati rodno neutralno i uključivo jezično okruženje.

Buduća istraživanja će dodatno proučiti ove metode i istražiti njihove primjene u različitim jezičnim i kulturnim kontekstima. Generativna umjetna inteligencija i veliki jezični modeli (LLM) pokazali su obećavajući napredak u smanjenju nejednakosti temeljenih na jeziku, pokazujući potrebu za daljnjim istraživanjem i primjenom ovih tehnologija za daljnje smanjenje pristranosti. Nadalje, potrebna je interdisciplinarna suradnja kako bi se osiguralo da se rezultati analize teksta učinkovito prevedu u praktične strategije za promicanje rodne ravnopravnosti. Korištenjem analize teksta, možemo doprinijeti pravednijem društvu u kojem jezik služi kao alat za uključivanje, a ne diskriminaciju.

## Zahvale

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