Gender representation in linguistic example sentences

Sarah Babinski, Christopher Geissler

Yale University

September 25, 2020

Collaborators

This work is done in collaboration with:

Hadas Kotek

Rikker Dockum GRD ‘19

Introduction

In 1996, the LSA publishes the *Guidelines for Non-Sexist Usage*.

In 1997, Macaulay and Brice, *Language*: An analysis of 11 syntax textbooks published 1969–1994.

> *"The **majority** of constructed example sentences in syntax textbooks are **biased toward male-gendered NPs**,and …contain **highly stereotyped representations** of both genders."*

20 years later, Pabst, Cepeda, Kotek, and Syrett (LSA, 2018) report similar results for a study of six syntax textbooks published 2005-2017.

Introduction

Today: A study of gender representation in journal papers published between 1997–2018 in *Language*, *Linguistic Inquiry*, and *Natural Language & Linguistic Theory*.

- Do the biases found in syntax textbooks extend beyond this limited genre and into scholarly work in linguistics?
  - …and what can we do about it?

Terminology

- **Conceptual gender:** the gender that is expressed, inferred, and used by a perceiver to classify a referent
  - including bias in *nurse, CEO*, names

- **Grammatical gender:** formal syntactic and/or semantic features that are morpho-syntactically defined (Ackerman 2019)

- We are generally treating gender as binary, which is not always the case for actual people

Roadmap

§1 Introduction

§2 Background: Macaulay and Brice (1997)

§3 Gender representation in journal papers

§4 Discussion: Why does this matter? How can we improve?

Roadmap

§1 Introduction

§2 **Background: Macaulay and Brice (1997)**

§3 Gender representation in journal papers

§4 Discussion: Why does this matter? How can we improve?

Macaulay & Brice (1997): Overview

Comparative study of constructed examples from 11 syntax textbooks published between 1969 and 1994.

- **Study 1**: 1,032 examples from one textbook ('Syntax textbook,' 1991); male author (published in Macaulay and Brice 1994)
- **Study 2**: 10 additional textbooks published between 1969 and 1994 to generalize results. 7 male authors, 3 female authors.

Macaulay & Brice (1997): Methods

200 examples were sampled from each textbook. NPs were coded for:

- **Grammatical gender** (female, male, other)
- **Grammatical function** (subject, DO, IO, etc.)
- **Theta roles** (agent, patient, experiencer, recipient, etc.)
- **Lexical choices** (pronouns, proper names, violence, appearance, reading and writing, etc.)

Macaulay & Brice (1997): Results

Men…

- Appear more often as **arguments** than women
- Are more likely to be **subjects** and **agents** than women
- Are **subjects** and **agents** more often than other arguments
- Have **pronouns** mentioned more often than women
- Have **proper names** twice as often as women
- Are engaged in '**intellectual activities**' (book reading/handling) and handle **cars** more often than women
- Are described as having **occupations** more often than women, with a wider range
- Perpetrate **violence** more often than women

Macaulay & Brice (1997): Results

Women…

- Often lack names, but are referred to with **kinship terms** (*X's wife, mother*) more often than male arguments are
- Have their **appearance** described more often than male arguments

Macaulay & Brice (1997): Selected examples

1. Every painting of Maja and photograph of Debbie pleased Ben.
2. Harry watches the fights and his wife the soap operas.
3. Bill is proud of his father and tired of his mother.
4. John might drown the kittens/his wife/??his goldfish/!his frying pan/!his birth.
5. Steven likes but Maja hates the man next door.
6. We consider him to be a genius and her to be a fool.
7. The man who shot her believed there was someone else who was seeing Helen.
8. His wife saw Hercule, her husband.
9. The man killed, cut up, and ate his children

Macaulay & Brice (1997): Selected examples

In addition, **explicit and suggestive language**:

1. Max doesn't beat his wife because he loves her.
2. She's fond of John naked.
3. After Rambo as a lover, she was exhausted.
4. I can't imagine you in kinky boots.
5. Personally, inflatable dolls bore me.
6. She'll soon tire of her sexploits.
7. What a nice pear Mary's got!
8. John forced Mary to be kissed by Bill.
9. He once glonked an out-of-work actress.
10. The lascivious tree who we saw in the magic forest waved his luxuriant branches lustfully at Mary and said, 'You can fondle my foliage anytime, darling'.

Macaulay & Brice (1997): Conclusion

> *"Our results clearly illustrate the need for such scrutiny:* ***females are simply not significant actors in the world constructed by sample sentences****." (p. 816)*

We might add…

- Neither are non-binary individuals.
- Very little has changed in more recent textbooks (Pabst, Cepeda, Kotek, and Syrett, 2019).

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§2 Background: Macaulay and Brice (1997)

§3 **Gender representation in journal papers**

§4 Discussion: Why does this matter? How can we improve?

Gender representation in journal papers

Textbooks are a very specific genre.

- Is this true of linguistic research more generally?

We examine all papers from 3 journals: *Linguistic Inquiry, Natural Language & Linguistic Theory, Language* between the years 1997–2018.

⇒ **806** papers in total; **25,085** 3rd person human arguments

Methods

24 Yale undergrads hired to code:

Aarohi Srivastava, Abigail Fortier, Amelia Lake, Calvin Kaleel, Faren Roth, Georgia Michelman, Joe Class, Joshua Celli, Justin Yamamura, Karina Di Franco, Lena Venkatraman, Michael Gancz, Nanyan Wu, Nico Kidd, Oliver Shoulson, Prastik Mohanraj, Ronnie Rodriguez, Serena Puang, Shayley Martin, Slater Smith, Stella Fitzgerald, Stella Xu, and Zhiliang Fang.

We thank the Yale Women Faculty Forum and Claire Bowern for providing funds to support this part of the project.

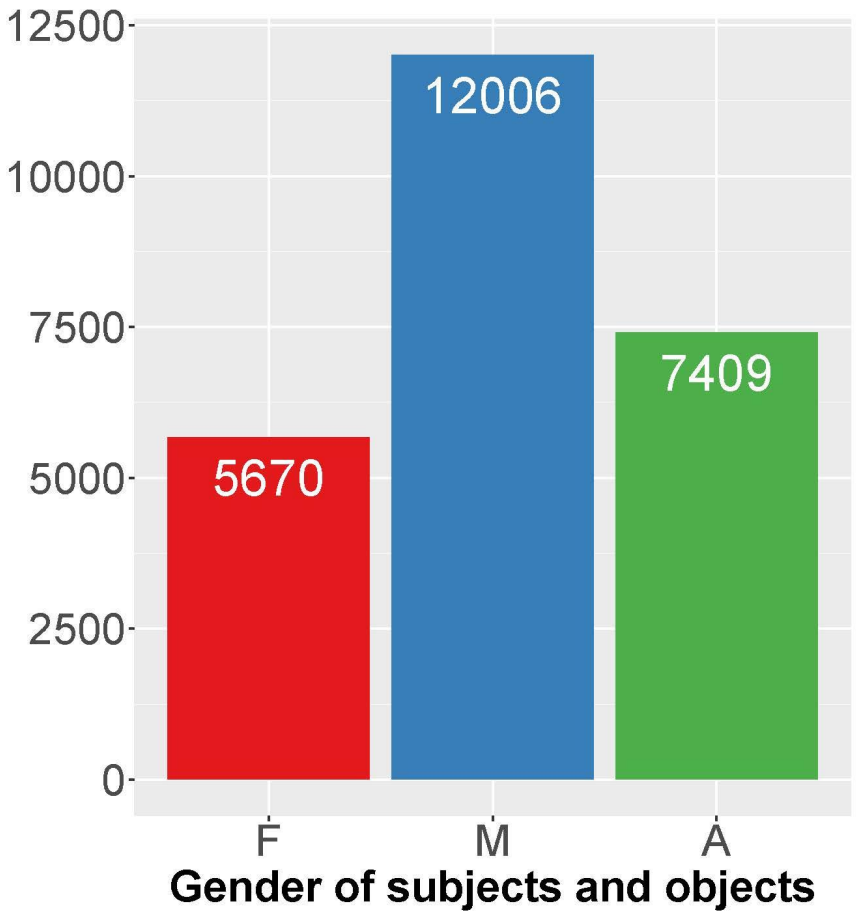
Methods

- Examples extracted using regular expressions, based on standardized format of examples

- Similar coding to textbook project--per argument:
  - Gender (F, M, non-gendered/ambiguous)
  - Grammatical function (subject, DO, IO)
  - Theta roles (agent, patient, experiencer, recipient)
  - Lexical choices (pronouns, proper names, violence, physical appearance, etc.)
  - Author gender (coded by us)

- Some coding relegated to automated tools:
  - positive/negative emotions (sentiment analysis)
  - specific tokens: kinship, violence, appearances, cars, intellectual (regex)

Arguments at a glance



Female-gendered NPs represent 22% of the total arguments (25,085)

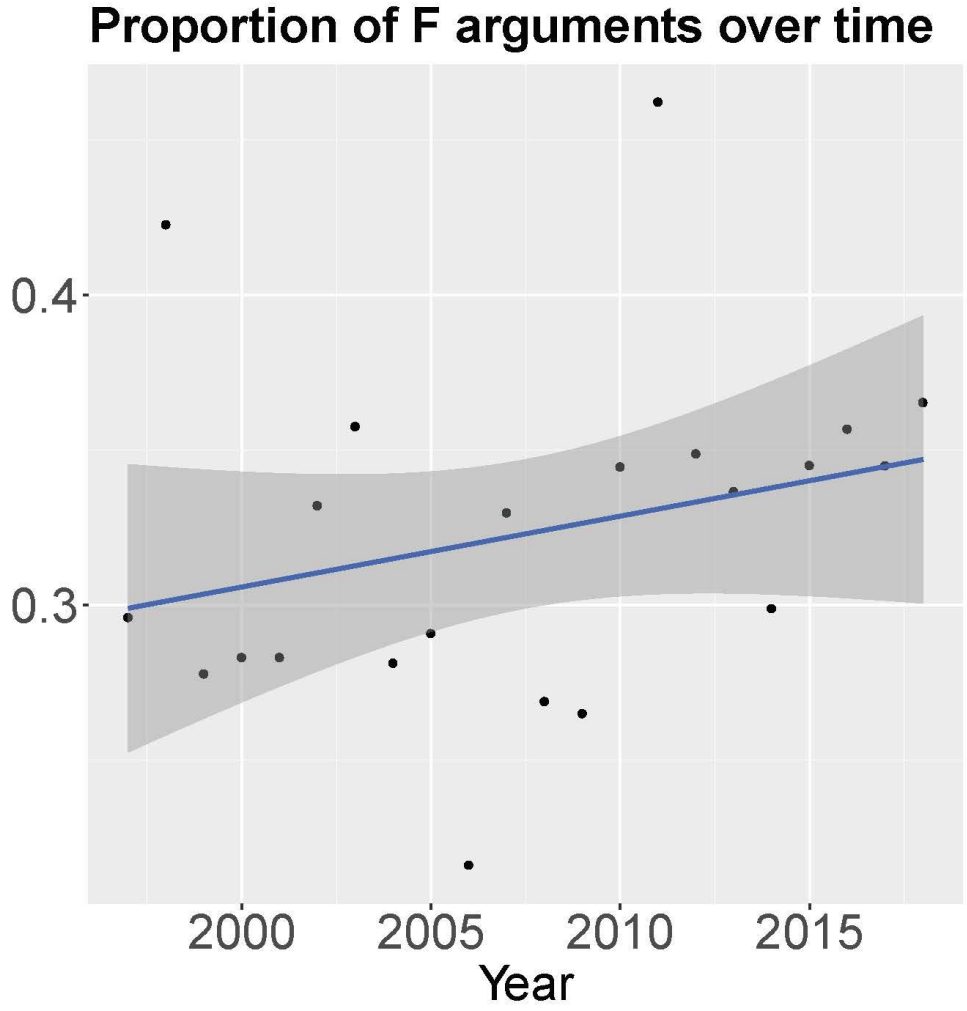
Non-gendered or ambiguous (A) NPs represent 30% of total arguments

Male-gendered NPs make up the remaining 48%

Ratio of 2.1 male arguments for every 1 female argument

Arguments over time

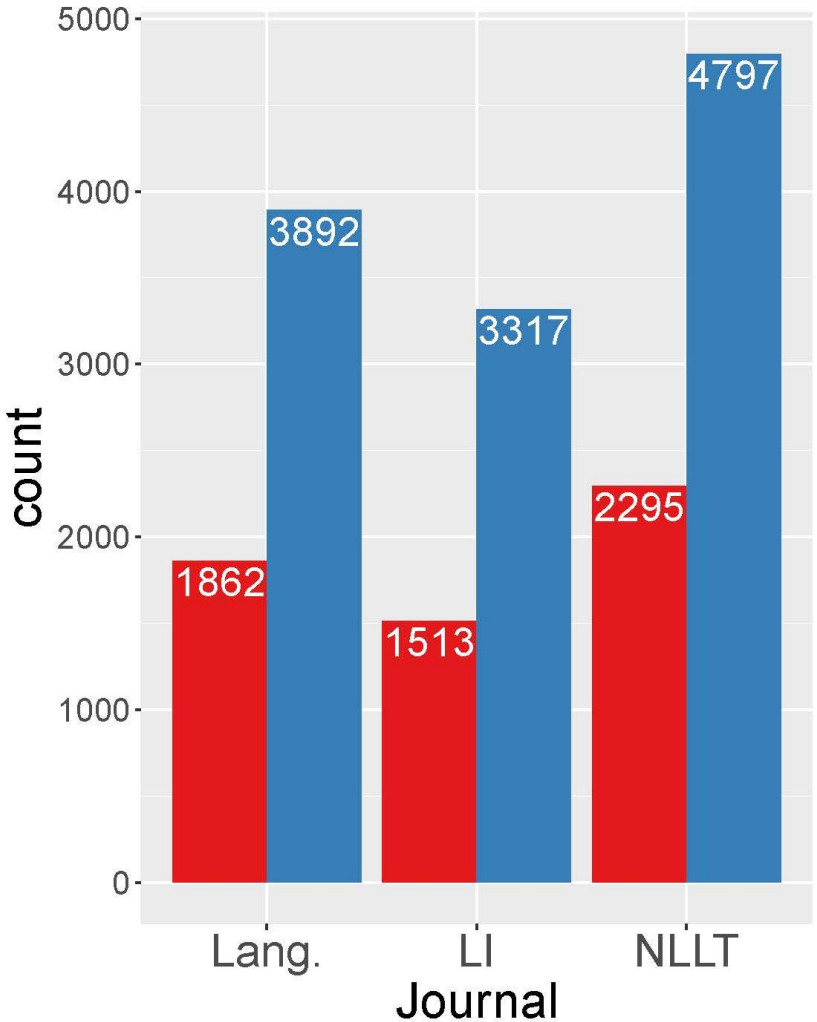
An ever so slight improvement over the 20 years we studied:



Arguments by journal

By journal: the same trends.

(We'll show collapsed graphs throughout.)

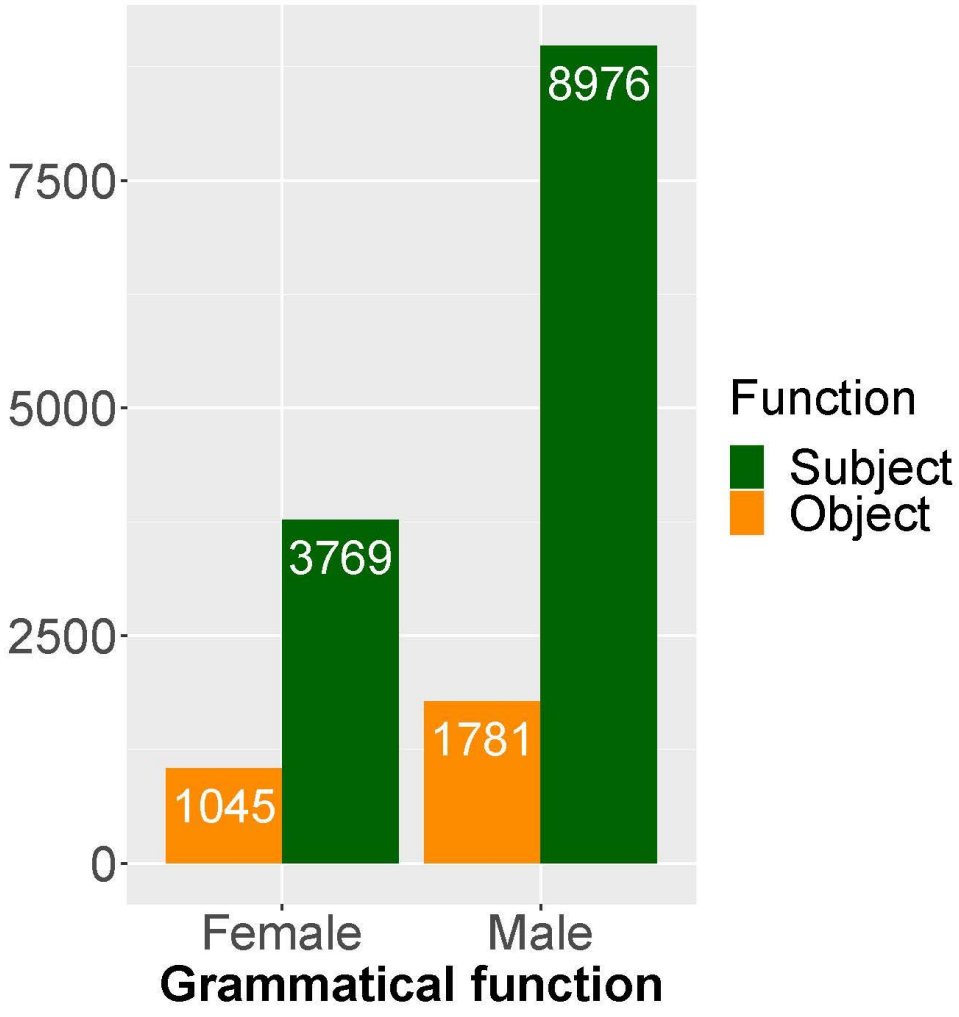


NLLT: 32%

LI: 31%

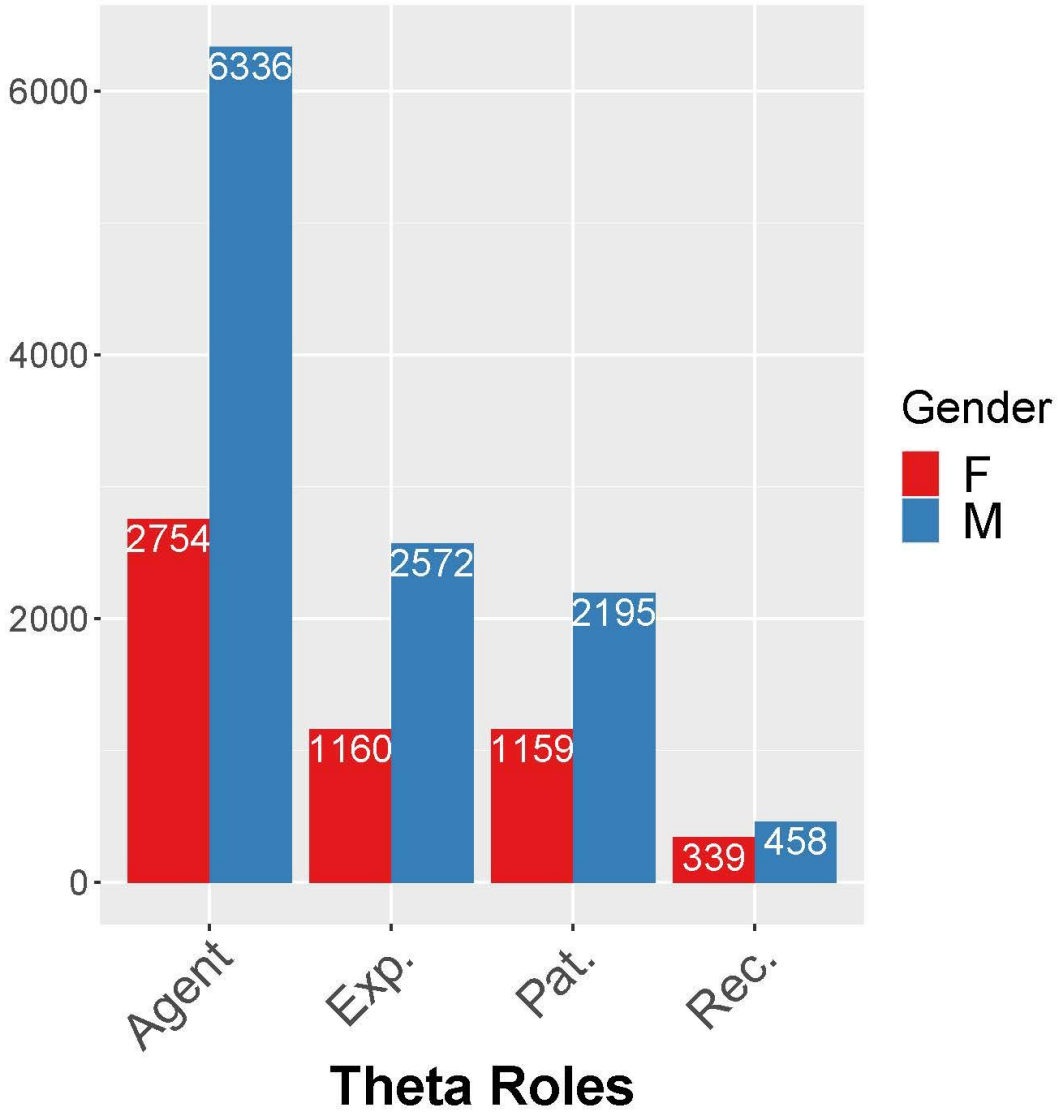
Language: 32%

Grammatical Function



83% of male arguments vs 78% of female arguments are **subjects**.

Theta roles



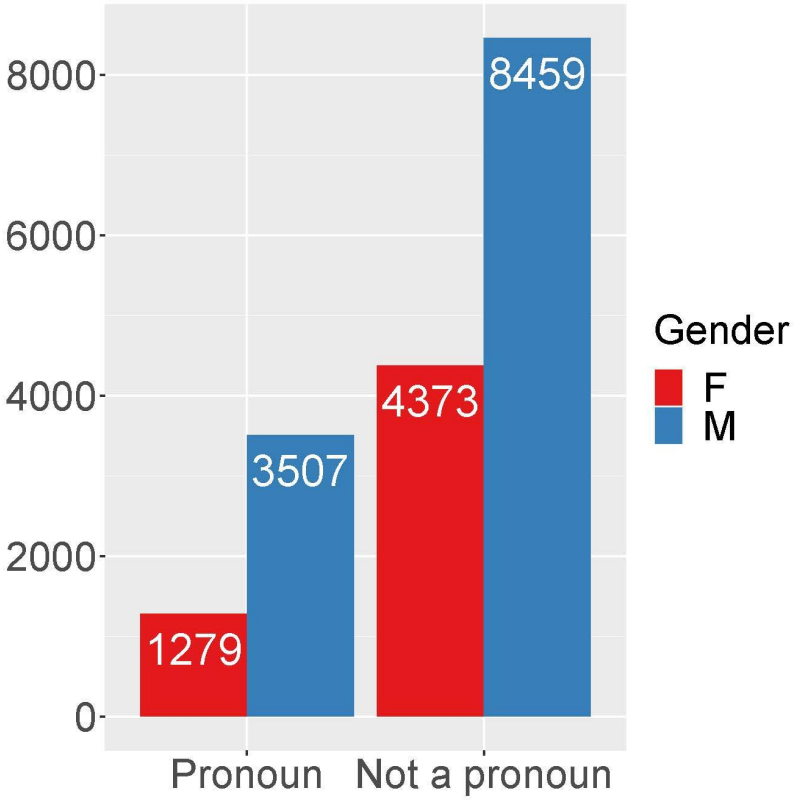
Agents: 30% female

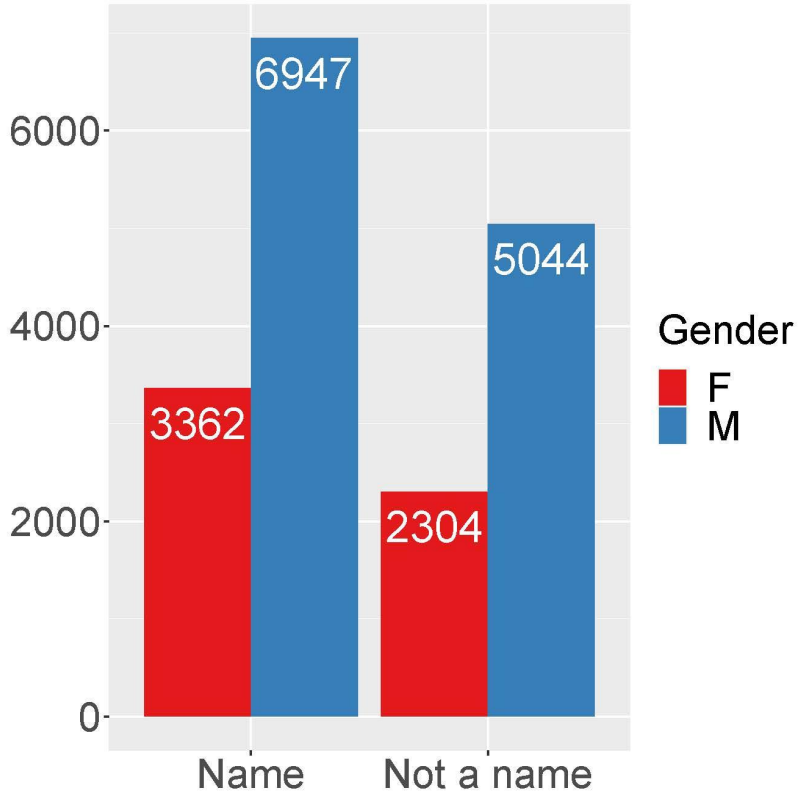
Experiencers: 31% female

Patients: 35% female

Recipients: 43% female

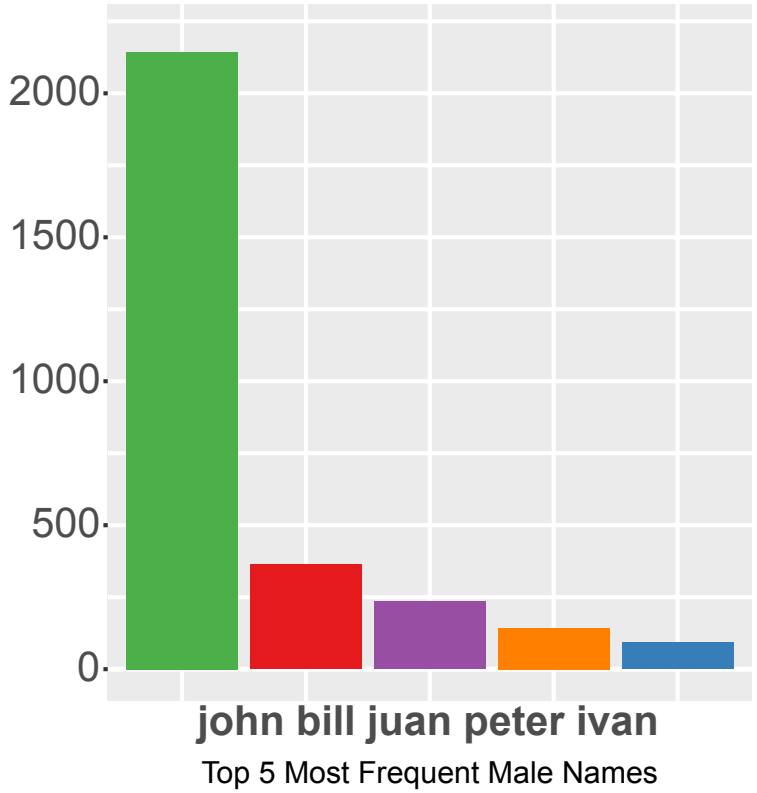
Pronouns and proper names



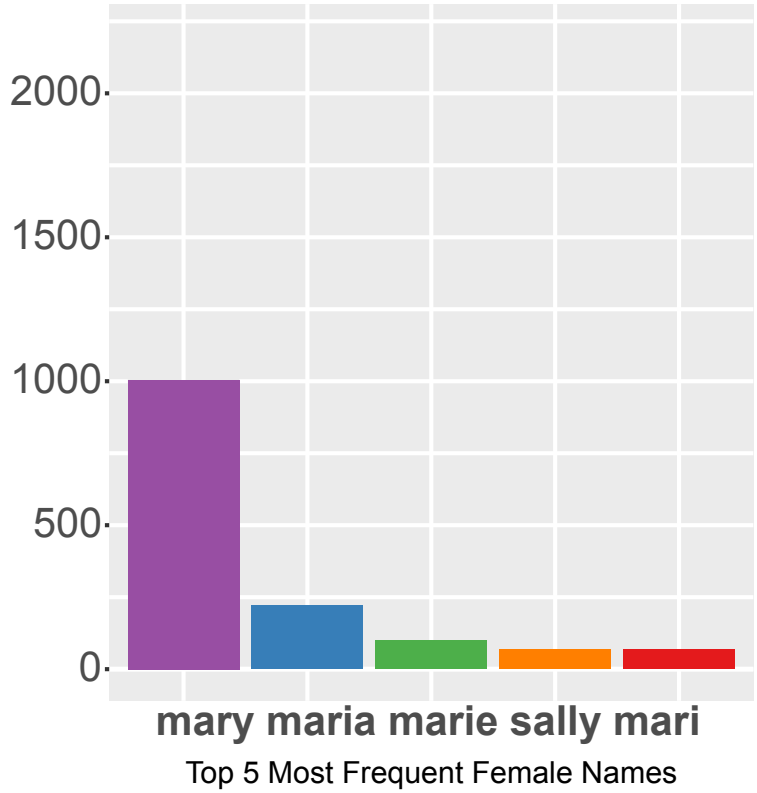


Male and female-gendered NPs have **pronouns** 29% vs 23% of the time. They are **proper names** 58% vs 59% of the time.

Proper names: Fun facts



Top 5 Most Frequent Male Names

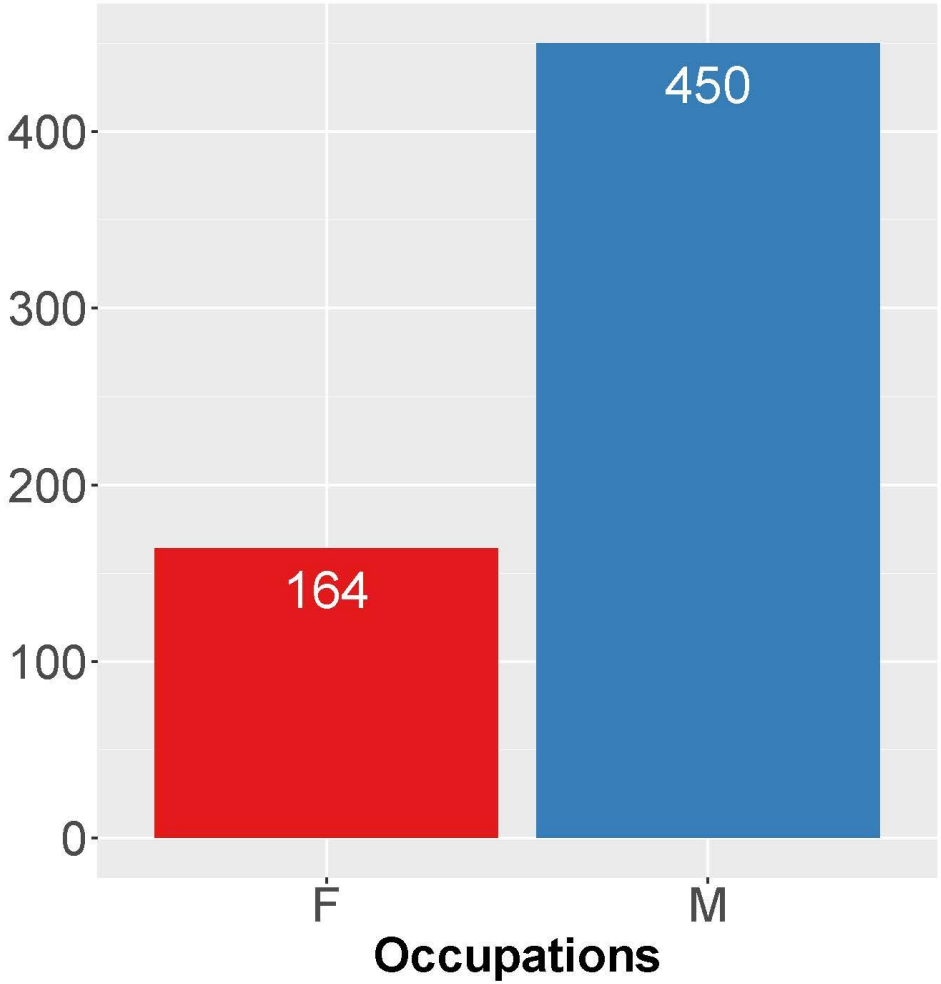


Top 5 Most Frequent Female Names

- 31% of all male names are **John**.
- 30% of all female names are **Mary**.
- 3 of the top 5 male names are *John variants:* John, Juan, and Ivan.
- 4 of the top 5 female names are *Mary variants:* Mary, Maria, Marie, and Mari.

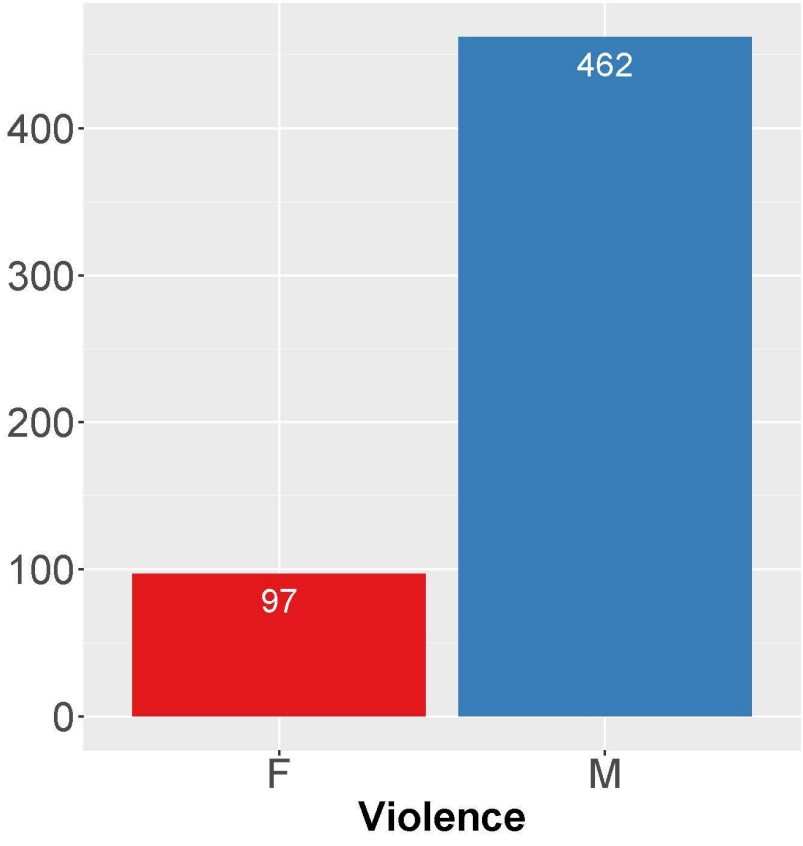
Lexical choices: Occupations

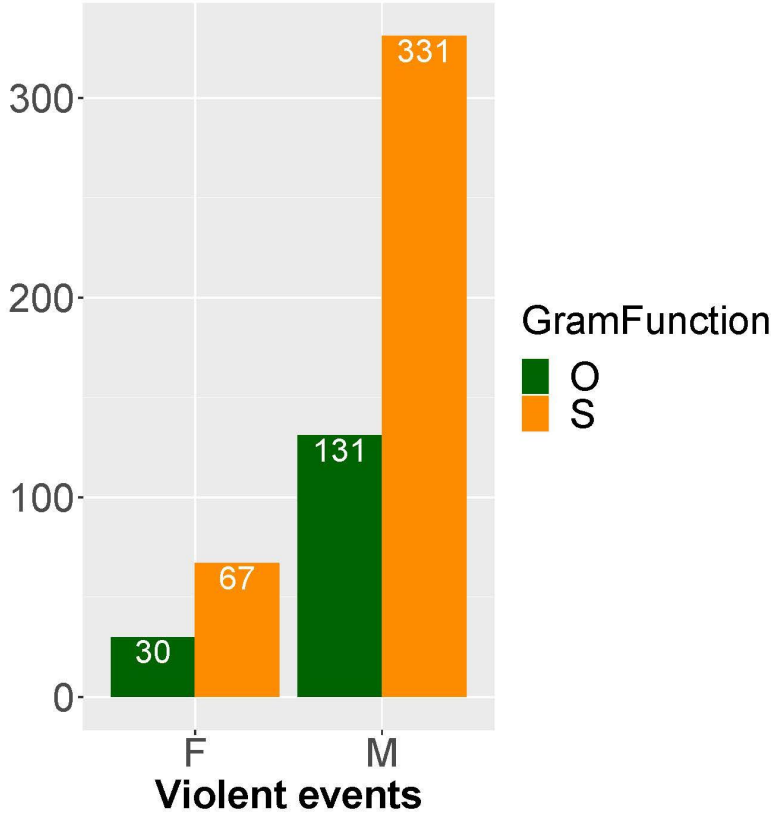
Male-gendered NPs are over-represented in occupation-related examples (73% M):



Lexical choices: Violence

Male-gendered NPs are also massively over-represented in violence-related exx (83% M):

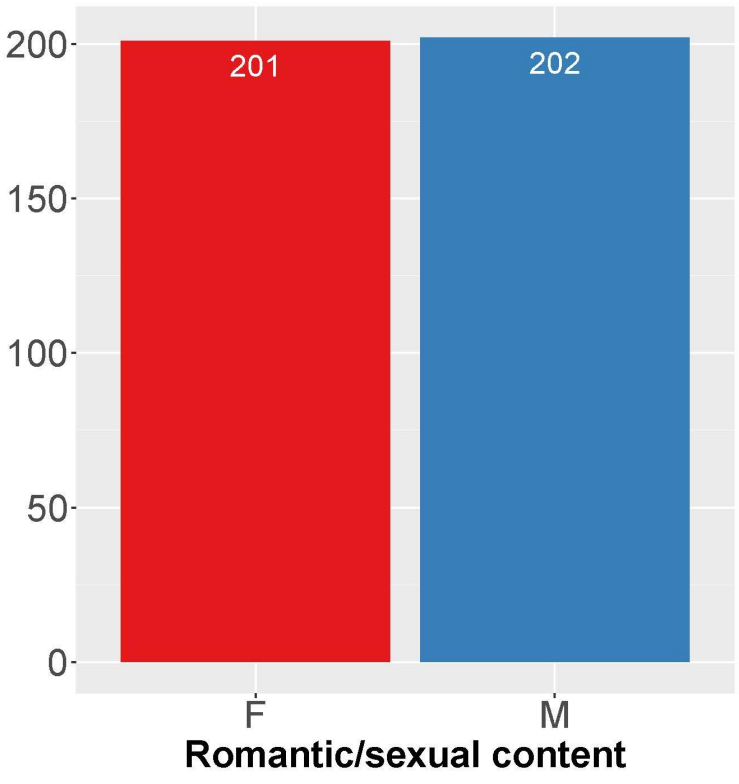


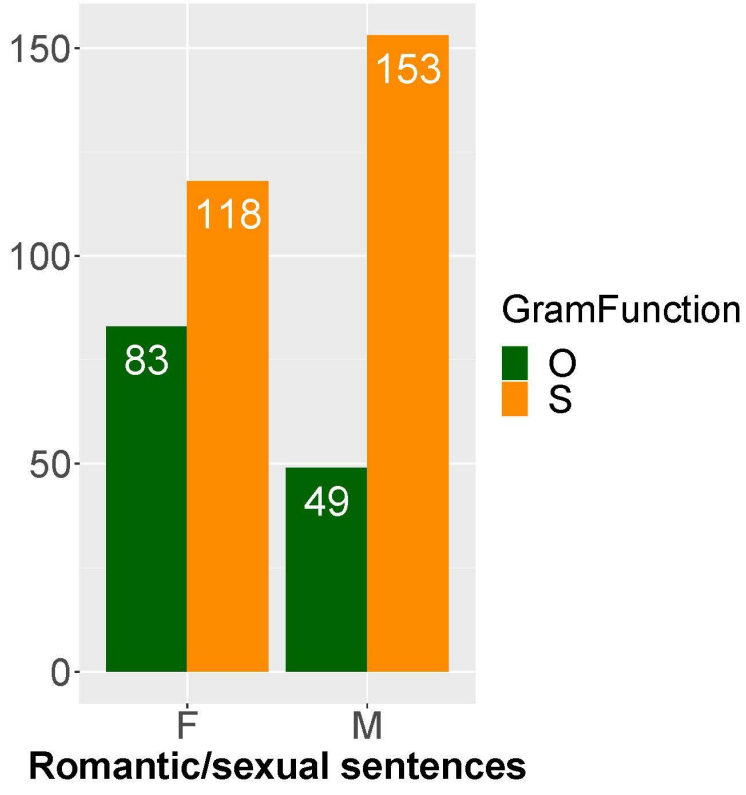


Female-gendered NPs: 69% subjects,
Male-gendered NPs: 72% subjects.

Lexical choices: Romantic/sexual contexts

Female-gendered NPs are over-represented in “romantic” exx (50% F):

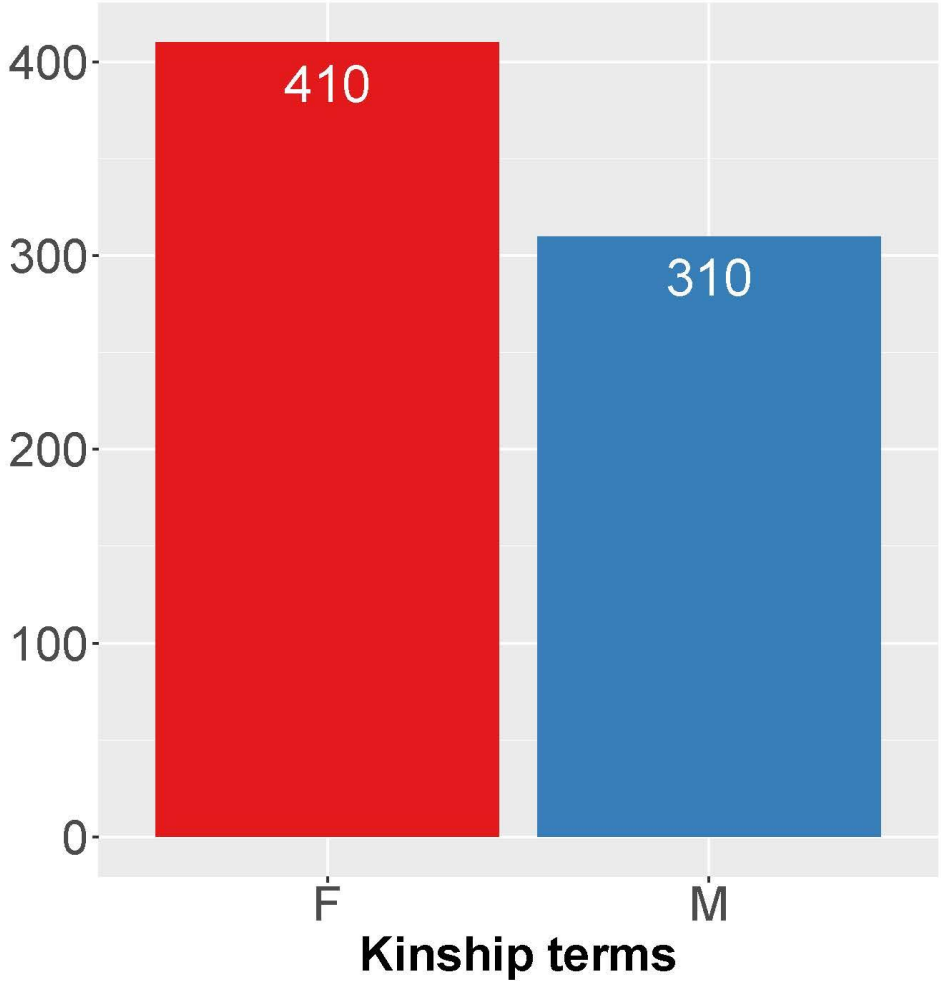




They are again over-represented as **objects** in such sentences: Subjects are 44% female, but objects are 63% female.

Lexical choices: Kinship terms

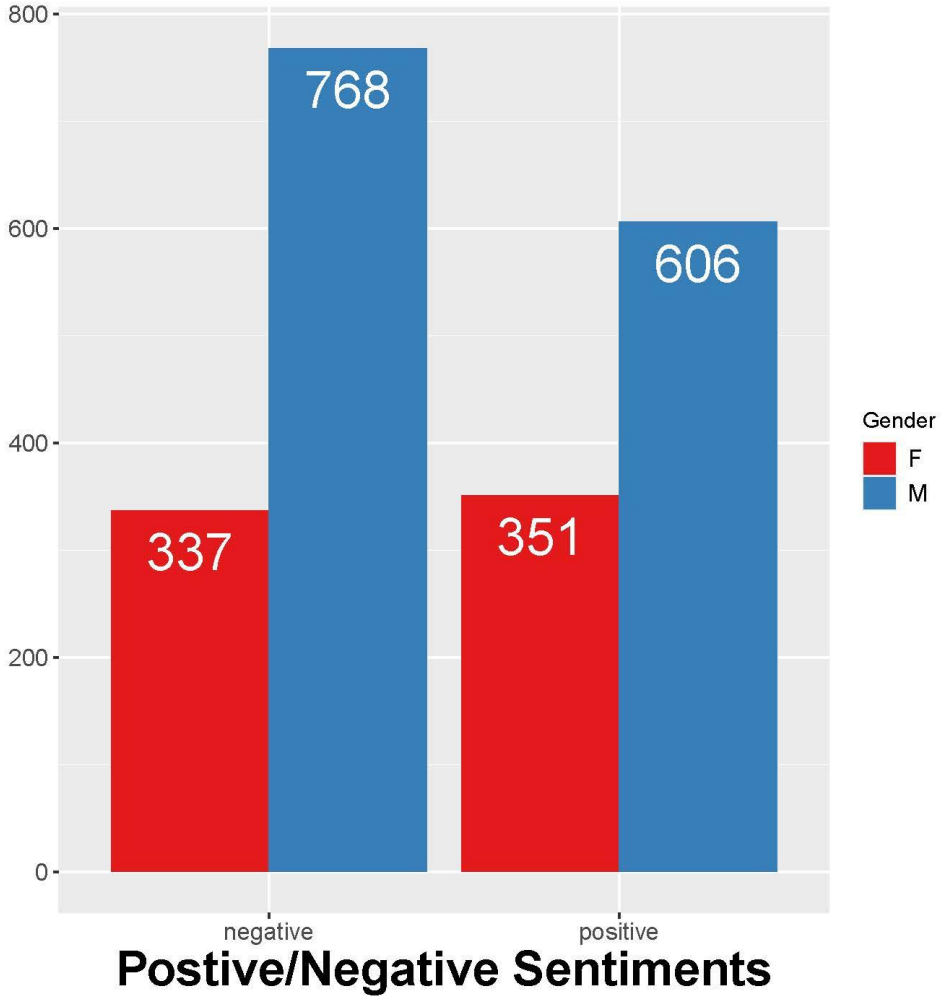
Female-gendered NPs are massively over-represented with respect to kinship terms (57% F):



Sentiment analysis: Methods

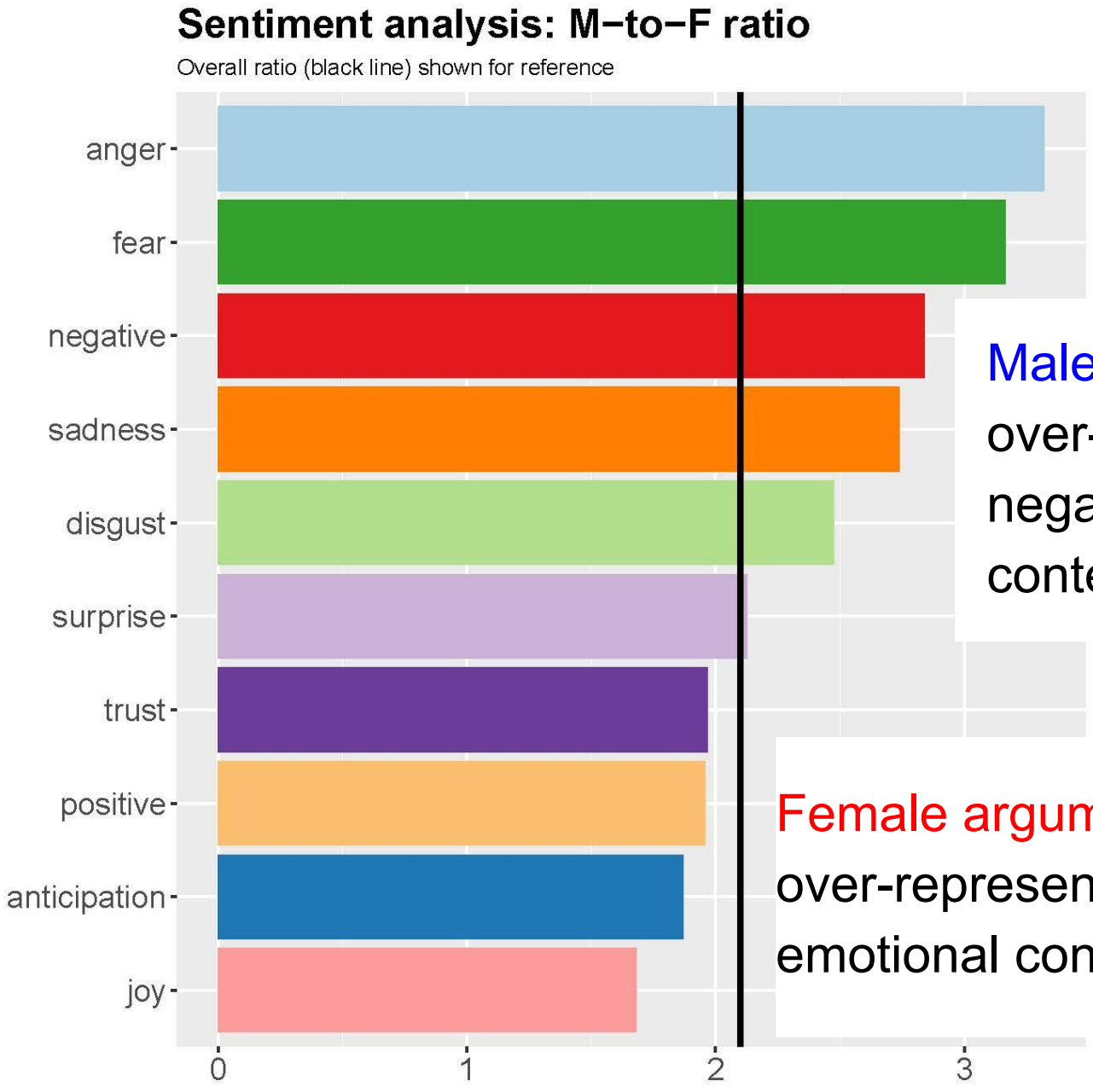
- **'get_sentiments'** function in R's tidytext package run on predicates & associated with NP arguments
  - (Silge & Robinson 2016; R Core Team 2015)
- Two types of categorization used
  - **'Bing'** method (Liu 2012): binary positive/negative
  - **'NRC'** method (Mohammad & Turney 2013): bins into 10 distinct sentiment groups

Sentiment analysis: Bing categorization



- Slight skew in gender distribution compared to overall ratio of 2.1:1
- Male arguments slightly over-represented in negative sentiments (ratio 2.3:1)
- Female arguments slightly over-represented in positive sentiments (ratio 1.7:1)

Sentiment analysis: NRC categorization



Male arguments are over-represented in negative emotional contexts

Female arguments are over-represented in positive emotional contexts

Inappropriate examples 1

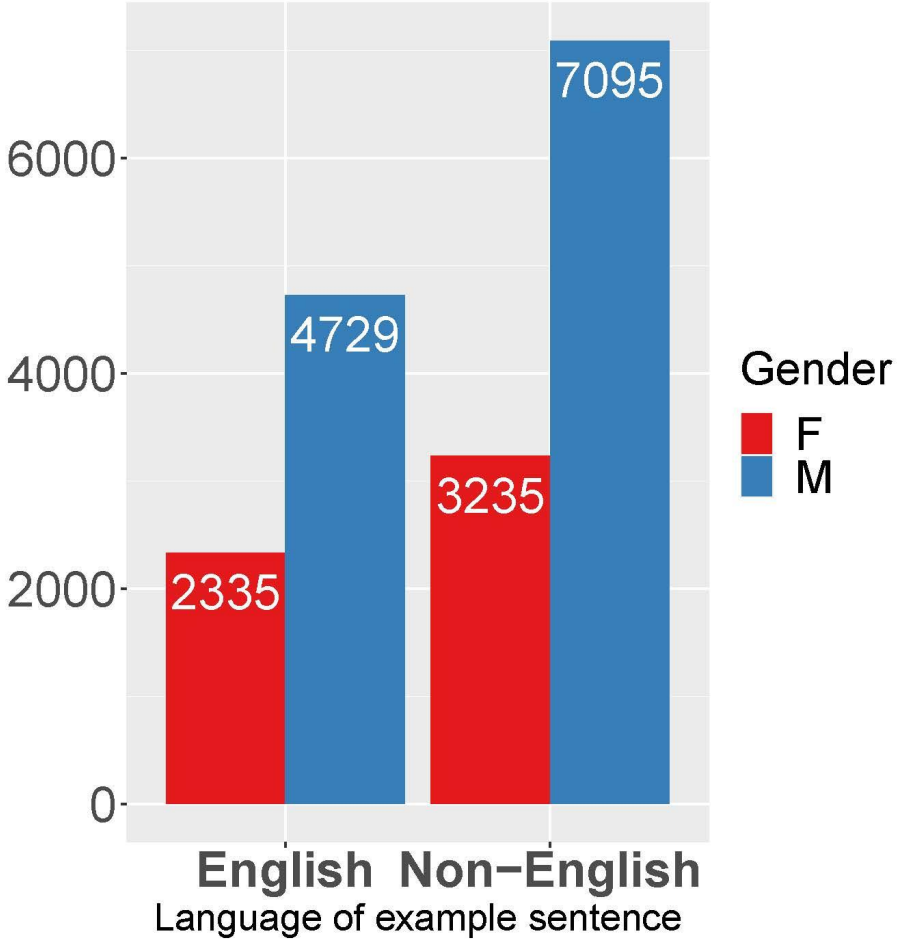
a. John ate the meal and Mary cleaned the dishes
b. John didn't eat the meal because he would have to clean the dishes
c. John thinks that he himself is a war hero
d. John told Bill that Mary began to cry without any reason
e. The boys had thrown no rock at the cars
f. Maria reviewed the novel, she didn't write it
g. The senator killed herself
h. Iraqi father drowned his 17 year old
i. Mary, being dumb, needs to sit down
j. Which Nobel prize winning author came in his car?

Inappropriate examples 2

a. For whom do you regret that she made a cake?
b. * Eat food that Mary$_i$ cooks, she$_i$ knows I never would
c. John (not Peter) washed cars well
d. * Kelly broke again tonight when she did the dishes
e. I called for a policeman, not a policewoman
f. The students are all the boys
g. Tomas replaced Ricardo as the captain
h. Every male student doesn't fear tigers
i. It is amazing how many cars he owns
j. At least one student of every professor$_i$ is horrified at his$_i$ grading procedure

Meta-analysis: Language of examples

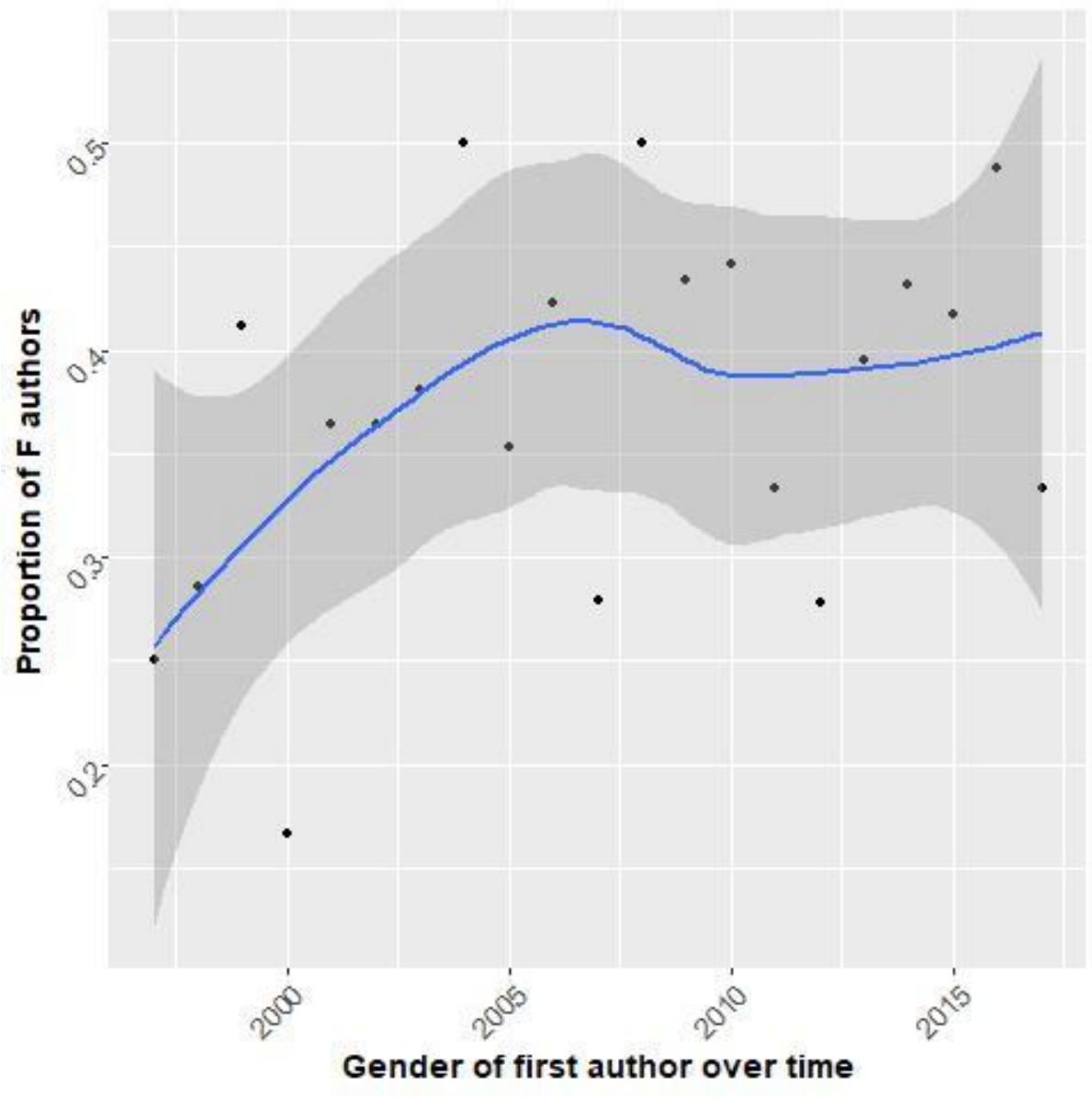
English and non-English examples don't appear different:



English: 33% female args

Non-English: 31% female args

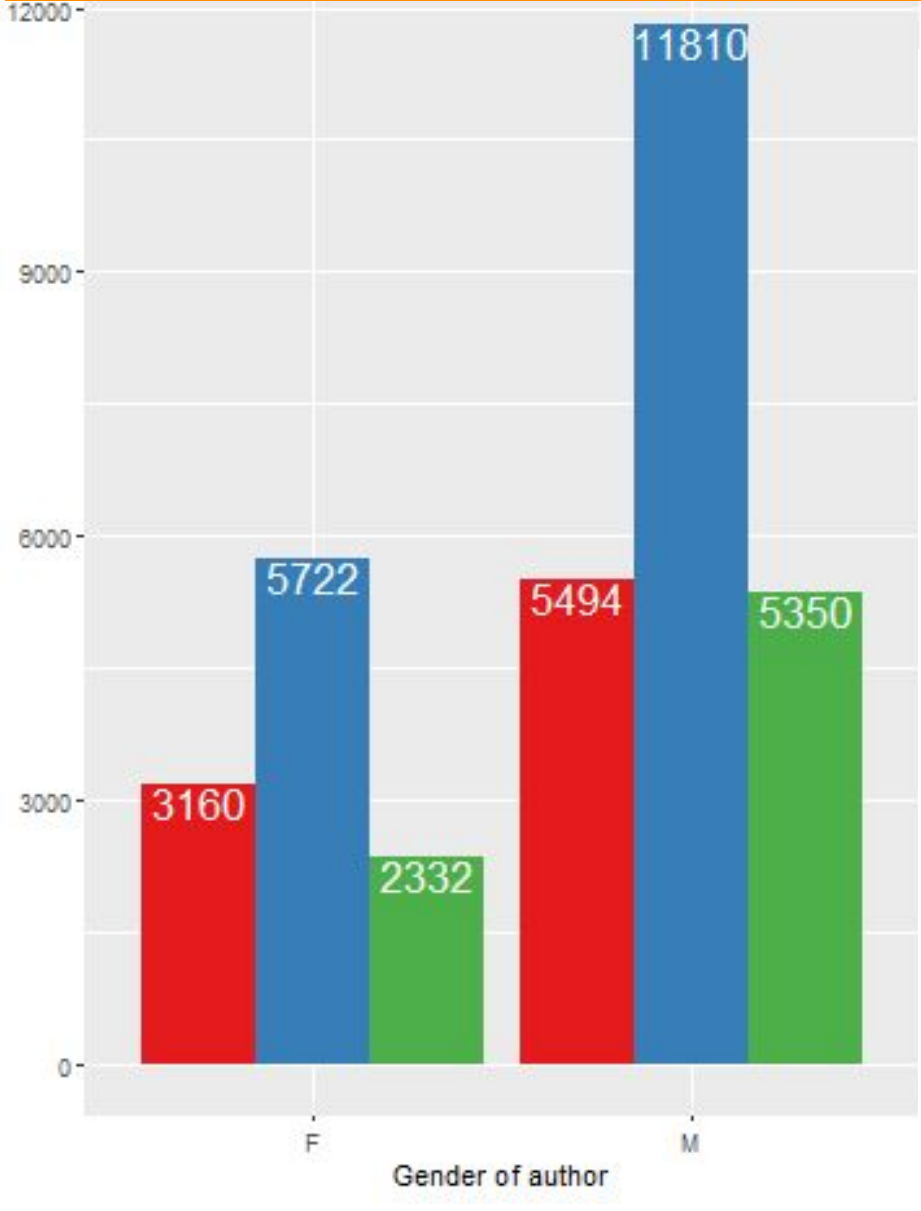
Meta-analysis: Gender of author



The proportion of female first authors has risen over time but remains below 50%

Meta-analysis: Gender of author

model = lmer(arg.gender ~ (1|individual) + author.gender)



- male and female authors both over-represent male NPs
- female authors are more likely to use female arguments than male authors ($z=|2.39|$, $p<0.05$)
- male and female authors are about equally likely to use non-gendered animate NPs

Summary

Male-gendered NPs…

- appear more often as **arguments** than female-gendered NPs do
- are more likely to be **subjects** of their sentences
- engage in significantly more **violence** than female-gendered NPs do
- have significantly more **occupations** than female-gendered NPs do
- have more **negative emotions** than female-gendered NPs

Summary

Female-gendered NPs…

- are over-represented as non-subjects, especially as **recipients**
- are over-represented in sentences involving **romantic/sexual language**
- are massively over-referred to using **kinship terms**
- are over-represented in sentences conveying **positive emotional sentiments**

Summary

- Not (m)any suggestive or explicit examples
- …although stereotypes are very much evident (replicating Pabst et al. 2019)
- We've tidied up the surface, but have done very little to address the underlying problem
- A slight improvement over the past 20 years: from low-30% to mid-30%

Beyond the gender binary

- Explicit discussions of non-binary gender identities are **entirely absent**.
- There are also a number of other issues that should be addressed:
  - Western vs. Non-Western names
  - Constructed vs. corpus examples
  - Elicited examples, narratives, etc.

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§4 **Discussion: Why does this matter? How can we improve?**

Why does this matter?

- As scientists we are trained to regard example sentence data as an **impartial, empirical source of evidence**
- However, we often ignore the **social aspects** that these examples occur in and that they exemplify
- Constructed example sentences used in the linguistic literature may encode **implicit biases**
- These then get handed down to new generations of linguists, perpetuating **a cycle**

Discussion & Conclusion

- We take the makeup of example sentences to be **signals to students and researchers** about what we take the world to be like
  - who is a free-thinking agent?
  - a genius?
  - who is likely a professor or a student?
  - who is a recipient of others' actions or belongings?
  - the object of their affections?
  - a caregiver?
  - a spouse?

Why does this matter?

Inclusive language encourages participation from underrepresented groups

- leading to a **better community**
- leading to **better science**

…at the cost of just a little more thoughtfulness.

LSA Responses to Gender and Inclusivity

- 1996 Guidelines for Non-Sexist Usage (COSWL)
- 2016 Guidelines for Inclusive Language (COSWL)
- 2018 Panel at Annual Meeting: Our Linguistics Community: Addressing Bias, Power Dynamics, Harassment
- 2019: LSA Statement on Race

What can we do?

In the interest of being maximally inclusive…

- Stereotypical language, sexually explicit and demeaning language, and language reflecting biases are easily avoidable, and should be.
- The use of gendered lexical items (-*man*, *he*, etc.) where unnecessary should be avoided.
- The biased and elevated frequency of particular gendered NPs in particular syntactic positions or semantic roles should be diminished.

What can we do?

Embrace singular *they*!

- We are often told that the pronoun *he* should be used for (singular) nouns whose gender is unknown.
- Despite this official designation, however, this pronoun feels exclusionary to non-male individuals.
- Singular *they* has been used for decades precisely for this purpose. #WordOfTheDecade

Conclusion: What can we do?

- **Instructors:**
  - Choose your examples wisely.
  - Be sensitive to how you portray all individuals in your examples.
  - Keep in mind that you are in a position of authority and can have a *positive* influence on young minds entering the field.
  - Consider gender ratios and representation in your syllabi

- **Authors**
  - Be thorough, inclusive, and balanced in your citations.
  - Do not perpetuate bias in the examples you cite.
  - Keep the Guidelines for Inclusive Language in mind.

- **Editors/Reviewers**
  - Pay attention to the examples and language authors use.

Thank you!

Thank you! Questions?

Special thanks to **Monica Macaulay** and **Colleen Brice** for the original inspiration behind this work. Additional thanks to **Katarina Pabst**, **Kristen Syrett**, and **Paola Cèpeda**, whose work on the 2018 textbook project together with Hadas Kotek laid the ground for this project.

We are also thankful to the **Yale Women Faculty Forum** and **Claire Bowern** for supporting this work, and to our audience at Yale, NYU, MIT, and Brandeis University, as well as the 2020 LSA Annual Meeting, esp. Kirby Conrod, Emily Bender, and Lauren Ackerman, for their feedback on ideas which inspired this work.

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