

It's a Man's Wikipedia

**gender bias in Wikipedia
paper by Wagner et al. (2015)**

Eric Kaiser

Wikipedia

- biographies of notable people + links between them
- editors are predominantly white and male
- highly influential → important to measure bias



The screenshot shows the Wikipedia article for Leonhard Euler. At the top left is the Wikipedia logo and navigation links. The article title is "Leonhard Euler" with a star and lock icon. Below the title is a redirect notice: "From Wikipedia, the free encyclopedia (Redirected from Leonhard euler)". A note states: "Euler* redirects here. For other uses, see Euler (disambiguation)." The main text begins with a lead sentence: "Leonhard Euler (ⁱ^{listen} ⁱ^{listen}; 15 April 1707 – 18 September 1783) was a Swiss mathematician, physicist, astronomer, geographer, logician and engineer who made important and influential discoveries in many branches of mathematics, such as infinitesimal calculus and graph theory, while also making pioneering contributions to several branches such as topology and analytic number theory. He also introduced much of the modern mathematical terminology and notation, particularly for mathematical analysis, such as the notion of a mathematical function.^[3] He is also known for his work in mechanics, fluid dynamics, optics, astronomy and music theory.^[4]

Euler was one of the most eminent mathematicians of the 18th century and is held to be one of the greatest in history. He is also widely considered to be the most prolific mathematician of all time. His collected works fill 92 volumes,^[5] more than anyone else in the field. He spent most of his adult life in Saint Petersburg, Russia, and in Berlin, then the capital of Prussia.

A statement attributed to Pierre-Simon Laplace expresses Euler's influence on mathematics: "Read Euler, read Euler, he is the master of us all."^{[6][7]}

On the right side, there is a portrait of Leonhard Euler by Jakob Emanuel Handmann (1753). Below the portrait is a table of biographical information:

Born	15 April 1707 Basel, Switzerland
Died	18 September 1783 (aged 76) [OS: 7 September 1783] Saint Petersburg, Russian Empire
Alma mater	University of Basel (MPhil)
Known for	See full list

At the bottom left of the article, there is a "Contents" section with a list of links:

- 1 Life
 - 1.1 Early years
 - 1.2 Saint Petersburg
 - 1.3 Berlin
 - 1.4 Eyesight deterioration
 - 1.5 Return to Russia and death

What the paper does

- **measure different types of gender bias**
- **six language editions**
- **very broad overview, simple measures**

Types of bias

- **coverage bias**

how many women and men are portrayed on Wikipedia?

- **structural bias**

how do links connect people? Does one gender link more to another?

- **lexical bias**

are men and women portrayed differently? (choice of words)

- **visibility bias**

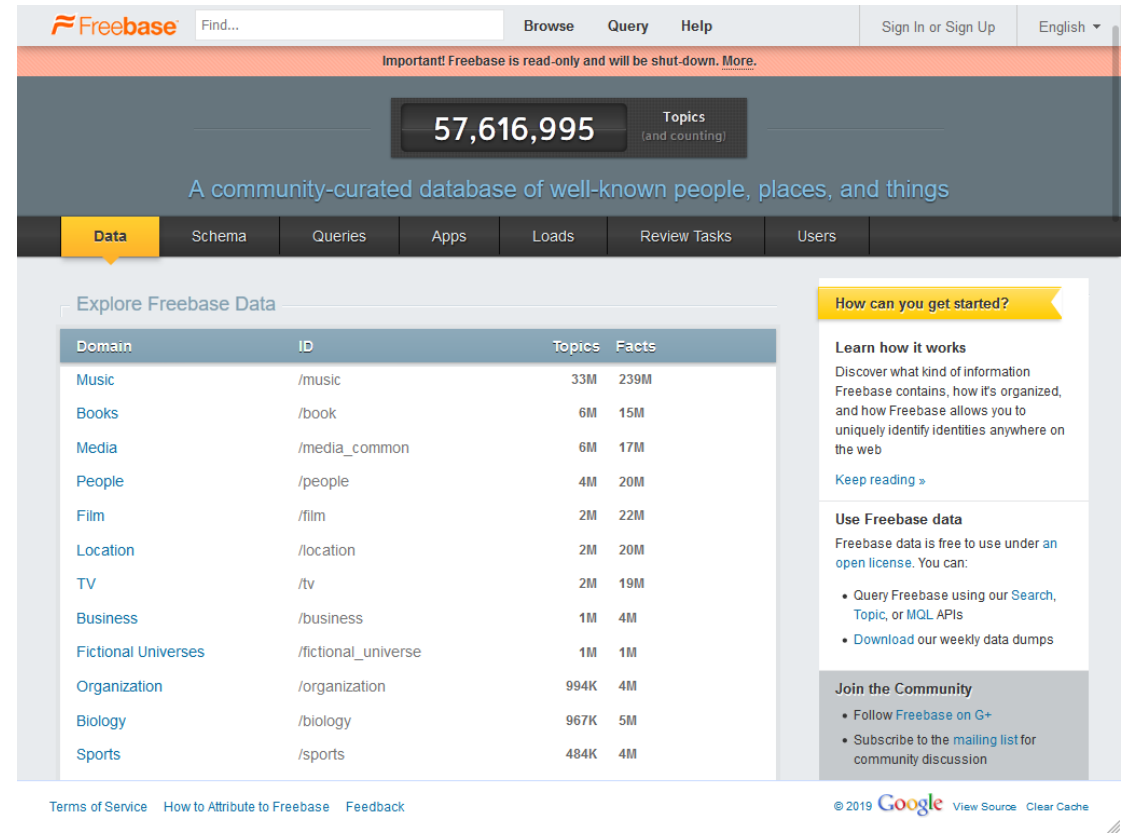
how many women and men make it to the front page?

Coverage bias

- **reference datasets**
 - Freebase
 - Pantheon
 - Human Accomplishment

Coverage bias

- reference datasets
 - **Freebase**
 - Pantheon
 - Human Accomplishment



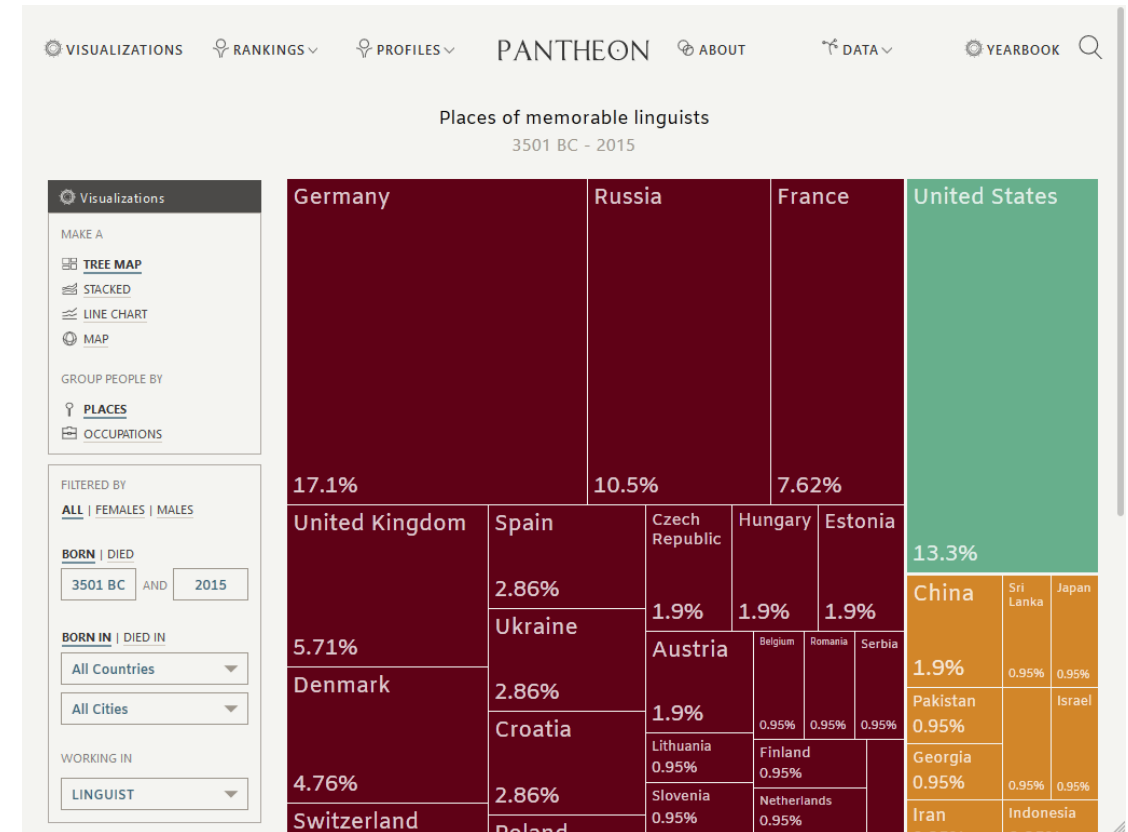
The screenshot shows the Freebase website interface. At the top, there is a search bar and navigation links for 'Browse', 'Query', and 'Help'. A prominent message states: 'Important! Freebase is read-only and will be shut-down. More.' Below this, a large counter displays '57,616,995 Topics (and counting)'. A navigation bar includes 'Data', 'Schema', 'Queries', 'Apps', 'Loads', 'Review Tasks', and 'Users'. The main content area is titled 'Explore Freebase Data' and features a table with the following data:

Domain	ID	Topics	Facts
Music	/music	33M	239M
Books	/book	6M	15M
Media	/media_common	6M	17M
People	/people	4M	20M
Film	/film	2M	22M
Location	/location	2M	20M
TV	/tv	2M	19M
Business	/business	1M	4M
Fictional Universes	/fictional_universe	1M	1M
Organization	/organization	994K	4M
Biology	/biology	967K	5M
Sports	/sports	484K	4M

On the right side, there are sections for 'How can you get started?', 'Learn how it works', 'Use Freebase data', and 'Join the Community'. The footer includes 'Terms of Service', 'How to Attribute to Freebase', 'Feedback', and '© 2019 Google View Source Clear Cache'.

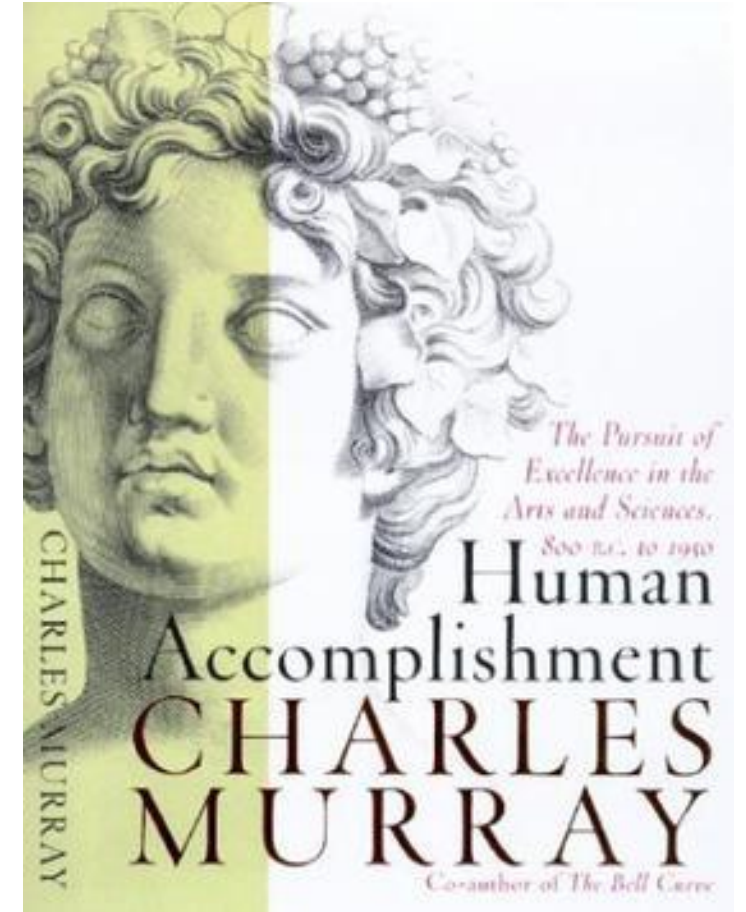
Coverage bias

- reference datasets
 - Freebase
 - **Pantheon**
 - Human Accomplishment



Coverage bias

- reference datasets
 - Freebase
 - Pantheon
 - **Human Accomplishment**

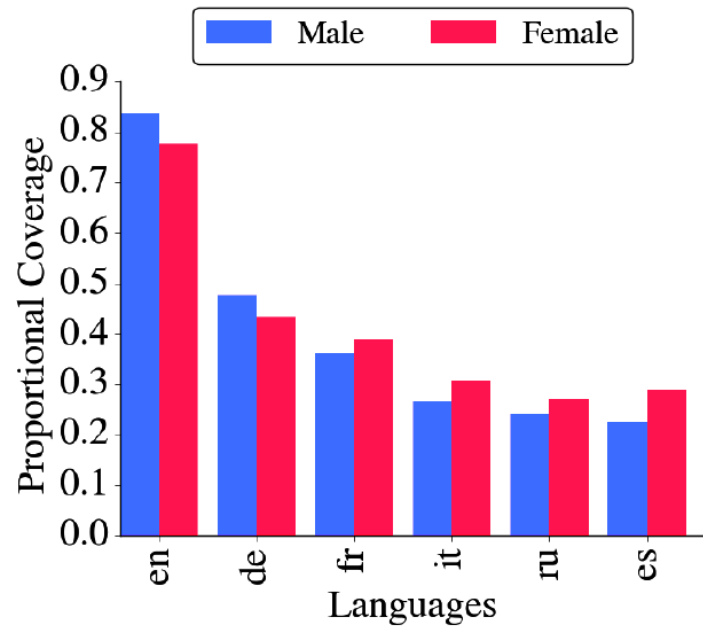


Coverage bias

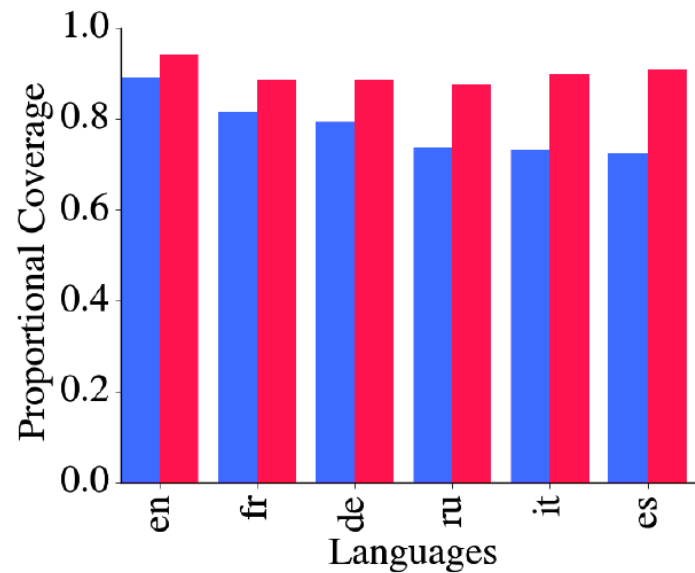
- **reference datasets**
 - Freebase
 - Pantheon
 - Human Accomplishment
- **very little overlap**
- **unknown amount of bias,
somewhat related to Wikipedia**

Coverage bias

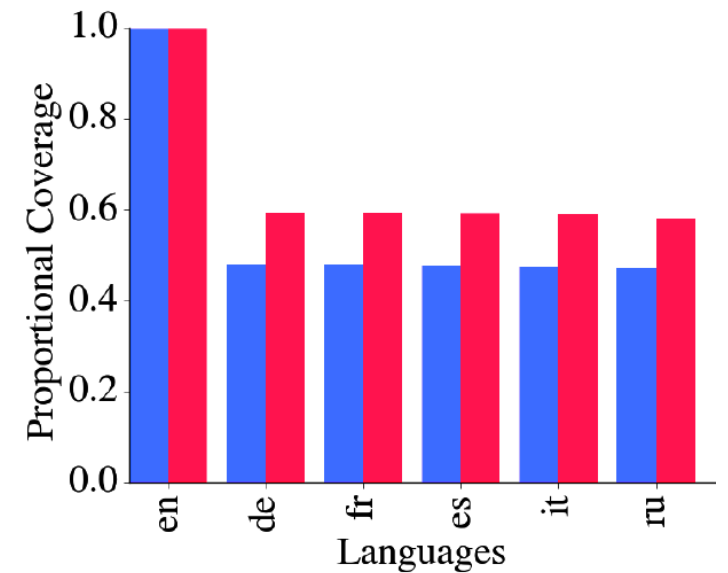
- women are apparently slightly overrepresented → no bias here (?)
- relies on reference datasets



(a) Freebase



(b) HA



(c) Pantheon

Structural bias

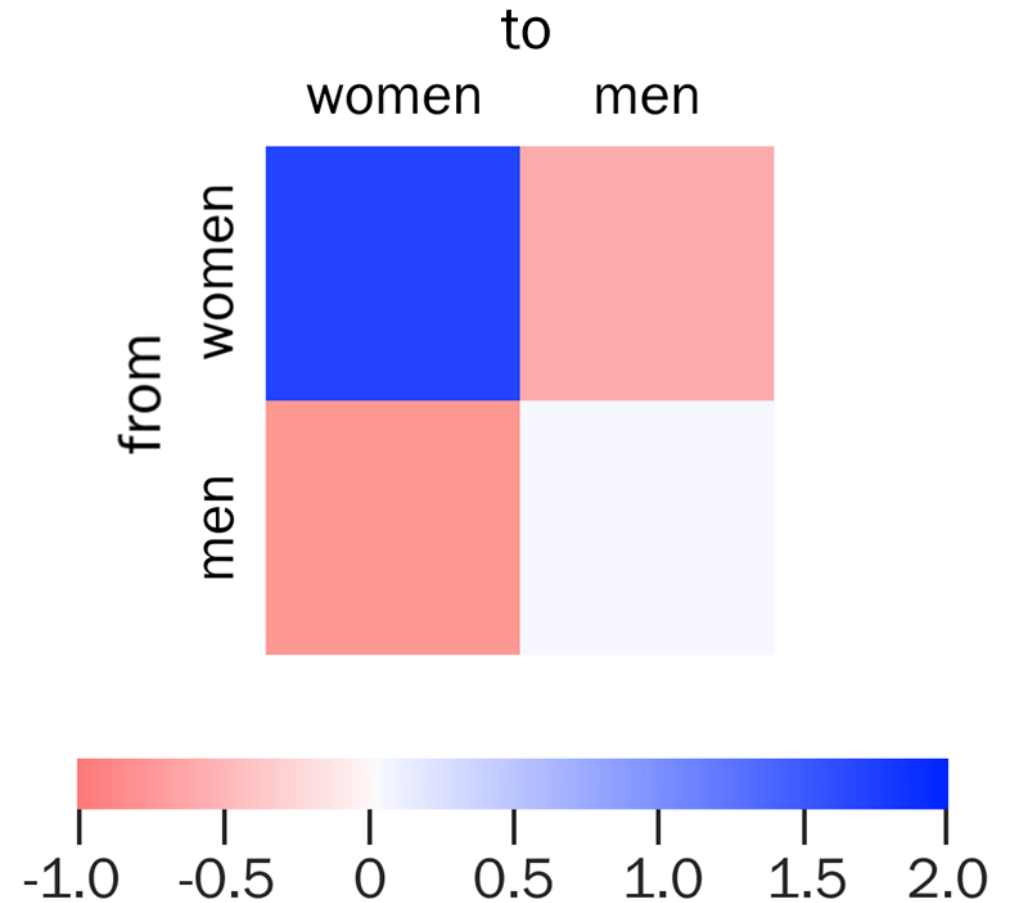
- reference data: “null models” (randomized)
- measures: assortativity, asymmetry, centrality

Structural bias

- assortativity

how much do people of the same gender stay among themselves?

$$L(g_1, g_2) = \log \left(\frac{P(\text{to} = g_2 | \text{from} = g_1)}{P(\text{to} = g_2)} \right)$$

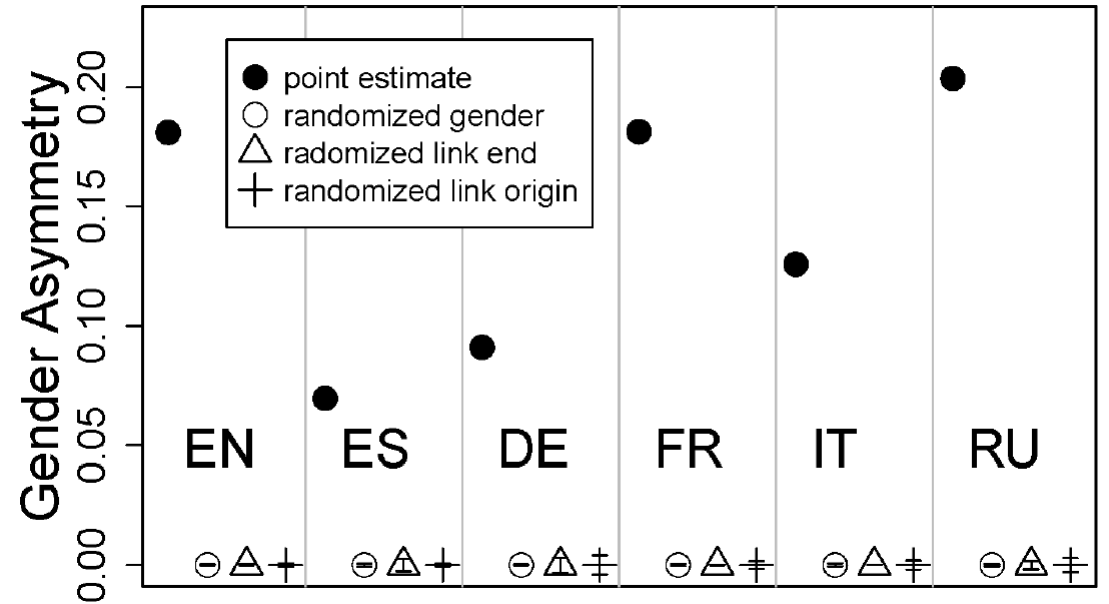


Structural bias

- **asymmetry**

does one gender link more to the other than vice versa?

$$A = L(F, M) - L(M, F)$$



Structural bias

- **centrality**

number of links to the person

	W_i	$p_i <$	$ks_i <$
EN	—	10^{-15}	10^{-15}
ES	+	0.17	0.02
DE	—	10^{-15}	10^{-15}
FR	—	10^{-9}	10^{-5}
IT	—	10^{-6}	10^{-3}
RU	—	10^{-4}	10^{-7}

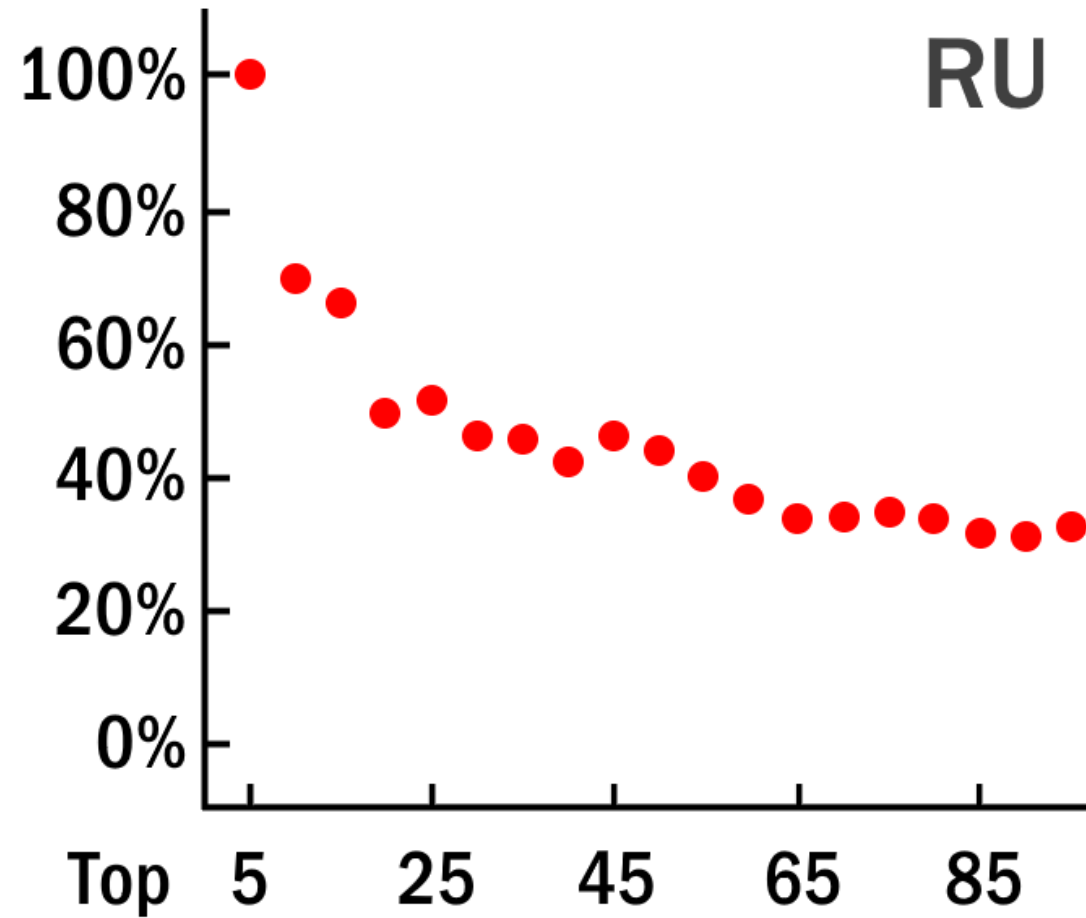
Lexical bias

- **Naive Bayes classifier (\approx text classification)**
 - which words are the best indicators for gender?
 - are there any words that are used disproportionately more for women?
- **word categories**
 - gender (“man”, “woman”, “lady” etc.)
 - relationship (“husband”, “married”, “divorced” etc.)
 - family (“children”, “mother”, “grandmother” etc.)

Lexical bias

- **best indicators for men: words from specific domains**
- **best indicators for women: gender/relationship/family words**
those make up about 25% of the top 150 indicators

Lexical bias



Lexical bias

word stem	women	men (by definition)
husband	9.2	1.0
female	8.2	1.0
aunt	6.5	1.0
women	6.4	1.0
madam	6.1	1.0
woman	5.6	1.0
grandmoth	5.5	1.0
girl	5.3	1.0
mrs	4.9	1.0
divorc	4.4	1.0



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Percy Bysshe Shelley

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"Percy Shelley" redirects here. For the son of the poet, see [Percy Florence Shelley](#). For the English potter, see [Percy Shelley \(potter\)](#).

"Shelley" redirects here. For other uses, see [Shelley \(disambiguation\)](#).

Percy Bysshe Shelley (/bɪʃ/ (listen) BISH^[*] 4 August 1792 – 8 July 1822) was one of the major [English Romantic poets](#), who is regarded by some as among the finest [lyric](#) and [philosophical poets](#) in the English language, and one of the most influential. A radical in his poetry as well as in his political and social views, Shelley did not see fame during his lifetime, but recognition of his achievements in poetry grew steadily following his death. Shelley was a key member of a close circle of visionary poets and writers that included [Lord Byron](#), [John Keats](#), [Leigh Hunt](#), [Thomas Love Peacock](#) and his own second wife, [Mary Shelley](#), the author of *Frankenstein*.

Shelley is perhaps best known for classic poems such as "Ozymandias", "Ode to the West Wind", "To a Skylark", "Music, When Soft Voices Die", "The Cloud" and *The Masque of Anarchy*. His other major works include a groundbreaking verse drama, *The Cenci* (1819), and long, visionary, philosophical poems such as *Queen Mab* (later reworked as *The Daemon of the World*), *Alastor*, *The Revolt of Islam*, *Adonais*, *Prometheus Unbound* (1820) – widely considered to be his masterpiece –, *Hellas: A Lyrical Drama* (1821) and his final, unfinished work, *The Triumph of Life* (1822).

Shelley's close circle of friends included some of the most important progressive thinkers of the day, including his father-in-law, the philosopher [William Godwin](#), and [Leigh Hunt](#). Though Shelley's poetry and prose output remained steady throughout his life, most publishers and journals declined to publish his work for fear of being arrested for either [blasphemy](#) or [sedition](#). Shelley's poetry sometimes had only an underground readership during his day, but his poetic achievements are widely recognized today, and his political and social thought had an impact on the [Chartist](#) and other movements in England, and reach down to the present day. Shelley's theories of economics and [morality](#), for example, had a profound influence on [Karl Marx](#); his early – perhaps first – writings on nonviolent resistance influenced [Leo Tolstoy](#), whose writings on the subject in turn influenced [Mahatma Gandhi](#), and through him [Martin Luther King Jr.](#) and others practicing [nonviolence](#) during the American [civil rights movement](#).

Shelley became a [lodestar](#) to the subsequent three or four generations of poets, including important [Victorian](#) and [Pre-Raphaelite](#) poets such as [Robert Browning](#) and [Dante Gabriel Rossetti](#). He was admired by [Oscar Wilde](#), [Thomas Hardy](#), [George Bernard Shaw](#), [Leo Tolstoy](#), [Bertrand Russell](#), [W. B. Yeats](#), [Upton Sinclair](#) and [Isadora Duncan](#).^[3] [Henry David Thoreau's](#) *Civil Disobedience* was apparently influenced by Shelley's writings and theories on nonviolence in protest and political action. Shelley's popularity and influence has continued to grow in contemporary poetry circles.

Contents [hide]

- 1 Life
 - 1.1 Early life and education
 - 1.2 Marriage

Percy Bysshe Shelley



Portrait of Shelley, by Alfred Clint (1829)

Born	4 August 1792 <div>Horsham, Sussex, England</div>
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Education	University of Oxford
Literary movement	Romanticism



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Percy Bysshe Shelley (/bɪʃ/ [ⓘ] [ⓘ] [ⓘ] [ⓘ] [ⓘ]) [ⓘ] [ⓘ] [ⓘ] 4 August 1792 – 8 July 1822) was one of the major English Romantic poets, who is regarded by some as among the finest lyric and philosophical poets in the English language, and one of the most influential. A radical in his poetry as well as in his political and social views, Shelley did not see fame during his lifetime, but recognition of his achievements in poetry grew steadily following his death. Shelley was a key member of a close circle of visionary poets and writers that included Lord Byron, John Keats, Leigh Hunt, Thomas Love Peacock and his own second wife, Mary Shelley, the author of *Frankenstein*.

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Mary Shelley



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For the romance film, see [Mary Shelley \(film\)](#).

"[Mary Wollstonecraft Godwin](#)" redirects here. For her mother, see [Mary Wollstonecraft](#).

Mary Wollstonecraft Shelley (UK: /ˈwɒlstənkrɑːft/, US: /-kræft/; née **Godwin**; 30 August 1797 – 1 February 1851) was an English novelist who wrote the Gothic novel *Frankenstein; or, The Modern Prometheus* (1818). She also edited and promoted the works of her husband, the Romantic poet and philosopher Percy Bysshe Shelley. Her father was the political philosopher William Godwin and her mother was the philosopher and feminist Mary Wollstonecraft.

Shelley's mother died less than a month after giving birth to her. She was raised by her father who was able to provide her with a rich if informal education, encouraging her to adhere to his own anarchist political theories. When she was four, her father married a neighbour with whom Shelley came to have a troubled relationship.^{[2][3]}

In 1814, Shelley began a romance with one of her father's political followers, Percy Bysshe Shelley, who was already married. Together with her stepsister, Claire Clairmont, she and Percy left for France and travelled through Europe. Upon their return to England, Shelley was pregnant with Percy's child. Over the next two years, she and Percy faced ostracism, constant debt and the death of their prematurely born daughter. They married in late 1816, after the suicide of Percy Shelley's first wife, Harriet.

In 1816, the couple famously spent a summer with Lord Byron, John William Polidori and Claire Clairmont near Geneva, Switzerland, where Shelley conceived the idea for her novel *Frankenstein*. The Shelleys left Britain in 1818 for Italy, where their second and third children died before Shelley gave birth to her last and only surviving child, Percy Florence Shelley. In 1822, her husband drowned when his sailing boat sank during a storm near Viareggio. A year later, Shelley returned to England and from then on devoted herself to the upbringing of her son and a career as a professional author. The last decade of her life was dogged by illness, most likely caused by the brain tumour which killed her at age 53.

Until the 1970s, Shelley was known mainly for her efforts to publish her husband's works and for her novel *Frankenstein*, which remains widely read and has inspired many theatrical and film adaptations. Recent scholarship has yielded a more comprehensive view of Shelley's achievements. Scholars have shown increasing interest in her literary output, particularly in her novels, which include the historical novels *Valperga* (1823) and *Perkin Warbeck* (1830), the apocalyptic novel *The Last Man* (1826) and her final two novels, *Lodore* (1835) and *Falkner* (1837). Studies of her lesser-known works, such as the travel book *Rambles in Germany and Italy* (1844) and the biographical articles for Dionysius Lardner's *Cabinet Cyclopaedia* (1829–1846), support the growing view that Shelley remained a political radical throughout her life. Shelley's works often argue that cooperation and sympathy, particularly as practised by women in the family, were the ways to reform civil society. This view was a direct challenge to the individualistic Romantic ethos promoted by Percy Shelley and the Enlightenment political theories articulated by her father, William Godwin.

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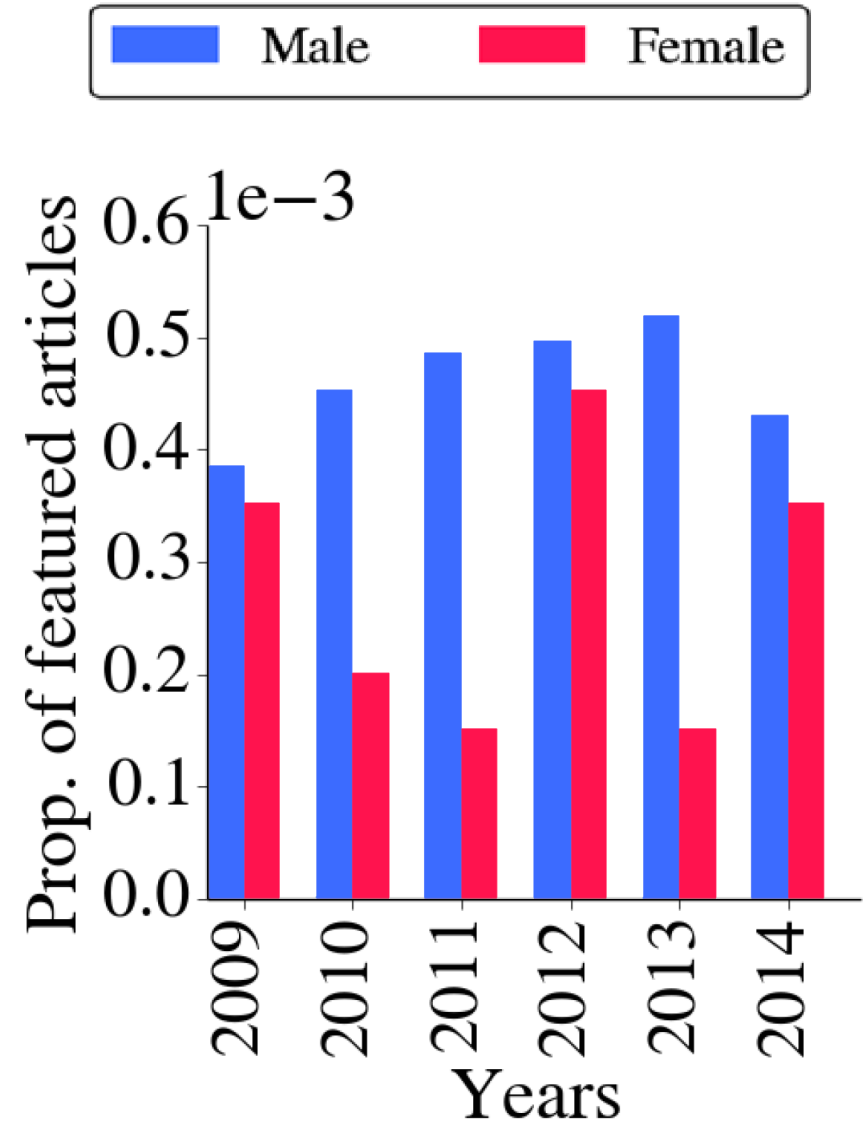
- 1 Life and career
 - 1.1 Early life



Richard Rothwell's portrait of Shelley was shown at the Royal Academy in 1840, accompanied by lines from Percy Shelley's poem "The Revolt of Islam" calling her a "child of love and light".^[1]

Visibility bias

- proportion of men and women who make it to the front page
- magnitudes too small
→ no evidence for bias here



Conclusion

- coverage bias X
- structural bias ✓
- lexical bias ✓
- visibility bias X

Conclusion

- **Wikipedia is aware of bias**
- **still: the way women are portrayed is different**
- **structural bias may have impact on search engines**
- **encourage editors to pay attention**

Potential questions to discuss

- can you think of more types of bias?
- does the choice of reference data make sense?
- how strong are the results?
- bias in other media, traditional or otherwise?

C. Wagner, D. Garcia, M. Jadidi, and M. Strohmaier. It's a man's wikipedia? assessing gender inequality in an online encyclopedia. In Ninth International AAAI Conference on Web and Social Media, 2015.