Controlled Analyses of Social Biases in Wikipedia Bios

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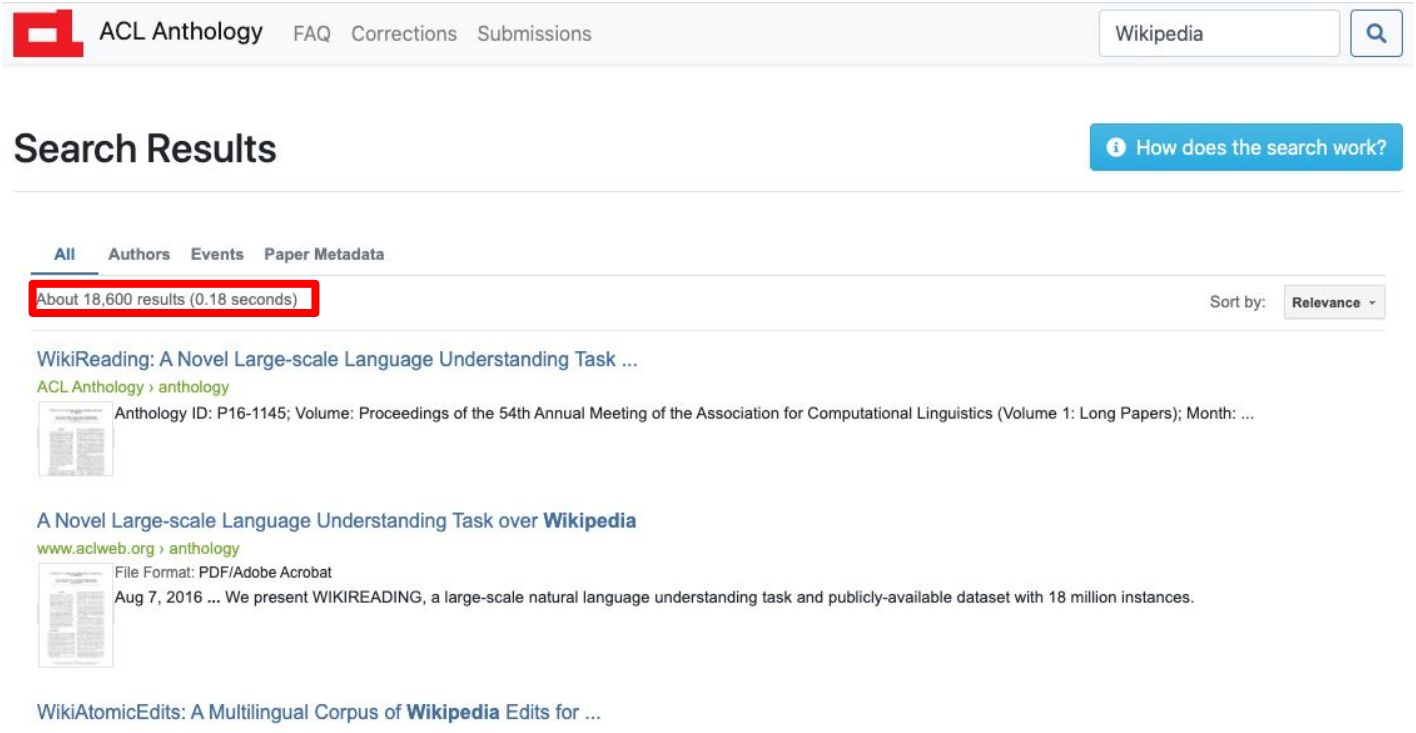
Wikipedia is widely read

Language	Language (local)	Wiki	Articles	Total	Edits	Admins	Users	Active users	Images	Depth
English	English	en	6,272,303	52,980,241	1,007,538,232	1,109	41,154,319	143,523	890,625	1,054
Cebuano	Cebuano	ceb	5,602,692	10,238,758	30,760,607	6	76,657	190	0	2
Swedish	svenska	sv	3,309,677	7,332,273	49,020,033	60	766,622	2,772	0	9
German	Deutsch	de	2,549,611	7,084,921	208,400,896	189	3,661,188	21,265	129,199	93
French	français	fr	2,309,095	11,251,461	180,419,157	157	4,042,091	21,933	63,842	240
Dutch	Nederlands	nl	2,048,410	4,318,501	58,347,781	35	1,128,809	4,561	21	16
Russian	русский	ru	1,706,803	6,502,835	112,675,004	80	2,940,342	12,325	230,210	136
Italian	italiano	it	1,679,991	6,986,343	118,981,112	115	2,095,124	9,988	141,437	169
Spanish	español	es	1,667,197	7,353,823	133,525,797	67	6,151,944	17,601	0	211
Polish	polski	pl	1,462,806	3,375,455	62,427,763	102	1,090,164	4,950	269	31
Waray	Winaray	war	1,264,912	2,879,597	6,229,339	3	47,613	85	42	3
Vietnamese	Tiếng Việt	vi	1,262,412	19,244,223	64,549,020	19	792,010	2,296	22,562	680
Japanese	日本語	ja	1,258,378	3,718,017	82,218,497	41	1,761,953	15,445	61,257	84
Egyptian Arabic	مصرى	arz	1,214,007	1,434,792	5,115,153	6	149,001	207	1,454	0
Chinese	中文	zh	1,183,402	6,532,789	64,466,980	79	3,061,679	8,399	55,290	201
Arabic	العربية	ar	1,107,222	7,206,082	52,954,562	26	2,045,431	8,885	43,177	222

Wikipedia is widely used in NLP research



Numerous studies examine *gender bias* in Wikipedia biography pages

- Coverage bias
  - Some studies have found notable women are more likely to be missing on Wikipedia than notable men (Reagle and Rhue 2011) more recent work has found the opposite (Wagner et al. 2015; Young et al. 2016)
  - Articles about women tend to be longer than articles about men (Graells-Garrido et al. 2015; Reagle and Rhue 2011; Wagner et al. 2015; Young et al. 2016)
- Structural bias
  - All biography articles tend to link to articles about men more than women (Young, Wigdor, and Kane 2016; Wagner et al. 2015, 2016; Eom et al. 2015)
- Content bias
  - Pages for women discuss personal relationships more frequently than pages for men (Bamman and Smith 2014; Graells-Garrido et al. 2015; Wagner et al. 2016)

Alan Turing

From Wikipedia, the free encyclopedia

"Turing" redirects here. For other uses, see Turing (disambiguation).

Alan Mathison Turing OBE FRS (/ˈtjʊərɪŋ/; 23 June 1912 – 7 June 1954) was an English mathematician, computer scientist, logician, cryptanalyst, philosopher, and theoretical biologist.[6][7] Turing was highly influential in the development of theoretical computer science, providing a formalisation of the concepts of algorithm and computation with the Turing machine, which can be considered a model of a general-purpose computer.[8][9][10] Turing is widely considered to be the father of theoretical computer science and artificial intelligence.[11]

Born in Maida Vale, London, Turing was raised in southern England. He graduated at King's College, Cambridge with a degree in mathematics. Whilst he was a fellow at Cambridge, he published a proof demonstrating that some purely mathematical yes–no questions can never be answered by computation and defined a Turing machine, and went on to prove the halting problem for Turing machines is undecidable. In 1938, he obtained his PhD from the Department of Mathematics at Princeton University. During the Second World War, Turing worked for the Government Code and Cypher School (GC&CS) at Bletchley Park, Britain's codebreaking centre that produced Ultra intelligence. For a time he led

Alan Turing
OBE FRS

Turing c. 1928 at age 16

Spanish

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Alan Turing

«Turing» redirige aquí. Para otras acepciones, véase Turing (desambiguación).

Alan Mathison Turing (Paddington, Londres; 23 de junio de 1912-Wilmslow, Cheshire; 7 de junio de 1954), fue un matemático, lógico, informático teórico, criptógrafo, filósofo, biólogo teórico, maratoniano y corredor de ultradistancia británico.[1] [2] [3] [4] [5]

Es considerado uno de los padres de la ciencia de la computación y precursor de la informática moderna. Proporcionó una influyente formalización de los conceptos de algoritmo y computación: la máquina de Turing. Formuló su propia versión que hoy es ampliamente aceptada como la tesis de Church-Turing (1936).

Durante la segunda guerra mundial, trabajó en descifrar los códigos nazis, particularmente los de la máquina Enigma, y durante un tiempo fue el director de la sección Naval Enigma de Bletchley Park. Se ha estimado que su trabajo acortó la duración de esa guerra entre dos y cuatro años.[6] Tras la guerra, diseñó uno de los primeros computadores electrónicos programables digitales en el Laboratorio Nacional de Física del Reino Unido y poco tiempo después construyó otra de las primeras máquinas en la Universidad de Mánchester.

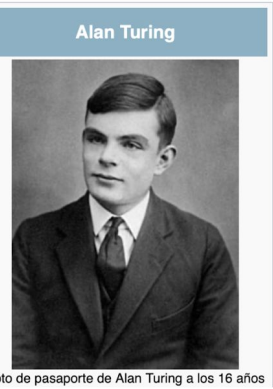

Foto de pasaporte de Alan Turing a los 16 años

Russian

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Тьюринг, Алан

Материал из Википедии — свободной энциклопедии

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А́лан Ма́тисон Тью́ринг, OBE (англ. *Alan Mathison Turing* [ˈtjʊərɪŋ]; 23 июня 1912 — 7 июня 1954) — английский математик, логик, криптограф, оказавший существенное влияние на развитие информатики. Кавалер Ордена Британской империи (1945), член Лондонского королевского общества (1951)[5]. Предложенная им в 1936 году абстрактная вычислительная «Машина Тьюринга», которую можно считать моделью компьютера общего назначения[6], позволила формализовать понятие алгоритма и до сих пор используется во множестве теоретических и практических исследований. Научные труды А. Тьюринга — общепризнанный вклад в основания информатики (и, в частности, — теории искусственного интеллекта)[7].

Во время Второй мировой войны Алан Тьюринг работал в Правительственной школе кодов и шифров, располагавшейся в Блетчли-парке, где была сосредоточена работа по взлому шифров и кодов стран Оси. Он возглавлял группу Hut 8, ответственную за криптоанализ сообщений военно-морского флота Германии. Тьюринг разработал ряд методов взлома, в том числе теоретическую базу для *Bombe* — машины, использованной для взлома немецкого шифратора Enigma.

После войны Тьюринг работал в Национальной физической лаборатории, где по его проекту был реализован первый в мире компьютер с хранимой в памяти программой — ACE. В 1948 учёный присоединился к вычислительной лаборатории Макса Ньюмана в Университете Манчестера, где ассистировал при создании Манчестерских Компьютеров[8], а позднее заинтересовался математической биологией. Тьюринг опубликовал работу по химическим основам морфогенеза и предсказал протекающие в колебательном режиме[en] химические реакции, такие, как реакция Белоусова — Жаботинского, которые впервые были представлены научному сообществу в 1968 году. В 1950 году предложил эмпирический тест Тьюринга для оценки искусственного интеллекта компьютера.

Алан Тьюринг
англ. *Alan Mathison Turing*


Фото на паспорт. 16 лет.

Are there differences in how English/Spanish/Russian/… Wikipedias portray people?

English Wikipedia:
He *accepted* the option of injections of what was then called stilboestrol.

Spanish Wikipedia:
Finalmente escogió las inyecciones de estrógenos.
Finally he chose estrogen injections.

Russian Wikipedia:
Учёный предпочёл инъекции стильбэстрола
The scientist preferred stilbestrol injections.

There are subtle differences in narratives

Why automatically identifying disparities?

- Identification of disparities in research studies has lead to editor action to reduce them (Reagle and Rhue 2011; Langrock and González-Bailón 2020)

- NLP models are liable to absorb and amplify data biases
  - Tools to identify disparities can aid NLP researchers in balancing training data sets

Limitation 1: Confounding variables limit conclusions of analyses

Men-assoc.	Women-assoc.
he	her
his	she
He	She
His	Her
season	Women
him	women
League	Actress
Club	husband

- football, football**er**, baseball, league (Graells-Garrido et al. 2015; Reagle and Rhue 2011; Wagner et al. 2015)

Does this imply Wikipedia editors omit the football achievements of women?

In society and on Wikipedia, there are more male football players than female ones

Limitation 2: Content disparities likely exist for social dimensions other than binary gender (e.g. race)

- Editors are predominately white and male
- Cultural identity is a motivating factor in what content people contribute (Miquel-Ribé, 2016)
- Edit-a-thons and other community initiatives to reduce observed cultural gaps
- Non-white sociologists are less likely to have articles (Adams, 2019)

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https://meta.wikimedia.org/wiki/Research:Wikipedia_Editors_Survey_2011_April
https://en.wikipedia.org/wiki/Racial_bias_on_Wikipedia

This work

Facilitate examinations of systemic differences in Wikipedia biography articles about people of different attributes (race, gender, LGBTQIA+)

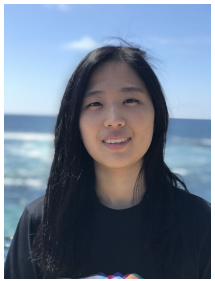
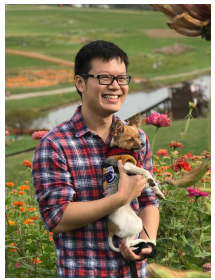
- Methodology to reduce the influence of confounding variables and isolate dimensions of interest
- Methodology for building corpora of biography pages
- Methodology for automatically analyzing how people are portrayed in multilingual texts

Intended use case: identify articles that may benefit from further editing

Controlled Analyses of Social Biases in Wikipedia Bios

- Wikipedia Bios *selection* methodology
  - Anjalie Field*, Chan Young Park*, Kevin Lin, and Yulia Tsvetkov (2022) **Controlled Analyses of Social Biases in Wikipedia Bios.** *TheWebConf*

- Wikipedia Bios *content analysis* methodology
  - Chan Young Park*, Xinru Yan*, Anjalie Field*, Yulia Tsvetkov (2021) **Multilingual Contextual Affective Analysis of LGBT People Portrayals in Wikipedia.** *ICWSM*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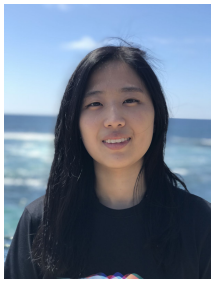
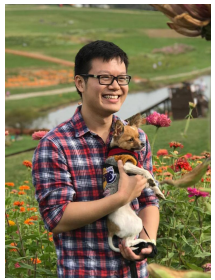
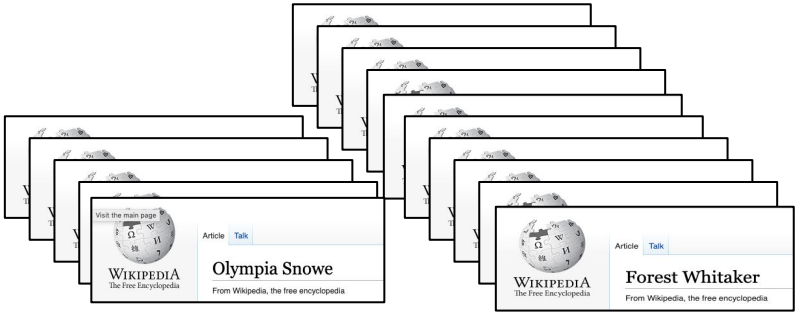



Reduce confounding variables through *Pivot-Slope TF-IDF Matching*

- Goal:
  - Isolate target attributes (e.g. gender, race) from other attributes that may affect how Wikipedia editors write articles (e.g. age, occupation, religion)

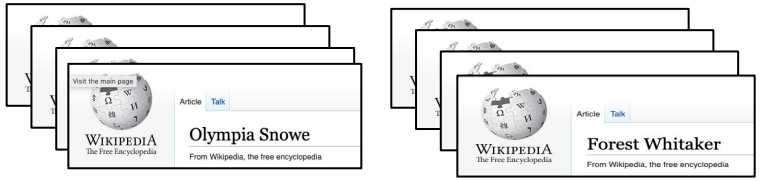
- Contribution:
  - Develop a matching algorithm to construct *comparison* corpus that matches the *target corpus* on as many attributes as possible, except the target one

Construction of comparable corpora



all articles about cisgender women (**target corpora**)

all articles about cisgender men (**candidate comparison corpora**)



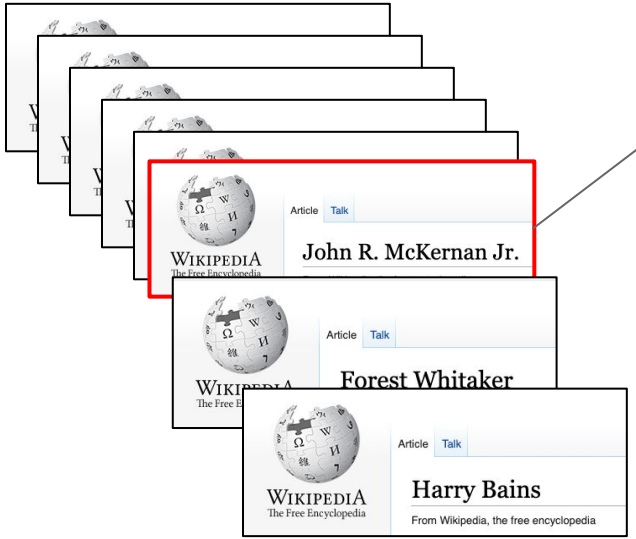
articles about cisgender women (**target corpora**)

articles about cisgender men (**comparison corpora**)

Similar distribution of all attributes except gender

High-level construction of comparison corpus

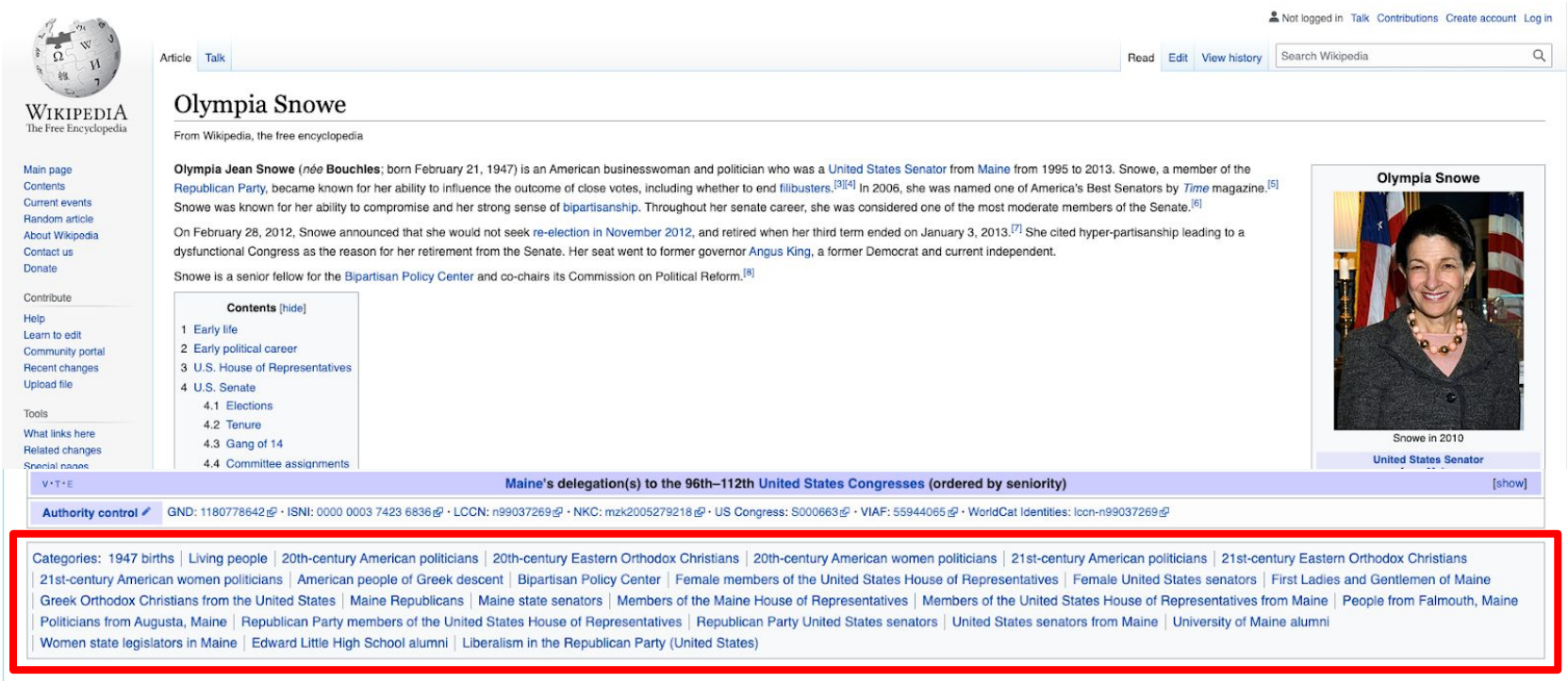
Article about a cisgender woman



Articles about cisgender men

Identify *comparison* article closest matching *target* article

Choice of attributes: Wikipedia categories



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Olympia Snowe

From Wikipedia, the free encyclopedia

Olympia Jean Snowe (*née* **Bouchles**; born February 21, 1947) is an American businesswoman and politician who was a United States Senator from Maine from 1995 to 2013. Snowe, a member of the Republican Party, became known for her ability to influence the outcome of close votes, including whether to end filibusters.[3][4] In 2006, she was named one of America's Best Senators by *Time* magazine.[5] Snowe was known for her ability to compromise and her strong sense of bipartisanship. Throughout her senate career, she was considered one of the most moderate members of the Senate.[6]

On February 28, 2012, Snowe announced that she would not seek re-election in November 2012, and retired when her third term ended on January 3, 2013.[7] She cited hyper-partisanship leading to a dysfunctional Congress as the reason for her retirement from the Senate. Her seat went to former governor Angus King, a former Democrat and current independent.

Snowe is a senior fellow for the Bipartisan Policy Center and co-chairs its Commission on Political Reform.[8]

Contents [hide]
1 Early life
2 Early political career
3 U.S. House of Representatives
4 U.S. Senate
4.1 Elections
4.2 Tenure
4.3 Gang of 14
4.4 Committee assignments

Olympia Snowe

Snowe in 2010

United States Senator

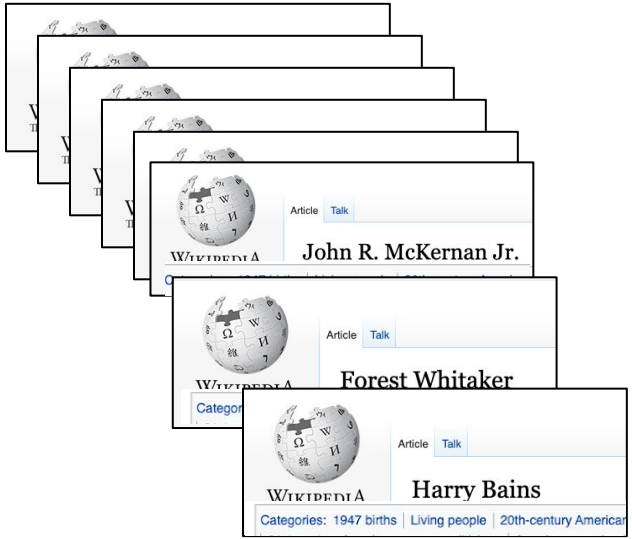
Maine's delegation(s) to the 96th–112th United States Congresses (ordered by seniority) [show]

Authority control GND: 1180778642 · ISNI: 0000 0003 7423 6836 · LCCN: n99037269 · NKC: mzk2005279218 · US Congress: S000663 · VIAF: 55944065 · WorldCat Identities: lccn-n99037269

Categories: 1947 births | Living people | 20th-century American politicians | 20th-century Eastern Orthodox Christians | 20th-century American women politicians | 21st-century American politicians | 21st-century Eastern Orthodox Christians | 21st-century American women politicians | American people of Greek descent | Bipartisan Policy Center | Female members of the United States House of Representatives | Female United States senators | First Ladies and Gentlemen of Maine | Greek Orthodox Christians from the United States | Maine Republicans | Maine state senators | Members of the Maine House of Representatives | Members of the United States House of Representatives from Maine | People from Falmouth, Maine | Politicians from Augusta, Maine | Republican Party members of the United States House of Representatives | Republican Party United States senators | United States senators from Maine | University of Maine alumni | Women state legislators in Maine | Edward Little High School alumni | Liberalism in the Republican Party (United States)

High-level construction of comparison corpus

Article about a cisgender woman



Articles about cisgender men

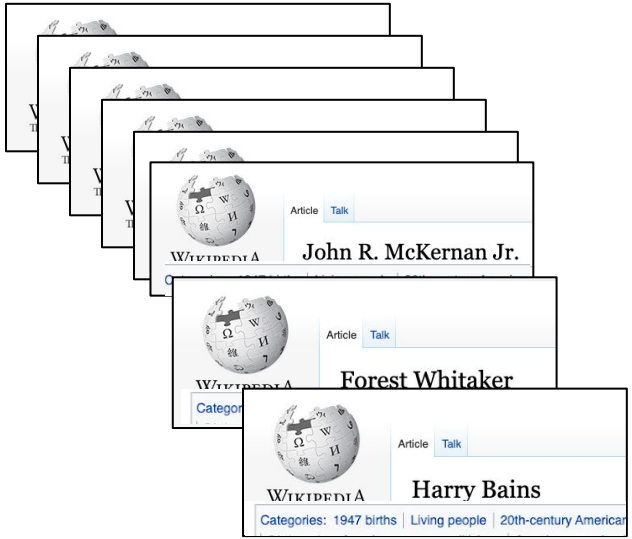
How do we identify comparison article with most similar categories?

Largest intersection of categories

- Weights categories equally
- Favors article with more categories

High-level construction of comparison corpus

Article about a cisgender woman

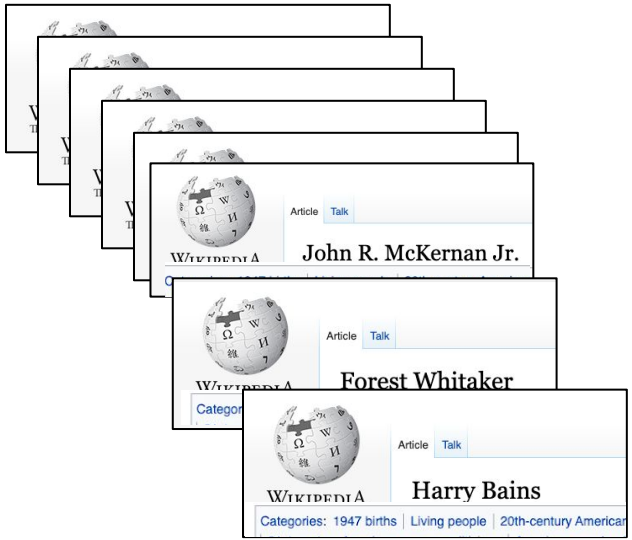


Articles about cisgender men

- Represent categories as **TF-IDF** vectors with a pivot-slope correction
- More descriptive categories like "*Members of the United States House of Representatives from Maine*" are weighted more than common categories like "*21st-century American politicians*"

High-level construction of comparison corpus

Article about a cisgender woman



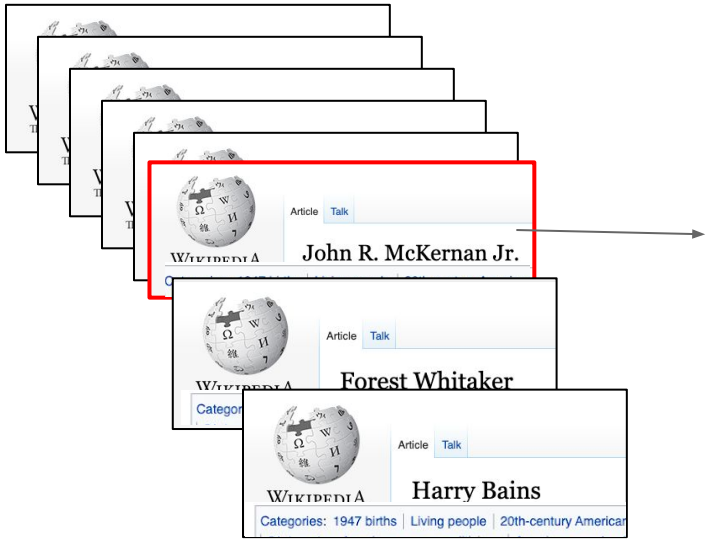
Articles about cisgender men

- Represent categories as TF-IDF vectors with a pivot-slope correction
- Correct tendency to favor articles with fewer categories

Singhal et al. (1996)

High-level construction of comparison corpus

Article about a cisgender woman

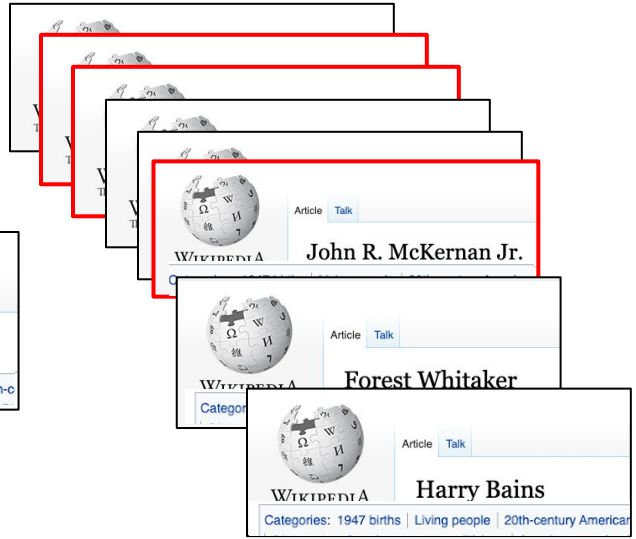


Articles about cisgender men

- Add article with highest cosine-similarity to comparison corpora
- *"Members of the United States House of Representatives from Maine"*
- *"People from Falmouth"*

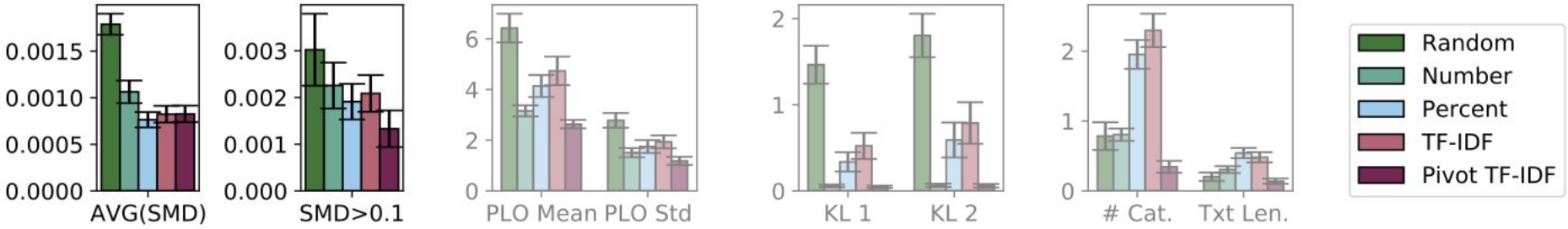
High-level construction of comparison corpus

Article about a cisgender woman



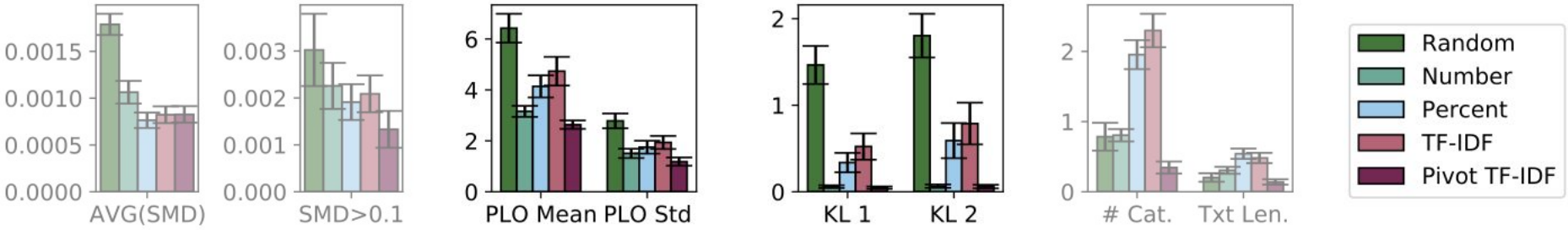
Articles about cisgender men

Evaluations: Random simulations (lower score is better)



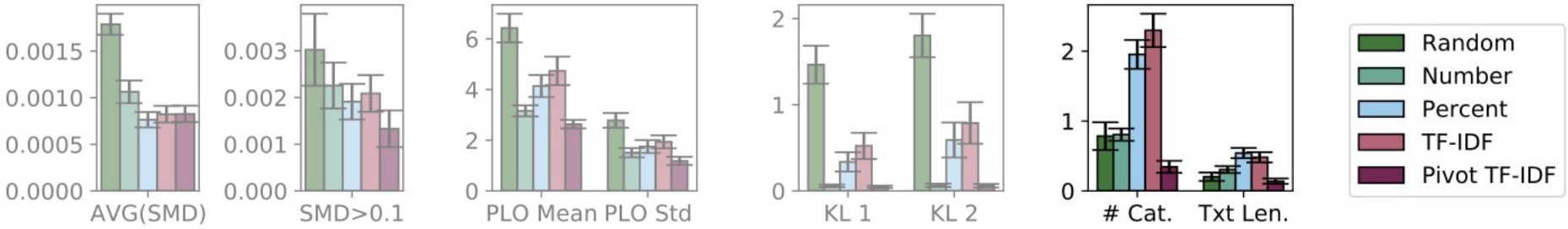
- Compare how well algorithms balance covariates (categories) using *standardized difference of means*

Evaluations: Random simulations (lower score is better)

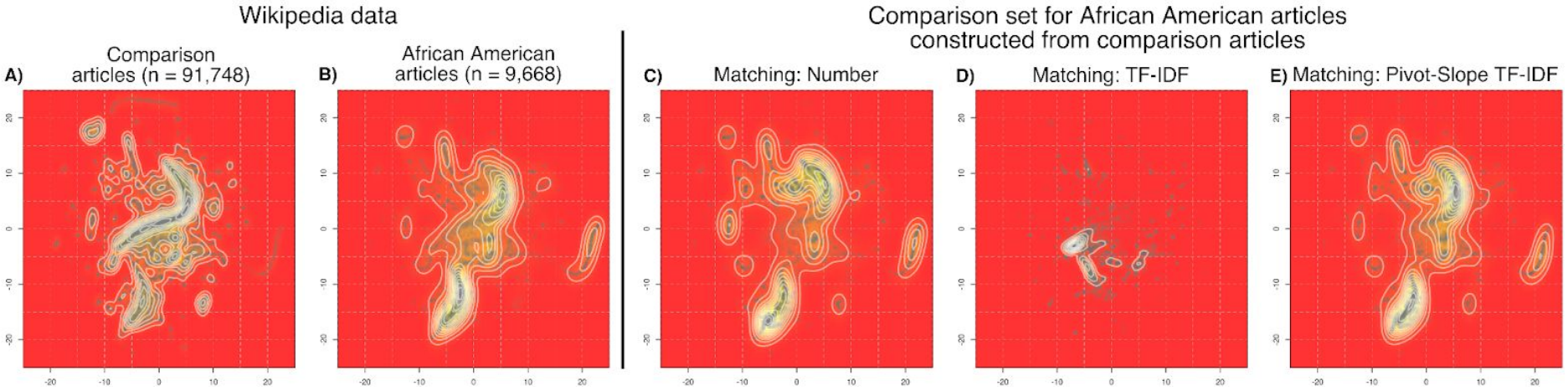


- Compare how well algorithms balance word statistics of article text

Evaluations: Random simulations (lower score is better)



- Examine if algorithm creates artificial findings (e.g. favors articles with more or fewer categories)


Wikipedia data
Comparison set for African American articles constructed from comparison articles
A)
Comparison articles (n = 91,748)
B)
African American articles (n = 9,668)
C)
Matching: Number
D)
Matching: TF-IDF
E)
Matching: Pivot-Slope TF-IDF

Dataset construction

- All articles with the category "Living people" on English Wikipedia in March 2020
  - discarded articles with < 2 categories, < 100 tokens, or marked as stubs (containing a category like "Actor stubs").
  - use English categories for matching, which we expect to be the most reliable, because English has the most active editor community.
  - ignore categories focused on article properties instead of people traits using a heuristics, e.g., categories containing "Pages with".

- Our final corpus consists of
  - 444,045 articles, containing on average 9.3 categories and 628.2 tokens.
  - the total number of categories considered valid for matching is 209,613

Social attributes

- Our goal is to identify *observed* gender and race as perceived by Wikipedia editors who assigned article metadata (or readers who may view them), as opposed to assuming ground-truth values
  - we derive race and gender directly from Wikipedia articles and associated metadata

- Gender – Wikidata — a crowd-sourced database corresponding to Wikipedia pages
  - non-binary, cis. women, transgender women, transgender men; cis. men as comparison group

- Race – social construct with no global definition
  - biographies of American people and commonly selected race/ethnicity categories from the U.S census: Black/African American, Asian American, Hispanic/LatinX American; unmarked as comparison group

Mary Bucholtz and Kira Hall. 2005. **Identity and interaction: A sociocultural linguistic approach.** *Discourse Studies* 7, 4-5 (2005), 585–614.
Alex Hanna, Emily Denton, Andrew Smart, and Jamila Smith-Loud (2020) **Towards a critical race methodology in algorithmic fairness.** *FAccT*.

Analysis Data

	Pre-match Size	Final Size
African American	9,998	8,404
Asian American	4,728	3,473
Hispanic/LatinX American	4,483	3,813
Unmarked American (comparison)	93,486	-
Non-Binary	200	127
Cisgender Women	108,915	64,828
Transgender Women	261	134
Transgender men	85	53
Cisgender men (comparison)	331,484	-

Analysis Metrics

https://anjalief.github.io/wikipedia_bias_viz/

- Focus on *content bias*, some metrics also capture *coverage bias*
- English articles:
  - Length
  - Language availability
  - Edit count
  - Article age
  - Percent of article devoted to common sections
  - Word statistics

- In top 10 edited languages:
  - Article lengths
  - Normalized section lengths

Limitations

- Numerous types of bias that our method does not capture
  - Reducing the influence of confounding variables could mask biases, e.g. race is so integral to U.S. society that it may not really be possible to separate it from other variables (Hanna et al. 2020)
- Reliant on category information
- Difficult to determine origins of content disparity
  - Articles about women may be shorter than articles about men because:
    - Wikipedia editors write them less carefully
    - Secondary sources may have less information about women (biases in media coverage perpetuate to Wikipedia)
    - Because of societal structures, it's difficult for women to achieve the same accomplishments as men
  - Our intended use case: identify articles that may benefit from further editing

Analysis Results: Motivating Example

Unmatched	
he	her
his	she
He	She
His	Her
season	Women
him	women
League	actress

Matched	
he	her
his	she
He	She
His	Her
him	Women
himself	women
wife	husband

Article length

	Without matching		With matching	
	Target	Comparison	Target	Comparison
African American	902.0	711.4	942.8	955.5
Asian American	741.3	711.4	795.64	854.6
Hispanic/Latinx American	972.5	711.4	1017.37	1028.11

Additional characteristics

	Edit History		Article Age		# of Languages	
	Target	Comp.	Target	Comp.	Target	Comp.
African American	243.4	245.8	**128.5**	136.2	**6.2**	6.8
Asian American	193.2	198.5	**123.2**	130.3	**6.0**	7.1
Hispanic/Latinx American	293.4	277.8	**130.0**	137.4	7.5	7.6

Intersectionality: African American Women

	Article Lengths		# of Languages	
	Target	Comp.	Target	Comp.
vs. unmarked Amer. women	906.78	864.81	**5.93**	7.19
vs. African American men	1036.79	1005.40	6.42	6.60
vs. unmarked American men	1012.53	958.52	6.10	**5.62**

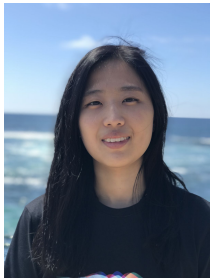
Highlights of Findings

- Articles about cisgender women, African Americans, and Asian Americans tend to be **shorter** and available in **fewer languages** than comparisons
- Articles about transgender women tend to have **more edits** and be **available in more languages** than comparisons
- Articles for all single-attribute target groups tend to be **written more recently** than comparisons
- Articles about African American women tend to be available in **more languages** than unspecified American men, but **fewer languages** than unspecified American women

Controlled Analyses of Social Biases in Wikipedia Bios

- Wikipedia Bios *selection* methodology
  - Anjalie Field*, Chan Young Park*, Kevin Lin, and Yulia Tsvetkov (2022) **Controlled Analyses of Social Biases in Wikipedia Bios.** *TheWebConf*

- Wikipedia Bios *content analysis* methodology
  - Chan Young Park*, Xinru Yan*, Anjalie Field*, Yulia Tsvetkov (2021) **Multilingual Contextual Affective Analysis of LGBT People Portrayals in Wikipedia.** *ICWSM*



Alan Turing

From Wikipedia, the free encyclopedia

"Turing" redirects here. For other uses, see Turing (disambiguation).

Alan Mathison Turing OBE FRS (/ˈtjʊərɪŋ/; 23 June 1912 – 7 June 1954) was an English mathematician, computer scientist, logician, cryptanalyst, philosopher, and theoretical biologist.[6][7] Turing was highly influential in the development of theoretical computer science, providing a formalisation of the concepts of algorithm and computation with the Turing machine, which can be considered a model of a general-purpose computer.[8][9][10] Turing is widely considered to be the father of theoretical computer science and artificial intelligence.[11]

Born in Maida Vale, London, Turing was raised in southern England. He graduated at King's College, Cambridge with a degree in mathematics. Whilst he was a fellow at Cambridge, he published a proof demonstrating that some purely mathematical yes–no questions can never be answered by computation and defined a Turing machine, and went on to prove the halting problem for Turing machines is undecidable. In 1938, he obtained his PhD from the Department of Mathematics at Princeton University. During the Second World War, Turing worked for the Government Code and Cypher School (GC&CS) at Bletchley Park, Britain's codebreaking centre that produced Ultra intelligence. For a time he led

Alan Turing
OBE FRS

Turing c. 1928 at age 16

Spanish

20 años de WIKIPEDIA

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Herramientas
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Información de la página
Citar esta página

Alan Turing

«Turing» redirige aquí. Para otras acepciones, véase Turing (desambiguación).

Alan Mathison Turing (Paddington, Londres; 23 de junio de 1912-Wilmslow, Cheshire; 7 de junio de 1954), fue un matemático, lógico, informático teórico, criptógrafo, filósofo, biólogo teórico, maratoniano y corredor de ultradistancia británico.[1] [2] [3] [4] [5]

Es considerado uno de los padres de la ciencia de la computación y precursor de la informática moderna. Proporcionó una influyente formalización de los conceptos de algoritmo y computación: la máquina de Turing. Formuló su propia versión que hoy es ampliamente aceptada como la tesis de Church-Turing (1936).

Durante la segunda guerra mundial, trabajó en descifrar los códigos nazis, particularmente los de la máquina Enigma, y durante un tiempo fue el director de la sección Naval Enigma de Bletchley Park. Se ha estimado que su trabajo acortó la duración de esa guerra entre dos y cuatro años.[6] Tras la guerra, diseñó uno de los primeros computadores electrónicos programables digitales en el Laboratorio Nacional de Física del Reino Unido y poco tiempo después construyó otra de las primeras máquinas en la Universidad de Mánchester.

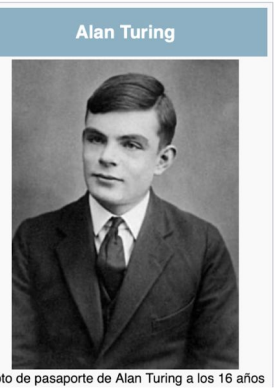

Foto de pasaporte de Alan Turing a los 16 años

Russian

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Тьюринг, Алан

Материал из Википедии — свободной энциклопедии

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А́лан Ма́тисон Тью́ринг, OBE (англ. *Alan Mathison Turing* [ˈtjʊərɪŋ]; 23 июня 1912 — 7 июня 1954) — английский математик, логик, криптограф, оказавший существенное влияние на развитие информатики. Кавалер Ордена Британской империи (1945), член Лондонского королевского общества (1951)[5]. Предложенная им в 1936 году абстрактная вычислительная «Машина Тьюринга», которую можно считать моделью компьютера общего назначения[6], позволила формализовать понятие алгоритма и до сих пор используется во множестве теоретических и практических исследований. Научные труды А. Тьюринга — общепризнанный вклад в основания информатики (и, в частности, — теории искусственного интеллекта)[7].

Во время Второй мировой войны Алан Тьюринг работал в Правительственной школе кодов и шифров, располагавшейся в Блетчли-парке, где была сосредоточена работа по взлому шифров и кодов стран Оси. Он возглавлял группу Hut 8, ответственную за криптоанализ сообщений военно-морского флота Германии. Тьюринг разработал ряд методов взлома, в том числе теоретическую базу для *Bombe* — машины, использованной для взлома немецкого шифратора Enigma.

После войны Тьюринг работал в Национальной физической лаборатории, где по его проекту был реализован первый в мире компьютер с хранимой в памяти программой — ACE. В 1948 учёный присоединился к вычислительной лаборатории Макса Ньюмана в Университете Манчестера, где ассистировал при создании Манчестерских Компьютеров[8], а позднее заинтересовался математической биологией. Тьюринг опубликовал работу по химическим основам морфогенеза и предсказал протекающие в колебательном режиме[en] химические реакции, такие, как реакция Белоусова — Жаботинского, которые впервые были представлены научному сообществу в 1968 году. В 1950 году предложил эмпирический тест Тьюринга для оценки искусственного интеллекта компьютера.

Алан Тьюринг
англ. *Alan Mathison Turing*


Фото на паспорт, 16 лет.

English Wikipedia:
He *accepted* the option of injections of what was then called stilboestrol.

Spanish Wikipedia:
Finalmente escogió las inyecciones de estrógenos.
Finally he chose estrogen injections.

Russian Wikipedia:
Учёный предпочёл инъекции стильбэстрола
The scientist preferred stilbestrol injections.

There are subtle differences in narratives

Are there differences in how English/Spanish/Russian/… Wikipedias portray people?

LGBTBio Corpus

- 1,340 Wikipedia articles about LGBT people
- 1,340 articles about non-LGBT people with similar characteristics
- Articles are in three languages: English, Spanish, Russian

Affect Control Theory

Besides a denotative meaning, three important, largely independent, dimensions of word meaning are:

- Valence / Sentiment
  - positive–negative
  - pleasant–unpleasant
- Arousal / Agency
  - active–passive
- Dominance / Power
  - dominant–submissive

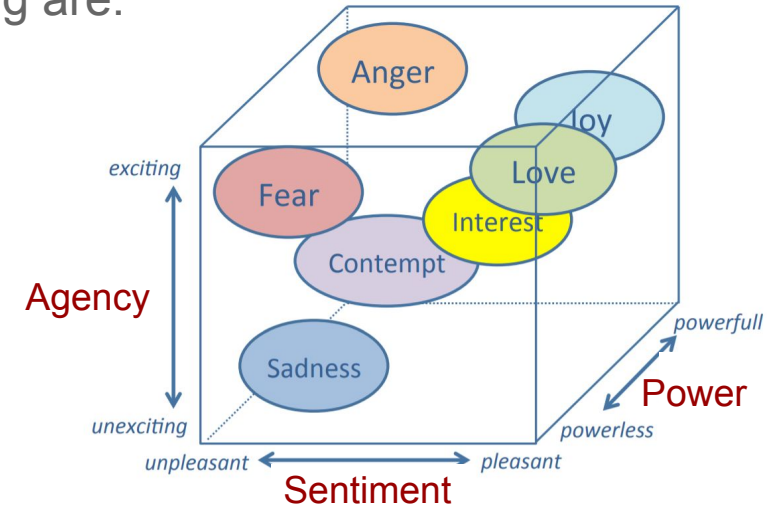


Figure credit: Tobias Schröder

Osgood, C.; Suci, G.; and Tannenbaum, P. 1957. **The Measurement of Meaning.** Illini Books, IB47. University of Illinois Press
Mohammad, Saif. **"Obtaining reliable human ratings of valence, arousal, and dominance for 20,000 english words.**" Proc. ACL'18

Contextual Affective Analysis

Find (Sentiment, Power, Agency) connotations in a given context:

"The **firefighter** **rescued** the **boy**"

- **Sentiment** towards **firefighter**: Positive (+)
- **Power** of **firefighter**: Positive (+)
- **Agency** of **firefighter**: Positive (+)

Rashkin, Hannah, Sameer Singh, and Yejin Choi. (2016) **Connotation Frames: A Data-Driven Investigation**. *ACL*
Sap, Maarten, et al. (2017) **Connotation frames of power and agency in modern films**. *EMNLP*
Field et al. (2019) **Contextual Affective Analysis: A Case Study of People Portrayals in Online #MeToo Stories.** *ICWSM*

Multilingual Contextualized Connotation Frames

Existing dataset:

X rescues Y	(+, +, +)
.	.
.	.
.	.
X deserves Y	(+, +, 0)

Verbs
→ (Sentiment, Power, Agency)

Multilingual Contextualized Connotation Frames

Existing dataset:

X rescues Y	(+, +, +)
.	.
.	.
.	.
X deserves Y	(+, +, 0)

in-context

in-language

New dataset

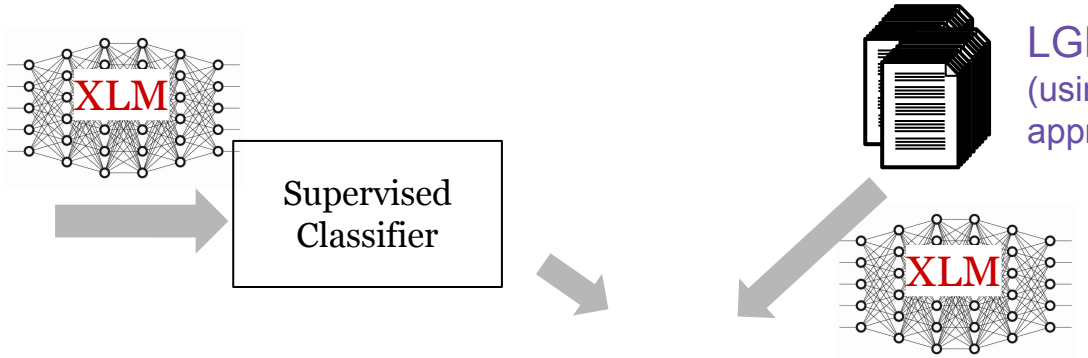
A boy deserves appellation	(+, +, 0)
A boy deserves punishment	(−, 0, 0)
.	.
.	.
.	.
The firefighter rescued the boy	(+, +, 0)

Un chico merece un castigo	(−, 0, 0)
.	.
.	.
.	.
Пожарный спас мальчика	(+, +, 0)

Method: Multilingual Connotation Classifier

- Sentence representations from cross-lingual pre-trained Language Models (XLM)
- A supervised classifier to measure sentiment, power, agency scores in people's mentions in the LGBTBio corpus

Crowdsourced Multilingual Contextual Connotation Frames



Classifier Evaluation Results

- in-language training data is important
- augmenting datasets from other languages helps

Tgt	Src	$\text{Sent}_{\text{subj}}$	Sent_{obj}	Pow.	Agen.
EN	EN	**43.4***	43.0	**41.1**	**48.2***
	ES	38.1	43.4	29.5	43.4
	RU	41.1	**44.3**	40.1	41.4

Tgt	Src	S_{subj}	S_{obj}	Pow.	Agen.
EN	EN	43.4	43.0	41.1	48.2
	+ES	44.8	**45.2***	40.5	49.7
	+RU	**46.5***	43.2	**41.8**	49.9
	+ES+RU	45.0	44.3	41.7	**50.0***

- Macro F1

Classifier Evaluation Results

- Same pattern in English, Spanish, and Russian

Tgt	Src	$Sent_{subj}$	$Sent_{obj}$	Pow.	Agen.
EN	EN	**43.4***	43.0	**41.1**	**48.2***
	ES	38.1	43.4	29.5	43.4
	RU	41.1	**44.3**	40.1	41.4
ES	EN	38.9	36.6	24.5	31.3
	ES	**49.5***	**51.2***	**43.6***	**43.6***
	RU	39.0	42.2	34.0	38.9
RU	EN	43.6	49.2	36.4	44.5
	ES	37.2	49.3	38.2	42.7
	RU	**46.4***	**54.9***	**45.3***	**49.9***

Table 3: Macro F1 score of classifiers trained and evaluated with different target and source languages. Matching the lan-

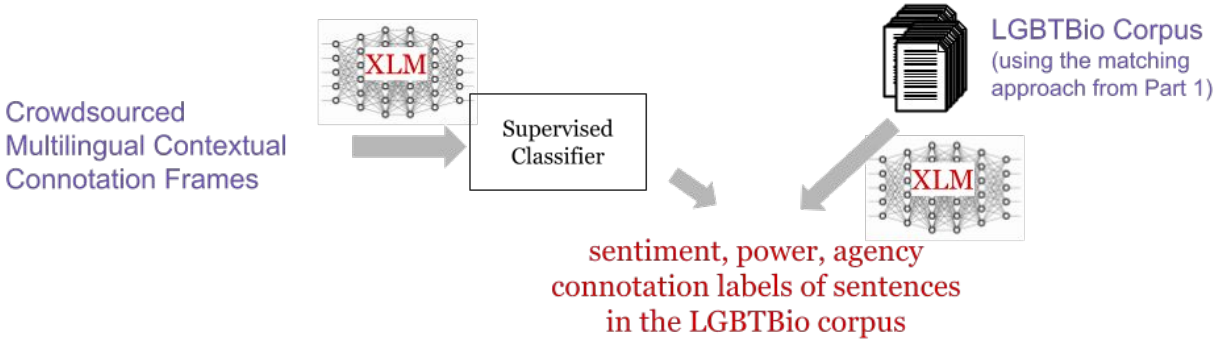
Tgt	Src	S_{subj}	S_{obj}	Pow.	Agen.
EN	EN	43.4	43.0	41.1	48.2
	+ES	44.8	**45.2***	40.5	49.7
	+RU	**46.5***	43.2	**41.8**	49.9
	+ES+RU	45.0	44.3	41.7	**50.0***
ES	ES	49.5	51.2	**43.6**	43.6
	+EN	50.4	51.6	36.4	45.5
	+RU	51.0	**55.0***	42.1	**45.6***
	+EN+RU	**51.8***	54.8	40.8	44.9
RU	RU	46.4	54.9	45.3	49.9
	+EN	45.6	55.7	44.1	50.9
	+ES	46.0	**59.2***	42.1	49.8
	+EN+ES	**47.7**	53.7	**46.9***	**51.7***

Research Questions

Writers have a choice in how they portray people:

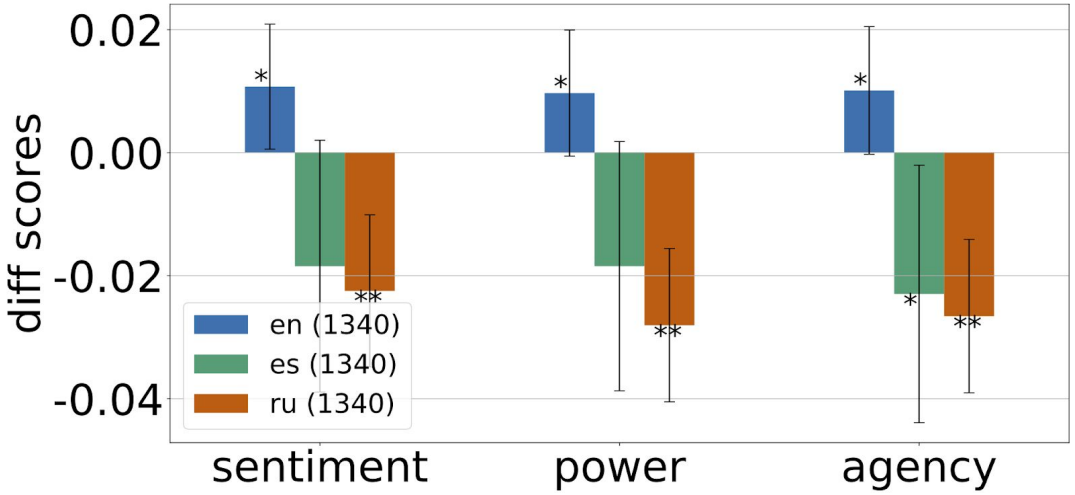
- Who is portrayed as powerful?
- Who is portrayed as sympathetic?
- Who is portrayed as having high agency?
- How do these portrayals differ across social attributes and languages?

Contextual Affective Analysis of Narratives Describing LGBT People



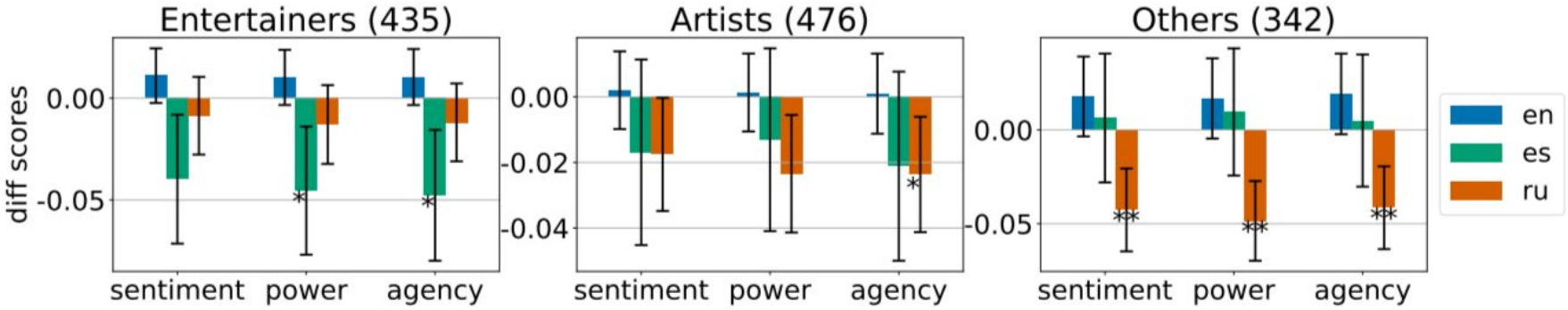
Cultural stereotypes: is there a difference in narratives across languages?

- Connotation scores of the articles in LGBTBio
- y axis here: how positively or negatively LGBT people are portrayed when compared to their non-lgbt control set (-1, 0, 1)



Occupational stereotypes: is there a difference in narratives across languages?

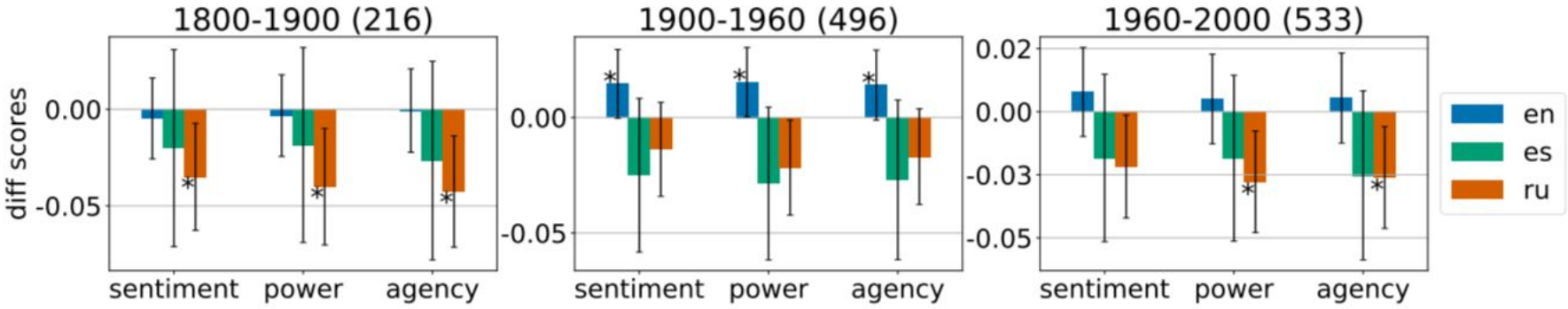
- Connotation scores of the articles in LGBTBio
- y axis here: how positively or negatively LGBT people from specific occupations are portrayed when compared to their non-lgbt control set (-1, 0, 1)



- politicians, scientists, activists

Changing global perceptions across time

- Connotation scores of the articles in LGBTBio
- y axis here: how positively or negatively LGBT people from specific time spans are portrayed when compared to their non-lgbt control set (-1, 0, 1)



Identification of imbalanced content

- https://en.wikipedia.org/wiki/Cleve_Jones
- https://ru.wikipedia.org/wiki/%D0%94%D0%B6%D0%BE%D0%BD%D1%81,_%D0%9A%D0%BB%D0%B8%D0%B2

Эта информация поразила Джонса, потому как многие из умерших были его друзьями или жили с ним по соседству в районе Кастро, он понял, что находится в центре ужасного невидимого бедствия.

(This information startled Jones, because many of the dead were his friends or lived with him in the Castro area, he realized that he was at the center of a terrible invisible disaster.)

The English article does not describe Jones as a passive observer of the U.S. AIDS epidemic. Instead, it focuses on projects that Jones initiated or worked on such as the AIDS Memorial Quilt.

Клив Джонс публично заявил по телевидению о том, что является ВИЧ-инфицированным, и тотчас стал получать угрозы в свой адрес, а однажды даже подвергся нападению двух бандитов, попытавшихся его убить.

(Cleve Jones publicly announced on television that he was HIV-positive, and immediately began to receive threats against him, and once even was attacked by two bandits who tried to kill him.)

The English article does say “Jones described his status as HIV+” but makes no mention of threats or attacks.

Important ethical considerations

- Limited conclusions -- variability in many entangled factors (individual, cultural, linguistic, technical) and many plausible interpretations. Any kind of analysis is going to make assumptions and have limitations -- but that doesn't mean we shouldn't (carefully) try
- Only public and publicized data; many methods are not applicable to large scale social network datasets
- Only aggregate analyses over sufficiently large groups
- NLP systems implicitly embed social attributes. Without explicit intervention, they risk perpetuating harmful stereotypes
- …

Thank you!

- Wikipedia Bios *selection* methodology
  - Anjalie Field*, Chan Young Park*, Kevin Lin, and Yulia Tsvetkov (2022) **Controlled Analyses of Social Biases in Wikipedia Bios.** *TheWebConf*

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