

Using NLP to Understand Organizational Change: The Case of the Bush Foundation from 1963 to 2012

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Background and Motivation

- Organizational strategic change as strategic choice or strategic momentum (*Boeker, 1989*).
- Organizations can only be understood in light of their history and evolution (*Irvin & Kavvas, 2020; Lawrence, 1984*).
- Private foundations offer an ideal context to study strategic choice as they face little external pressure to change and can serve as innovation catalyst (*Fleishman, 2009*).

Research Questions

RQ1: What are the key programmatic and mission changes of the Bush Foundation in the last 50 years?

RQ2: What issues have become more salient over time?

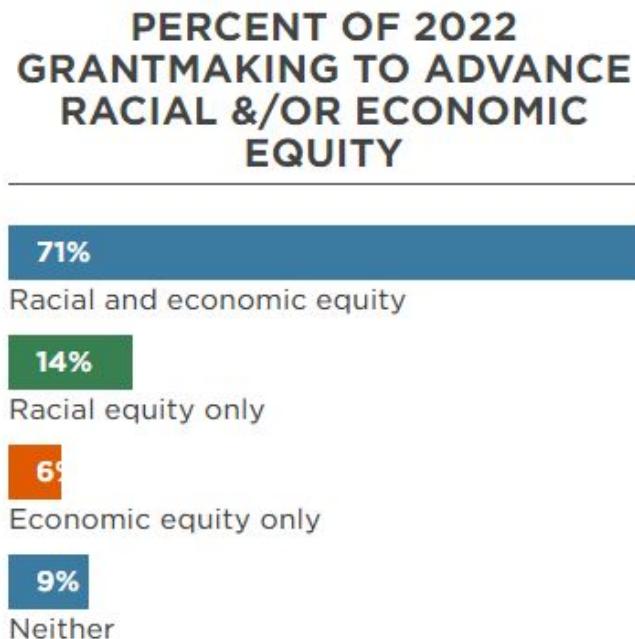
RQ3: How do programmatic priorities change based on the tenure of different CEOs?

Case Selection



Year of Establishment	1953
Founder	Archie Bush - Chair of 3M's Executive Committee
Initial Asset	\$22 Million
Early Grant-making Focus	Private higher education, arts and human services
Are family continuously involved in foundation governance?	No (no children)
Current Asset (2021)	\$1.8 Billion
Current Grant-making Focus	Address Racial Wealth Gaps; Support Native People and Nations
Foundation Presidents	1971-1997- Humphrey Doermann; Anita Pampusch, 1997-2007; Peter Hutchinson, 2007-2012; Jennifer Ford Reedy, 2012 - Present

Bush Foundation granted \$146 million in 2022 (75 grants*)



\$51M
PROGRESS TOWARD OUR
GOAL OF \$50M TO ADDRESS
RACIAL WEALTH GAPS BY
2025

68%

PERCENT OF 2022
GRANTMAKING TO SUPPORT
NATIVE PEOPLE AND NATIVE
NATIONS

Community Innovation Grantees in Fargo, ND

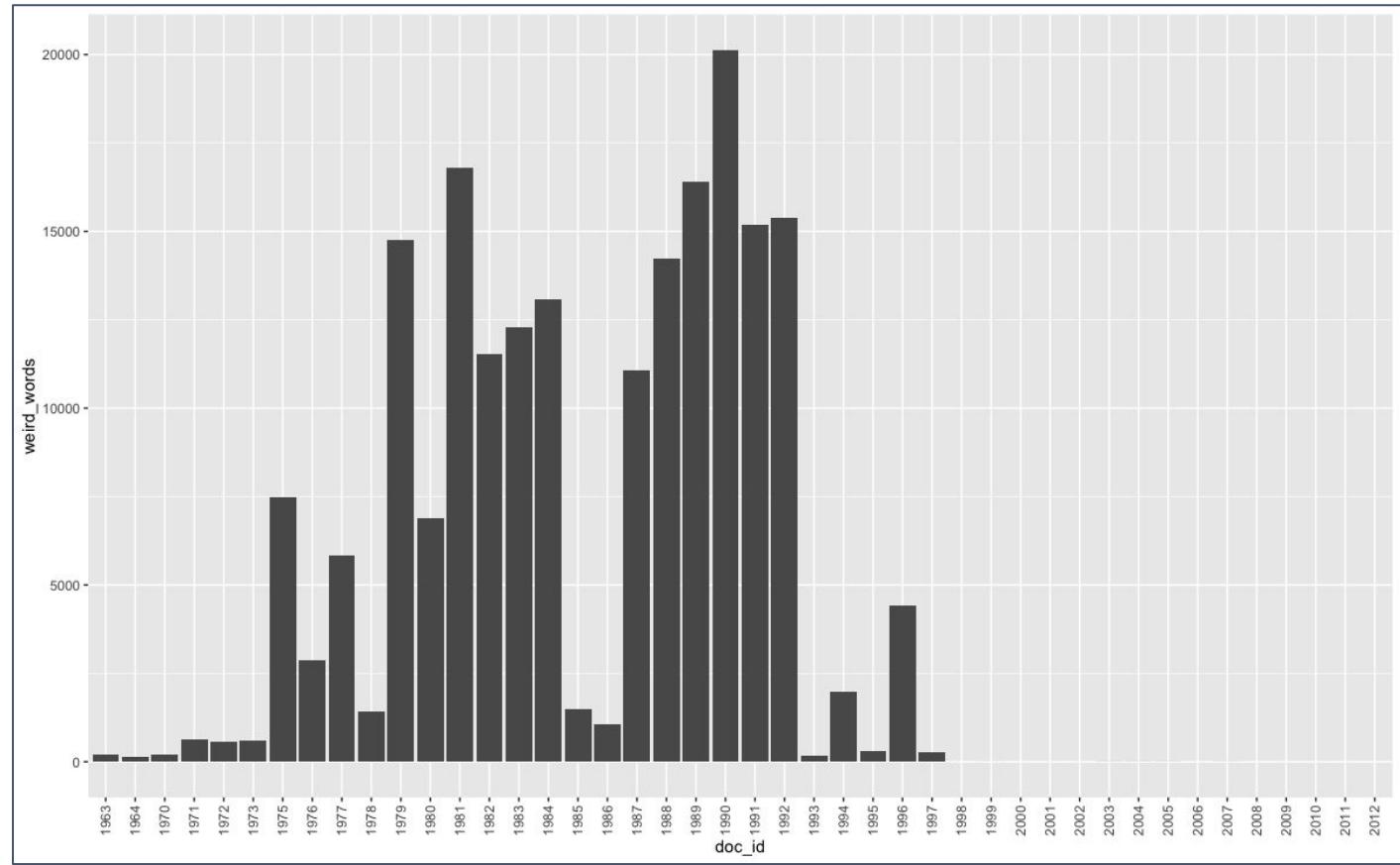


Data Collection

- Annual reports from 1963 to 2012 were downloaded from the Bush Foundation archives.
 - 1998 to 2012 were in native PDF format and were converted to text using **pdftools::pdf_text** in R.
 - 1963 to 1997 were scanned PDFs from physical reports, translated into text using the **tesseract::ocr** function.
- Additional information gathered from the website (e.g., tenure of the foundation president)

Artifacts from scanned documents translated using OCR

- At first, top features were mostly nonsense 2-, 3-, and 4-letter words.
- These were coming from scanned documents (pre-1998) translated with OCR.
- Solved by restricting analysis to words of length ≥ 5 .



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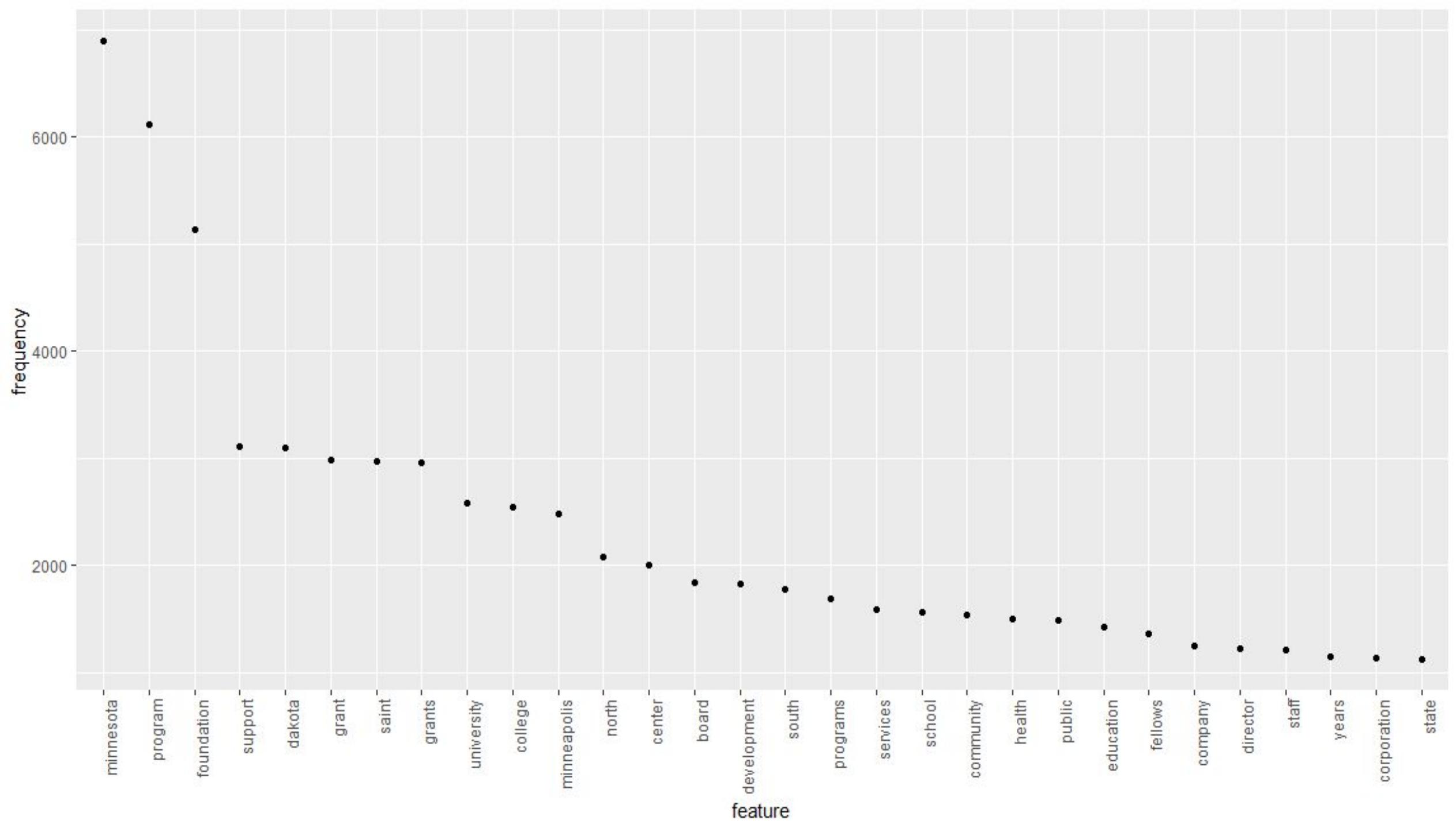
NLP analysis

- Word frequency
- Lexical Dispersion Plot for different keywords (e.g., family, native, university)
- Use keyness to compare unique words used by different presidents
- Topic modeling

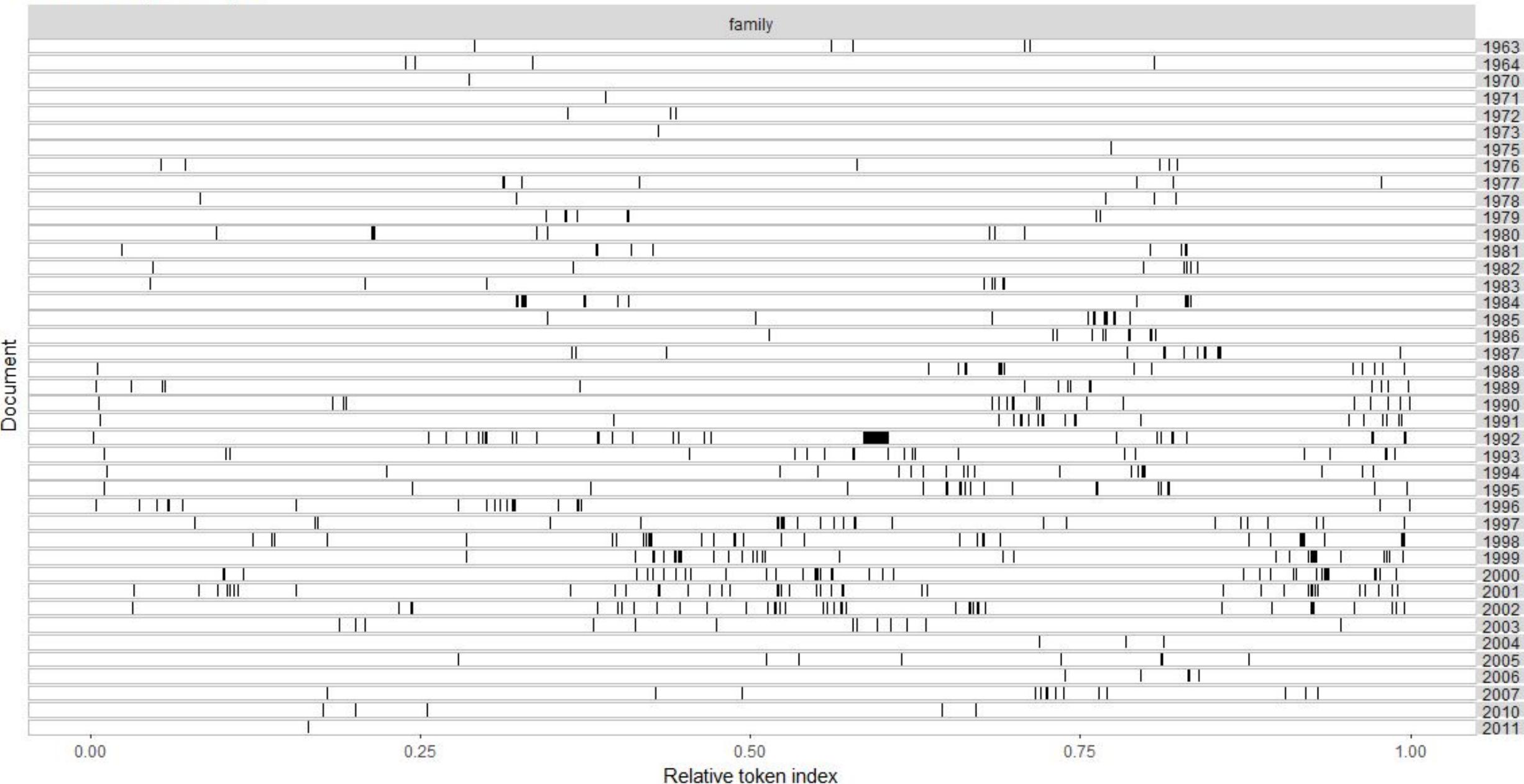
For Zoltan

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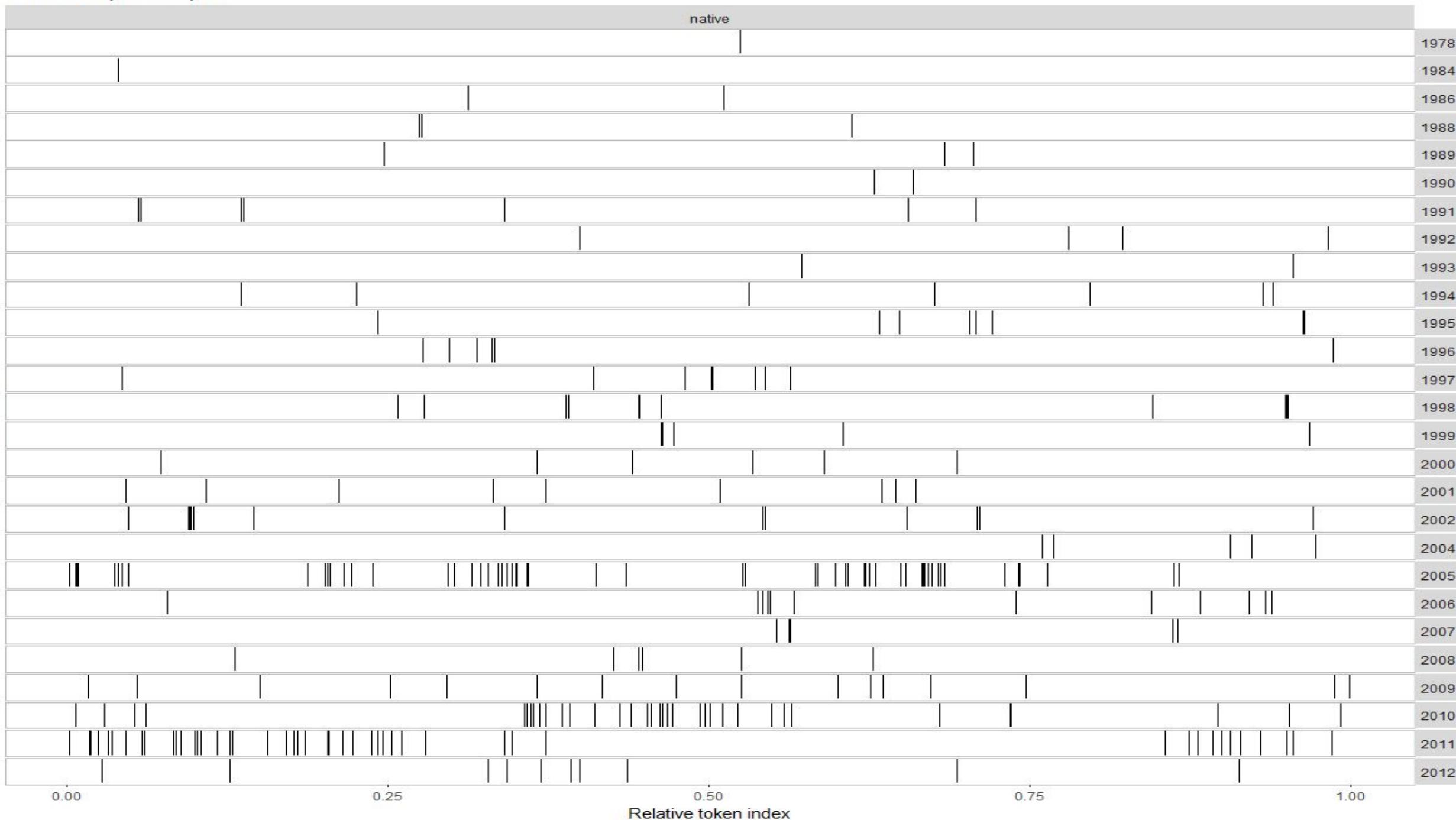
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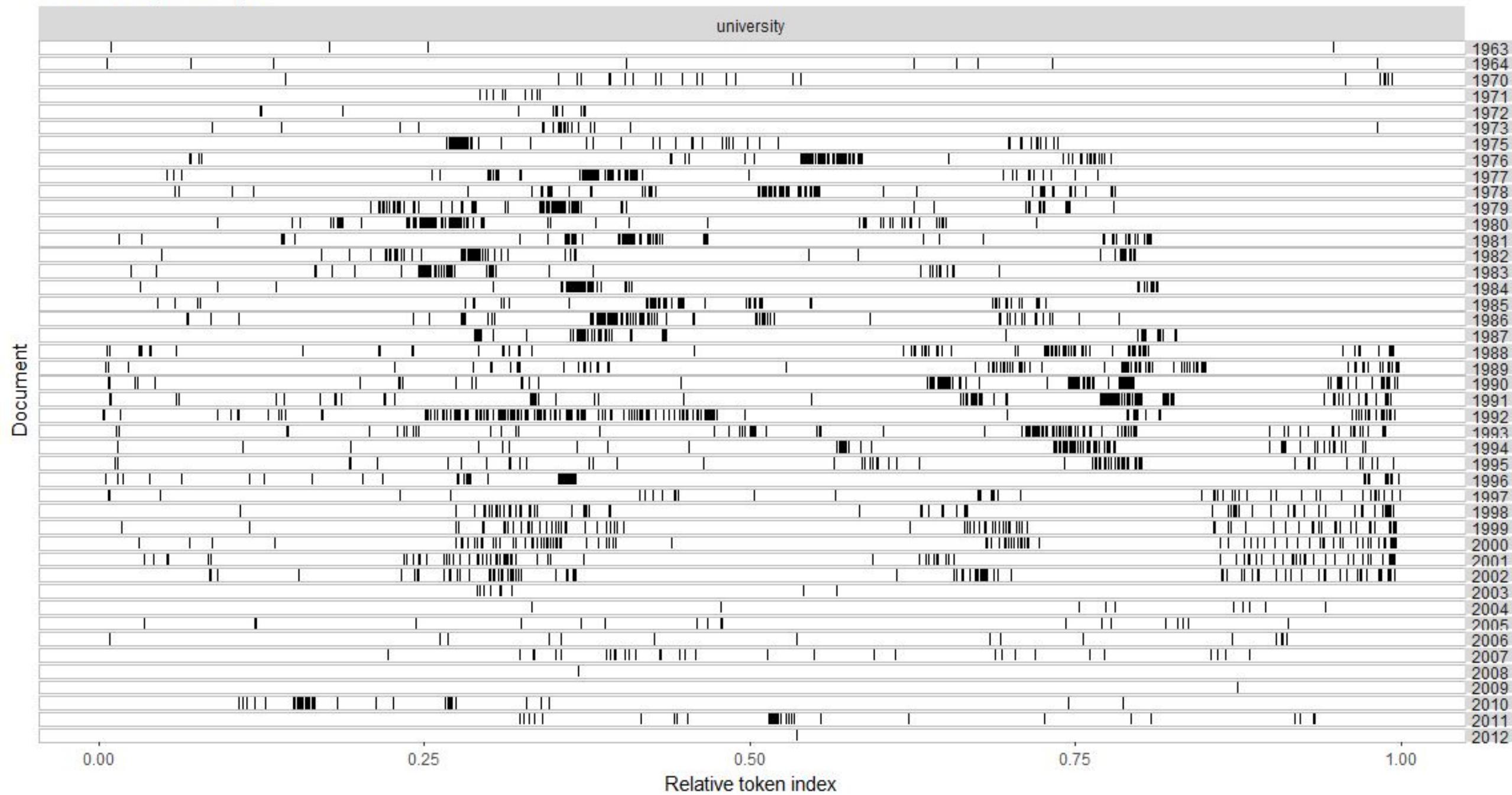
Lexical dispersion plot



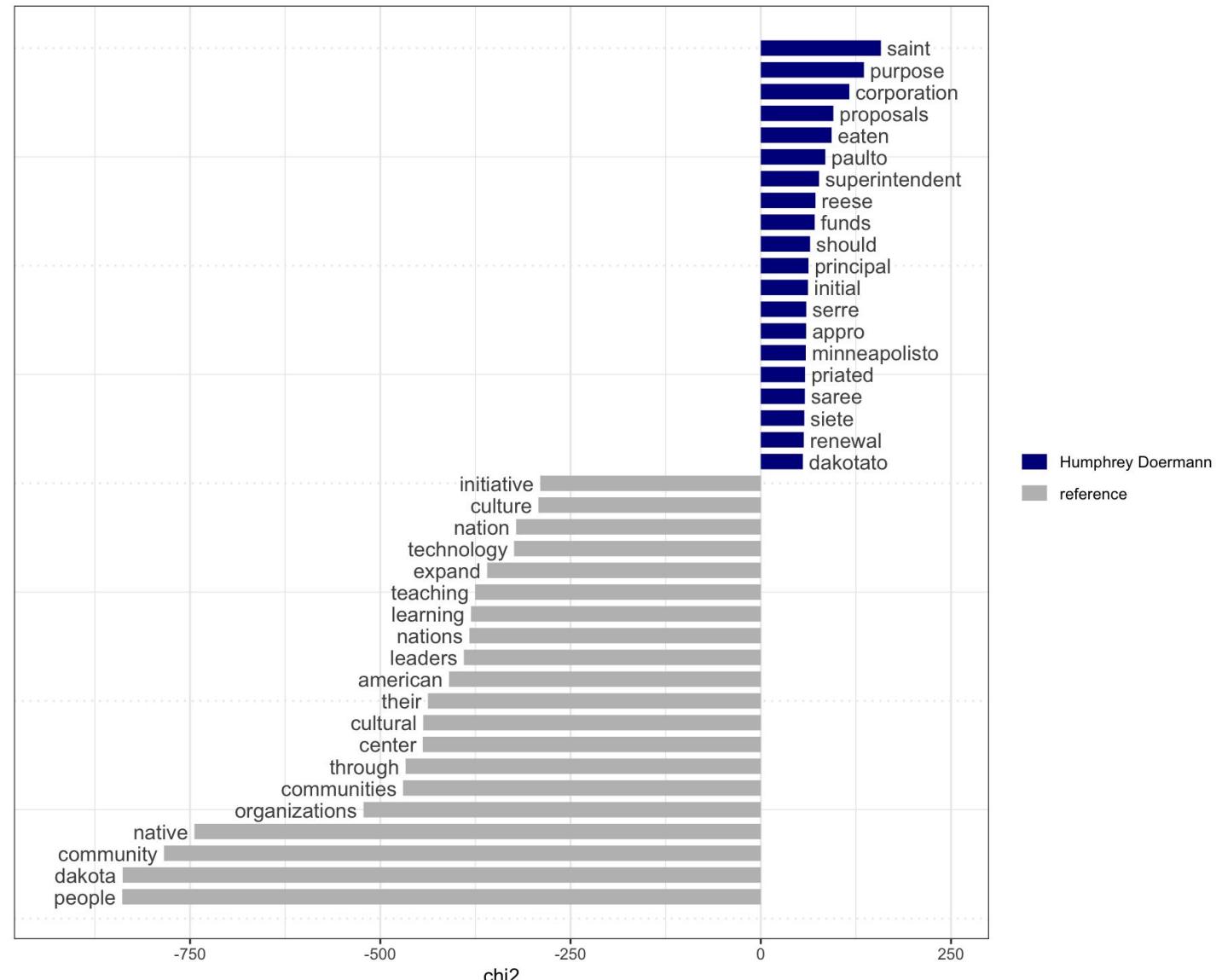
Lexical dispersion plot



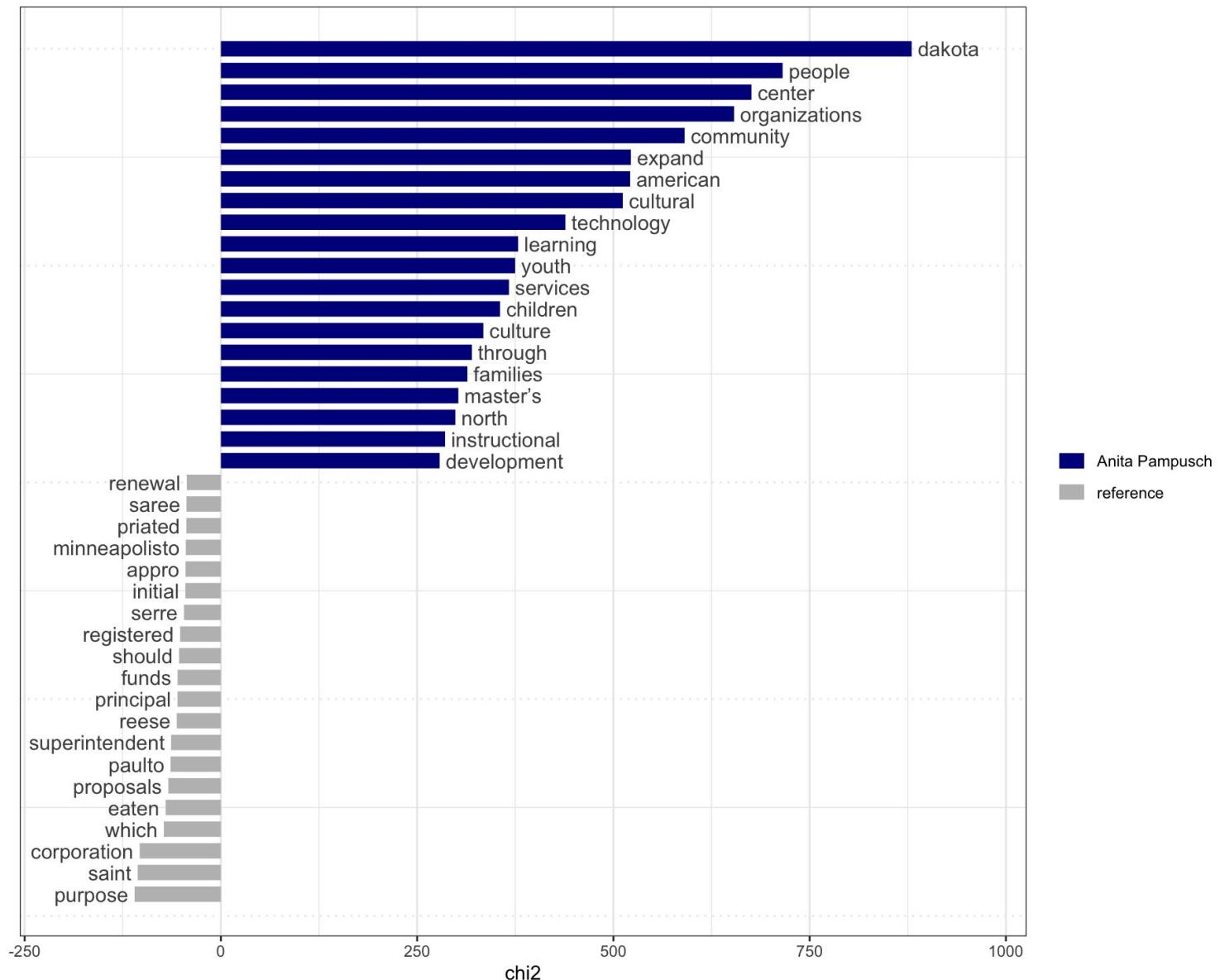
Lexical dispersion plot



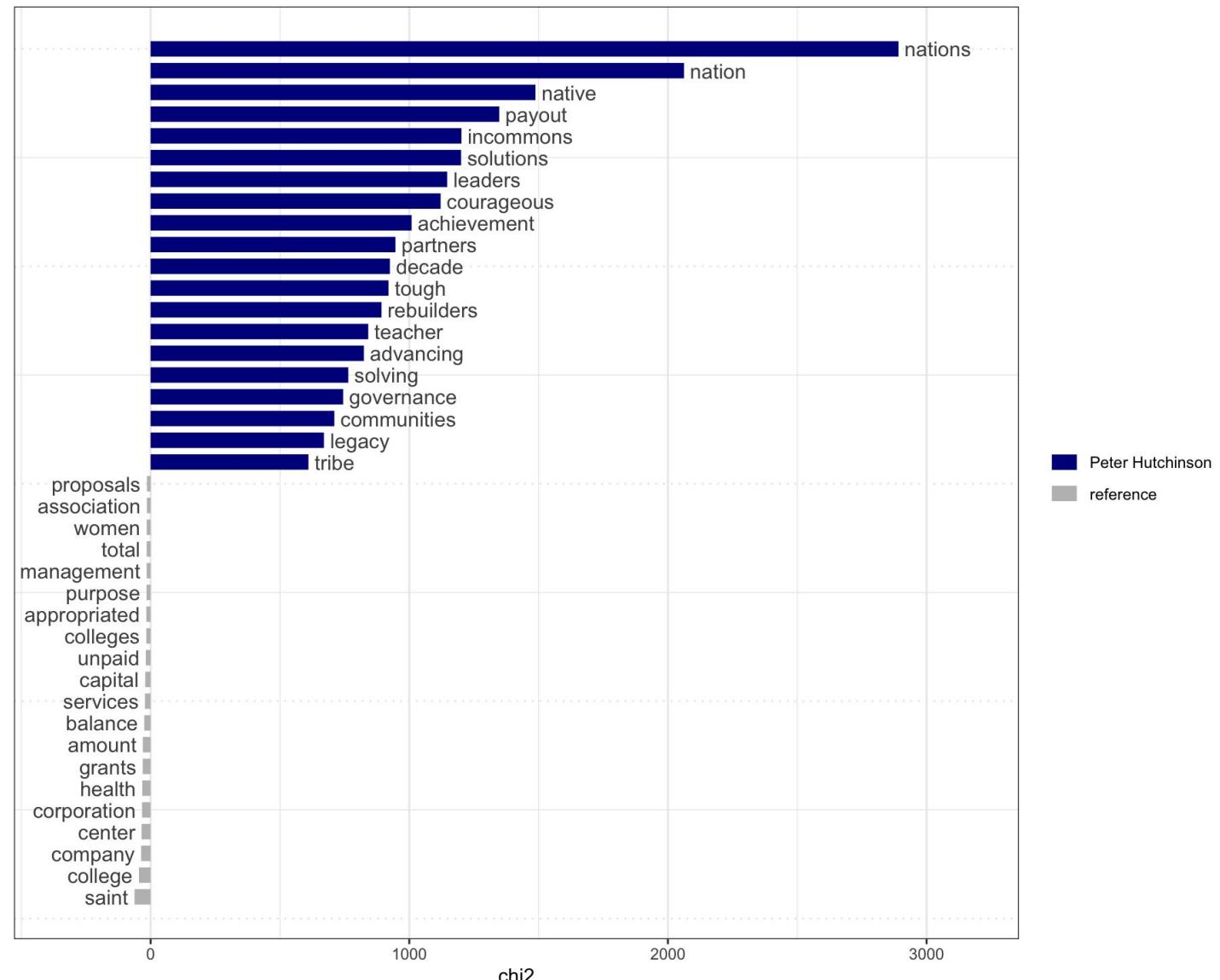
Keyness by President - 1971 to 1997



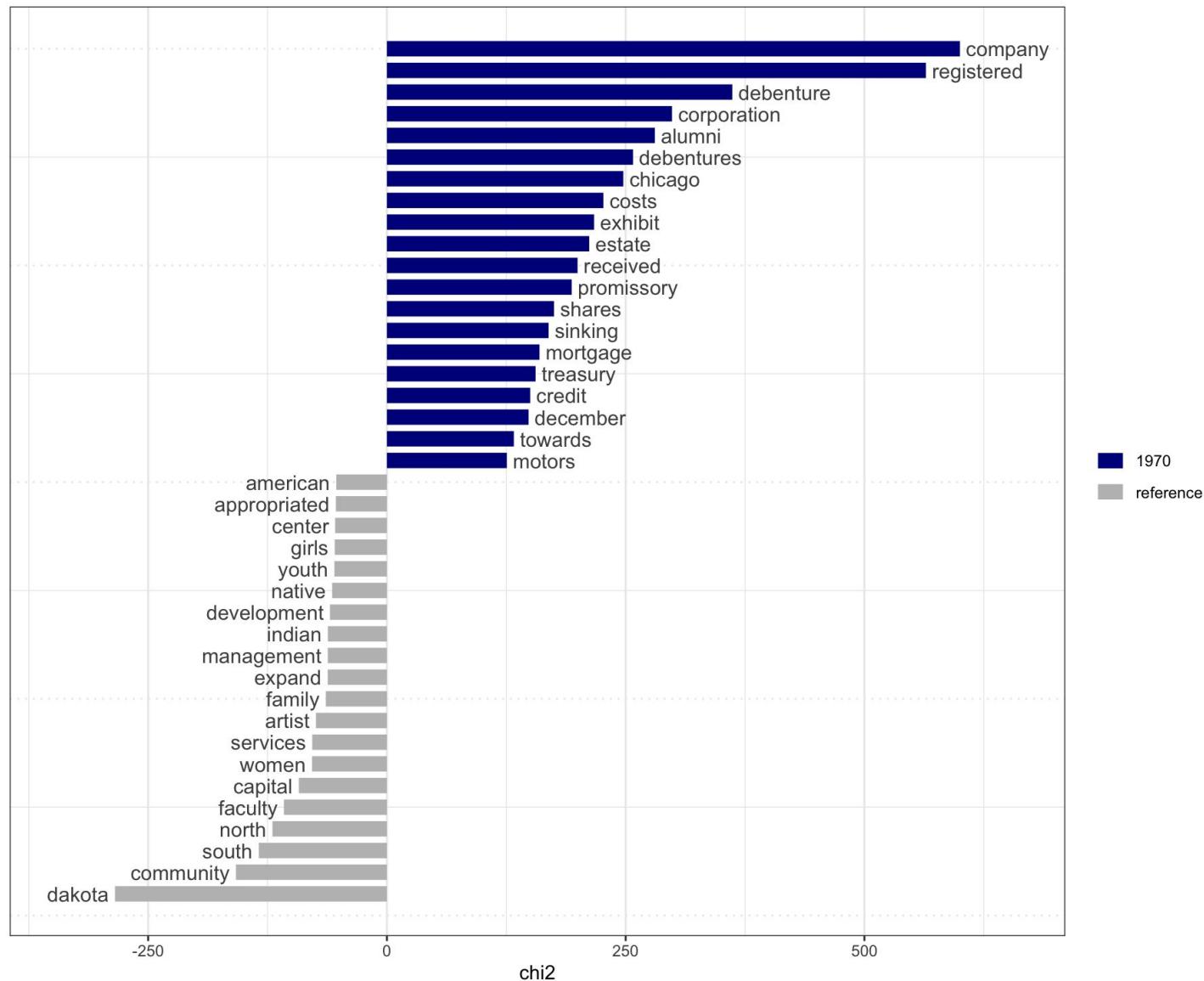
Keyness by President - 1998 to 2007



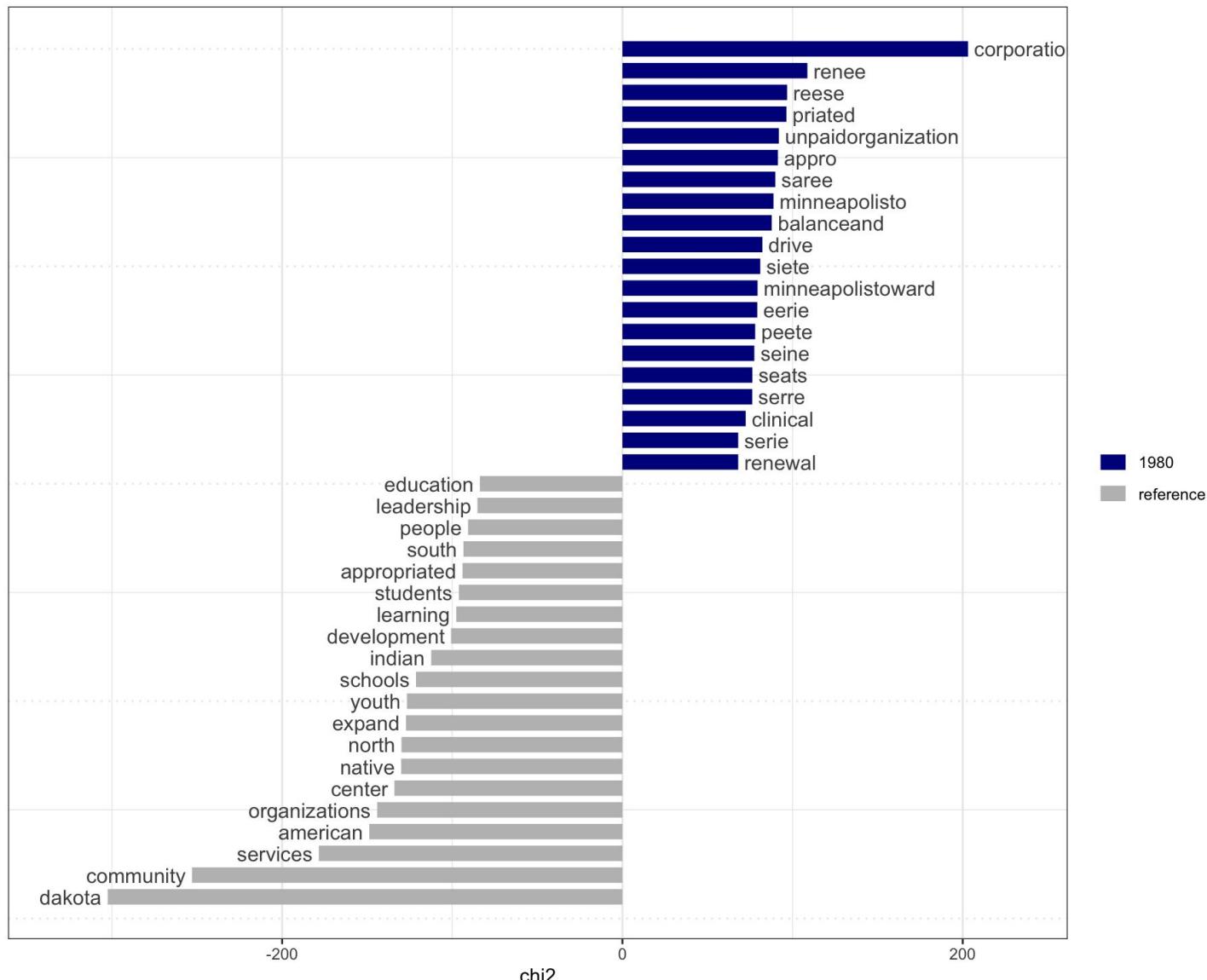
Keyness by President - 2008 to 2012



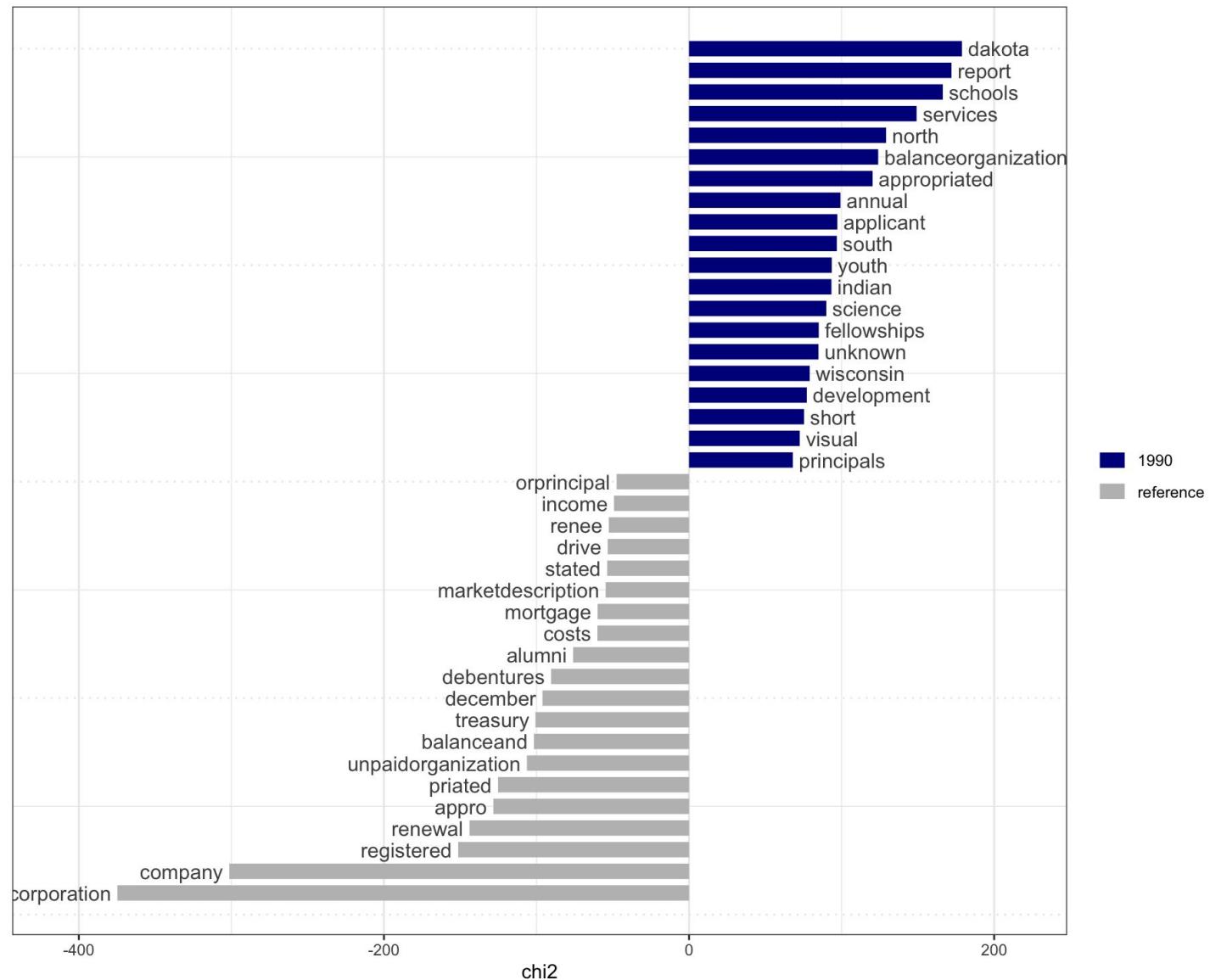
Keyness by Decade - 1970



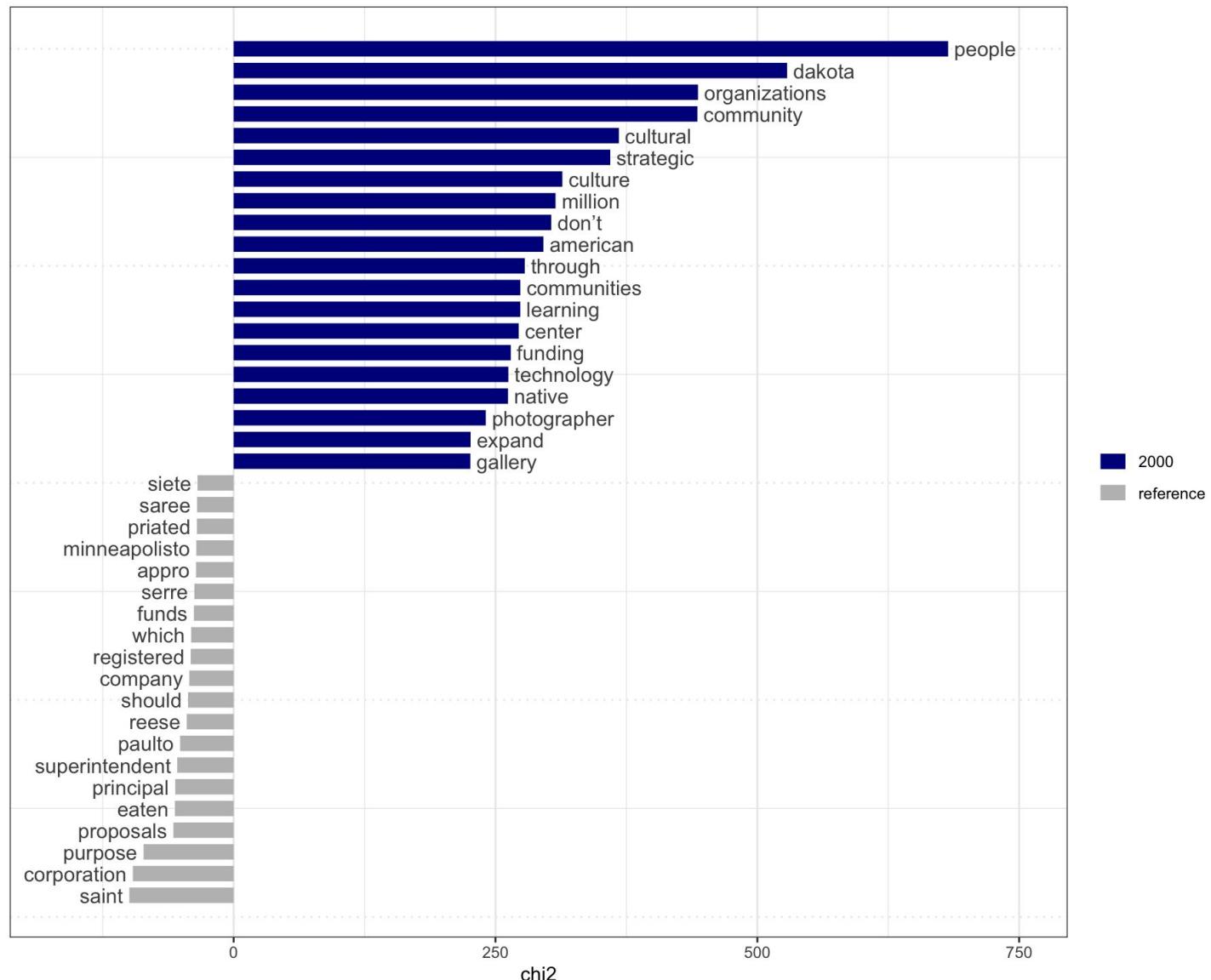
Keyness by Decade - 1980



Keyness by Decade - 1990



Keyness by Decade - 2000



Topic Modeling

A topic model with 5 topics, 44 documents and a 22929 word dictionary.

Topic 1 Top Words:

Highest Prob: native, south, communities, million, leaders, american, artist
FREX: courageous, didn't, website, tirrel, bensman, nothing, engagement
Lift: andrea, besides, certainly, doctor, inspiring, watching, can't
Score: courageous, don't, governance, incommons, we're, nations, didn't

Topic 2 Top Words:

Highest Prob: south, project, faculty, amount, purpose, proposals, balance
FREX: 501c3, sunos, judgesname, districtst, tires, preceptorships, resis
Lift: losers, plications, sarum, simha, _____, _catholic, _college
Score: eaten, eerie, reese, serre, saree, priated, unpaidorganization

Topic 3 Top Words:

Highest Prob: south, faculty, expand, amount, unpaid, appropriated, youth
FREX: instructional, obtain, technology, hmong, equivalents, master's, expand
Lift: adaptors, africa, aftermath, amherst, arkansas, artemis, artwise
Score: unpaid, master's, appropriated, equivalents, collateral, flows, unclassified

Topic 4 Top Words:

Highest Prob: corporation, company, amount, balance, renewal, registered, purpose
FREX: debentures, debenture, convertible, promissory, registereddebentures, telegraph, registeredsinking
Lift: _3total, 000deferred, 000international, 000minnesota, 000montgomery, 000saint, 000the
Score: debentures, balanceand, unpaidorganization, priated, appro, registered, eaten

Topic 5 Top Words:

Highest Prob: south, schools, purpose, project, fellowships, proposals, assistant
FREX: foundationsaint, literatureminneapolis, unknown, balanceorganization, abigail, clayton, crosse
Lift: #492austin, 25,000fort, abigail, alwayswelcomed, analog, areasaint, associationminneapolis
Score: eaten, anata, balanceorganization, institutionsinitial, eater, eatin, appropriated

Native and
Community*

Programs

Higher
Education

Corporate and
Financial

Grants and
Proposals

Topic Modeling (ChatGPT)

**Native and
Community***

Topic 1: Native American Leadership and Art

Summary: Native communities, leaders, and artists in the South.

Programs

Topic 2: Project Proposals and Balance

Summary: Faculty projects, proposals, and balancing resources.

**Higher
Education**

Topic 3: Youth Education and Funding

Summary: Expanding youth education in the South through appropriated funds.

**Corporate and
Financial**

Topic 4: Corporate Purpose and Balance

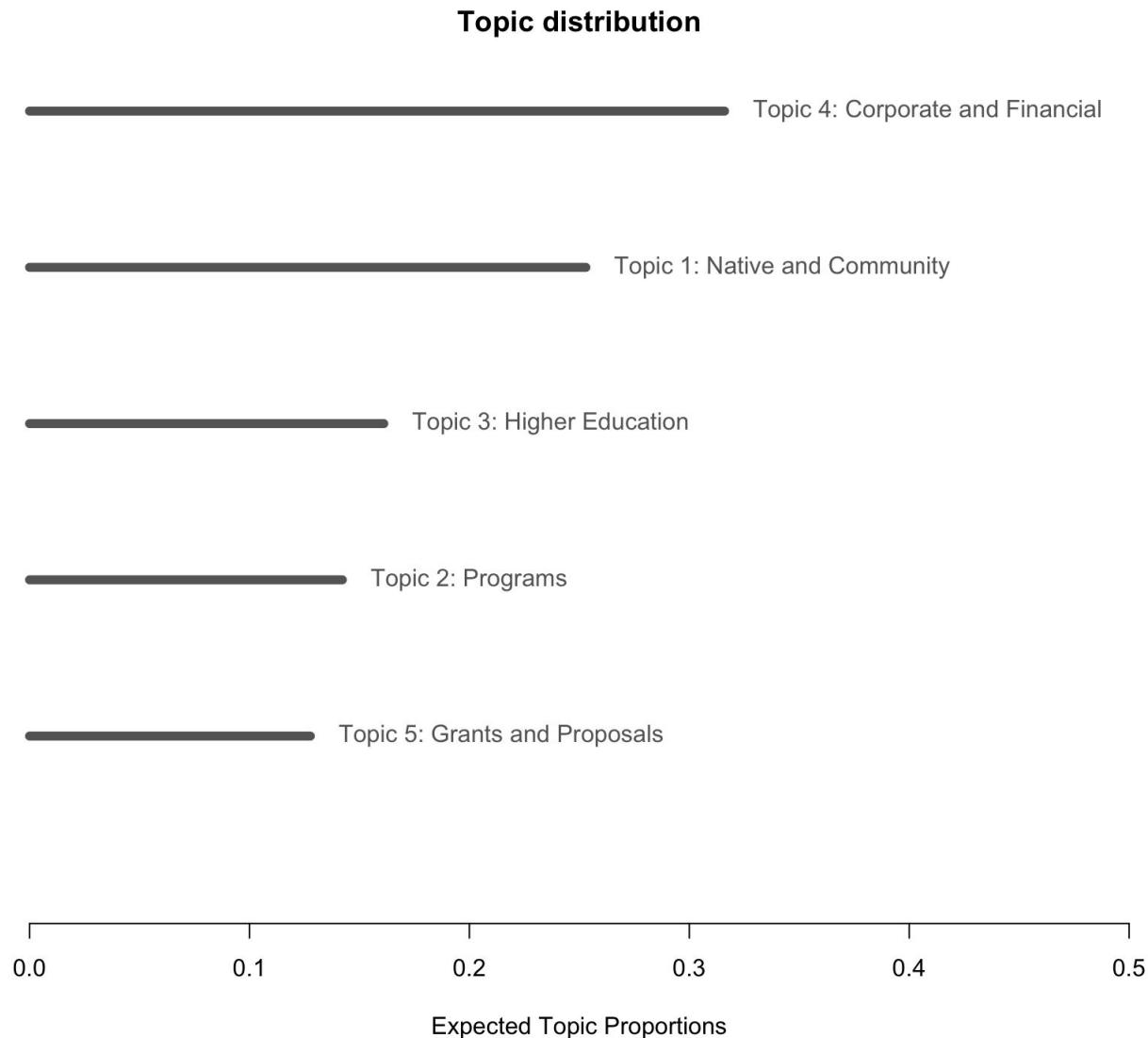
Summary: Companies and corporations balancing their financial resources and purposes.

**Grants and
Proposals**

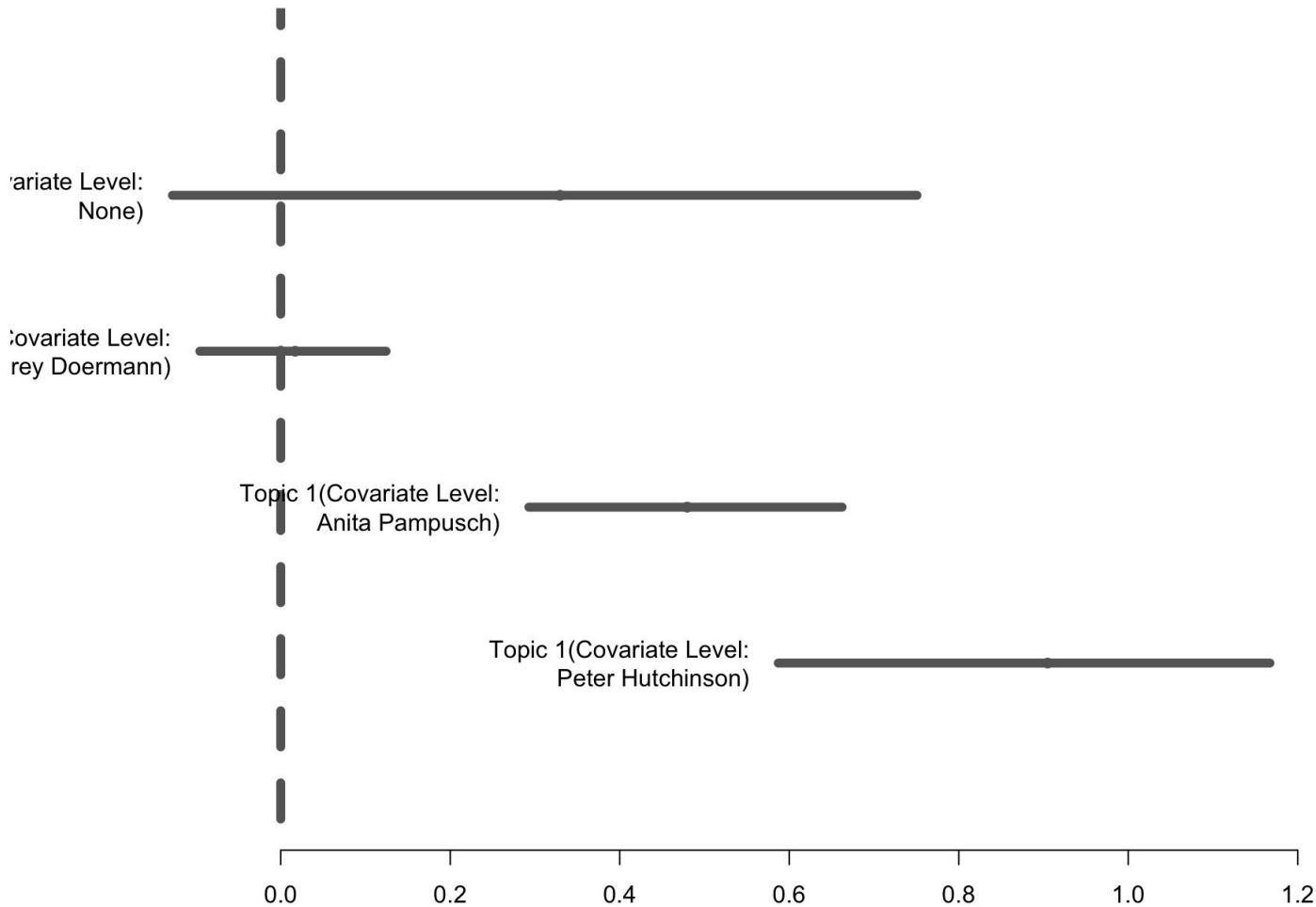
Topic 5: Education and Fellowships in the South

Summary: Educational initiatives, fellowships, and project proposals in Southern schools.

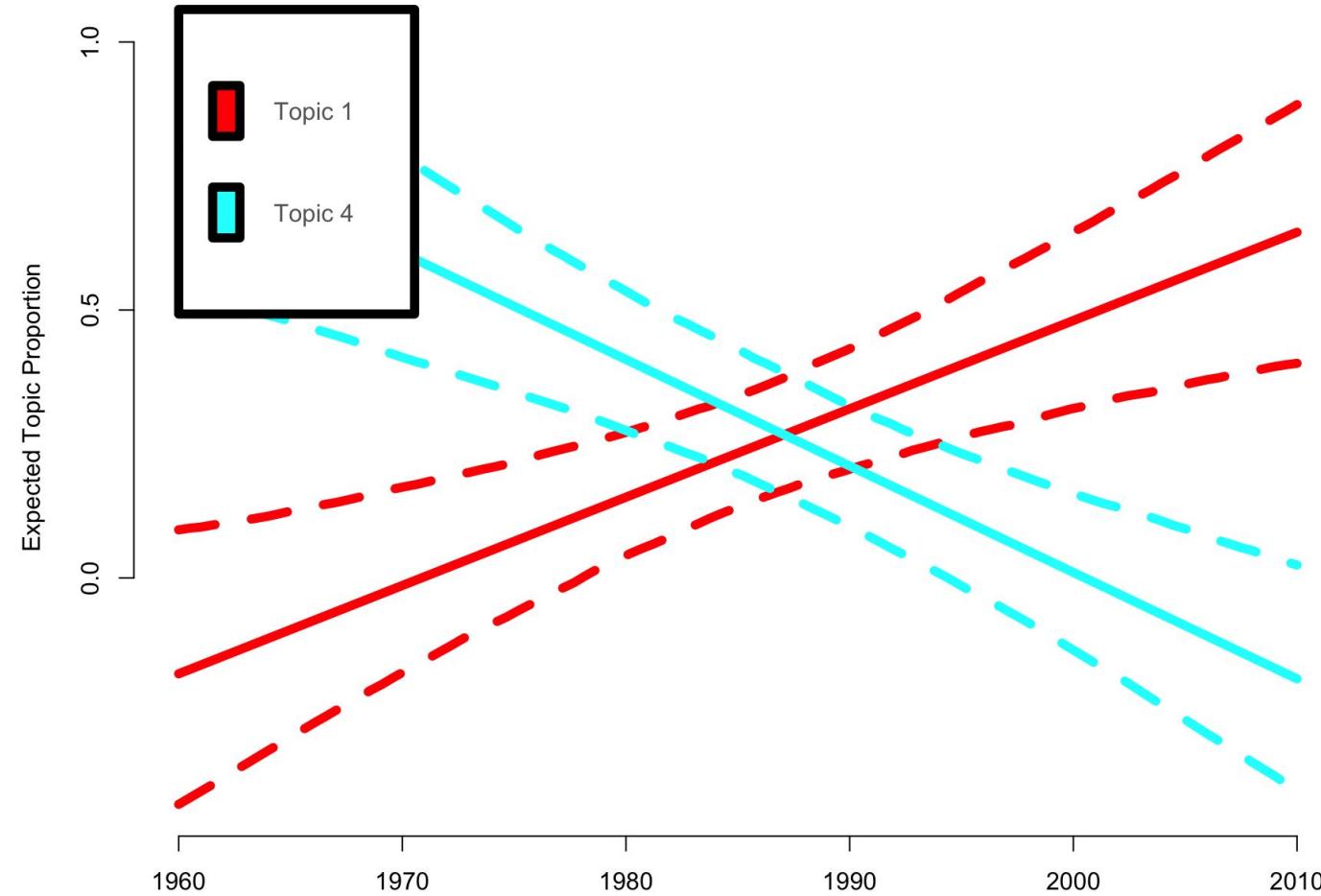
Topic Modeling



Topic Modeling Trends - “Native and Community” (topic 1)



Topic Modeling Trends - “Native and Community” (topic 1) vs. “Corporate and Financial” (topic 4)



Reflections on Methodology and Next Steps

- Processing pdf and scanned image for text analysis
- Data processing and cleaning is key to effective text analysis
- Gather online magazine for text analysis so we incorporate more recent data from 2013 to present
- Including additional data sources to understand mechanism behind changes (e.g., board meeting minutes, news coverage, social media, public financial data)

Manuscripts Collection

Part or all of this collection is restricted.
For details, please see the [restrictions](#).

▼ OVERVIEW

Creator: Bush Foundation, creator.

Title: Foundation records.

Dates: 1953-2015.

Language: Materials in English.

Abstract: Grant files and other records of a St. Paul-based nonprofit foundation, incorporated in 1953 with an endowment from 3M executive Archibald G. Bush, that provides grants to charitable, scientific, literary, musical, educational, and arts organizations located primarily in Minnesota and the Upper Midwest. The records provide a wealth of information about the grantee organizations' programs and finances.

Quantity: 639.3 cubic feet (644 boxes).

Location: Remote Storage: See [Detailed Description](#) for shelf locations.

Bush Foundation to distribute \$100M - Grants target Black, Native American individuals for past injustices



March 30, 2021 | St. Paul Pioneer Press (MN)

Author/Byline: Bob Shaw bshaw@pioneerpress.com | Page: A5 | Section: Main
493 Words



[Read News Document](#)

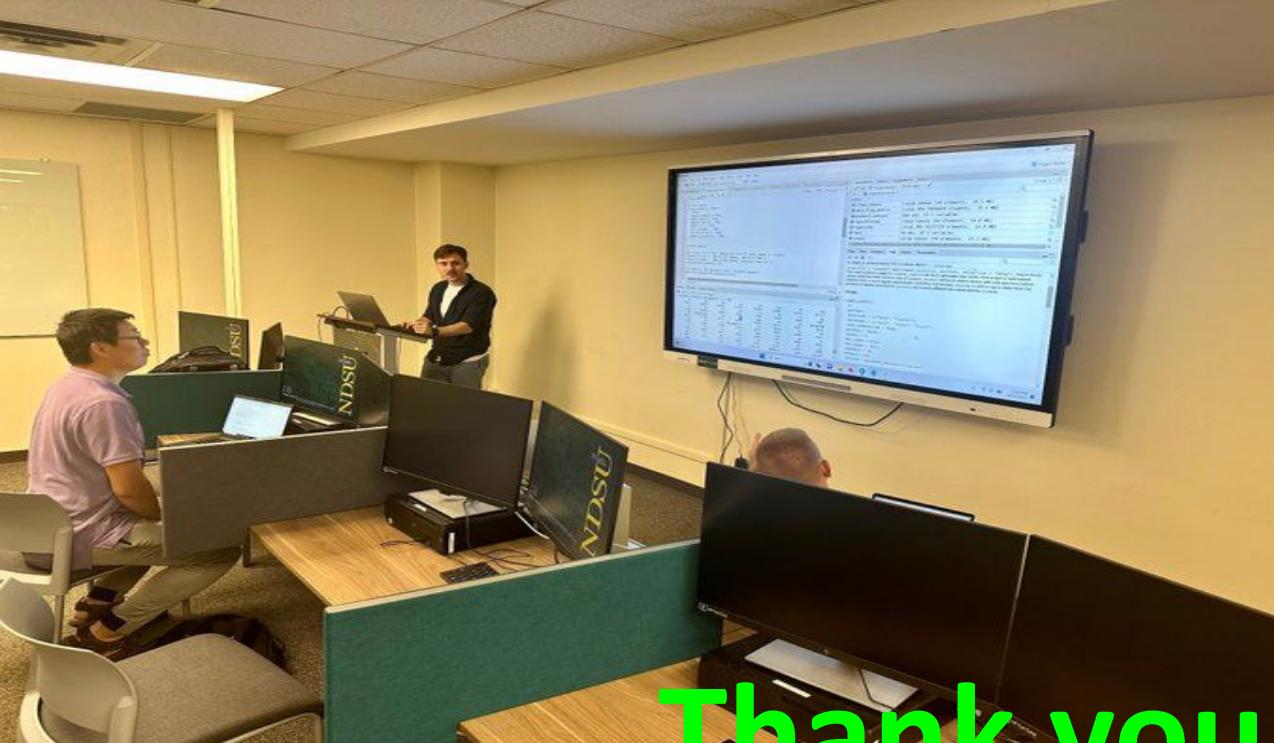


The **Bush Foundation** is allocating \$100 million to close the wealth gap between whites and Blacks and Native Americans -- a move with similarities to race-based reparations.

The St. Paul-based foundation has set up trust funds for Black and Native Americans in Minnesota, North Dakota, South Dakota and 23 Native nations.

"This is not reparations, but it's in the spirit of reparations," said grantmaking director Jackie Statum Allen.

The money will be paid to individuals for developing their wealth -- in such ways as financing a college education, making a down payment on a house, or providing seed money to start a business.



Thank you very much!