

Reading between the Emails: Gendered Patterns of Communication in Local Government

Matthew J. Denny

Penn State University — mdenny@psu.edu

www.mjdenny.com

[@MatthewJDenny](#)

Collaborators: James ben Aaron, Hanna Wallach,
Bruce A. Desmarais

Gender and Communication in Local Government

- ▶ Gender bias in organizations.
- ▶ How does gender shape communication?
- ▶ Differences across domains?
- ▶ Relation to previous findings?

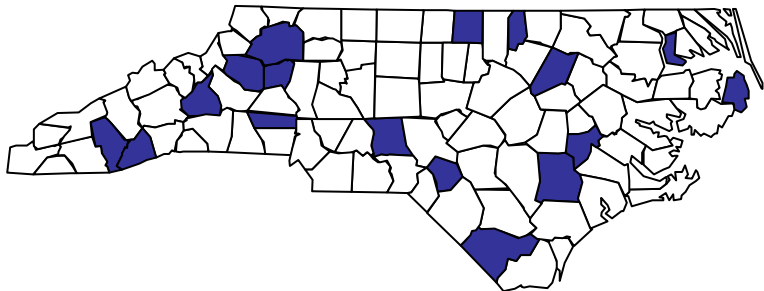
Challenges and Opportunities

- ▶ Observational and self report data.
 - ▶ Restricted in scope. Biased?
- ▶ Electronic communication data.
 - ▶ Primary source, day-to-day.
 - ▶ Public records laws.
- ▶ Study micro-level interactions.

Public Domain Email Data

County Government Email Data

- ▶ Public records requests.
- ▶ Department manager email data from 17 North Carolina Counties.
- ▶ 500,000 emails, 17,000 between managers.



The Data

County	Manager Gender		# Emails
	Male	Female	
Alexander	12	9	907
Caldwell	12	8	121
Chowan	12	11	2,027
Columbus	14	10	920
Dare	15	12	2,247
Duplin	13	14	1,914
⋮	⋮	⋮	⋮
Transylvania	16	4	1,857
Vance	10	8	185
Wilkes	15	2	303
Total	223	139	17,863

Descriptive Analysis

Aggregate Patterns

	Manager Gender	
	Male	Female
Average # emails sent	48.3	51
Average # recipients per email sent	1.45	1.43
Average # emails received	70.8	71.6

- ▶ No evidence for gender bias in aggregate.
- ▶ Mild gender-heterophily.

Individual Department Gender Breakdown

	Emergency Manager		HR	Finance	IT	Health	Plan/Dev	Util/Waste	Tax	Parks/Rec	Soc_Serv	Transport	Info	Misc	Inspections
Male	29	15	3	5	11	6	17	15	11	9	8	8	2	5	13
Female	3	2	12	12	2	11	6	2	7	5	10	1	6	2	3
Total	32	17	15	17	13	17	23	17	18	14	18	9	8	7	16

Male dominated positions

Female dominated positions

Department Affiliation as Domain

Female-Centric Dyads

FF > FM > MF > MM

HR & Health

HR & Information Technology

HR & County Manager

Planning & HR

Register of Deeds & HR

Parks and Recreation & HR

Finance & HR

Finance & Parks and Recreation

Social Services & HR

Solid Waste and Recycling & HR

Tax Administrator & HR

Male-Centric Dyads

MM > FM > MF > FF

Planning & Information Technology

Solid Waste and Recycling & Health

Sheriff & Health

Tax Administrator & Planning

Tax Administrator & Social Services

Inspections & Tax Administrator

Animal Control & Finance

Environment & Health

Environment & Solid Waste and Recycling

Email Content as Domain

A Generative Model for Email Data

finance, budget, year, pay, fiscal

shots, flu, health, senior, hospital

police, judge, jail, firearm, testify

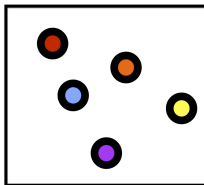
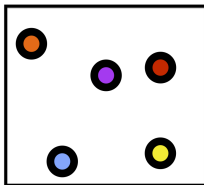
meeting, office, schedule, afternoon

} **Topics**

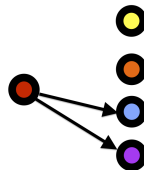
Content {

Here is the draft **budget** for the coming **fiscal year**. Please take a look at it before the **meeting** this **afternoon**.
Thanks,
Keith

Interaction Patterns



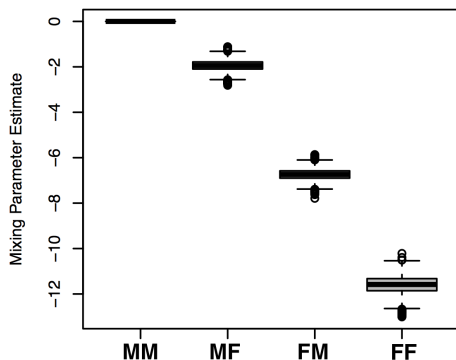
Recipients



Inference

- ▶ Metropolis within Gibbs sampling.
- ▶ Separate model for each county.
- ▶ Include gender mixing covariates.
- ▶ 40 topics, 4 interaction patterns.
- ▶ Human code topics used in analysis.

Example Model Output



Coding	Topic top words
Sandy	will, track, winds, system, forecast
Sandy	storm, sandy, high, coastal, tides, night
Harbor	status, update, boat, today, weather
Planning	board, meeting, planning, seafood, hearing
Storm	box, planning, director, permit, building

Female-Centric Topics of Communication

Coding	FF > FM > MF > MM
Finance	order, time, good, april, attached, requests
Finance	budget, phone, finance, media, ext, department
Health	meeting, going, fyi, tricaster, health, project
Finance	meeting, box, fax, finance, attached, resolution
Finance	equity, fax, debt, refunding, time, finance, call
Finance	debt, box, fax, finance, policies, contract, audit
Finance	learn, leader, director, washington, dream
Finance	fax, ext, phone, finance, director, street
Health	public, health, email, contact, disclosure
Finance	good, time, increase, call, pay, office, today
Budget	manager, street, main, fax, office, east, budget
Budget	fund, budget, balance, year, funds, pay, original

Male-Centric Topics of Communication

Coding	MM > FM > MF > FF
Manager	office, email, time, staff, meeting, work, good
IT	electronic, mail, intended, email, message
Health	health, department, project, email, code, garden
Comments	jail, mobile, inmates, ago, money, jails
Planning	east, planning, street, court, administrator
Public Works	public, nashville, suite, washington
Public Works	email, energy, carolina, north, address
Planning	description, director, street, church, suite
Planning	description, fax, phone, director, street, church
Zoning	board, meeting, planning, amendment
Emergency	operations, emergency, director, lines, street
Development	description, director, development, projects

Open Questions, Future Directions

- ▶ Locus of control.
- ▶ Direction of causality.
- ▶ Interventions to improve gender mixing.
- ▶ Cross-organization communication.