Streaming Gender Differences in Swiss Parliamentarians' Twitter Communication

Degree programme : MAS Data Science

Since the last federal elections in 2019, the Swiss parliament now counts more women than ever before. Yet existing research suggests that women remain mis- and underrepresented in various fields of political online communication, including on Twitter. This project provides a near-realtime architecture and analysis of gender differences in Swiss parliamentarians' Twitter communication. The results show that gender similarities on Twitter outweigh any differences.

Introduction & Goal

Social media, especially Twitter, have become central to the communication for politicians - both as a means of informal online debate among politicians and as a way to connect with the larger electorate. To critically test existing claims of gender differences in politicians' social media communicaiton, this project pursues three main goals:

– build a near-realtime Twitter stream pipeline
– formally test for gender differences/similarities in streamed data
– visualize gender differences/similarities in a live web dashboard

Method

The near-realtime architecture

The architecture consists of an initial Tweepy python script deployed on an AWS EC2 instance for accessing the Twitter Streaming API. AWS Kinesis Firehose handles the incoming data stream and dumps the raw stream elements in a S3 bucket for storage. Finally, a python script processes stream elements and uses various data visualizations for Plotly Dash to build an interactive web dashboard.

The analytical framework

The analysis of gender differences/similarities is based on a series of Bayesian mean comparison of women and men parliamentarians across several outcomes. This includes measures of Twitter activity (i.e. daily posted tweets, daily received mentions, likelihood of addressing - or being addressed by - other parliamentarians of the same gender), Twitter network (i.e. outdegree centrality, indegree centrality, eigenvector centrality, betweenness centrality, and reciprocity of communication), and Twitter content (i.e. average sender tweet sentiment and average receiver tweet sentiment). Finally, a Bayesian hiearchical random-effects model is used to estimte a summary effect of standardized gender differences (Hedges' g) across all outcomes.

Results and discussion

The analysis does not substantiate any evidence in support of gender differences in Swiss parliamentarians' Twitter communication, except for one outcome measure. The average sentiment of tweets addressing women parliamentarians is slightly more negative than for men. The null-finding for the summary effect further compounds the overall pattern of gender similarities. Across all outcomes, an absence of gender differences is 51.28 times more likely under the data than their presence. Tracking the gender differences in near-realtime and at different points during data collection suggests that the lack of gender difference is rather stable over time.

The findings show that gender similarities clearly outweigh gender differences in parliamentarians' Twitter communication. On the one hand, the findings reflect a changing political landscape, with gender norms and stereotypes shifting in a gender-equitable direction. On the other hand, a less gender-differentiated political environment may also mean that parliamentarians have less reason to build their political and social identities around gendered notions.
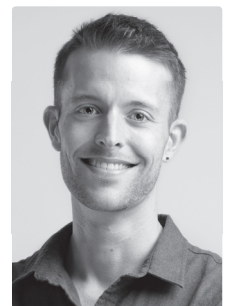
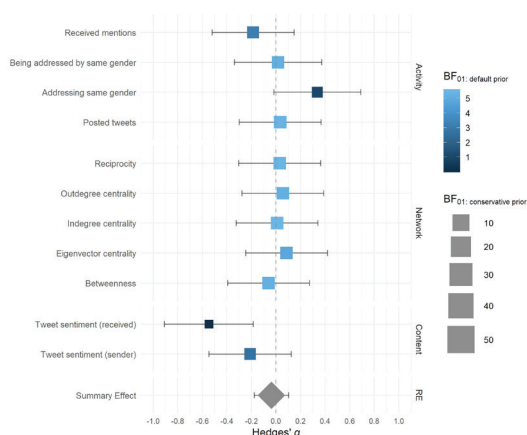Tobias Rohrbach
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Figure 1. Overview of gender differences/similarities on Twitter