

Teaching & Learning Guide for: Textual network analysis

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1 | AUTHOR'S INTRODUCTION

One of the greatest challenges of our digital society is information overload. We are constantly required to make sense of the information coming from social media, “real” and “fake” news, the advertisement industry, or the different results for our search queries. In many cases, the information we get is framed and tailored to promote obvious but also hidden aims and goals. In this course, we introduce a new method for content analysis—textual network analysis—for detecting political and economic biases in the text. We first introduce the key concepts associated with the network theory, looking at various political, social, economic, technological, and cultural perspectives. Then we investigate a number of case study examples to illustrate aspects in the literature. Finally, we learn to use Visone, a software tool to conduct textual network analyses in order to identify the main themes in the text and its biases.

2 | READING RECOMMENDS

A good place to start would be the overview paper of Borgatti et al. *Network analysis in the Social Sciences* (Science, 2009). This paper introduces various applications of network analysis in the social science. For the specific use of network analysis in text, the papers of Kathleen M. Carley: *Coding choices for textual analysis* (Sociological Methodology) and *Extracting culture through textual analysis* (Poetics) introduce guidelines for textual network analysis. She also demonstrates the potential of textual network analysis of thesaurus, fiction book, and even interview transcripts to highlight various aspects of the American culture. The course is based on Segev's paper: *Textual network analysis: Detecting prevailing themes and biases in international news and social media* (Sociology Compass, 2020).

3 | ONLINE MATERIALS

Stages of analysis	Web-based & software	R and Python packages (require programming skills)
1.1 Define and refine the sample	News: Factiva, Nexis Uni Social Media: DMI, Mozdeh, TAGS	Prominent R packages that can be used for most of the stages in textual network analysis are: <i>quanteda</i> and <i>textnets</i> For python Text-Network Analysis or a combination of the <i>nlTK</i> and <i>NetworkX</i> packages can be used for most of the stages
1.2 Identify the main actors in the network	For identifying frequent words: Textual Network Analysis, Mozdeh, Count Words	
1.3 Clean and refine the list	Use Textual Network Analysis to clean stop-words and then manually choose relevant words	
2.1 Convert the text and list of words to a network	Textual Network Analysis, Visone with NLP extension	
2.2 Network sparsification	Visone, Gephi, NodeXL	
2.3 Identify clusters and the structure of the network		
2.4 Identify the central words		

Sources: General textual network analysis tools: <http://www.eladsegev.com/tools>, Count Words: <http://www.countwordsfree.com>, Digital Methods Initiative (DMI): <https://wiki.digitalmethods.net/Dmi/ToolDatabase>, Mozdeh: <http://mozdeh.wlv.ac.uk>, TAGS: <https://tags.hawksey.info>, Visone: <https://visone.info>, Gephi: <https://gephi.org>, NodeXL: <https://nodexl.com>, *quanteda*: https://quanteda.io/reference/textplot_network.html, *textnets*: <https://github.com/cbail/textnets>, Text-Network Analysis: <https://github.com/michal-pikusa/text-network-analysis>

4 | SAMPLE SYLLABUS

Lessons 1–2: Introduction to network analysis

- Barabási A. L. (2002) *Linked: The new science of networks*, Perseus, Cambridge, MA
- Borgatti, S. P., Mehra, A., Brass, D. J. and Labianca, G. (2009). Network analysis in the social sciences. *Science* 323, 892–895.

Lesson 3: Textual network analysis

- Segev, E. (2020). Textual network analysis: Detecting prevailing themes and biases in international news and social media. *Sociology Compass*. doi:10.1111/soc4.12779
- Carley, K. (1993). Coding choices for textual analysis: A comparison of content analysis and map analysis. *Sociological Methodology*, 23, 75–126.
- Carley, K. (1994). Extracting culture through textual analysis. *Poetics*, 22(4), 291–312.
- Danowski, J. A. (1993). Network analysis of message content. In W. D. Richards & G. A. Barnett (eds.), *Progress in Communication Sciences*, Vol. 12 (pp. 198–221). Norwood, New Jersey: Ablex Publishing Corp.

Lessons 4–5:Visone—Network analysis and vizualisation software

- Brandes, U. and Wagner, D. 2004. “Visone: Analysis and visualization of social networks”. In *Graph drawing software*, Edited by: ünger, M. J and Mutzel, P. 321–340. New York, NY: Springer-Verlag.
- Visone (2016). *Tutorial*. Available at: <http://visone.info/wiki/index.php/Tutorials>

See also materials on network centrality.

Lessons 6–7: Application of network analysis

International news

- Segev, E. & Blondheim, M. (2013). America's Global Standing According to Popular News Sites from Around the World. *Political Communication*, 30(1), 139–161. doi:10.1080/10584609.2012.737418

International searches

- Segev, E. (2018). Googling the world: Global and Regional information flows in Google Trends. *International Journal of Communication*, 12, 2,232–2,250.

5 | SEMINAR/PROJECT IDEA

As part of the course, students will develop their own textual-related networks to identify the biases and framings in different texts. Projects can focus on the analysis of any given text, such as the network of politicians in the news, the international coverage of protests in twitter, socialists concepts in the communist manifesto, the social networks of biblical figures, the representations of crime networks on television, differences between professional and amateur film reviews, the commercialisation of YouTube celebrities, and discourse on global warming.

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