



Content Analysis Versus Structured Topic Modeling: Unethical Military Leadership

Virginia Cheng, Kimi Hsiao, Braden Smolko, Jordan Epistola* & Paul Hanges
 Dynamical Systems Lab, University of Maryland, College Park

Introduction

- The U.S. Military strives to address unethical behavior by targeting unethical leadership in the organization.
- Understanding & identifying unethical leadership is critical for eradicating the harm produced by these leaders.
- This research examines Military unethical leadership by utilizing: Content Analysis & Structured Topic Modeling (STM).
- Content analysis is a method of identifying themes/patterns in order to interpret the qualitative data by hand.
- STM is a machine learning algorithm that identifies themes in the text using natural language processing.

Research Question

How does STM compare to content analysis in understanding Military unethical leadership?

Interview Process

- 439 semi-structured interviews were conducted with military personnel at six different locations.
- Interviews covered several issues regarding unethical leadership.
- Interviews lasted 45-90 minutes.
- Audio recordings were transcribed by two professional agencies.

Content Analysis

The Traditional Content Analysis Method:

- Each researcher independently read the same MAXQDA transcript and identified overall themes using a shared coding scheme.
- Researchers compared the themes for interrater agreement & sources of confusion. This process continued three times until an acceptable level of agreement was met. They then were randomly paired up and content coded the interview data.

The Traditional Content Analysis Results

- Content Analysis results determined 5 general categories of unethical leadership:

- Leader Hypocrisy
- Leader Favoritism
- Abusive Supervision
- Leader Abusing Power
- Leaders Encouraging Unethical Cadet Behavior

Theme:	Leader Encouraging Unethical Cadet Behavior	Leader Hypocrisy	Leader Favoritism
Example Quote:	"He blatantly was just telling kids like, "Yeah, just lie about it." ... like some kids nearly got in trouble cuz they're like, "Oh, that's what you do?" And it's like, "No, no, don't listen to that guy, like he's horrible guy, don't do it."..." -Location 3, Interviewee 37	"...the double standard in our company, ... [the plebes] were expected to have our rooms perfect... at all times... then you see upperclassmen room, their closet... has crap thrown all through it. That's a very poisonous thing because all it does is build cynicism which is then carried on up the chain and reflects down on the people coming in behind you." -Location 3, Interviewee 33	"I mean there've been times and in the submarine community where a supervisor has been told, "You are done because you've done this in such a grievous way that we can't allow you to stay." - Location 6, Interviewee 23

Structured Topic Modeling Algorithm

The Structural Topic Modeling Analysis Method:

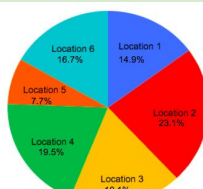
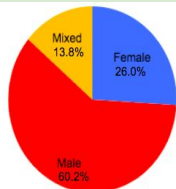
- The transcripts were first modified by removing extraneous information (i.e. time markings, labels, tags, and filler words) and normalizing words.
- The STM algorithm was then conducted on RStudio using the 'Spacy' (Benoit, 2020), 'ldatuning' (Nikita & Chaney, 2020), and 'stm' packages.

The Structural Topic Modeling Analysis Results:

- STM reveals the highest probability (i.e. Highest Prob) words within each topic, frequent and exclusive words for each topic (i.e. FREX), and coefficient estimates of each location.
- 50 topics were examined based on Griffiths & Steyvers (2004) procedure.
 - 42 out of the 50 were interpreted similarly by two or more researchers.
 - 10 out of the 50 were interpreted similarly by four or more researchers.

	Incompetence (Topic 1)	Hypocrisy (Topic 2)	Arbitrary Punishment (Topic 50)
Highest Prob	Leader, get, people, example, kind, someone	Room, standard, known, thing, kind, look	Community, kind, way, lot, leader, hate
FREX	School, plan, approach, legal, dishonest, junior	Room, inspect, standard, uniform, uphold, AMI	Community, hate, advoc, helicopter, voice, way
Locations	Intercept = .01 Location 1: b = -.02 Location 2: b = -0.01 Location 3: b = 0.02 Location 4: b = 0.00 Location 5: b = -0.01 Location 6: b = -0.01	Intercept = .01 Location 1: b = -.11 Location 2: b = 0.01 Location 3: b = 0.00 Location 4: b = 0.04 Location 5: b = 0.03 Location 6: b = 0.04*	Intercept = .00 Location 1: b = -.096 Location 2: b = 0.00 Location 3: b = 0.02** Location 4: b = 0.00 Location 5: b = 0.00 Location 6: b = 0.00

Participants



Discussion and Future Directions

- First study to compare content analysis with STM in leadership.
- Both content analysis and STM Algorithm produced similar results.
- STM generated new insights in understanding unethical leadership.
- Future research could focus on replicating the methodology of comparing content analysis versus STM approach using a larger, different set of participants.

The views expressed in this poster are those of the authors and do not reflect the official policy or position of the Department of the Army, DOD, or the U.S. Government.

References available upon request.