Shifting Meaning of Inequity: Insights from the Blog Posts Of National Black Farmers Association

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Abstract

This paper uses topic modelling to study 217 blogs from the National Black Farmers Association. A blog is a verbal behavior of the blogger; every verbal behavior or utterance has a probability of emission. How often a blogger will emit a response depends upon reinforcements for the response. The results of our empirical analysis indicate that perceptions of racial discrimination, including beliefs about the consequences of racial discrimination, are widely shared among the members of the National Black Farmers Association.

Introduction

This paper queries the blogs published by the National Black Farmers Association (NBFA)[2] using topic models[3] to explore inequality beliefs held by minority farmers. NBFA's website hosts a blog page with entries highlighting a variety of discriminatory practices in industry such as John Deere's non-participation in NFBA conferences and inequity in government agencies such as USDA's lending practices.

A blog is a verbal behavior of the blogger; it includes written words, idioms, and sentences.

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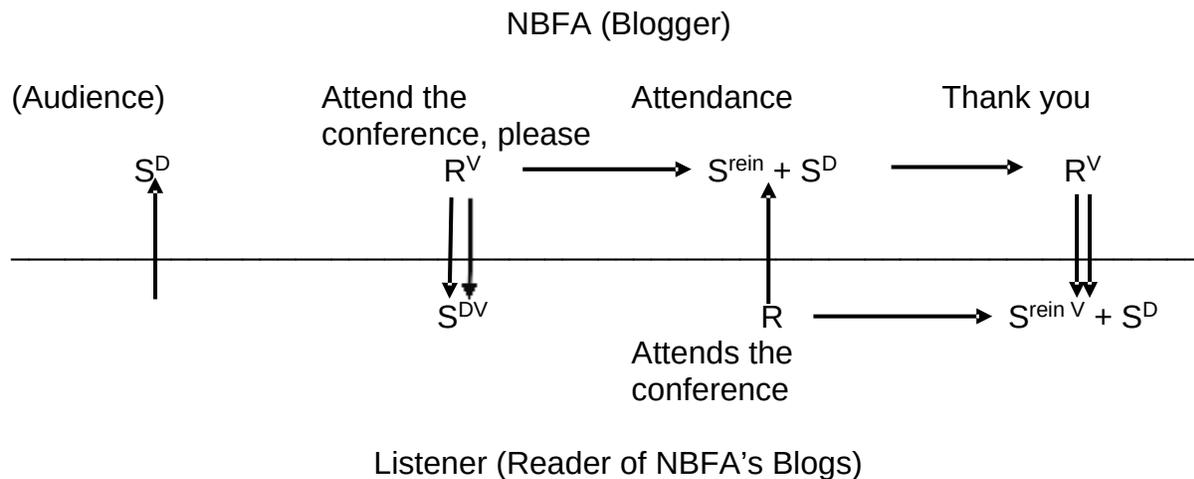[2] https://www.blackfarmers.org/.
[3] For an example of topic spotting, see Athiyaman, A. (2019). Thirty years of IIRA's Rural Research Reports: A thematic analysis. *Research Brief*, 1(1), 1-6. Available: http://www.instituteintelligence.com/wp-content/uploads/2019/08/Topic_Model_RRR_v1_1.pdf.

Every verbal behavior or utterance[4] has a probability of emission. How often a blogger will emit a response depends upon reinforcements for the response; the blogger's audiences should, for example, like the message. The antecedent for verbal behavior would be one or more discriminative stimuli[5]. Figure 1 illustrates the conceptualization of verbal operant using a model of audience response to a request by the NBFA for attendance at its annual conference.

Figure 1: Verbal Operant and its Reinforcements

NBFA (Blogger)

Listener (Reader of NBFA's Blogs)

Note: The S and R denote stimulus and response, respectively; v indicates verbal mode of communication; "rein" is the abbreviation for reinforcement.

In Figure 1, the presence of audience serves as a discriminative stimulus for the blogger to request audiences' attendance at the conference (attend the conference, please, R^V). The blogger's verbal behavior produces a verbal stimulus for the listener; the stimulation provides the occasion (S^{DV}) for the nonverbal response of attending the conference. The effect upon the blogger is to reinforce the communication by the attendance at the conference. This is followed by another verbal response from the blogger, "Thank you"; it assures similar behavior of the listener in the future.

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[4] Technically, an utterance is a verbal operant; the utterance will affect the environment (audiences) which has a return effect upon the blogger; for more about behavioral concepts, see Akpan, B. (2020). Classical and Operant Conditioning—Ivan Pavlov; Burrhus Skinner. In *Science Education in Theory and Practice* (pp. 71-84). Springer, Cham.
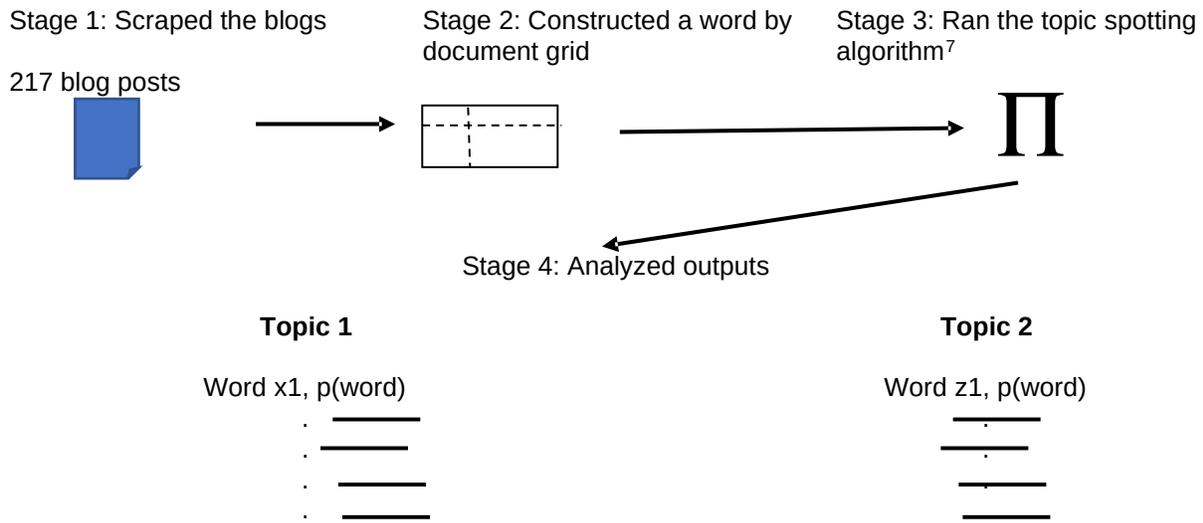
[5] The presence of a discriminative stimulus results in a verbal behavior which is reinforced; see Thibaut, J. W., & Kelley, H. H. (2017). *The social psychology of groups*. Routledge.

Topic Spotting

Topic spotting helps one to understand the basic, underlying dimensions of the linguistic data. The verbal operant model in Figure 1 implies that words spoken or written are probabilistic; the strength of an utterance is determined by its reinforcement.

The NBFA website contains 217 blogs, including blogs that are archived. Since bloggers' beliefs about inequity was the focus of the study, a series of topic models with 5, 7, and 9 topics were estimated[6]. Figure 2 shows how the topic models were applied to the 217 blogs.

Figure 2: The Process of Topic Spotting – NBFA Blogs

Stage 1: Scraped the blogs

217 blog posts

Stage 2: Constructed a word by document grid

Stage 3: Ran the topic spotting algorithm[7]

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Stage 4: Analyzed outputs

Topic 1

Word x1, p(word)

Topic 2

Word z1, p(word)

Findings

To determine the optimal number of topics, I compared the three models, with 3, 5, 7, and 9 topics, using the level of coherence statistic[8]. Then, I looked at 10 words from each topic and settled on three topics.

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[6] Based on arguments that one's memory can process only 7∓ 2 chunks of information, beliefs for the purposes of this study; see, Miller, G. A. *(1956).* "The magical number seven, plus or minus two: Some limits on our capacity for processing information"*. Psychological Review.* **63** *(2): 81–97.*
[7] Details about the topic spotting algorithm used in the study can be obtained from the methodology section of the paper given in footnote 3.
[8] Coherence farther from 0 is better; see, Mimno, D., Wallach, H., Talley, E., Leenders, M., & McCallum, A. (2011, July). Optimizing semantic coherence in topic models. In *Proceedings of the 2011 conference on empirical methods in natural language processing* (pp. 262-272).
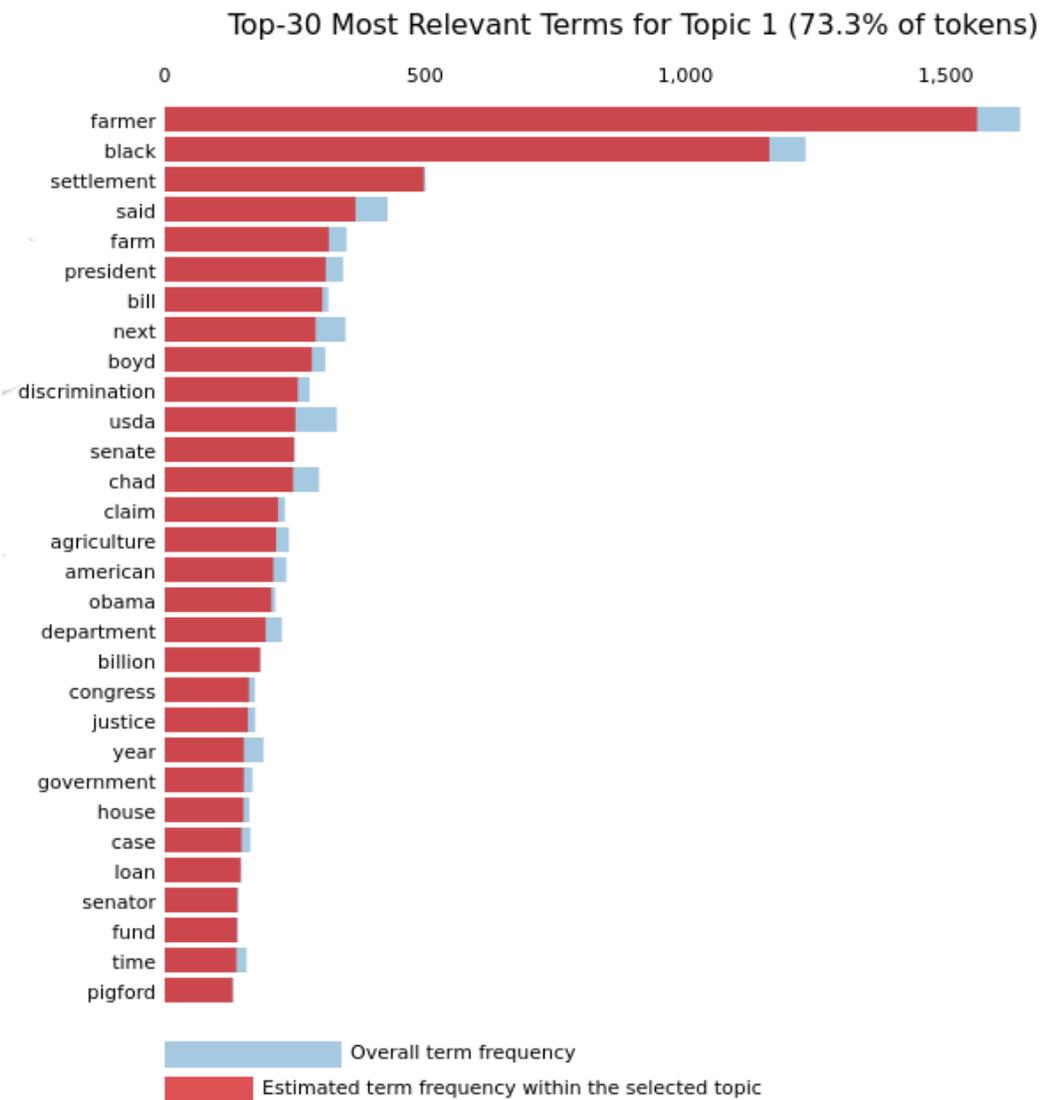
Topic 1: Financial Assistance

The passage of Senate Amendment to H.R. 1319, the American Rescue Plan Act of 2012, which provided $5Billion for farmers of color to pay off federal loans was the topic of discussion. The most representative words of this topic are farmer, black, and settlement (Figure 3).

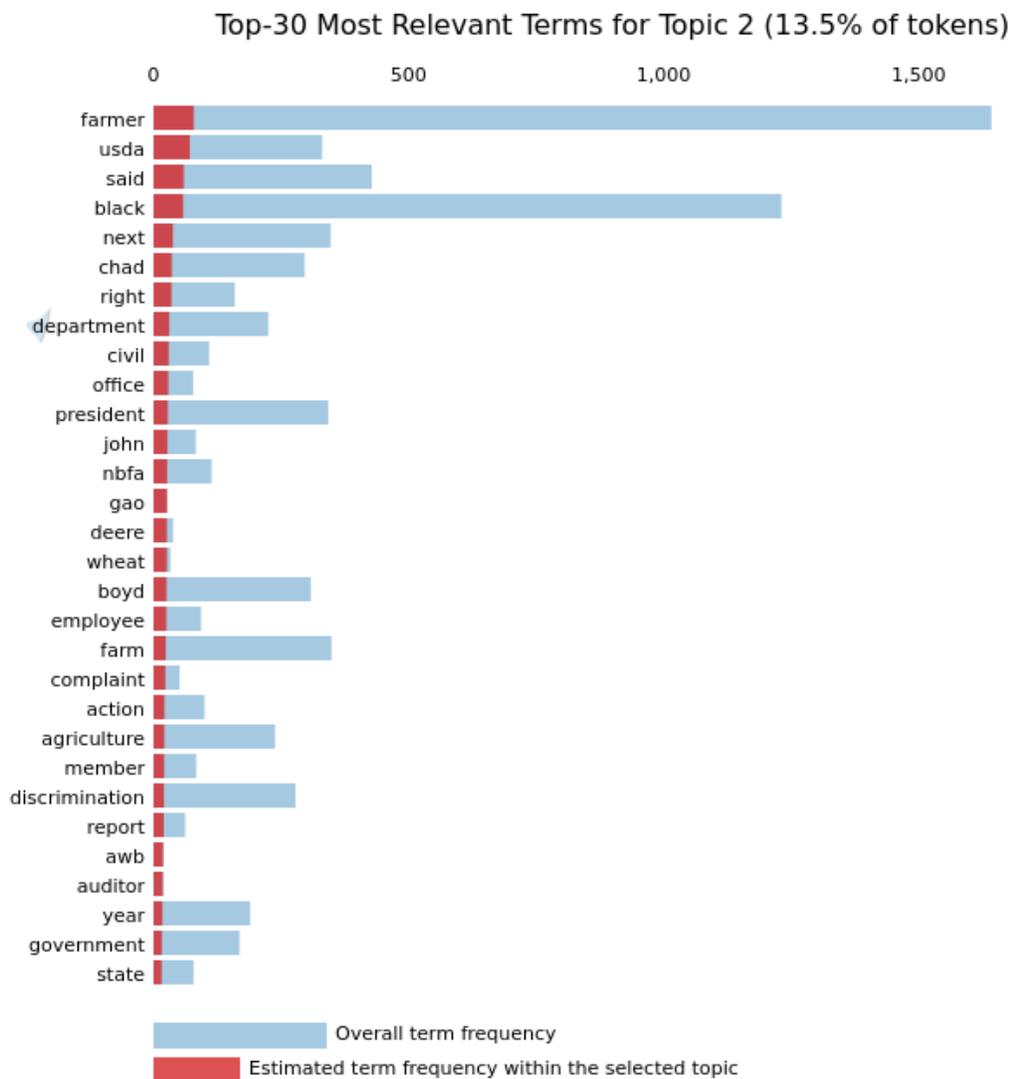**Figure 3: Topic 1: Financial Assistance**

Top-30 Most Relevant Terms for Topic 1 (73.3% of tokens)

Topic 2: Racial Discrimination

Discrimination related words dominate this topic. For example, NBFA's boycott of John Deere equipment resulting from the company's refusal to display some of its farming equipment in the NFBA conference, and difficulties faced by Black farmers in accessing government loans, underlie utterances or verbal operant such as USDA, civil, right, discrimination, etc. (Figure 4).
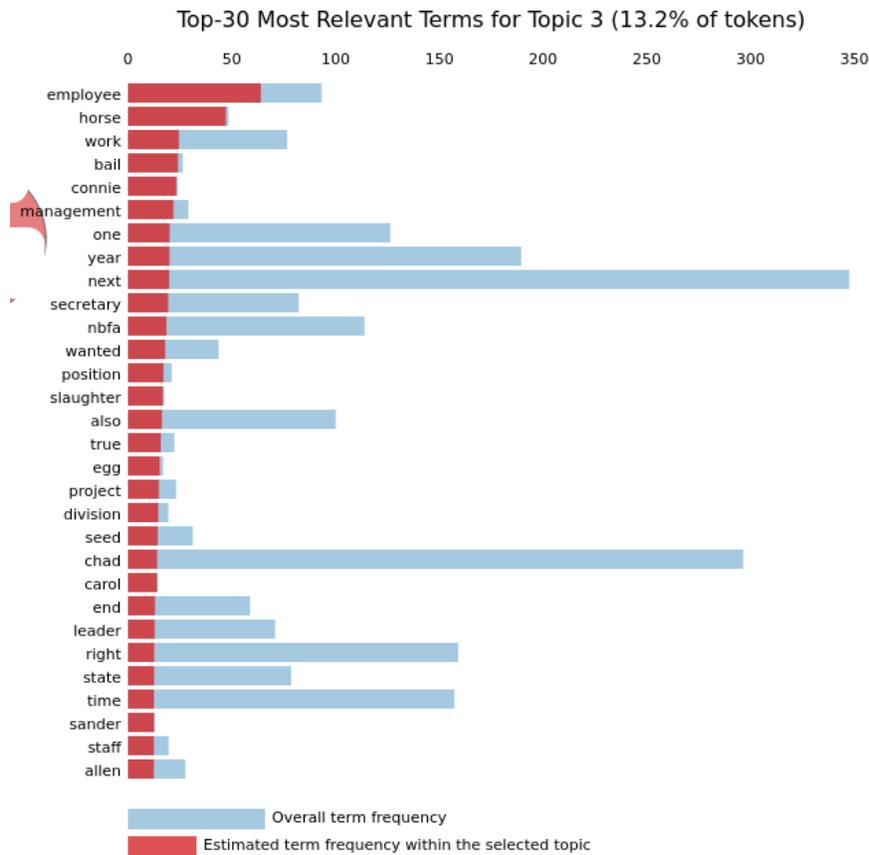
Figure 4: Topic 2: Racial Discrimination

Top-30 Most Relevant Terms for Topic 2 (13.5% of tokens)

Overall term frequency

Estimated term frequency within the selected topic

Topic 3: The Need to Find Extra Work

Black farmers are finding it difficult to make a living from their farming activities; they had to find additional work to support their families. Figure 5 shows the words that are salient to this topic.

Figure 5: Topic 3: Need for More Work

Top-30 Most Relevant Terms for Topic 3 (13.2% of tokens)

Overall term frequency
Estimated term frequency within the selected topic

Summary and Conclusion

Three themes dominate the blog discussions of the NBFA: need for financial assistance for black and other minority farmers, racial discrimination faced by farmers of color, and the inadequacy of farm income. These 'qualitative' results correlate positively with our earlier, quantitative analyses on minority farmers[9].

[9] See, for example, Athiyaman, A. (2022). Illinois farm ownership by race and farm productivity. *Research Brief*, 4(10), May. Available: http://www.iira.org/wp-content/uploads/2022/05/RB410-Illinois-Farm-Ownership-by-race-and-farm-productivity.pdf.

In conclusion, the NBFA blogs do create perceptions of black-farmer inequity among its members. The question is whether these beliefs have been generalized to other social media and digital platforms such as Twitter and YouTube; a topic for future research.