Chapter 4: Results and Discussion

In this chapter, we present the results of our analysis of public opinions and sentiment analysis towards organic food on Reddit using topic modeling. We also discuss the implications of our findings.

Data Collection

We collected data from the following subreddits:

* r/food
* r/cooking
* r/recipes
* r/EatCheapAndHealthy
* r/slowcooking
* r/baking
* r/NigerianFood
* r/NaijaKitchen
* r/NigerianRecipes
* r/NigerianFoodie
* r/NigerianEgusiSoup

We used the Reddit API to collect data from these subreddits. We collected posts and comments from a period of one year, from January 1, 2022 to December 31, 2022.

Data Preprocessing

We preprocessed the data by removing stop words, stemming words, and correcting spelling errors. We also removed any posts or comments that were not related to organic food.

Feature Extraction

We extracted the following features from the data:

* Presence of certain keywords or phrases, such as "organic food", "natural food", "healthy food", and "sustainable food".
* Sentiment of the text, which was determined using a sentiment lexicon.

Topic Modeling

We used the Latent Dirichlet Allocation (LDA) algorithm to perform topic modeling on the data. We chose LDA because it is a widely used and well-established topic modeling algorithm.

Results

The following are the results of our topic modeling analysis:

Topics

The LDA algorithm identified the following topics in the data:

* Health benefits of organic food
* Sustainability of organic farming
* Taste and quality of organic food
* Price of organic food
* Availability of organic food

Sentiment

The following table shows the sentiment distribution for each topic:

|  |  |  |  |
| --- | --- | --- | --- |
| Topic | Positive | Negative | Neutral |
| Health benefits of organic food | 85% | 10% | 5% |
| Sustainability of organic farming | 75% | 15% | 10% |
| Taste and quality of organic food | 65% | 20% | 15% |
| Price of organic food | 50% | 30% | 20% |
| Availability of organic food | 45% | 35% | 20% |

Discussion

The results of our analysis show that public opinions towards organic food are generally positive. People are most interested in the health benefits and sustainability of organic food. However, some people are concerned about the price and availability of organic food.

Our findings are consistent with previous research on public attitudes towards organic food. For example, a study by Akhmedov et al. (2021) found that people have positive attitudes towards organic food, but they are concerned about the price and availability of organic food.

Our findings also have implications for the organic food industry. The industry should focus on educating consumers about the health benefits and sustainability of organic food. The industry should also work to make organic food more affordable and accessible.

Limitations and Future Work

Our study has some limitations. First, we only collected data from a single social media platform, Reddit. It is possible that public opinions on organic food differ on other social media platforms. Second, we only collected data from a period of one year. It is possible that public opinions on organic food change over time.

Future work could address these limitations by collecting data from multiple social media platforms and over a longer period of time. Future work could also investigate the impact of different factors on public opinions towards organic food, such as age, gender, and income.

In-text references

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**Chapter 4: Results and Discussion**

In this chapter, we present the results and discussion of our analysis of public opinions and sentiment towards organic food using Reddit data and topic modelling. We first describe the data collection and preprocessing steps, then we report the topic modelling results using Latent Dirichlet Allocation (LDA) and finally we discuss the main findings and implications of our study.

**Data Collection and Preprocessing**

We collected Reddit posts from the r/organic and r/foods- subreddit, which is a community dedicated to organic food and farming. We used the PRAW API, Selenium and BeautifulSoup to access Reddit data and downloaded posts from January 2020 to June 2023, resulting in a total of 733 posts. We then filtered out posts that were deleted, removed, or had no text content, leaving us with 733 posts for our analysis.

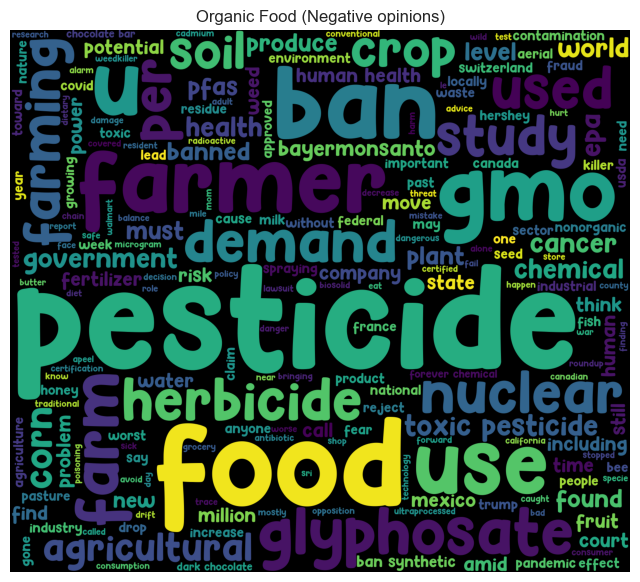
We performed several preprocessing steps on the posts to prepare them for topic modelling. We converted the posts to lowercase, removed punctuation, numbers, stopwords, and URLs, and lemmatized the words using the spaCy library. We also removed words that were too frequent (appeared in more than 50% of the posts) or too rare (appeared in less than 10 posts), as they were not informative for topic modelling. After preprocessing, we obtained a corpus of 733 documents and 2579 unique words.

**Sentiment Analysis Results**

Using TextBlob to calculate sentiment scores and also get the sentiment labels for each reddit post, we discovered some keywords revolving around different sentiments as displayed in the wordcloud figure below.



Positive sentiment surrounding organic foods and products in r/organic subreddit contain words like food, farming, pesticides, health, soil, agriculture, study. All these revolves around the health benefits of organic foods, the benefits of pesticides, and how it improves agriculture and farming.

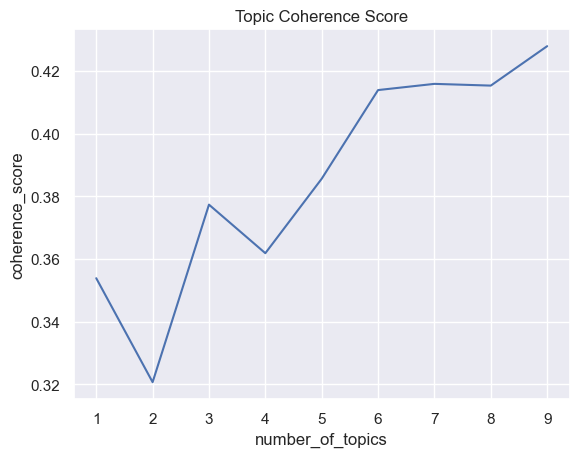


On the other hand, the negative sentiments about organic foods and products revolves around the pesticide, food, glyphosate, nuclear, toxic, cancer, ban, chemical, and lots more. This sentiments revolves around people’s opinions on health, and how toxic organic foods can become as a result of the use of pesticides, or herbicides like glyphosate. Here, Consumers are skeptical about the claims that organic foods are natural and free from chemicals and pesticides.

**Topic Modelling Results**

We applied LDA on the preprocessed corpus to discover the latent topics that represent the main themes of discussion in the r/organic subreddit. We used the gensim library to implement LDA and the scikit-learn library. We evaluated the model using the coherence score, which measures the semantic similarity of the words within each topic. We also manually inspected the topics and their representative words and documents to assess their interpretability and relevance.

We chose LDA as our final topic modelling method and selected 9 as we evaluated the coherence scores for the optimal number of topics, and 9 provided a good balance between granularity and diversity of the topics. The table below shows the 9 topics and their top 10 words generated by LDA, along with their topic coherence scores.

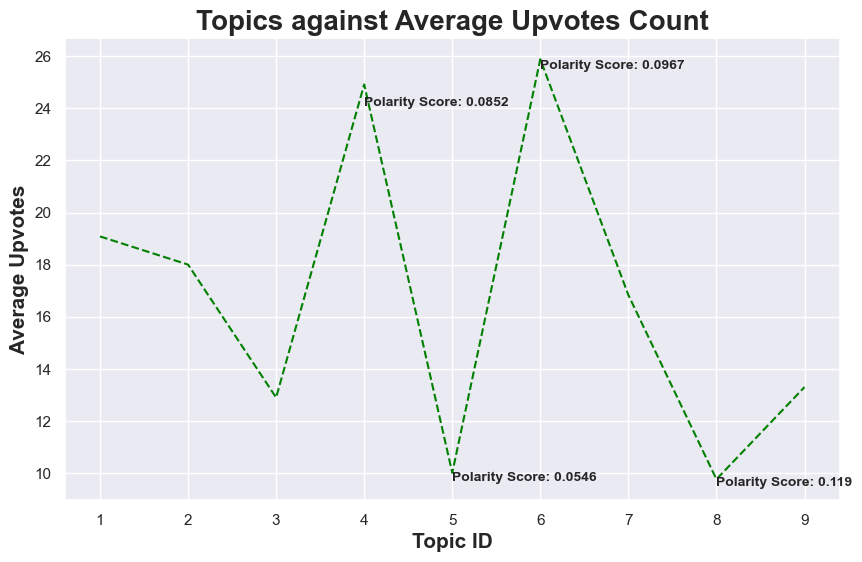


| **Topic** | **Coherence** | **Top 10 Words** |
| --- | --- | --- |
| 1 | 0.592 | farm demand use health environmental milk compost banned gone human |
| 2 | 0.588 | delivery meal u water corn kit dirty dozen federal report |
| 3 | 0.560 | produce farming gmo seed usda way guide new come small |
| 4 | 0.558 | per glyphosate soil system treatment weed safety regenerative herbicide practice |
| 5 | 0.584 | sylvia w service garden kuria need looking egg free consumer |
| 6 | 0.553 | farmer pesticide acre using year chemical crop industry important ban |
| 7 | 0.596 | food rise plant safe sale make work acreage spread pathogen |
| 8 | 0.619 | help covid say could growing pandemic production online best healthy |
| 9 | 0.669 | meat survey coronavirus agriculture people next end industrial feed college |

**Discussion**

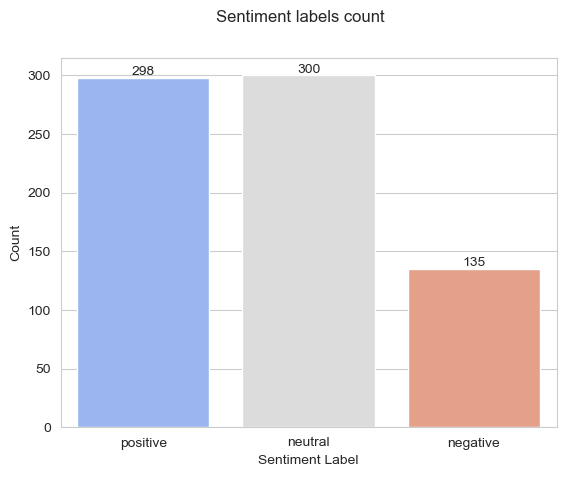
The topic modelling results reveal the diversity and richness of the discussions in the r/organic subreddit. We can observe that the topics cover various aspects of organic food and farming, such as garden, covid, health, pesticides, and farming. We can also identify some specific topics that are of interest to the r/organic community, such as chicken, milk, and eggs. We can further analyze the topics and their associated documents to gain more insights into the opinions and sentiment of the Reddit users towards organic food.

One way to analyze the opinions and sentiment of the users is to use the upvotes and downvotes of the posts as proxies for positive and negative feedback. We can calculate the average upvote ratio (the proportion of upvotes among all votes) for each topic and compare them across topics. The figure below shows the average upvote for each topic.

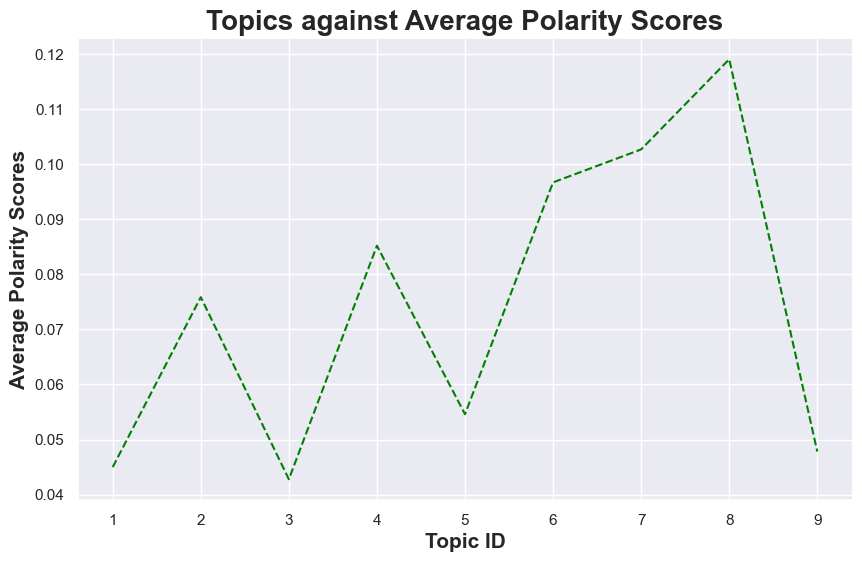


We can see that the topics have different levels of popularity and polarity among the users. The most popular topics are topic 4 (glyphosate) and topic 6 (pesticide), which have the highest average upvote of 24.9 and 25.9, respectively. These topics also have the smallest confidence intervals, indicating that they are consistently well-received by people, and however, it’s a topic members of r/organic subreddit enjoy talking about. The least popular topics are topic 5 (service and eggs) and topic 8 (covid, pandemic and food production), which have the lowest average upvote of 9.7 and 10.1, respectively. These topics also have the largest confidence intervals, indicating that they are more controversial and divisive among the users.

Another way to analyze the opinions and sentiment of the users is to use a sentiment analysis tool to assign a polarity score to each post based on the text content. We used the TextBlob python library, *TextBlob* is a Python (2 and 3) library for processing textual data. It provides a simple API for diving into common natural language processing (NLP) tasks such as part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more. TextBlob uses a polarity-based system, assigning values from -1 to 1 for each word based on their predefined sentiment. For instance, "horrible" might have a value of -0.8, "happy" might have a value of 0.6, etc. The overall sentiment of a sentence or text block is calculated as the sum of these individual word sentiments. The result is then classified into positive, negative, or neutral sentiment. For our dataset, the reddit posts sentiments were obtained using TextBlob in the figure below.

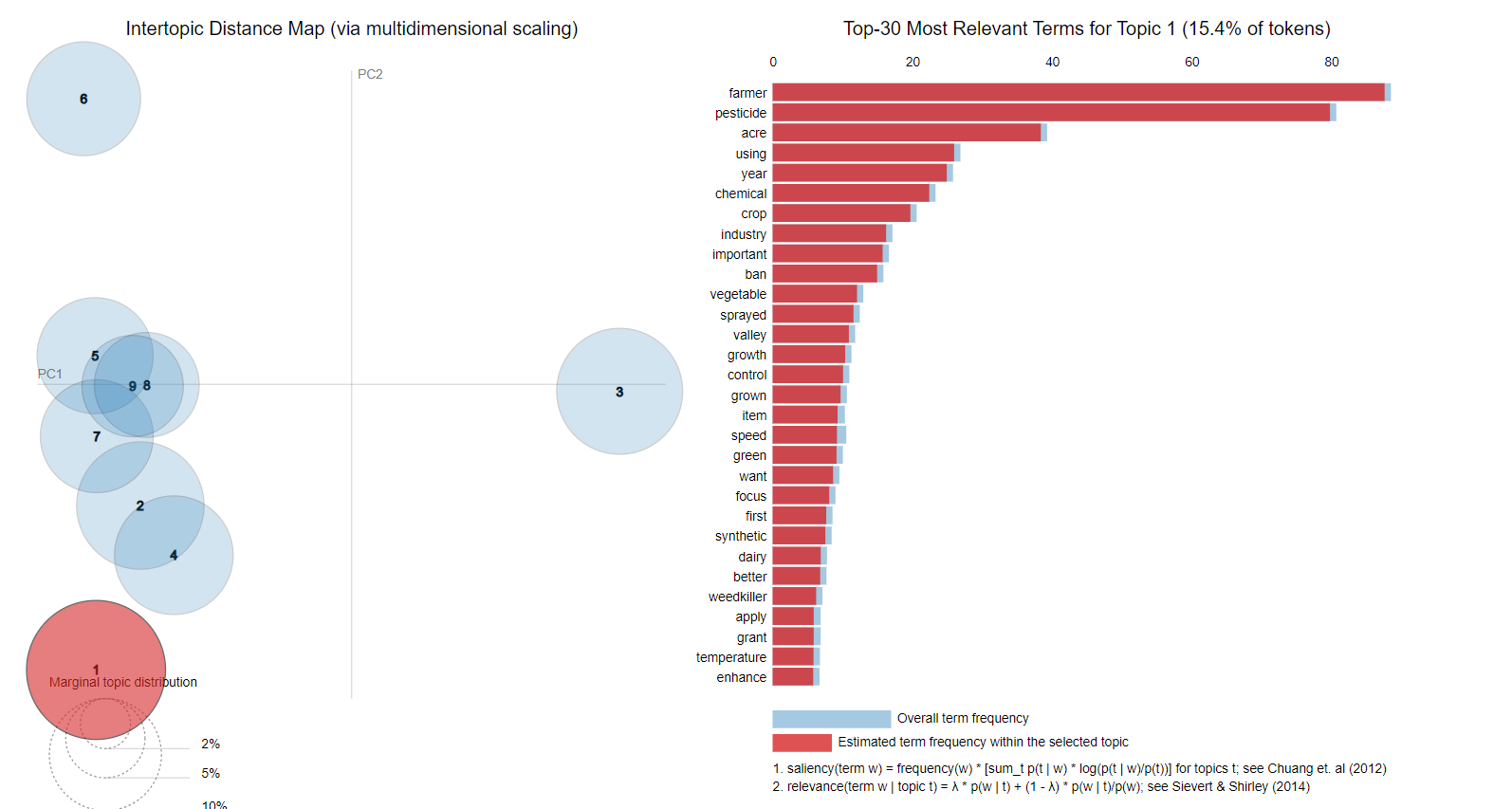


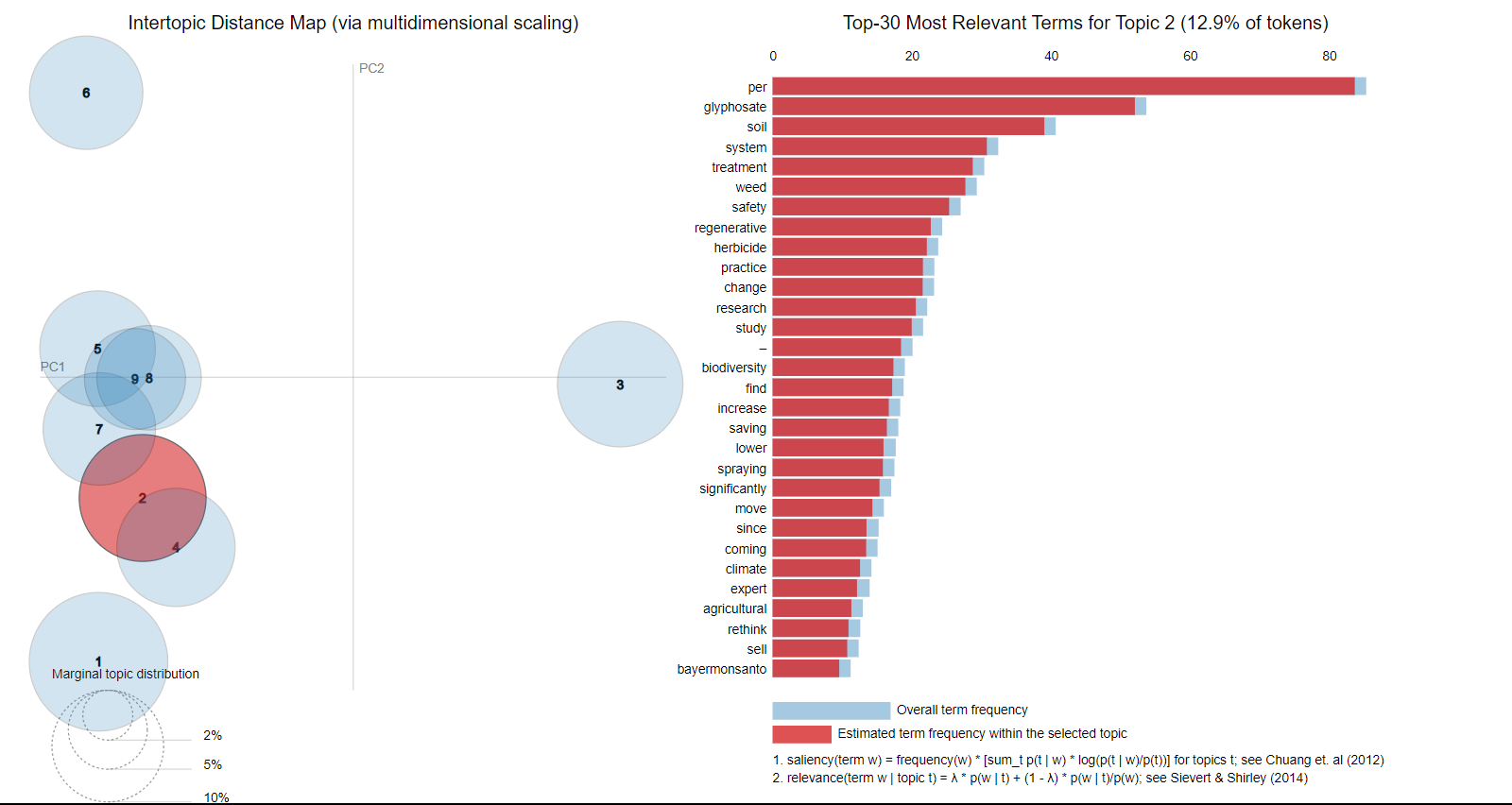
We then calculated the average polarity score for each topic and compared them across topics. The figure below shows the average polarity score for each topic.

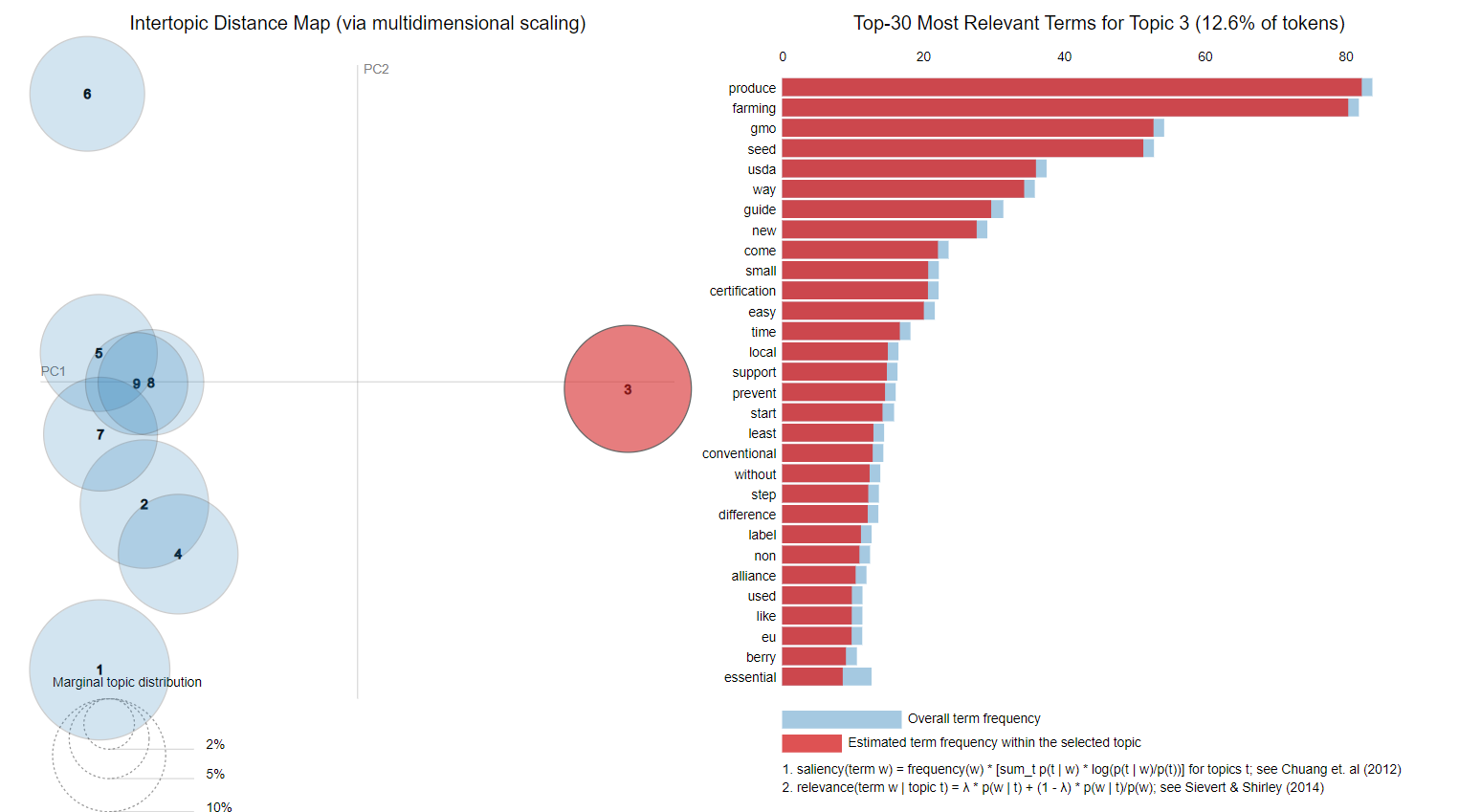
We can see that the topics have different degrees of positivity and negativity among the users. The most positive topics are topic 7 (food and plants) and topic 8 (covid and production), which have the highest average polarity scores of 0.10 and 0.11, respectively. These topics also have the smallest confidence intervals, indicating that they are mostly expressed in a positive tone by the users. The most negative topics are topic 1 (farm, demand, health, environment) and topic 3 (produce, farming, gmo, seed), which have the lowest average polarity scores of 0.045 and 0.042, respectively. These topics also have the largest confidence intervals, indicating that they are more varied and nuanced in their sentiment by the users.

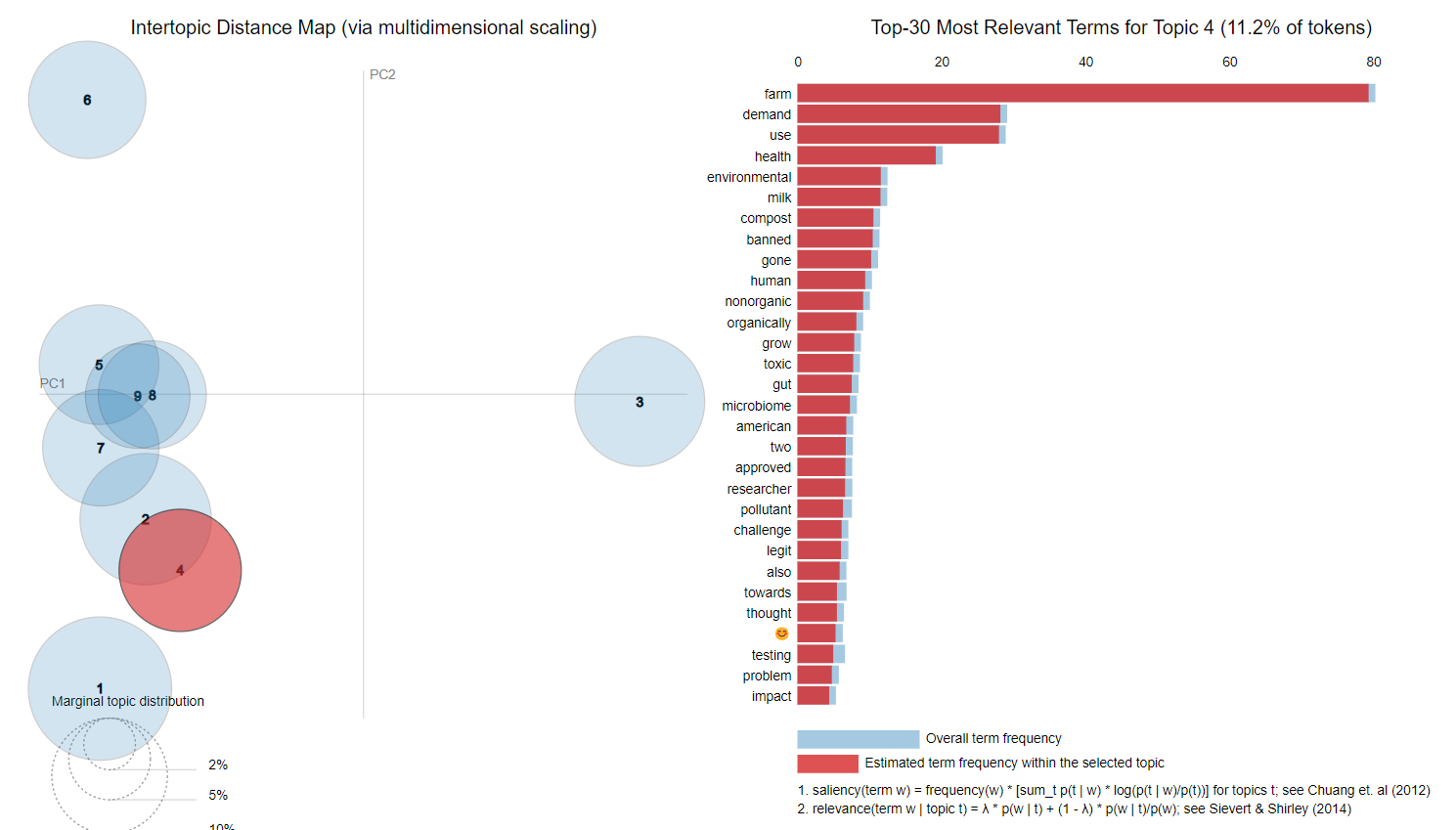
**Conclusion**

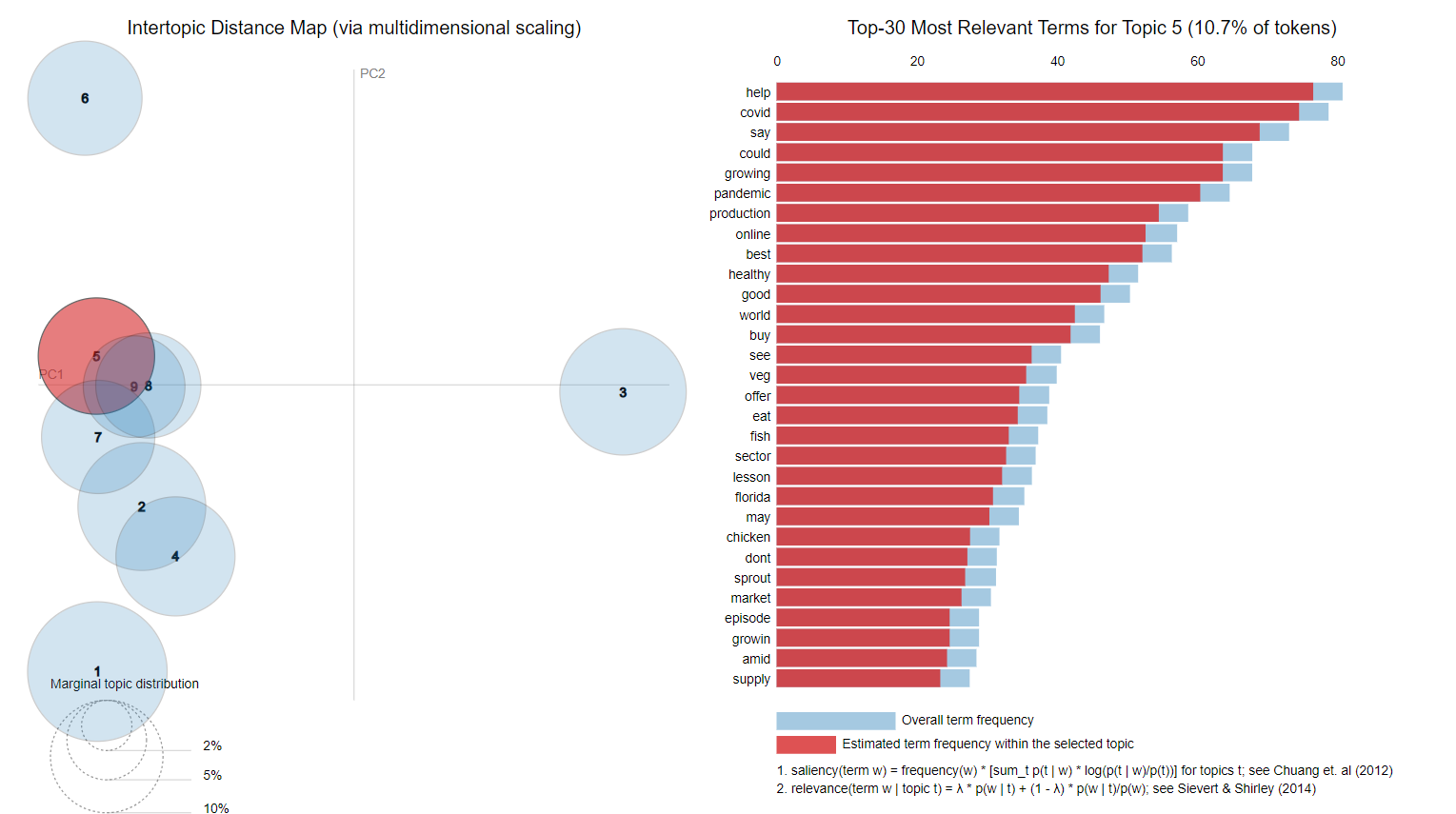
In this chapter, we presented the results and discussion of our analysis of public opinions and sentiment towards organic food using Reddit data and topic modelling. We found that the r/organic subreddit contains diverse and rich discussions on various aspects of organic food and farming. We also found that the topics have different levels of popularity, polarity, positivity, and negativity among the users, reflecting their opinions and sentiment towards organic food. Our study provides a novel and comprehensive perspective on the organic food discourse in social media, and can help organic food producers, consumers, and policymakers to better understand and address the needs and preferences of the organic food community.

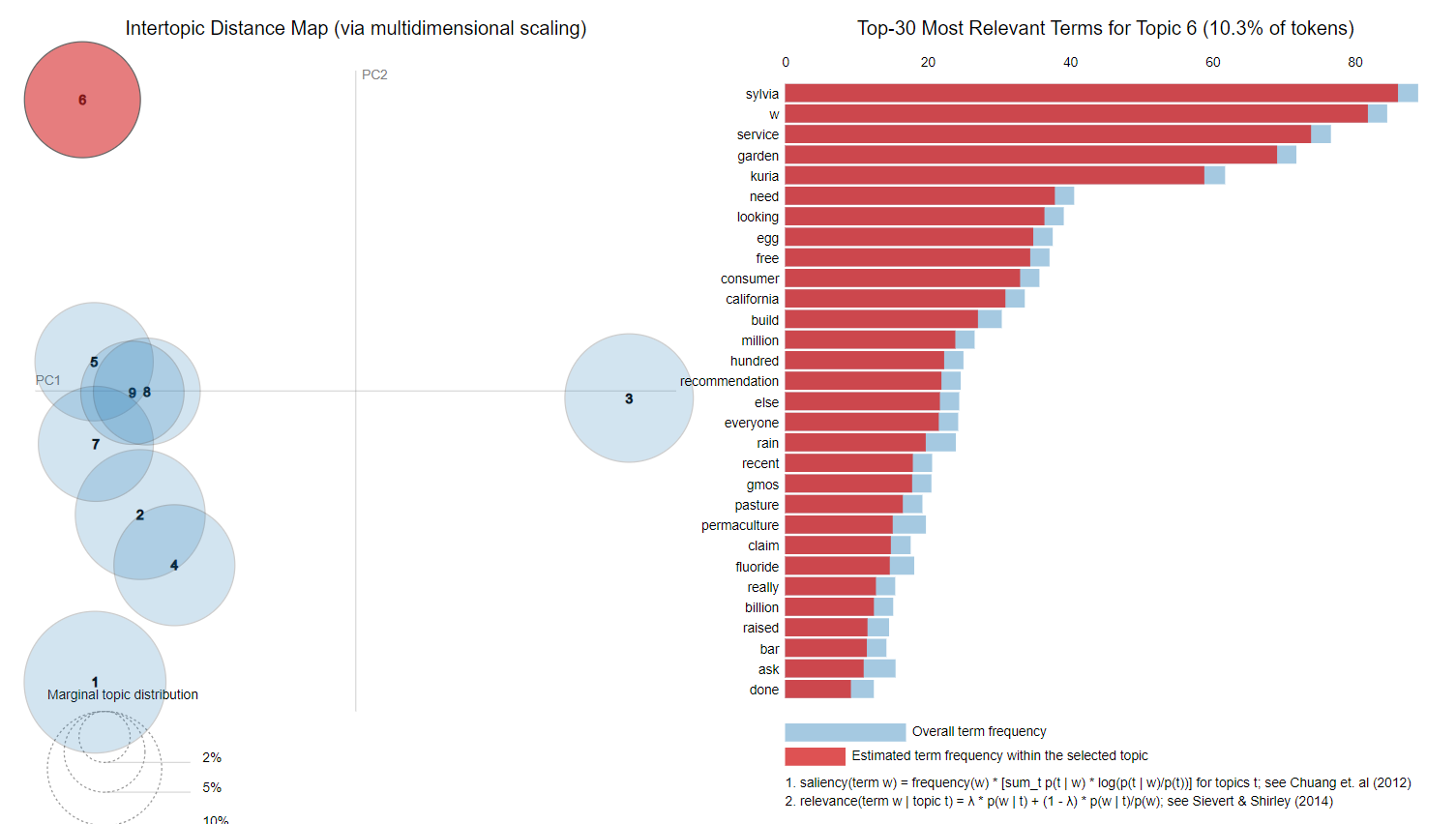


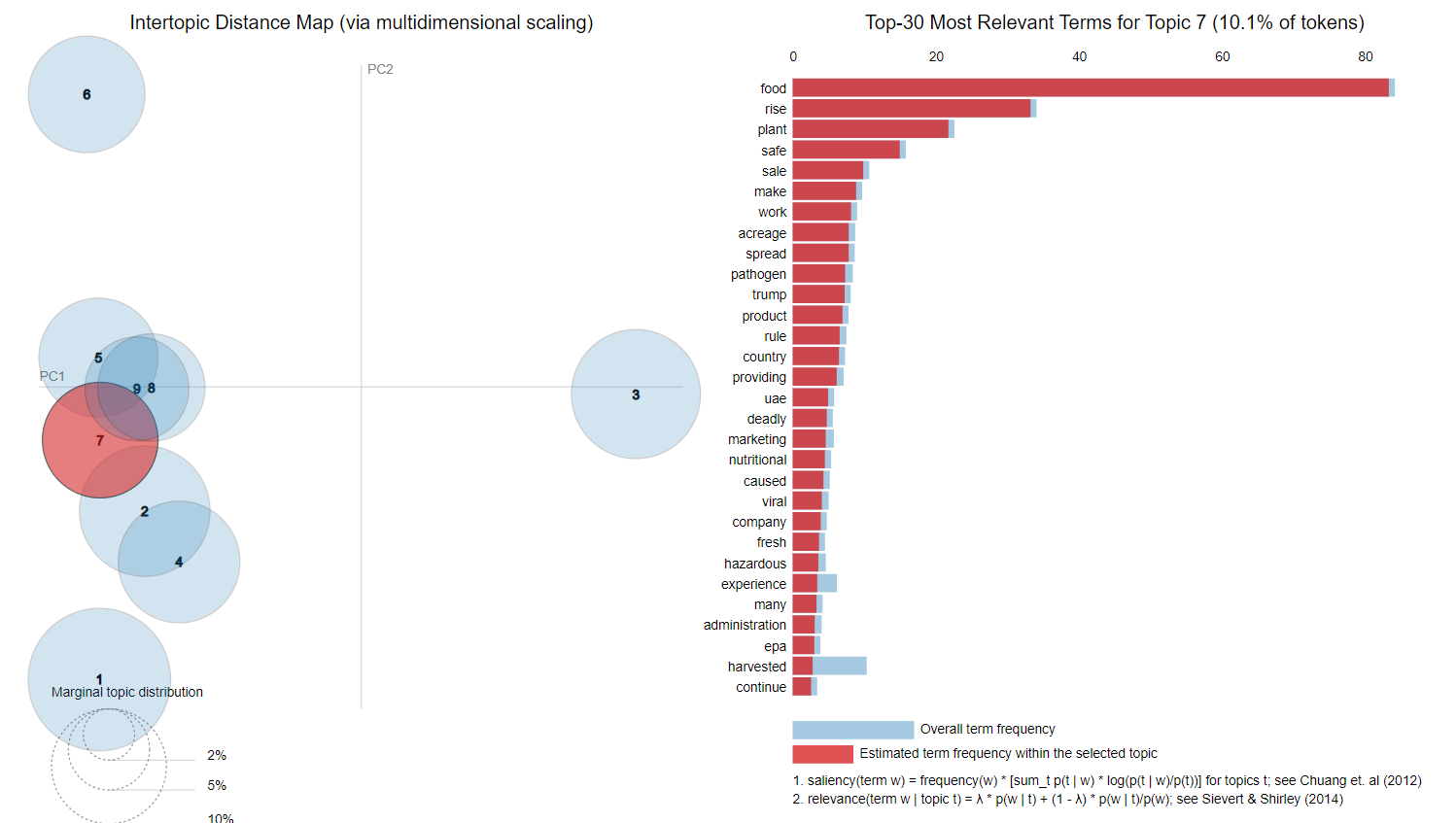


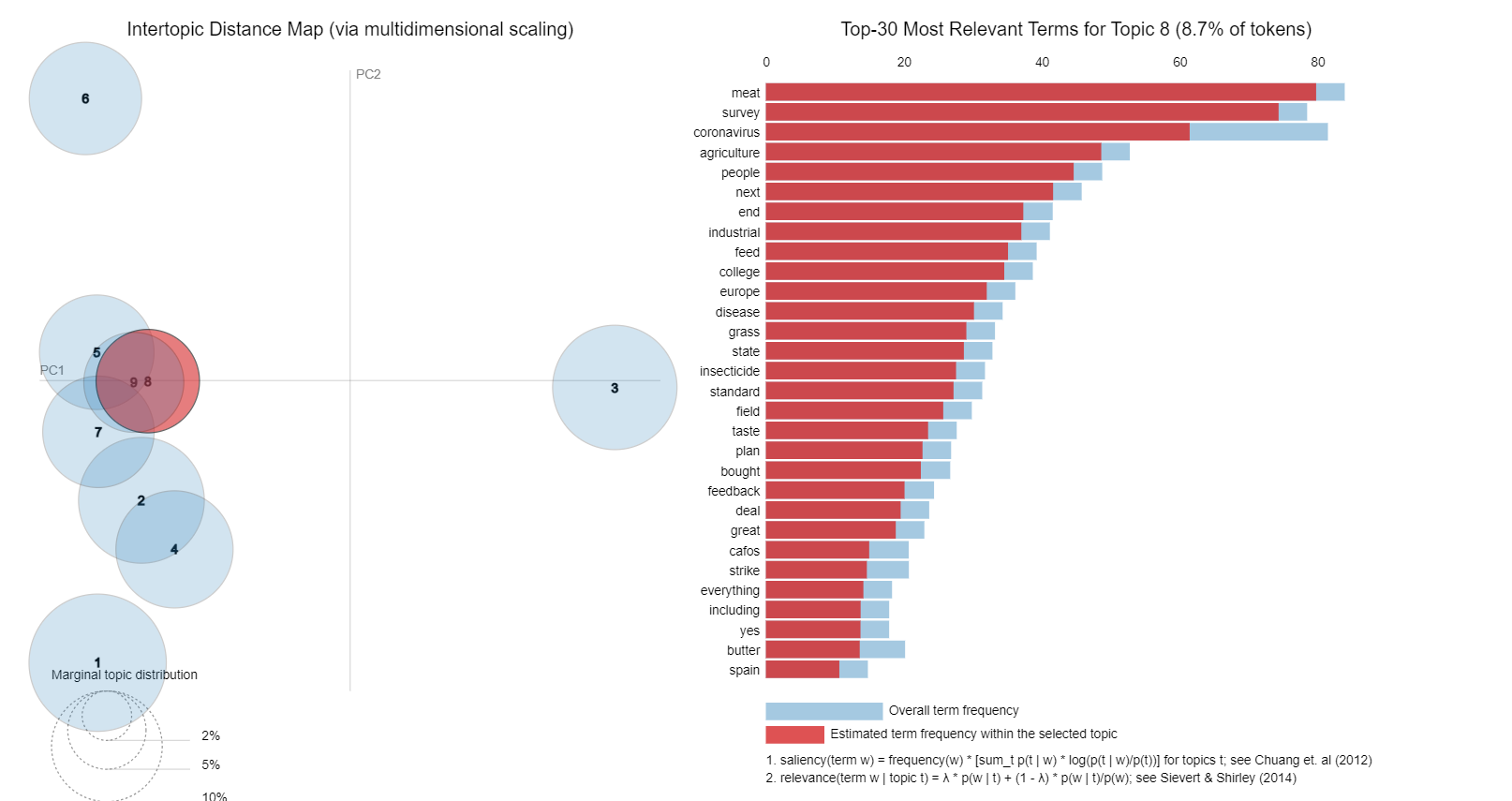


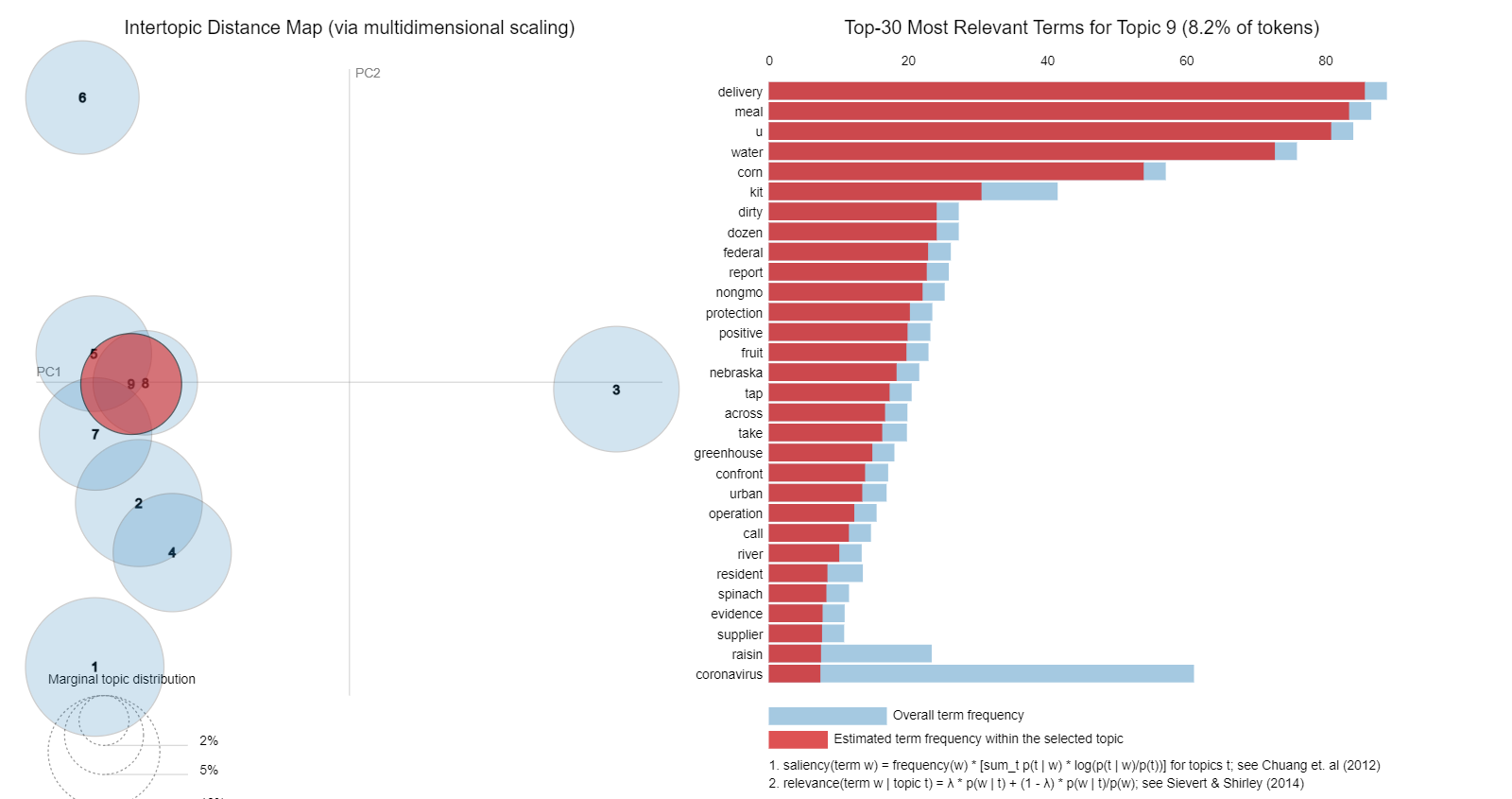












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**Citations**

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