Amazon Reviews Analysis

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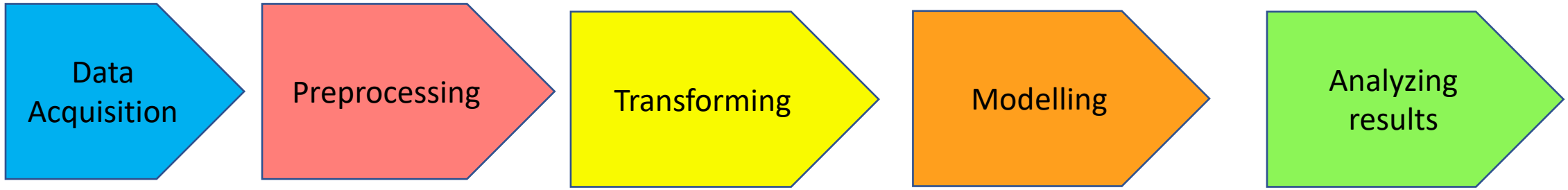
Business Case

- Amazon Reviews is a product in itself
- Customer reviews offer insights about:
  - Who is buying the products
  - What is important for customers
  - Active communities
  - Customer segmentation

Data

- A collection of reviews written in the Amazon.com marketplace and associated metadata from 1995 until 2015
  - Amazon Customer Reviews Dataset available in S3
  - Sports category
  - 4,832,539 reviews
- Prices from a selected topic:
  - Scraped using Requests in python

Topic pipeline



- Extracting data
- Loading in python

- Removing nulls and duplicates
- Grouping all reviews for same product

- Converting to lower case, removing stop words, punctuation

- LDA
- Verification with KMeans

- Finding communalities between reviews grouped under the same topic

THE MODEL

- Latent Dirichlet Allocation (LDA) for topic identification
  - Topic 0: Teams and Gifts
  - Topic 1: Airsoft Guns
  - Topic 2: Clothes
  - Topic 3:Fishing
  - Topic 4: Workout routines

- Evaluating potential relationship with product price
  - Part of speech regression, vocab regression and classification, neural networks

Topic 0: Teams and Gifts

Sally the family shopper:

- She is likely married
- She does her Christmas shopping online
- She is likely to buy sports apparel
- She often buys gifts for her husband and kids
- Arrival time is important

Topic 1: Airsoft

John the enthusiast

- He is very is very much into airsoft guns
- He would write about specific features of the product.
- Quality is important
- Price is a factor

Conclusions

- Amazon reviews for the sport category were split into topics
- Five distinct topics were identified
- The language in each topics was used to identify commonalities and potential reviewers characteristics
- There is not evidence of relationship between product price and reviews

Future work:

- Further examine recommendation systems and cross selling

Tools

- Spyder
- Requests
- GENSIM
- NLTK
- KMEANs
- LDA
- LDAvis

- keras. text_to_word_sequence
- sklearn.cross_validation
- sklearn.model_selection
- sklearn.preprocessing
- TfidfVectorizer
- LSA (TruncatedSVD)
- Word2Vec
- GridSearchCV
- keras.engine

- keras.layers:Dense, Embedding, Conv1D, MaxPooling1D, Flatten
- GradientBoostingClassifier
- sklearn.linear_model
- sklearn naive_bayes

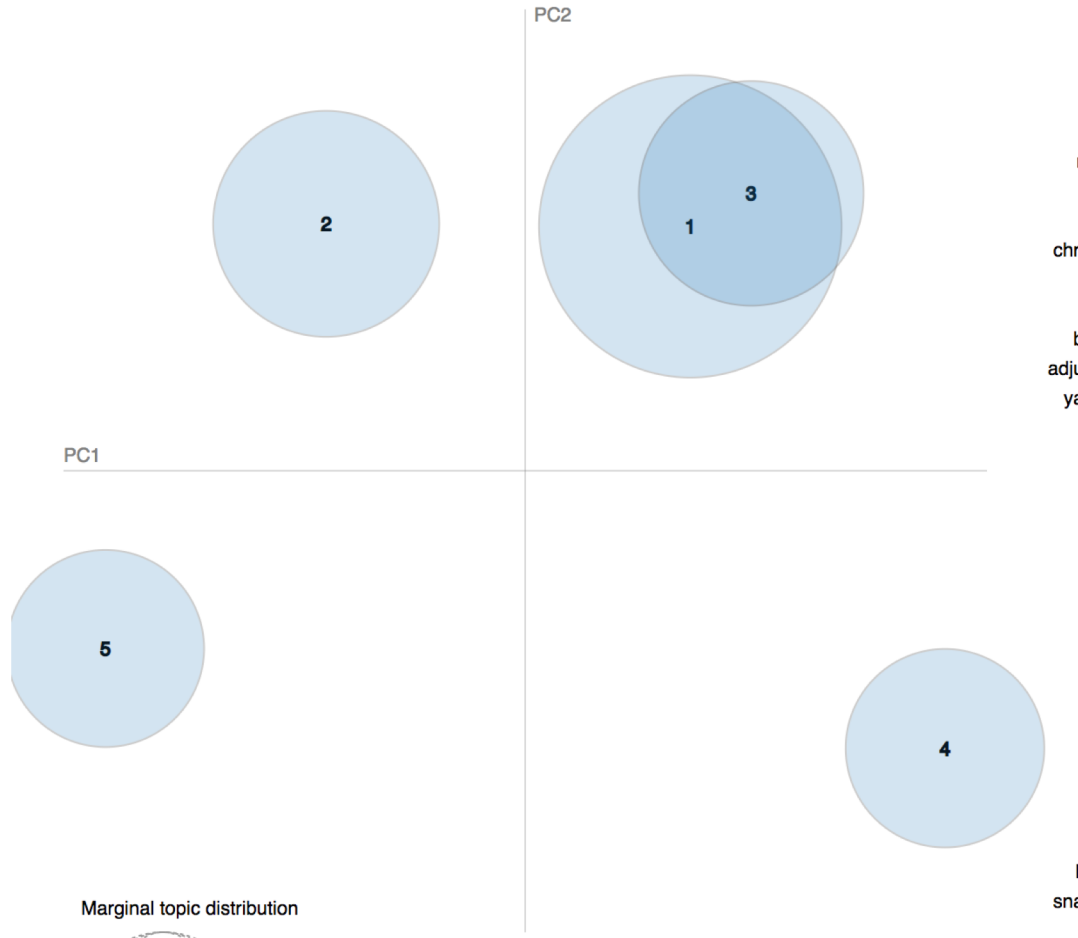
Topic 0: Teams and Gifts

Slide to adjust relevance metric:(2)

λ = 1

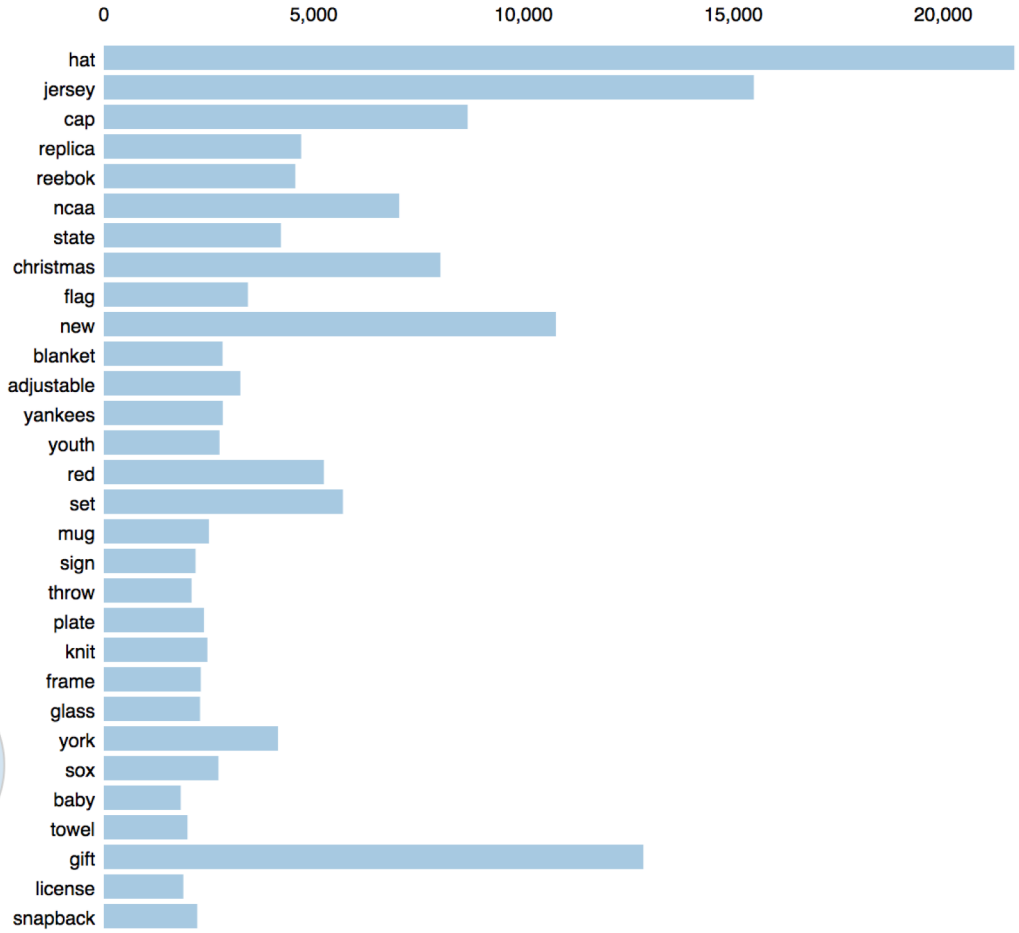
0.0 0.2 0.4 0.6 0.8 1.0

Intertopic Distance Map (via multidimensional scaling)



Marginal topic distribution

Top-30 Most Salient Terms[1]

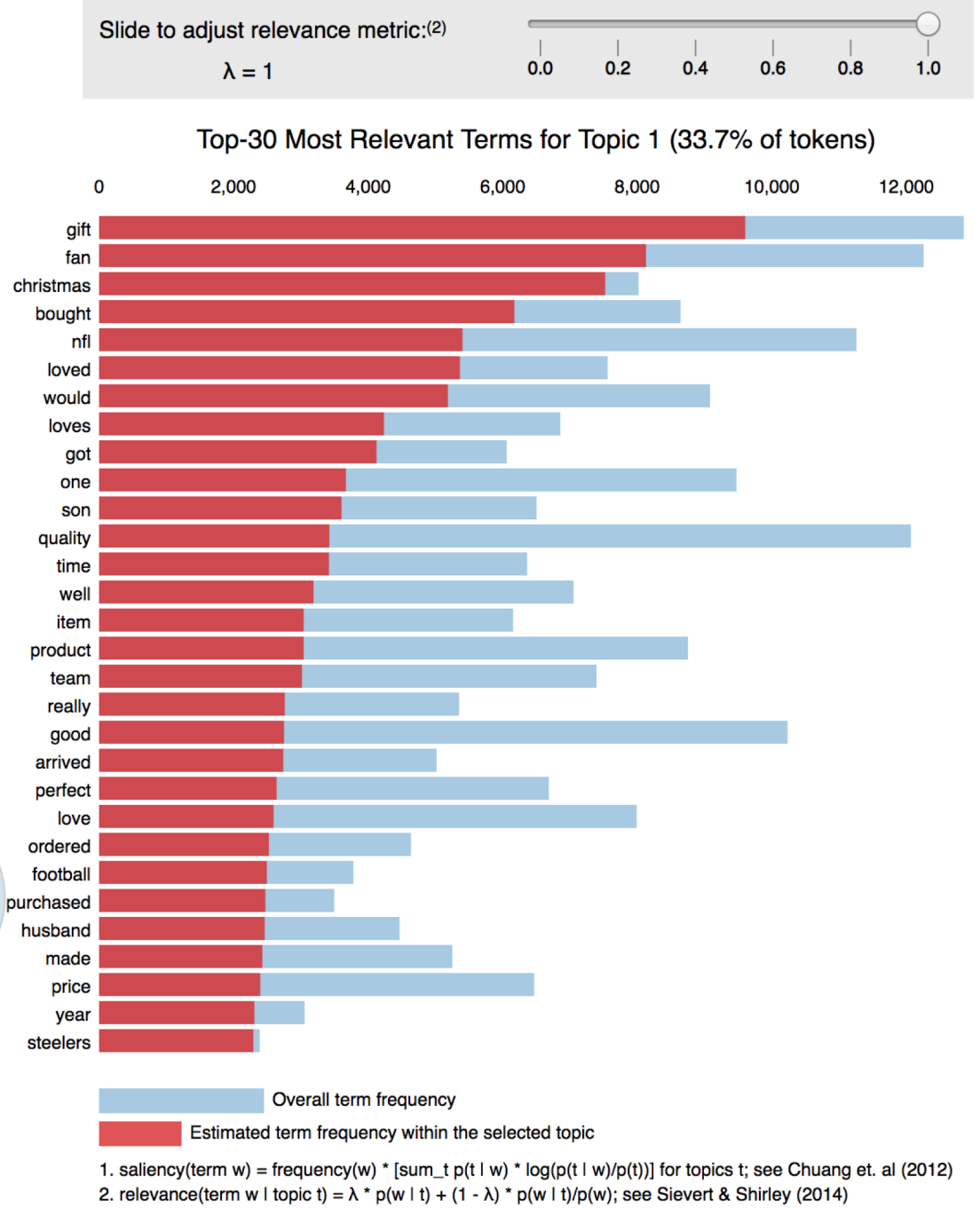


Overall term frequency

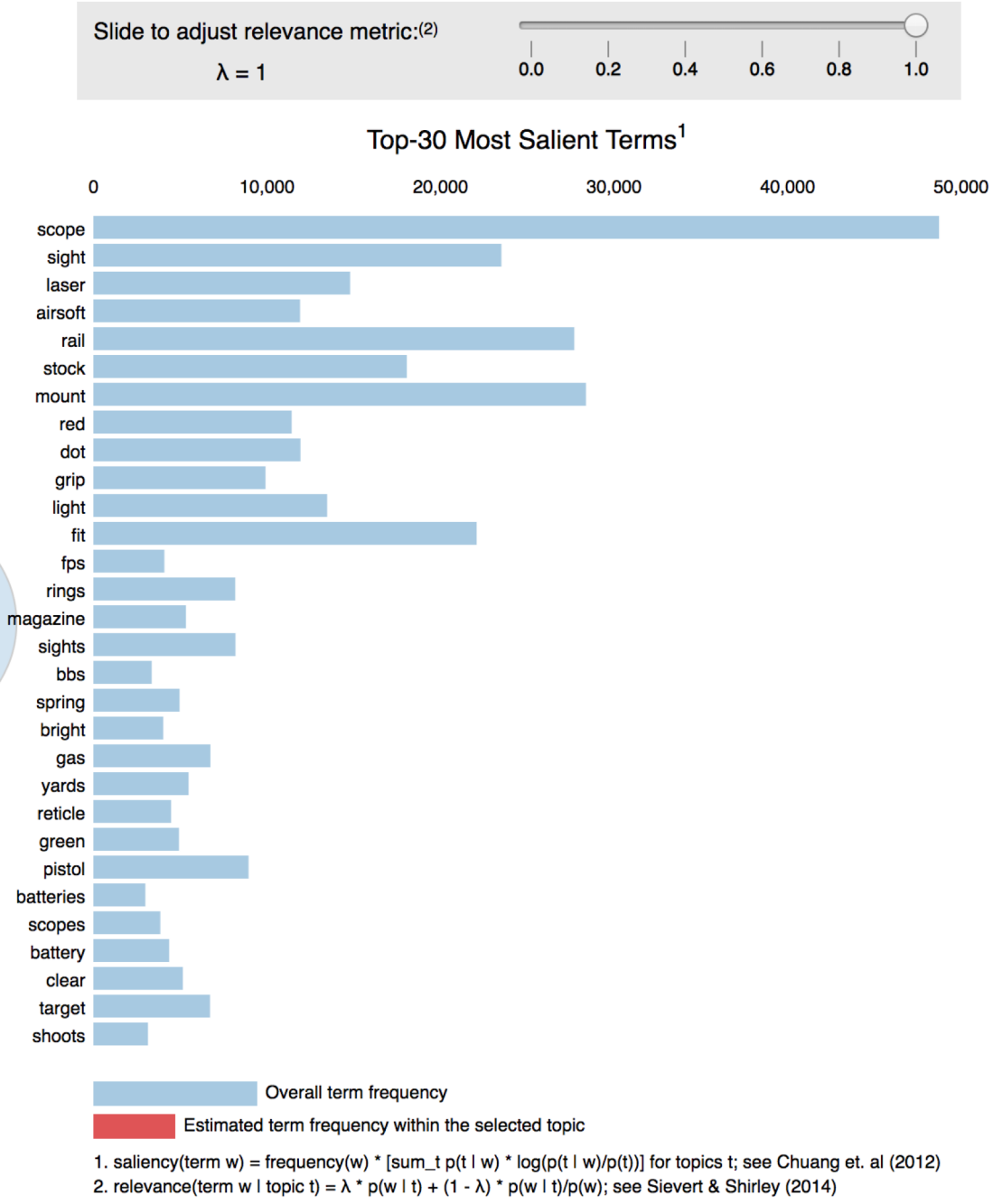
Estimated term frequency within the selected topic

1. saliency(term w) = frequency(w) * [sum_t p(t | w) * log(p(t | w)/p(t))] for topics t; see Chuang et. al (2012)
2. relevance(term w | topic t) = λ * p(w | t) + (1 - λ) * p(w | t)/p(w); see Sievert & Shirley (2014)

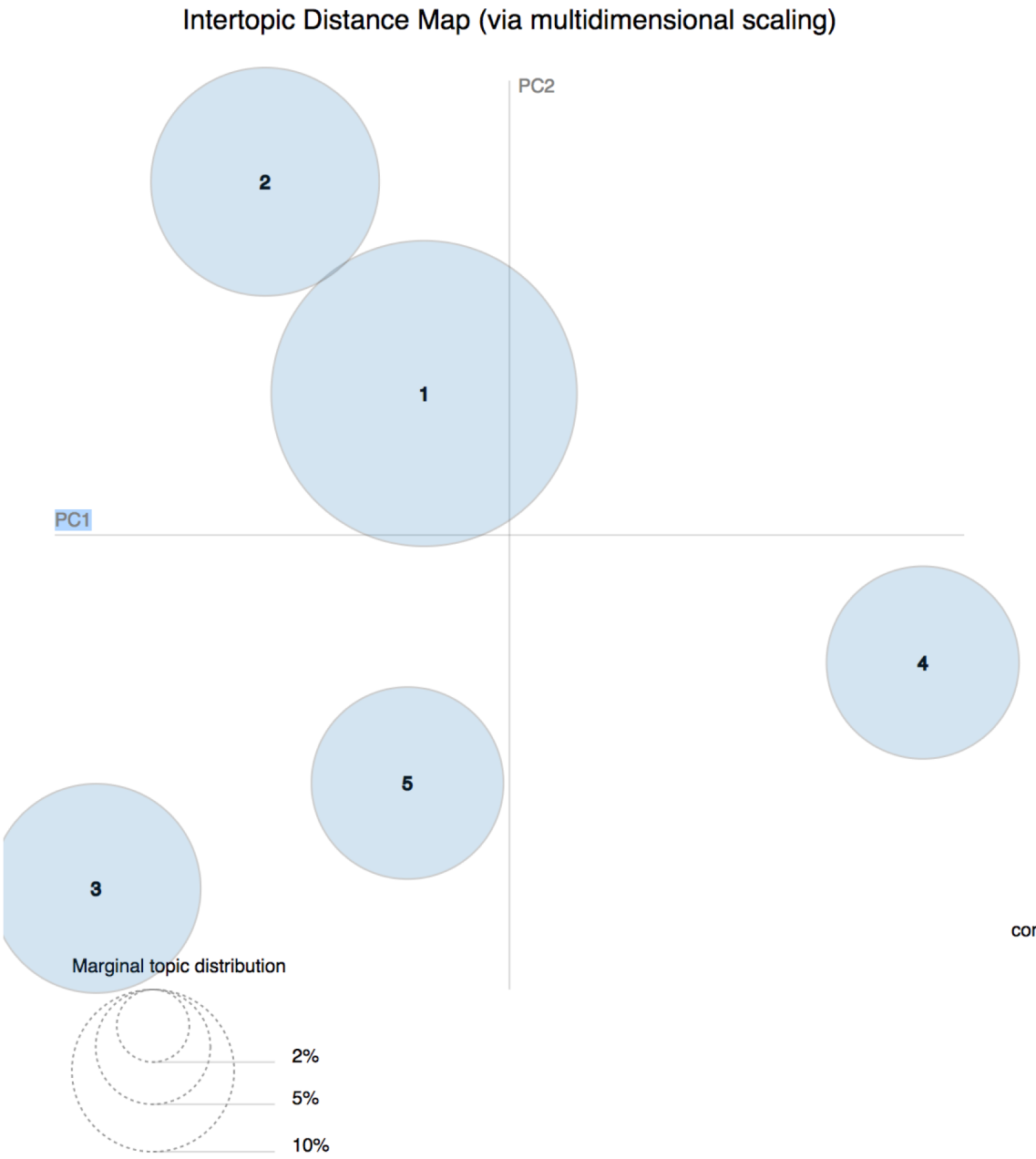
Topic 0: Teams and Gifts Subtopics

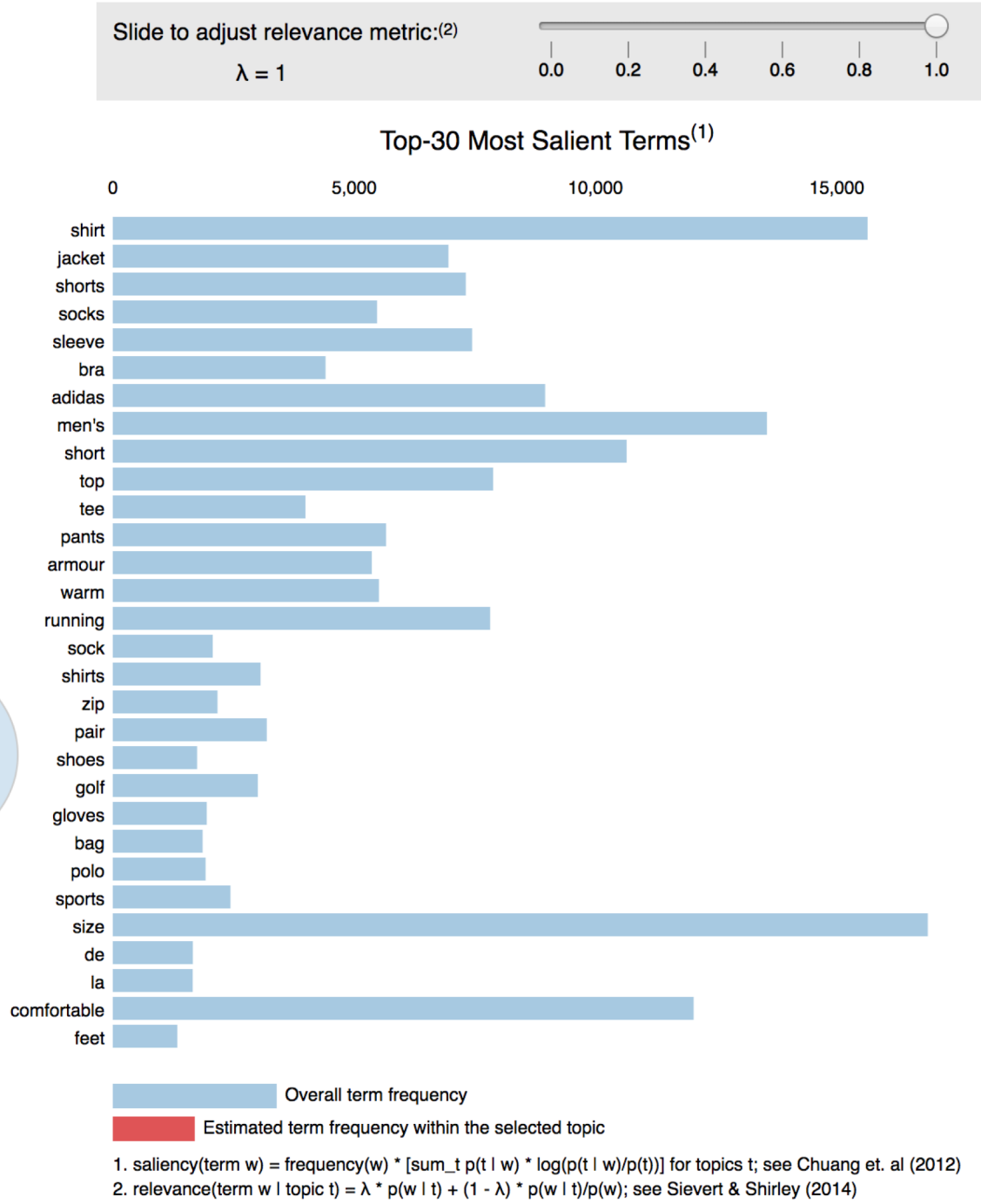


Topic 1: AirSoft Guns

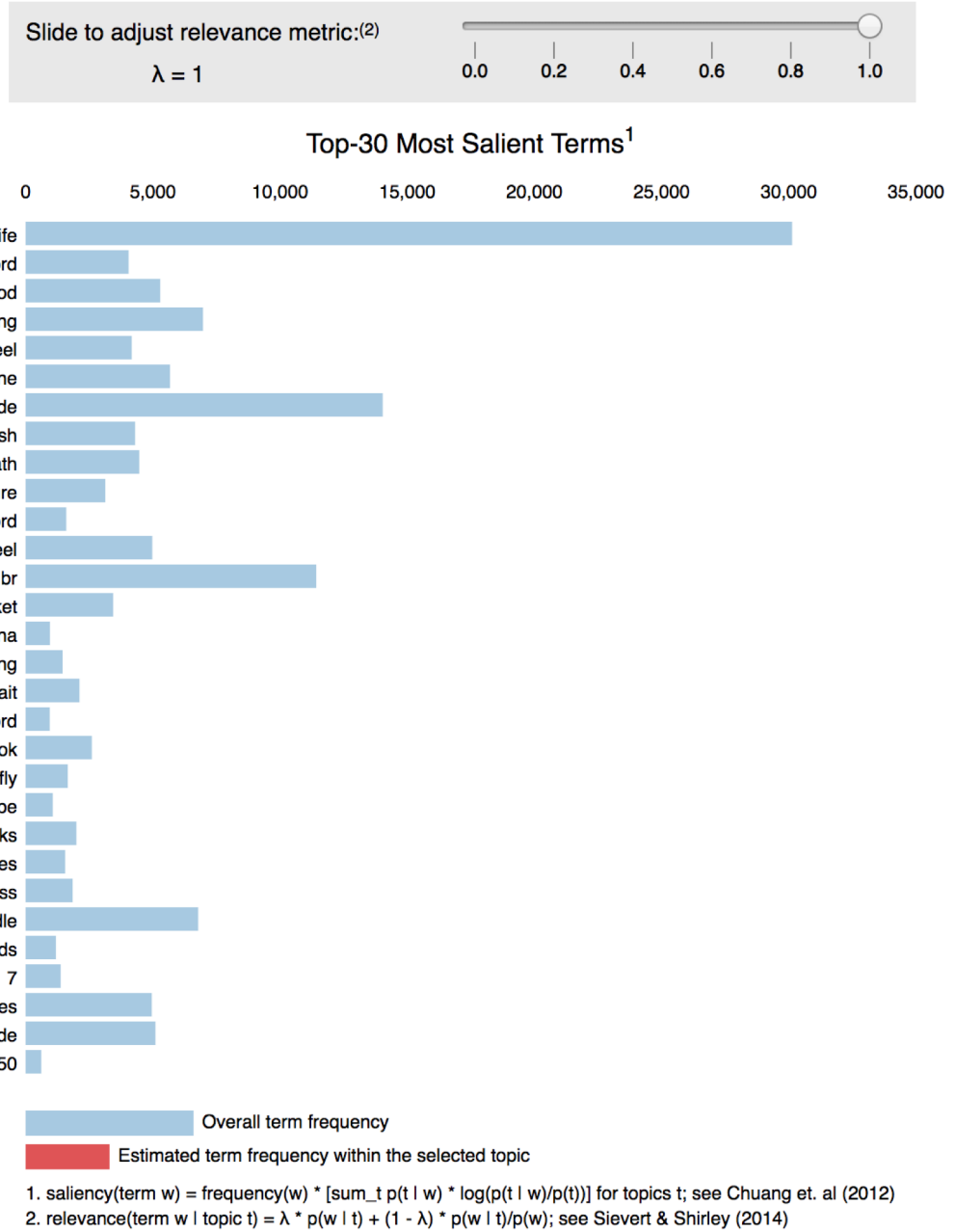


Topic 2: Clothes

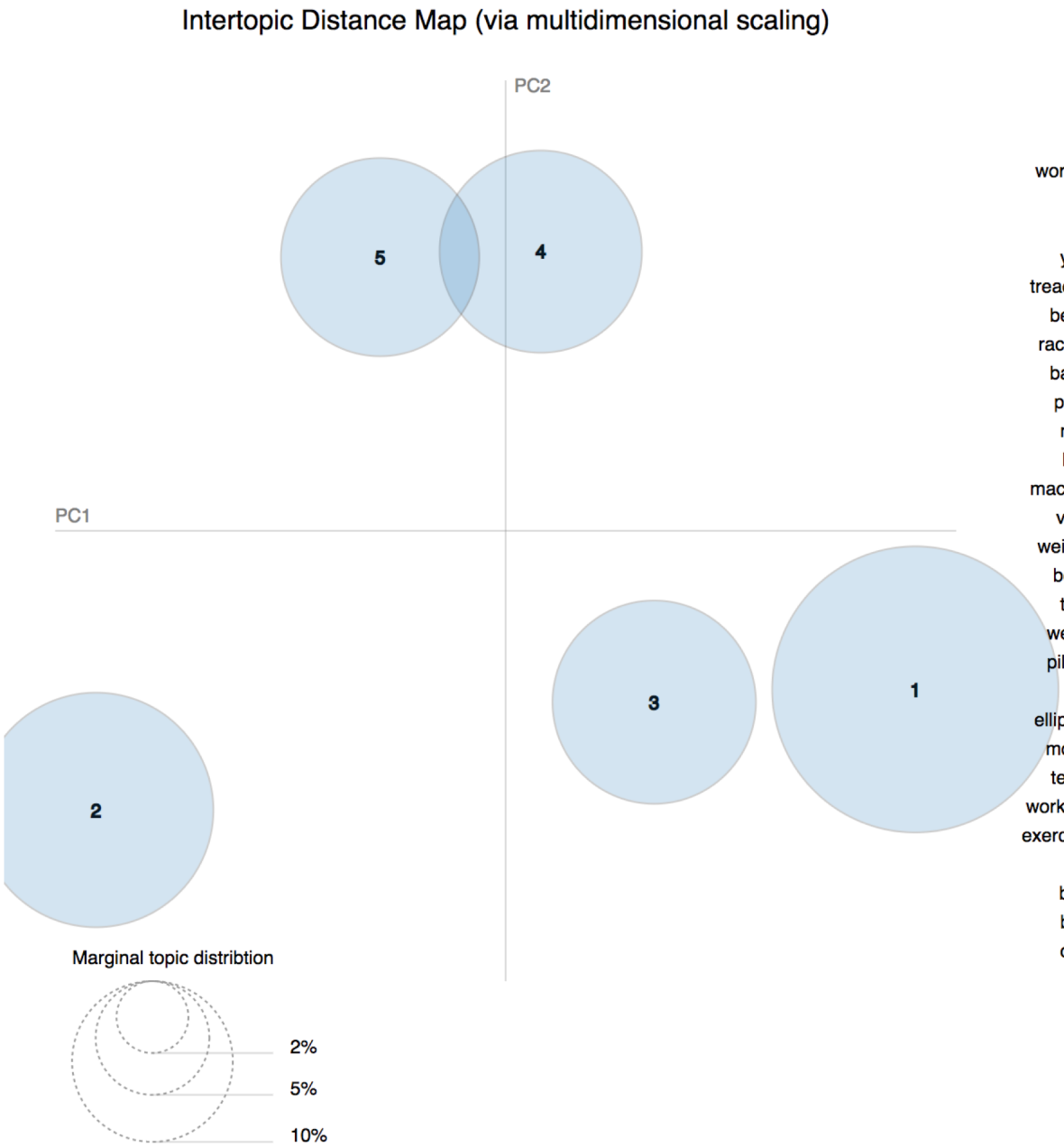


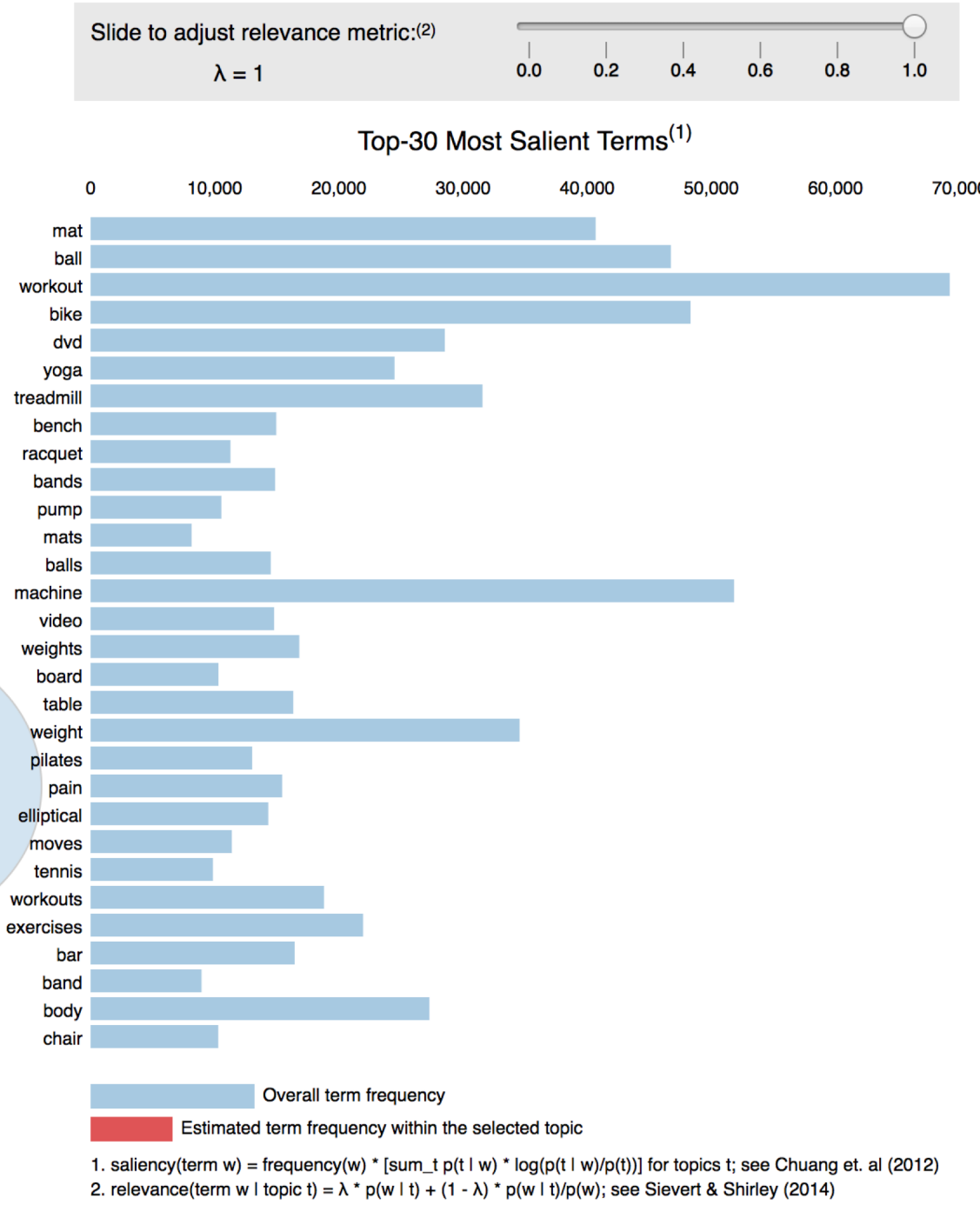


Topic 3: Fishing and Knives



Topic 4: Workout Routines





Topic 2: Clothes

Kathy the golfer

- The most important things about her purchase are comfort and size
- Materials are important
- She cares about staying warm
- Price is not the main concern in her clothing purchases

Topic 3: Fishing and knives

Paul the fisherman

- Quality and experience are important
- Knives are very big portion of this topic
- Pocket knives and swords are different subcategories
- Price is part of his vocabulary

Topic 4: Workout routines

Home gym Jeff

- He would buy exercise equipment
- Workout DVDs
- Play tennis and sometimes practice yoga.
- This topic could probably be subdivided