Linguistic Positivity in Time

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Linguistic Positivity Bias (LPB)

- Positive words are more frequent than negative words
  - Here we are concerned only with token frequencies
    - E.g. “good” is more frequent than “bad”
- This pattern has been found across different languages and corpora
- It has been suggested that LPB is a cultural universal

LPB: Possible Explanations

- Mere exposure effect
  - Familiarity breeds positivity
- Pollyanna principle
  - Positive information is cognitively privileged
- Objective circumstances
  - Positive events are more prevalent
- Subjective mood
  - Positive affect is more prevalent
- Prosociality
  - Positive language facilitates social interactions

Static vs Dynamic Approaches

- Most of the previous work was focused on demonstrating the generalizability of the phenomenon across languages
- When a language is treated as static, it is difficult to distinguish between the different theoretical explanations
- Adding a temporal component to language allows us to distinguish between some of the theoretical explanations

Possible Patterns in American English

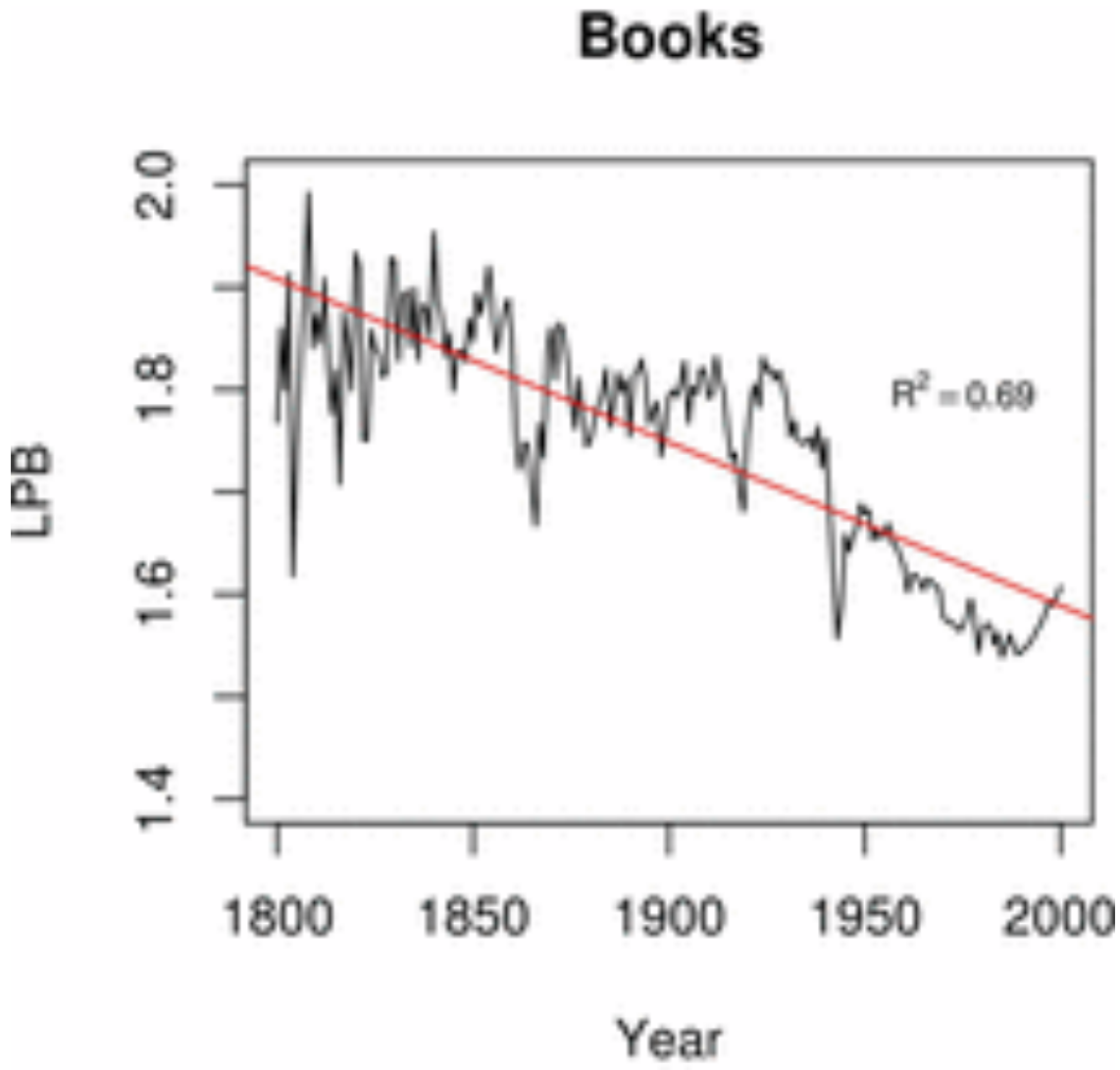
Explanation	Linear Trends	Short-term fluctuations
Mere Exposure	*No*	*No*
Pollyanna Principle	*No*	*No*
Objective Circumstances	Yes (positive trend)	Yes
Subjective Mood	Yes (no trend)	Yes
Prosociality	Yes (negative trend)	*No*

Empirical Studies

- The Google books corpus
  - Time range: 1800-2000
  - Size: 1.3 million books
- To measure affect we looked at the ratio of positive to negative words from the LIWC affect dictionary.

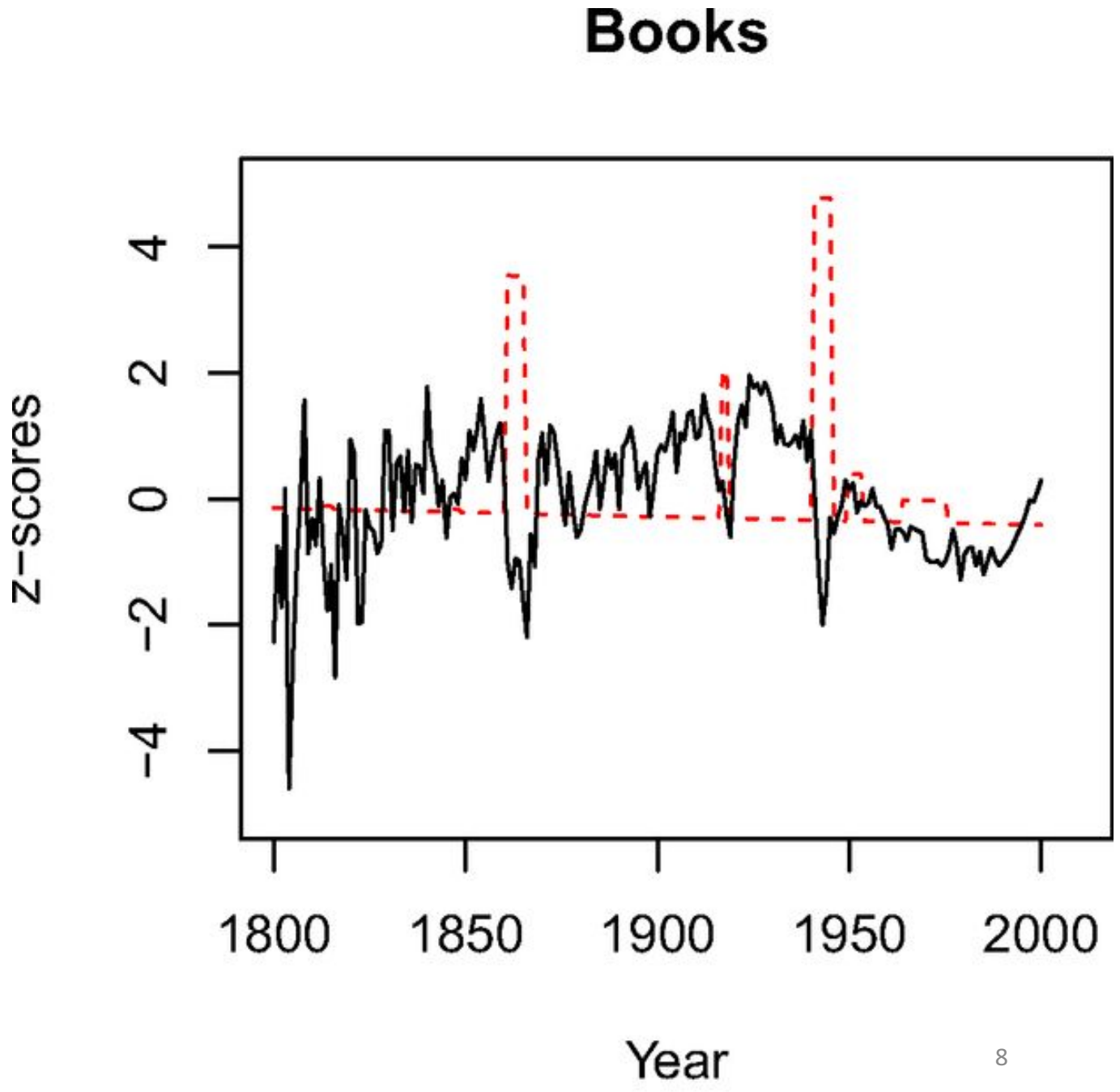
Linear Trends

- Both types of affective words have become less frequent overt time
- The drop was steeper for positive words, resulting in a decrease in LPB over time.
  - t(199) = -18.97, p<.001



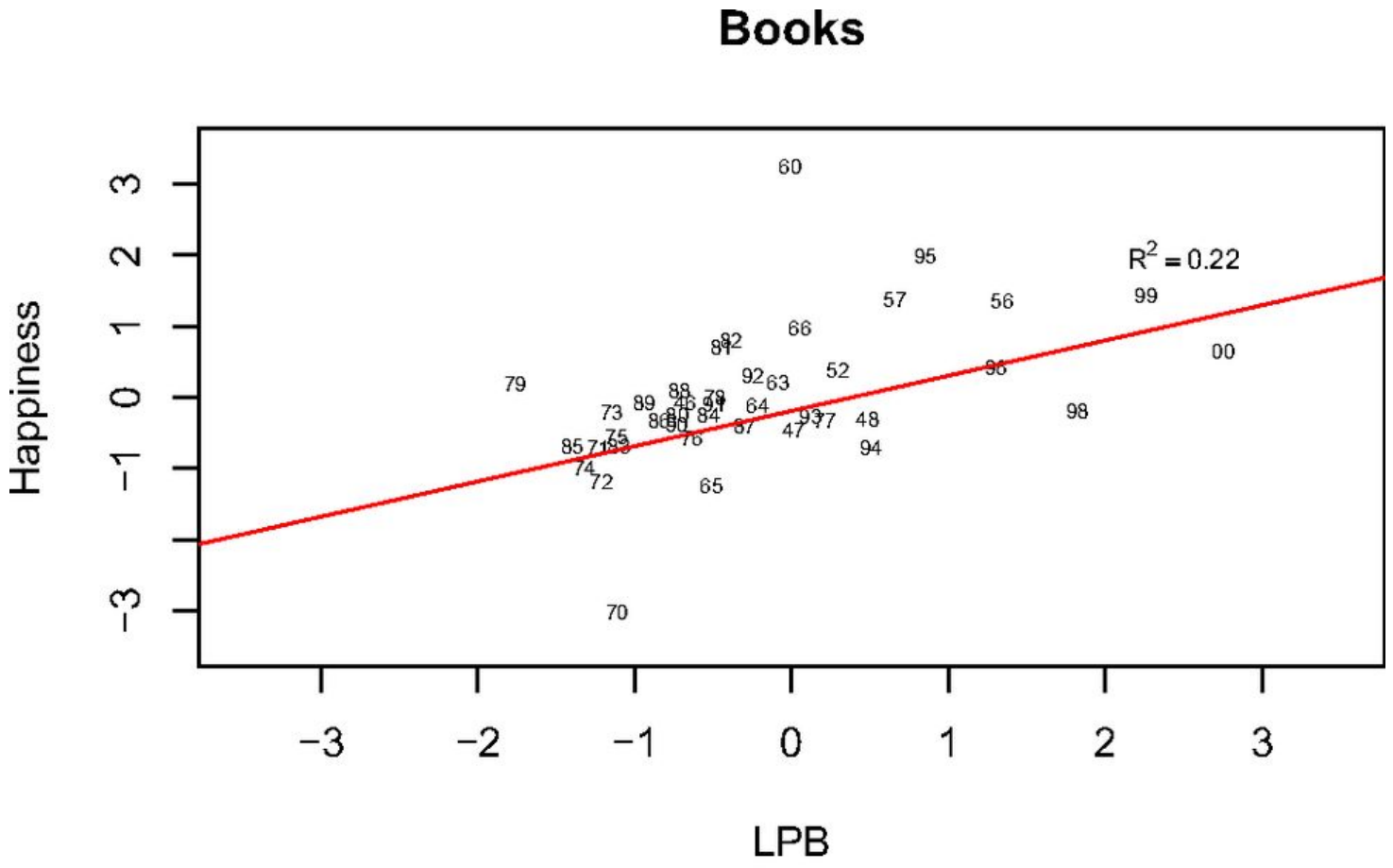
Objective Circumstances: War

- Casualties of war data was collected from government sources
- There was a significant negative relationship between LPB and the number of military casualties
  - t(198) = - 3.71, p<.001



Subjective Affect

- Historical trends in nation-level happiness were based on self-reported survey measures
  - Time range: 1946-2000
- There was a significant negative relationship between LPB and happiness
  - t(38) = 3.59, p<.001



Summary of Results

Explanation	Linear Trends	Short-term fluctuations
Mere Exposure	*No*	*No*
Pollyanna Principle	*No*	*No*
Objective Circumstances	Yes (positive trend)	**Yes**
Subjective Mood	Yes (no trend)	**Yes**
Prosociality	**Yes (negative trend)**	*No*

Replication: The New York Times Corpus

- We computed historical word frequencies using the nytabs Chronicle tool
  - Time range: 1851 – 2015
  - Size: 14.9 million articles
- Results
  - All results found in the Google books corpus were replicated

Main Contributions

- Language positivity in American English has been declining
  - Both positive and negative words are becoming more rare
  - The decline in positive words has been faster
- LPB seems to be related to multiple factors
  - Cognitive frameworks alone cannot explain LPB
- Correspondence between self-reported and text-derived historical measures of affect

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Objective Circumstances: Economics

- Historical trends in LPB were correlated with the misery index
- Misery index is a combination of unemployment and inflation rates.
- There was a significant negative relationship between LPB and war
  - Google books: t(198) = 3.71, p<.001