



MORALIZATION OF UNPRODUCTIVE EFFORT: A CROSS-CULTURE AND HISTORICAL PERSPECTIVE

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Introduction

- What makes people perceive effort to be virtuous, even when it lacks efficiency (i.e., unproductive effort)? These work ethics are important in shaping personal or professional pursuits in many cultures.
- In this study, we explored the moral evaluations of effort and efficiency in two large political corpora, using natural language processing.

Method

Model Training

- Data: US Congressional Speeches (1873-2010) and China's People's Daily Newspaper (1950-2021).
- Training: Word2Vec algorithm implemented in Python using Gensim 4.1.0.

Measure Moral Values of Effort and Efficiency

- Natural language processing techniques can convert words in a large corpus into numerical vectors, i.e., word embeddings.
- Researcher studied human-like biases by comparing the pair-wise similarities between vector representations of words.

- Moral Values of Effort (or Efficiency) =

$$\text{similarity}(\mathbf{v}_{effort}, \mathbf{v}_{virtue}) - \text{similarity}(\mathbf{v}_{effort}, \mathbf{v}_{vice})$$

- Moral Values of unproductive Effort =

$$\text{similarity}(\mathbf{v}_{effort}, \mathbf{v}_{virtue}) - \text{similarity}(\mathbf{v}_{effici}, \mathbf{v}_{virtue})$$

Other cultural variables

- Individualism/Collectivism: word frequencies from Google Ngram Viewers

Effort/Efficiency Dictionary Development

- We developed the dictionaries of effort and efficiency separately in Chinese and English, utilizing the combination of pre-trained language models and human ratings.
- The Chinese version of the Moral Foundation Dictionary was translated from the English version (Garten et al., 2018) and manually validated (Chen et al., under review).
- Individualism/Collectivism-related words were extracted from previous studies (Greenfield, 2013; Zeng and Greenfield, 2015).

Effort	努力	Efficiency	效率	MFD category	Seed words
effort	努力	efficiency	效益	Authority virtue	authority obey respect tradition
toil	力求	efficient	效率	Authority vice	subversion disobey disrespect chaos
hardwork	尽力	successful	效用	Care virtue	kindness compassion nurture empathy
travail	殚思竭虑	productive	效能	Care vice	suffer cruel hurt harm
labors	刻苦	expedient	效果	Fairness virtue	loyal solidarity patriot fidelity
endeavor	奋斗	effective	最优化	Fairness vice	cheat fraud unfair injustice
perseverance	持之以恒	efficacious	产出率	Loyalty virtue	fairness equality justice rights
persistence	力争	economical	节俭降耗	Loyalty vice	betray treason disloyal traitor
tenacity	坚持不懈	profitable	利用率	Sanctity virtue	purity sanctity sacred wholesome
dedication	孜孜不息	beneficial	增值性	Sanctity vice	impurity depravity degradation unnatural

Fig. 1: Dictionary examples



Results

- The prioritization of effort over efficiency as a moral value coincided with periods of economic decline.
- Historically, the US has placed a higher or equal value on efficiency than on effort until the 1950s.
- In comparison, China has long prioritized effort over efficiency. However, as China's economic performance grows, the country has shifted towards a greater emphasis on maximizing results.
- As a result, the gap between the moral values of effort over efficiency is rapidly closing in China.

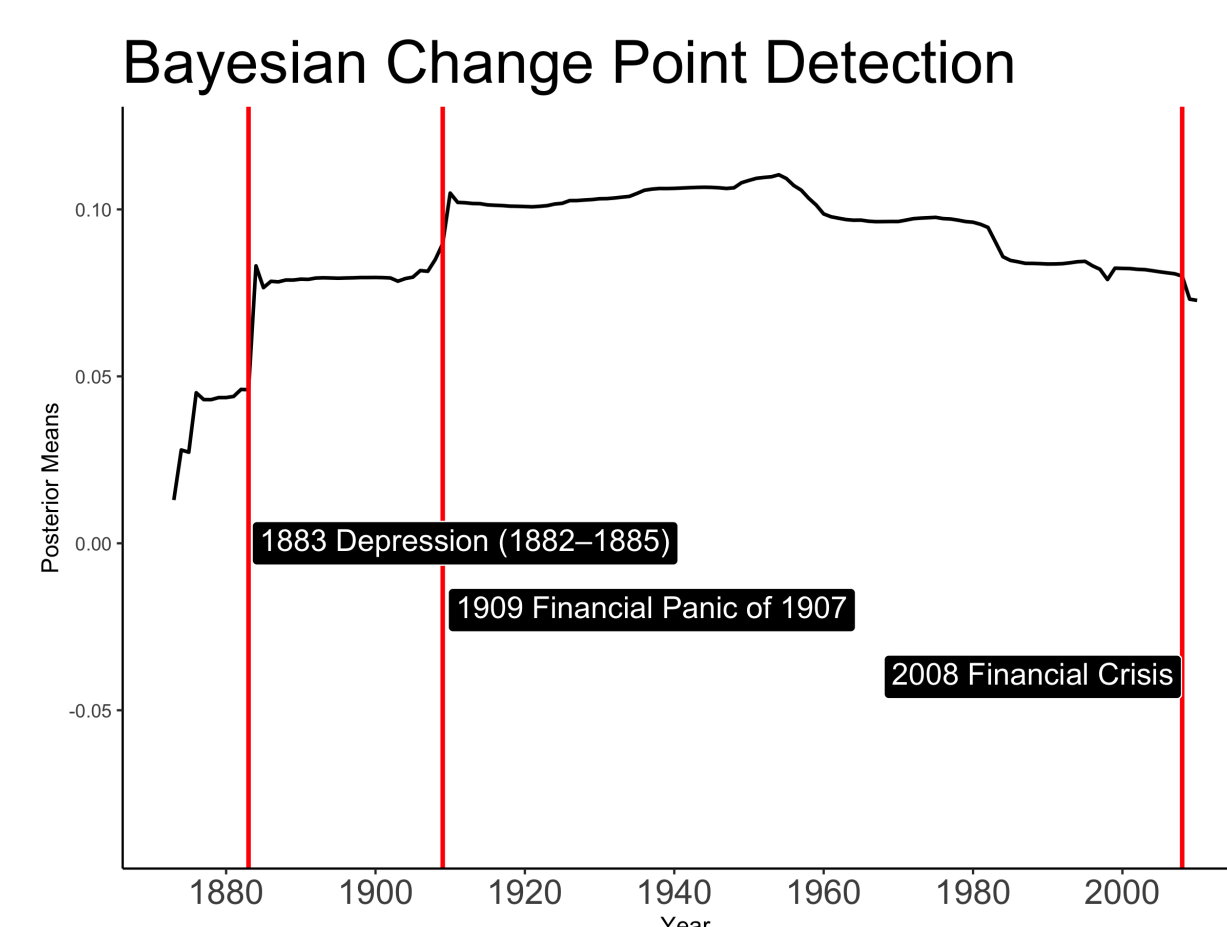


Fig. 2-1 US: Effort over Efficiency

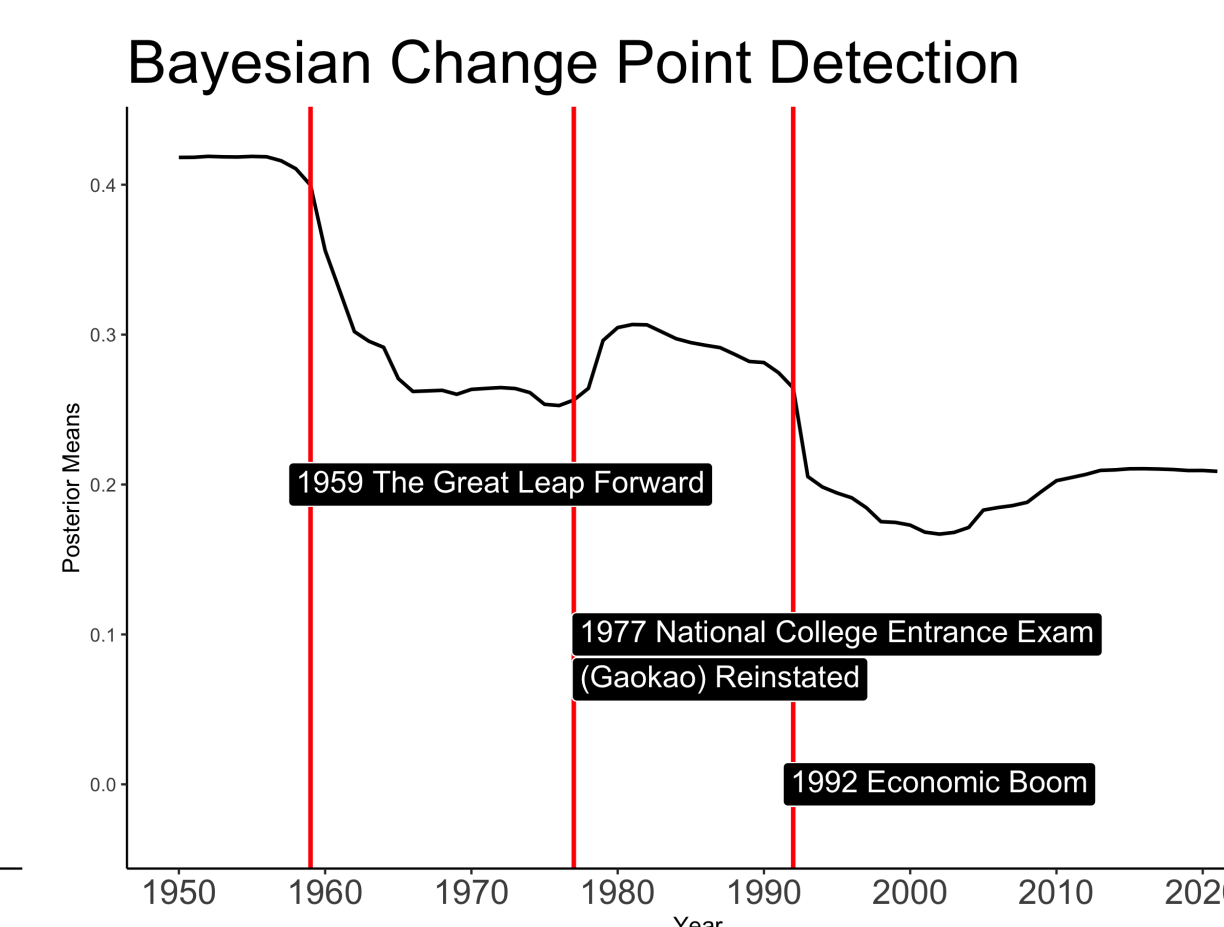


Fig. 2-3 China: Effort over Efficiency

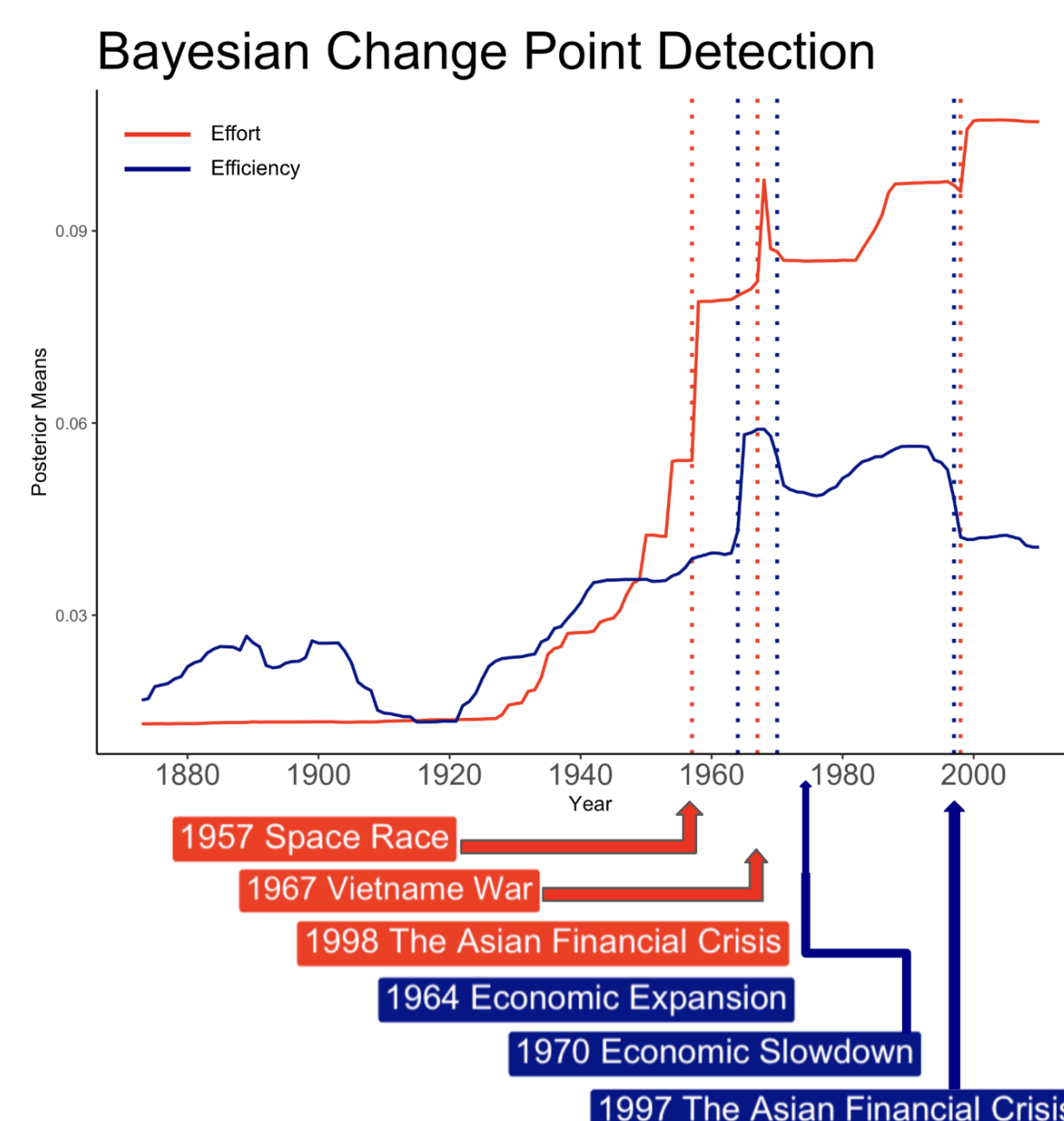


Fig. 2-2 US: Effort and Efficiency

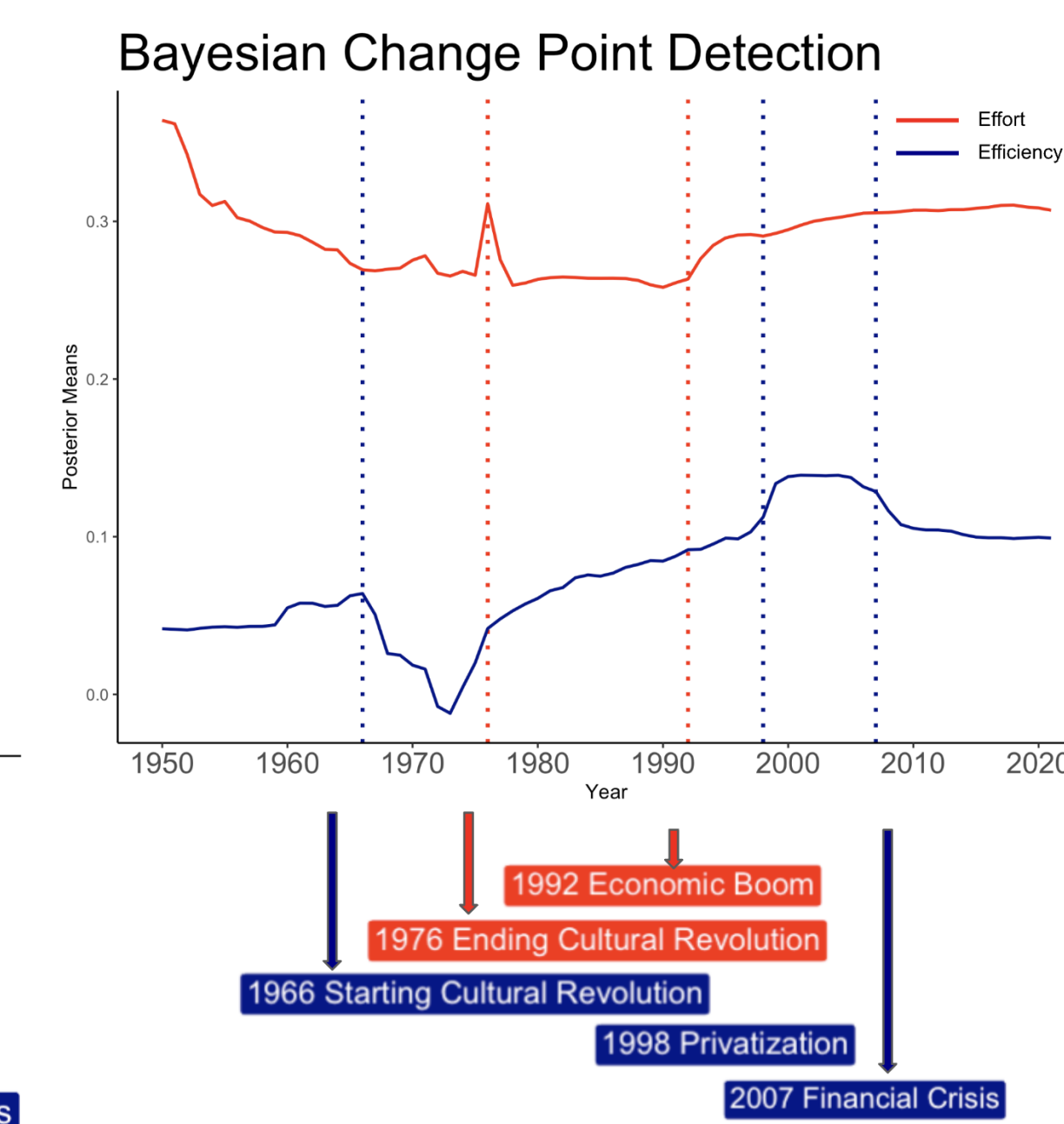


Fig. 2-4 China: Effort and Efficiency

- The rise of individualism was preceded by an increase in the moral values of unproductive effort in US text, but decrease in China's.

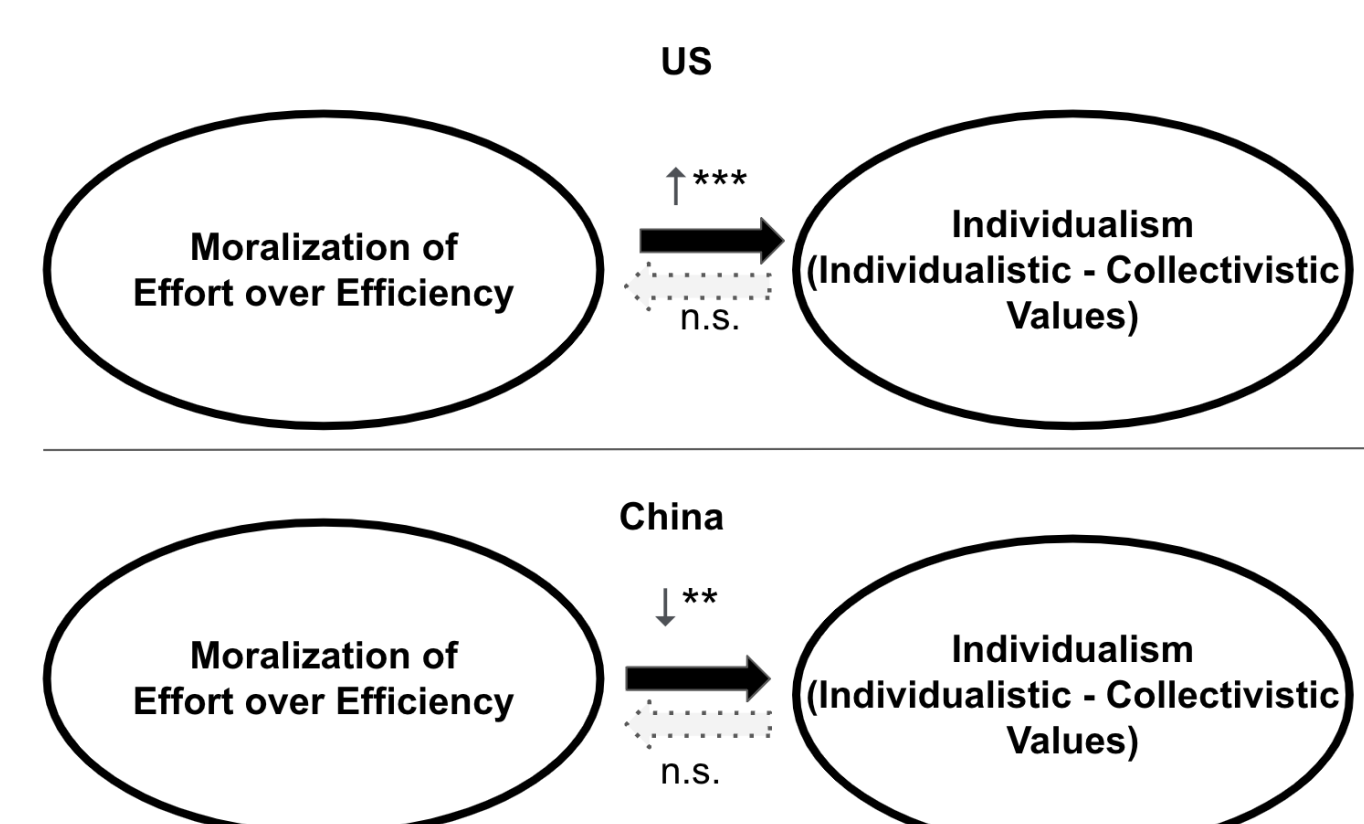


Fig. 3 Causality tests based on variable residuals of autoregressive integrated moving average (ARIMA)

Results (Cont.)

- US: the moral values of both effort and efficiency increased at the different rates
- China: the moral values of efficiency steadily increased, while those of effort stay relatively stable

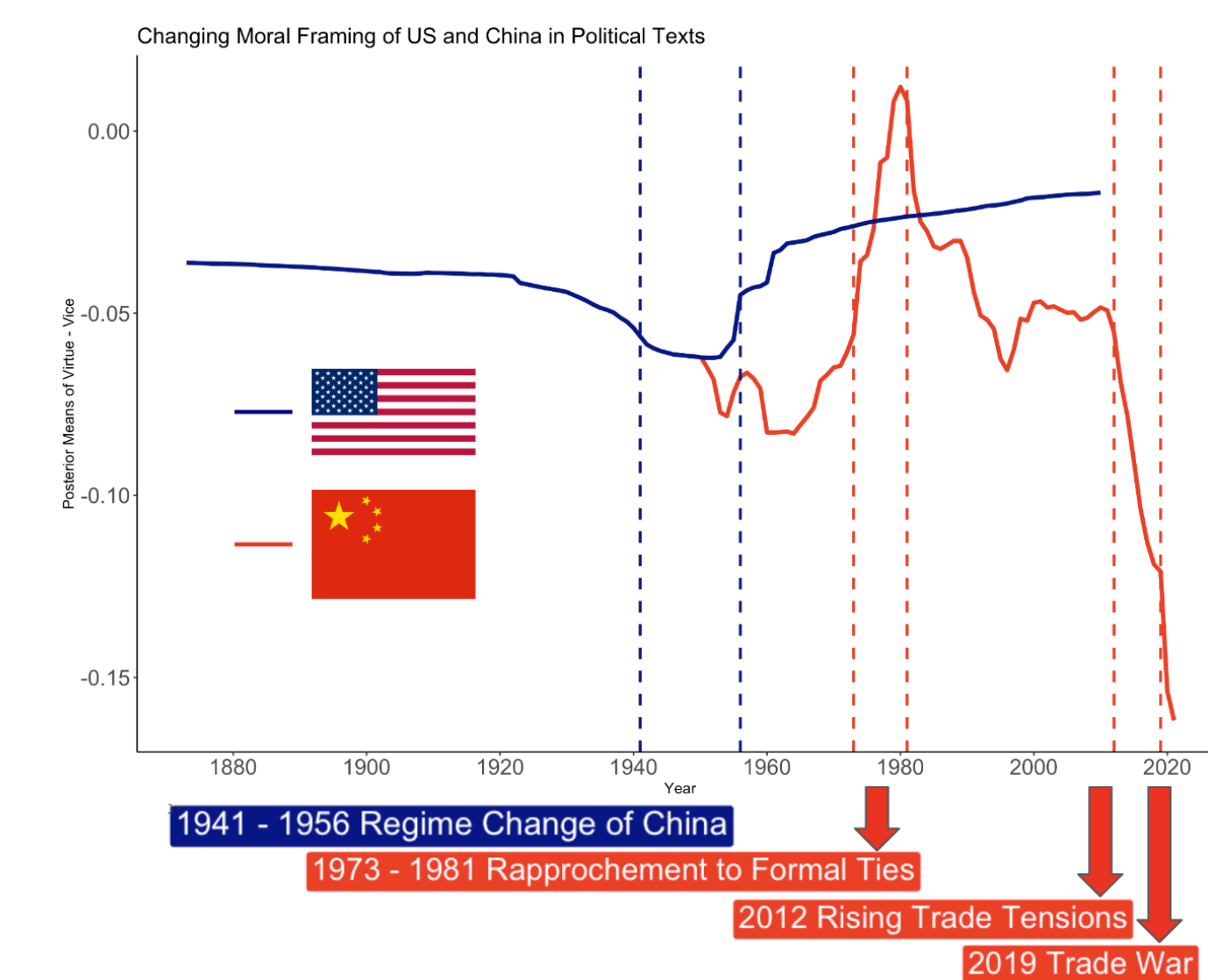


Fig.4 Validation of the morality dictionaries.

Discussion

- Moralization of effort over efficiency marked a shift in values, as societies began to prioritize hard work over optimal outcomes.
- The divergent patterns between the US and China suggest that the meaning and purpose of effort and efficiency can vary significantly across cultures.

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References

- Chen, Y., Chen, A. X., Yu, H., & Sun, S. (under review). Unraveling moral and emotional discourses on social media: A study of three cases.
- Garten, J., Hoover, J., Johnson, K. M., Boghrati, R., Iskiwch, C., & Dehghani, M. (2018). Dictionaries and distributions: Combining expert knowledge and large scale textual data content analysis. *Behavior Research Methods*, 50(1), 344–361. <https://doi.org/10.3758/s13428-017-0875-9>
- Greenfield, P. M. (2013). The Changing Psychology of Culture From 1800 Through 2000. *Psychological Science*, 24(9), 1722–1731. <https://doi.org/10.1177/0956797613479387>
- Zeng, R., & Greenfield, P. M. (2015). Cultural evolution over the last 40 years in China: Using the Google Ngram Viewer to study implications of social and political change for cultural values. *International Journal of Psychology*, 50(1), 47–55. <https://doi.org/10.1002/ijop.12125>

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