

## Research Question

How did the global financial crisis of 2007-2009 affect the frame of reasoning for regulation?

## Hypothesis

The crisis highlighted the importance of *fairness* in the distribution of financial risk

## Moral Foundations Theory

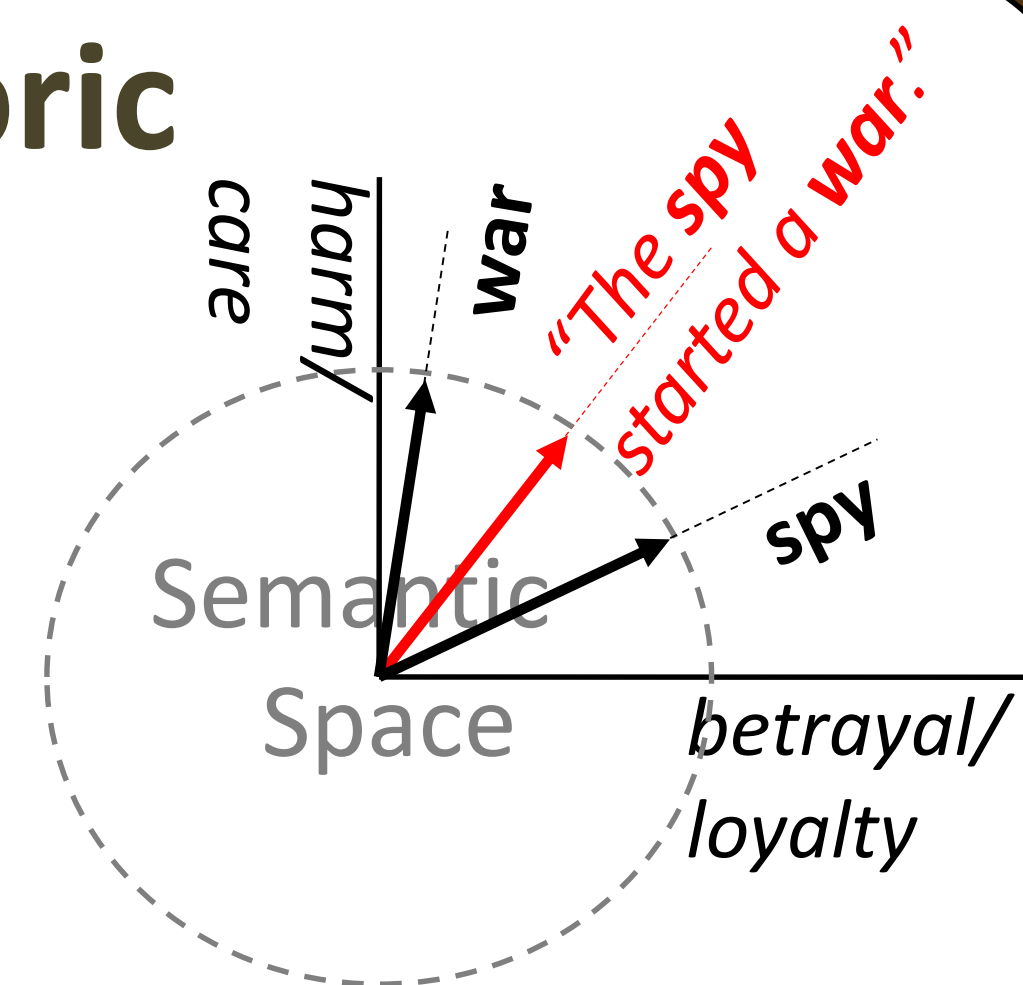
Haidt & Joseph (2004)

- ❖ 5 categories of moral concerns:
  - ❖ Authority (*comply; respect; protest*)
  - ❖ Fairness (*reasonable; rights; prejudice*)
  - ❖ Harm (*protection; safety; suffered*)
  - ❖ Loyalty (*enemy; member; together*)
  - ❖ Purity (*integrity; pervert; preserve*)
- ❖ Moral Foundations Dictionary (Graham et al., 2009)
- ❖ A set of terms associated with each concern

## Measuring Moral Rhetoric

- ❖ Based on Sagi & Deghani (2014)
- ❖ Words as vectors in a *semantic space*
- ❖ **Data points:** Paragraphs of Basel II & III

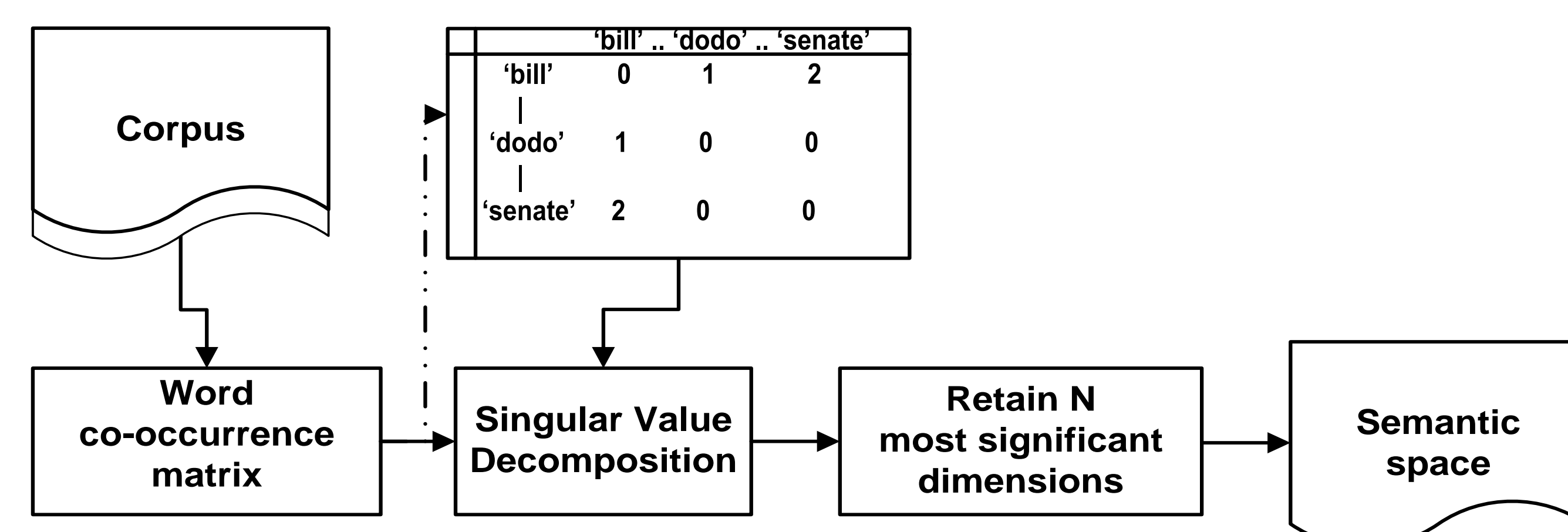
- ❖ **Basic measure:** Angle between vectors of paragraphs and terms from the Moral Foundations Dictionary



## Semantic Spaces

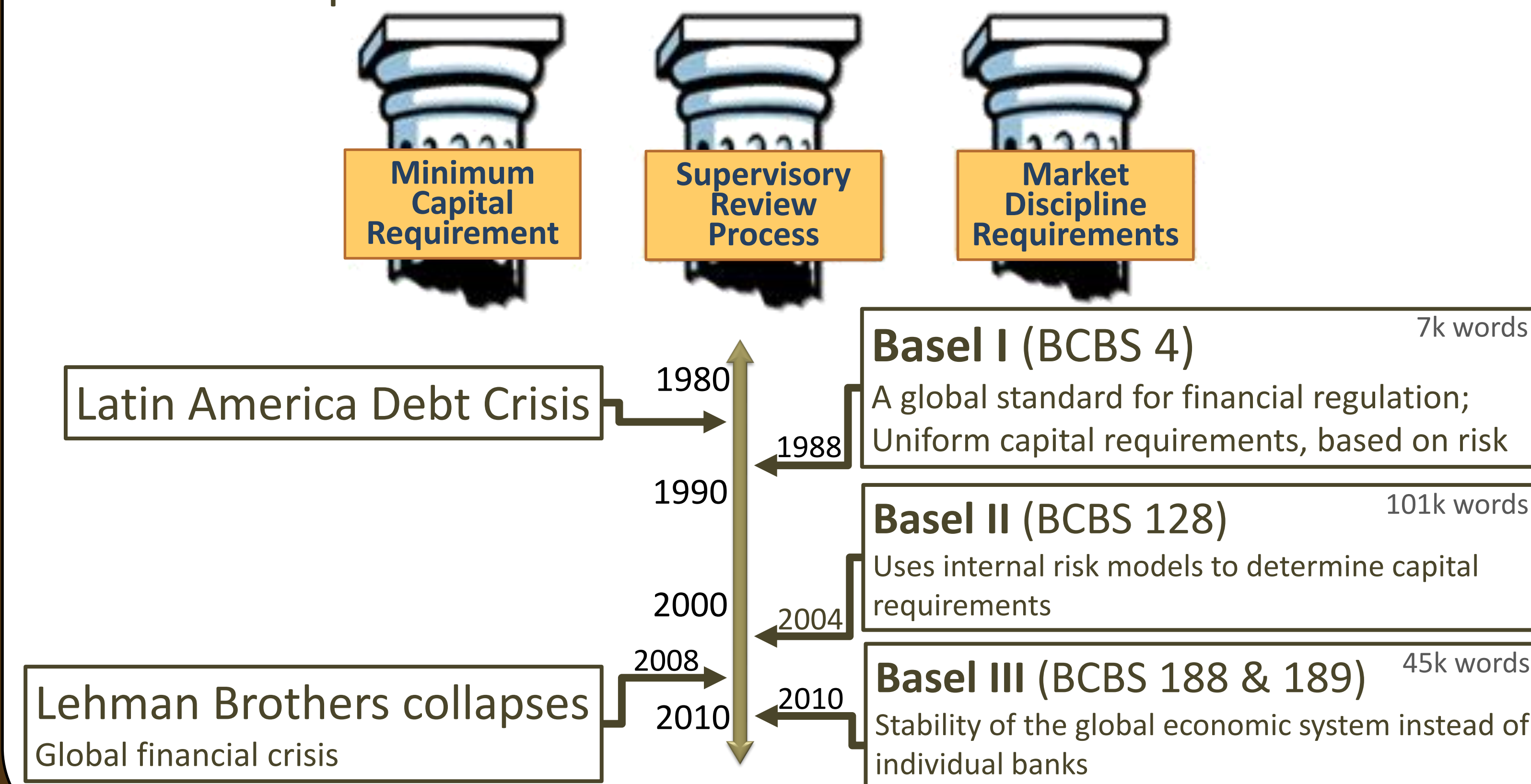
**Topicality:** Words that occur together likely relate to the same topic

- ❖ Based on *Infomap* (Takayama et al., 1999)
  - ❖ Similar to *Latent Semantic Analysis* (Deerwester et al., 1990)
- ❖ Semantic space is based on patterns of *word co-occurrence*
  - ❖ Linear space generated using Singular Value Decomposition (generalized factoring)



## The Basel Accords for Risk Management

International treaties on the regulation of the banking industry  
Based on 3 pillars:



## Samples of text from the accords

### Basel II: Authority

"A bank may be required to submit these policies and procedures to supervisors..." (BCBS 128, pg. 213)

### Basel II: Purity

"Banks with loan portfolios concentrated in a particular market segment and range of default risk must have enough grades within that range to avoid undue concentrations of borrowers in particular grades" (BCBS 128, pg. 91)

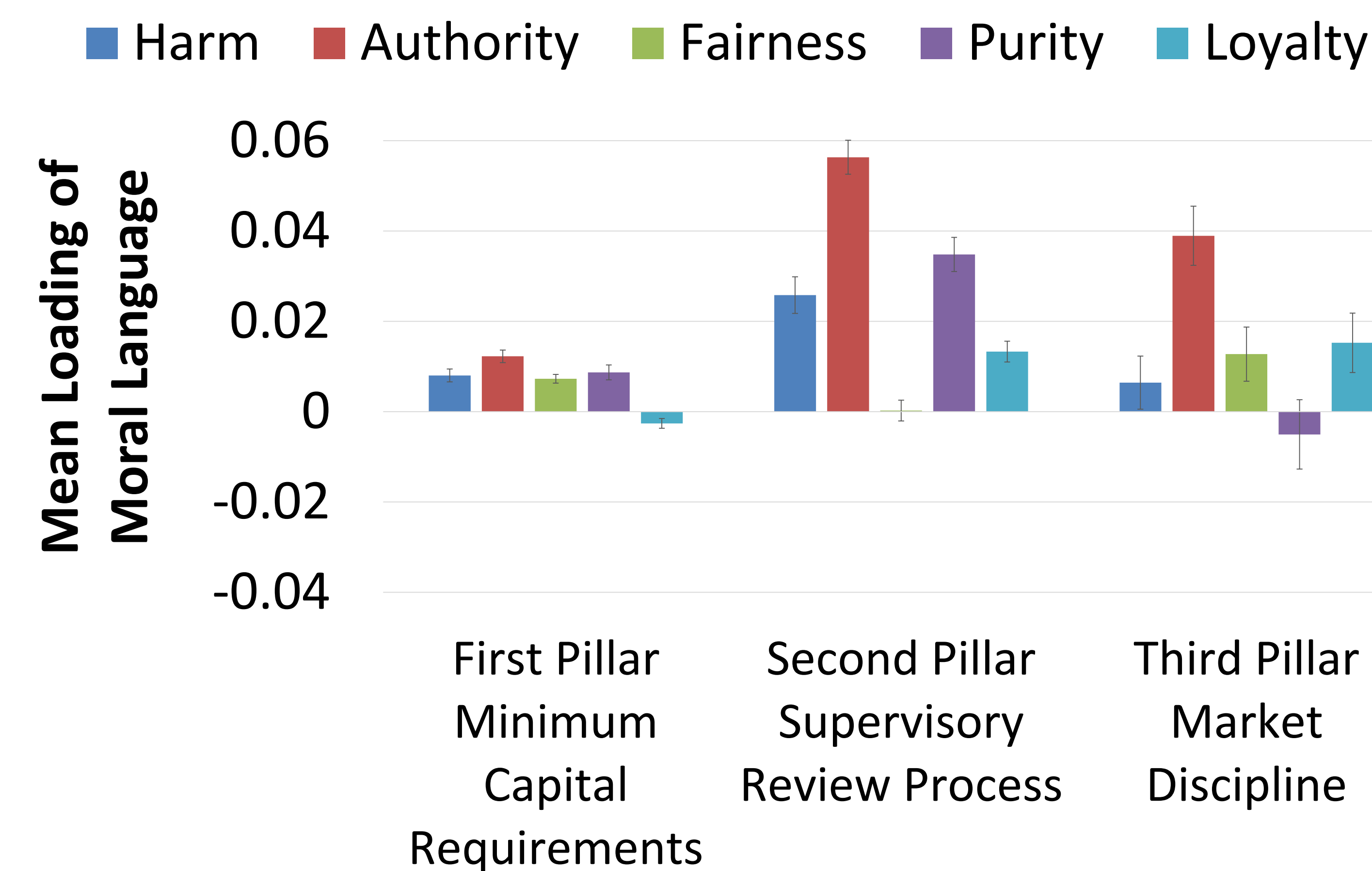
### Basel III: Fairness

"These stakeholders, rather than depositors, must bear the risk that recovery will not be forthcoming." (BCBS 189, pg. 55)

### Basel III: Loyalty

"Banks must apply a "corresponding deduction approach" to such investments in the capital of other banks, other financial institutions and insurance entities." (BCBS 189, pg. 24)

## Moral language in Basel II



Error bars in graphs represent standard error of the mean

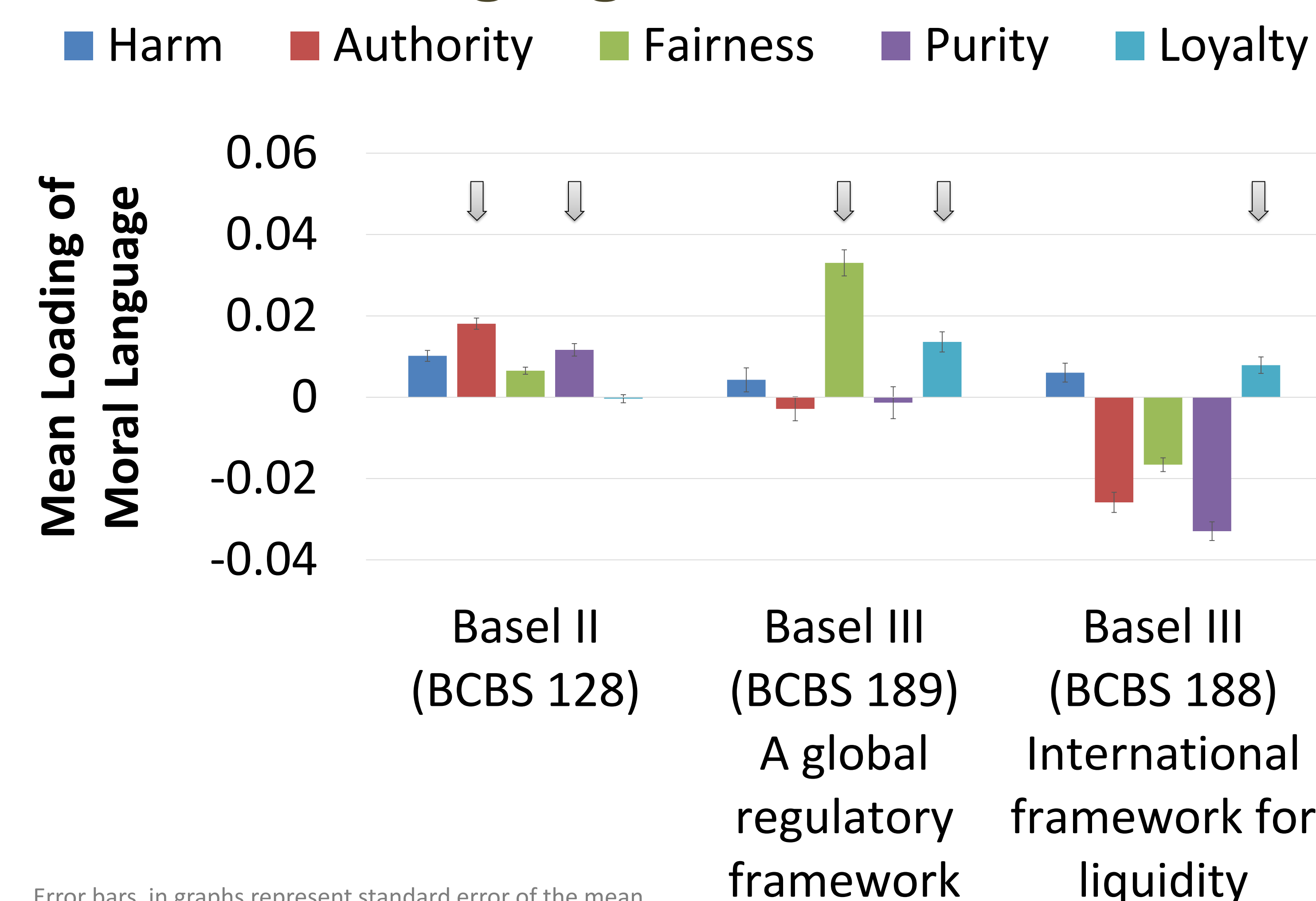
## Summary

- ❖ A shift in language
  - ❖ from *authority* and *integrity* (purity)
  - ❖ to *fairness* and *loyalty*
- ❖ Regulators are influenced by their surroundings and social climate

## Future Directions

- ❖ Do we see similar shifts in other agreements following the crisis?
- ❖ Does moral language affect
  - ❖ ... the views of individuals reading the text?
  - ❖ ... how the treaties are implemented by legislators?

## Moral language in Basel II and III



Error bars in graphs represent standard error of the mean

## References

1. Deerwester, S., Dumais, S. T., Furnas, G. W., Landauer, T. K., & Harshman, R. (1990) Indexing by Latent Semantic Analysis. *Journal of the American Society for Information Science*, 41, 391-407.
2. Haidt, J., & Joseph, C. (2004). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus*, 133(4), 55-66.
3. Infomap [Computer Software]. (2007) <http://infomap-nlp.sourceforge.net/> Stanford, CA.
4. Sagi, E., & Deghani, M. (2014) Moral Rhetoric in Twitter: A Case Study of the U.S. Federal Shutdown of 2013. In P. Bello, Guarini, M., McShane, M., & Scassellati, B., *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp. 1347-1352).
5. Takayama, Y., Flournoy, R., Kaufmann, S. & Peters, S. (1999) Information retrieval based on domain-specific word associations. In Cercone, N. and Naruedomkul K. (eds.), *Proceedings of the Pacific Association for Computational Linguistics (PACLING'99)*, Waterloo, Canada. 155-161.