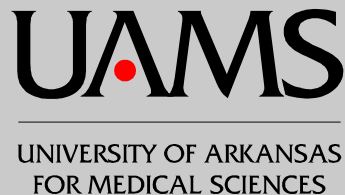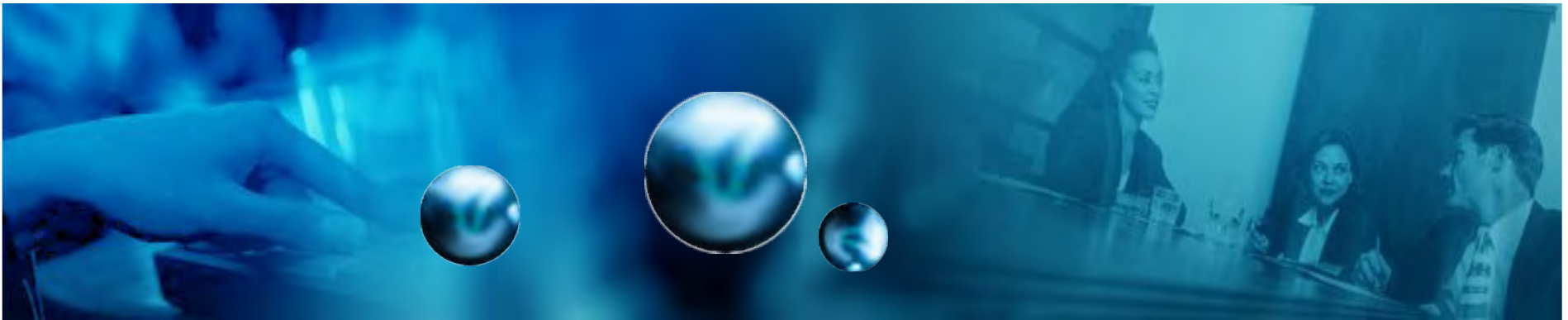# Use of a Novel Content Analysis Method to Examine Trends in Research Integrity Literature (1996 – 2005)

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# BACKGROUND

- Research integrity - an emergent field of inquiry

- Examination of research integrity publishing trends

- Literature scan to identify important issues and trends in field

# MIXED METHODS DESIGN

- **Bibliometrics:**
  - Mathematical and statistical methods applied to books and other communication media (Pritchard, 1969)

- **Content Analysis:**
  - Standard social science methodology to objectively and systematically describe content of communication or text

- **Natural language processing (NLP):**
  - Subfield of artificial intelligence and linguistics using computational techniques to analyze naturally occurring text (free text) at one or more levels of linguistic analysis (e.g., morphological, semantic).

# METHODS

- Adaptation of methods from *Integrity in Scientific Research* report (IOM 2002, Appendix A)

- 5 journals, prolific publishers of RRI (IOM 2002, Steneck 2000)
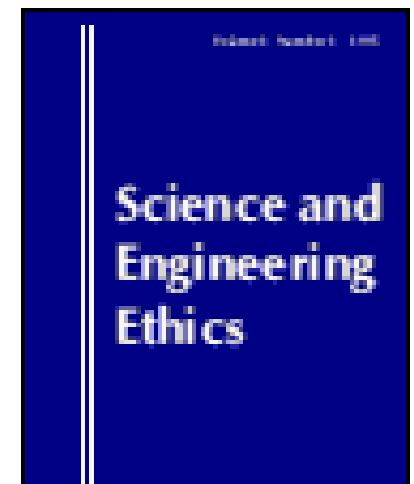
*Academic Medicine*   *BMJ*   *JAMA*   *Science*   *Science & Engineering Ethics*

# Bibliographic Search Strategy

- ## OVID-Medline, 1996-2005

- ## 36 search terms IOM (2002), Appendix A:
  - MESH headings
  - Text-words
    - i.e., research integrity, mentoring, peer review

- ## 17 additional terms added to strategy:
    - i.e., institutional ethics, ethical climate

# ANALYSES

- Article titles sorted into 21 categories using SPSS Text Analysis for Surveys:
    - NLP algorithms with linguistic sort methods
    - Investigator judgment

- Chi-square analysis used to examine temporal trends comparing frequency of categories for 1996-2000 vs. 2001-2005
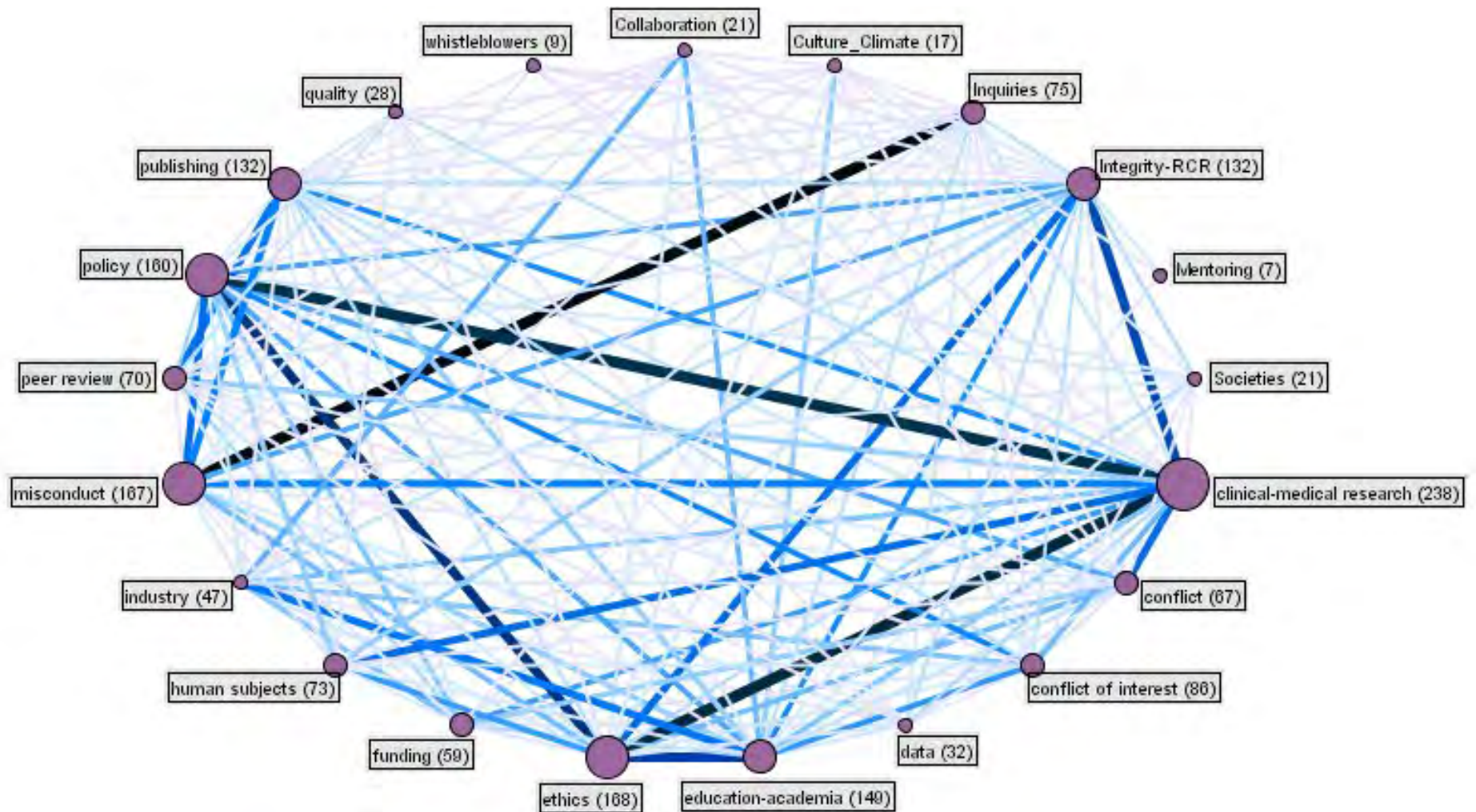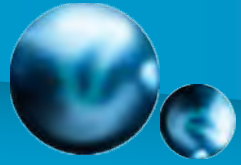
# RESULTS

- A total of 1,086 article titles identified
  - 10% in *Academic Medicine*
  - 14% in *BMJ*
  - 16% in *JAMA*
  - 17% in *Science & Engineering Ethics*
  - 43% in *Science*

- 43% published in 1996-2000

- 57% published in 2001-2005

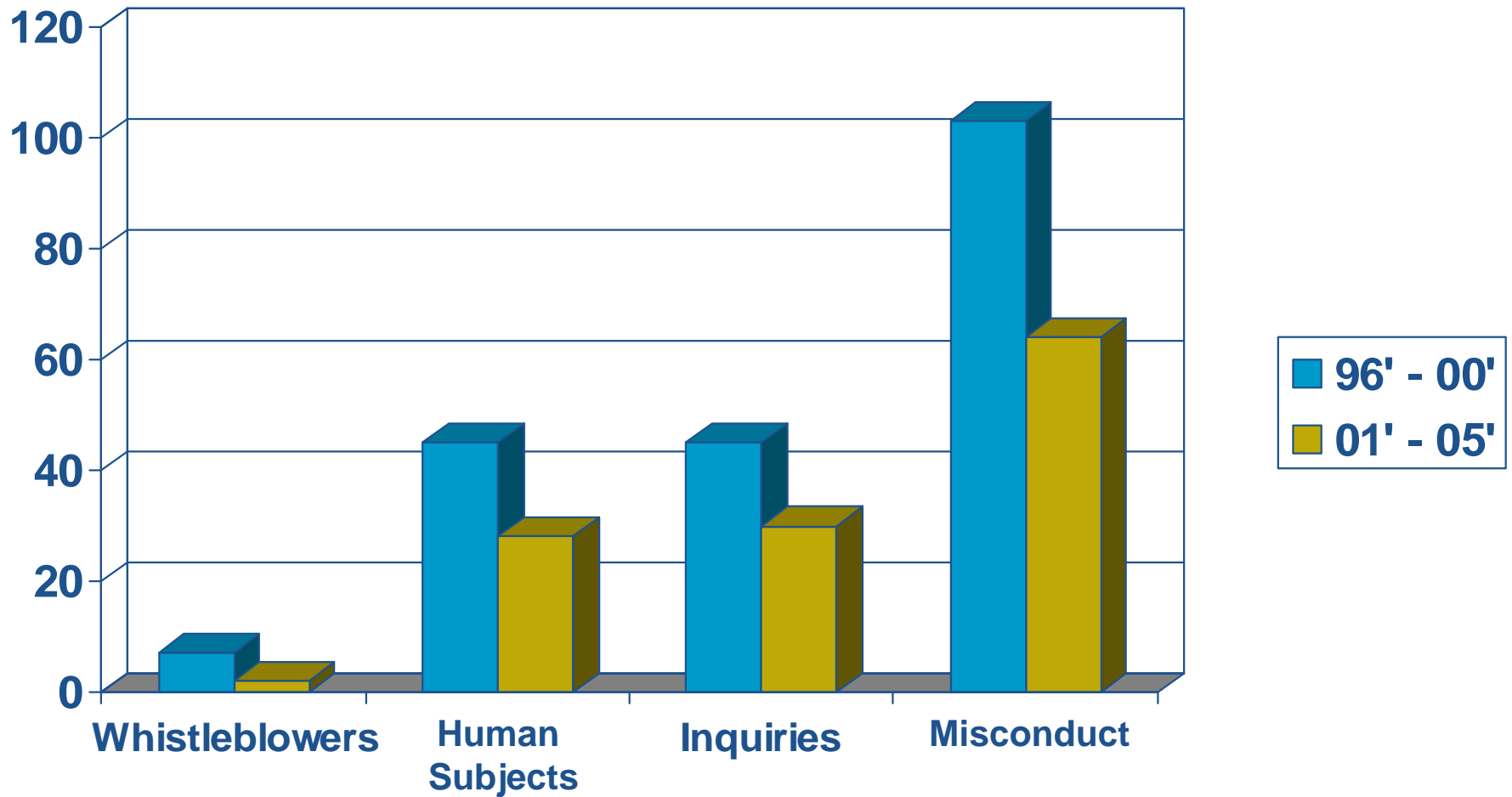- 1,056 categorized into at least one category
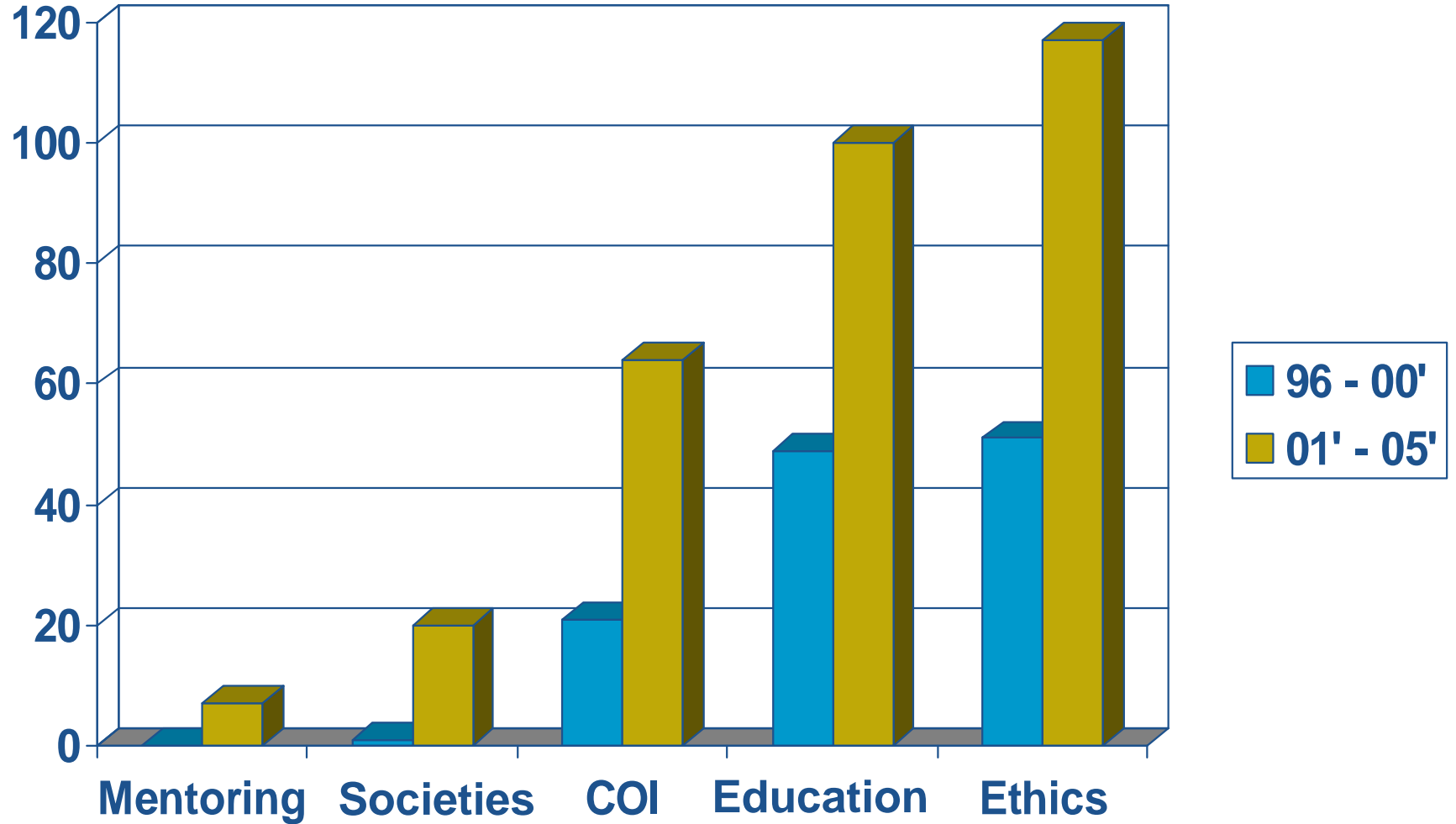
# Visualization Web Graph

# Temporal Shifts in Categories

# Temporal Shifts in Categories

# No Significant Change in Categories

- Industry
- Culture/Climate
- Quality
- Data
- Conflicts
- Funding
- Publishing

- Peer Review
- Collaboration
- Policy
- Integrity – RCR
- Clinical-medical research

# SUMMARY

- Results limited to subset of journals, one bibliographic database, and article titles only

- Results suggest research integrity discourse shifting to address more complex and diverse areas
  - mentoring
  - role of academic societies in promoting integrity
  - conflict of interest issues
  - education
  - ethics