



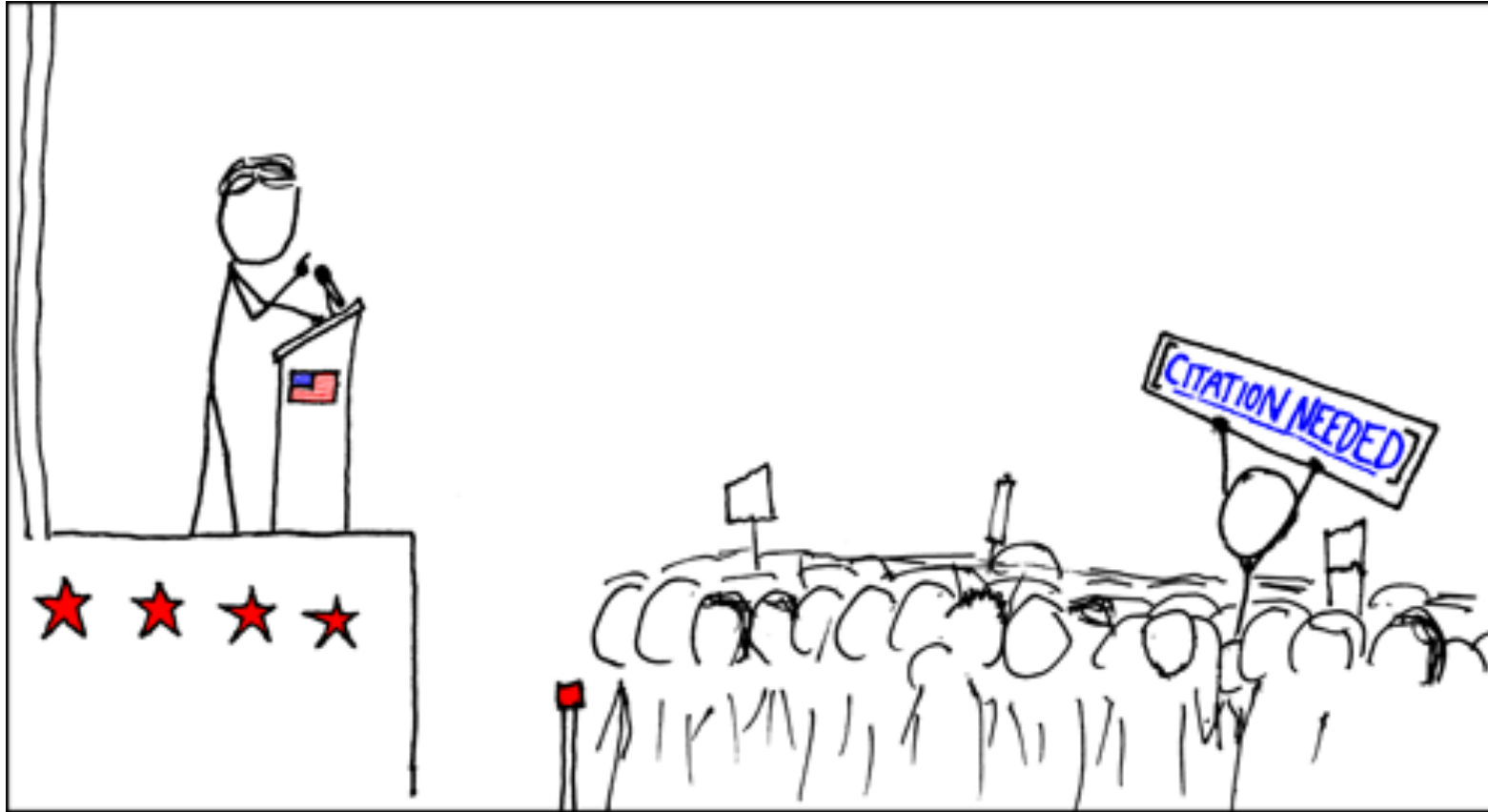
**MONTANA**  
**STATE UNIVERSITY**

# **Understanding Factors Influencing the Citation Count for Conference Papers**

Utkarsh Goel

Sandhya Thangavel

# Motivation



# Null Hypothesis



# Null Hypothesis

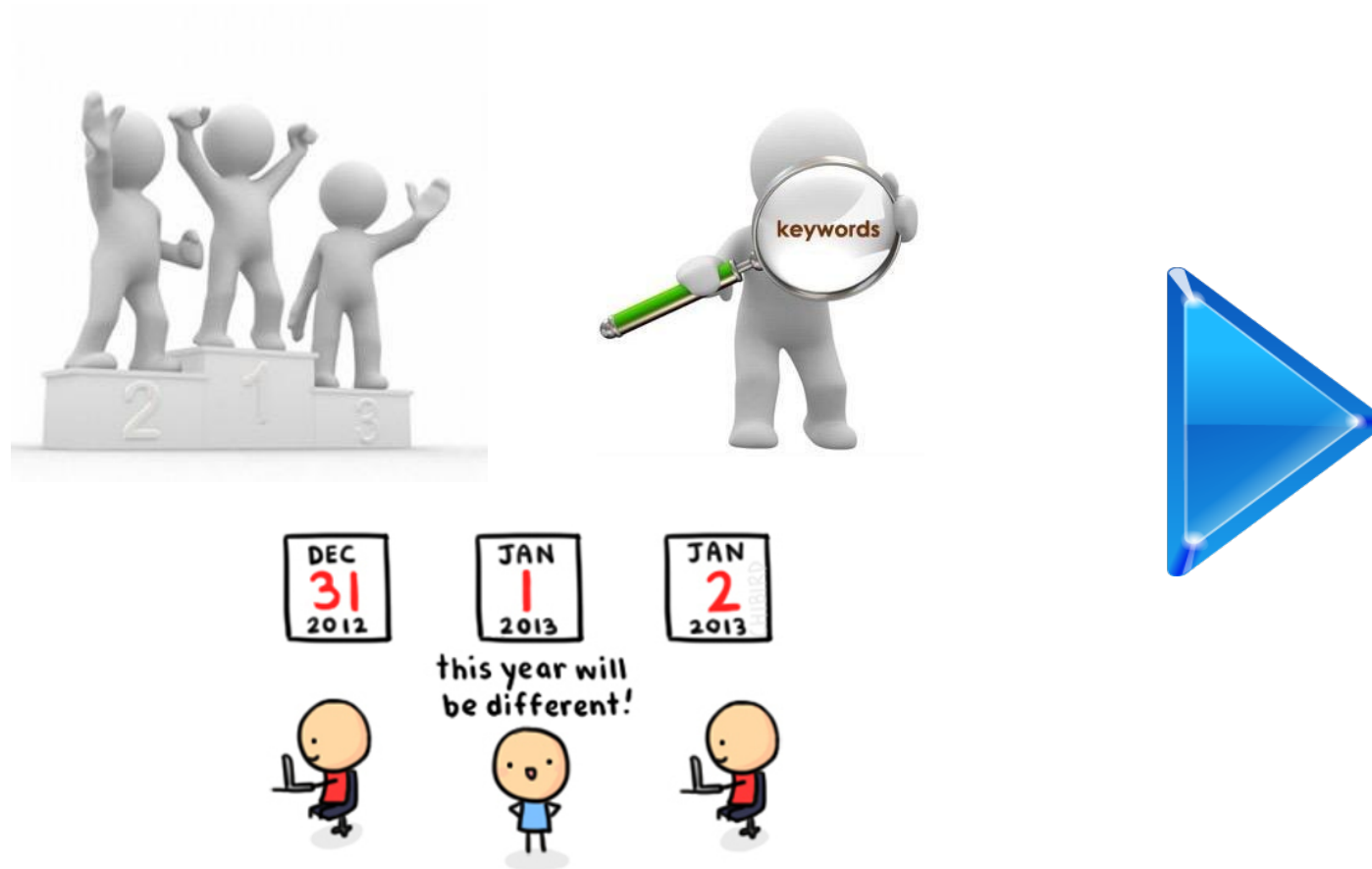


# Null Hypothesis





# Alternate Hypothesis



# Response Variable and Factors

- Response variable
  - Citation count
- Factors
  - Choice of keywords in the paper title
    - Cloud, Distributed, Security, Mobile, Performance
  - Conference Rank
    - A, B, C
  - Publication year
    - 2008 until 2012 (5 years)

# Research Questions

- How to **classify conferences** in different ranks?
- Is there an **accurate database** for conference rankings?
- Does the rankings **change over time**?



# Data Collection Technique

- Google Survey for determining conference ranking  
Insight of Community opinion (47 responses)
- Online Conference Ranking Databases  
Core Conference Portal, ERA Ranking Portal
- Prof. Kevin Almeroth's blog on Conference Statistics  
Acceptance rate, #Papers submitted, #Papers accepted
- Google Scholar  
Paper Title, Citation Count, Conference Name, Publication Year

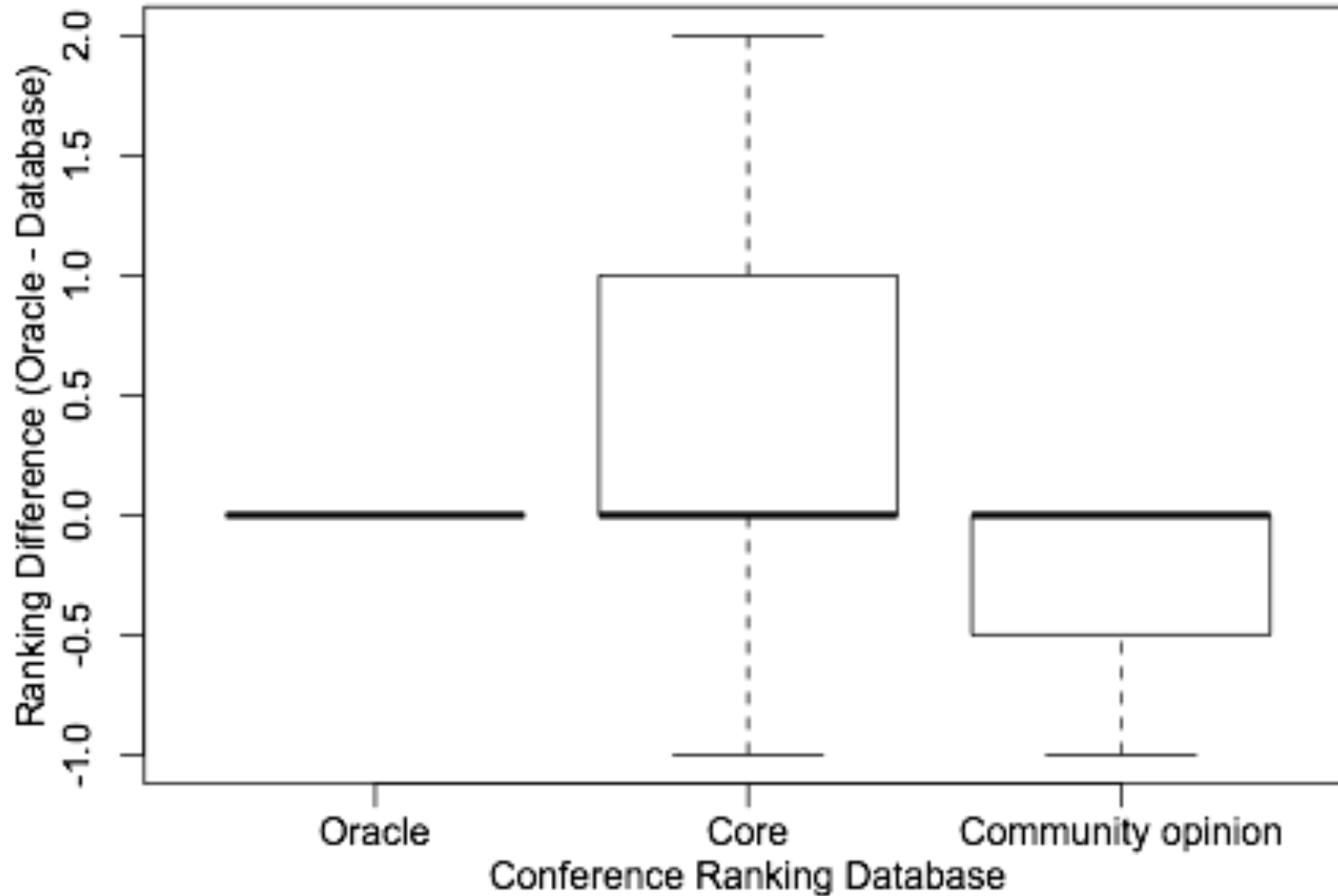
# Data Collected

- 63 networking conferences
  - 22 rank A conferences** (Acceptance Rate: 11% to 20.9%)
  - 22 rank B conferences** (Acceptance Rate: 21% to 30.9%)
  - 19 rank C conferences** (Acceptance Rate: 31% to 40.9%)
- Total papers = 38895
  - #Papers in Rank A Conferences = 8224**
  - #Papers in Rank B Conferences = 7134**
  - #Papers in Rank C Conferences = 23537**

# Research Questions

- How to **classify conferences** in different ranks?
- Is there an **accurate database** for conference rankings?
- Does the rankings **change over time**?
- What

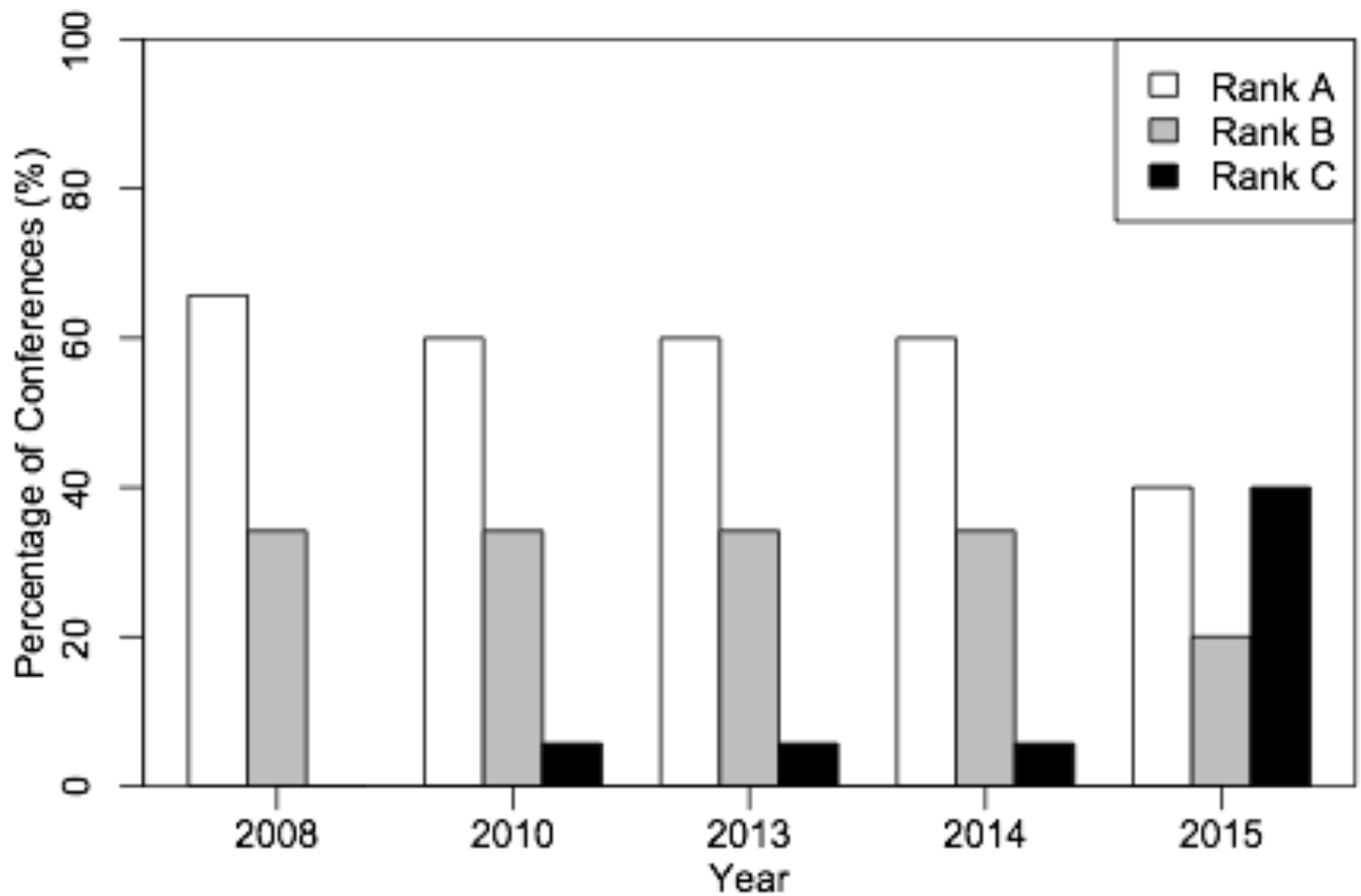
# Variation in Conference Ranking



# Research Questions

- How to **classify conferences** in different ranks?
- Is there an **accurate database** for conference rankings?
- Does conference rankings **change over time**?

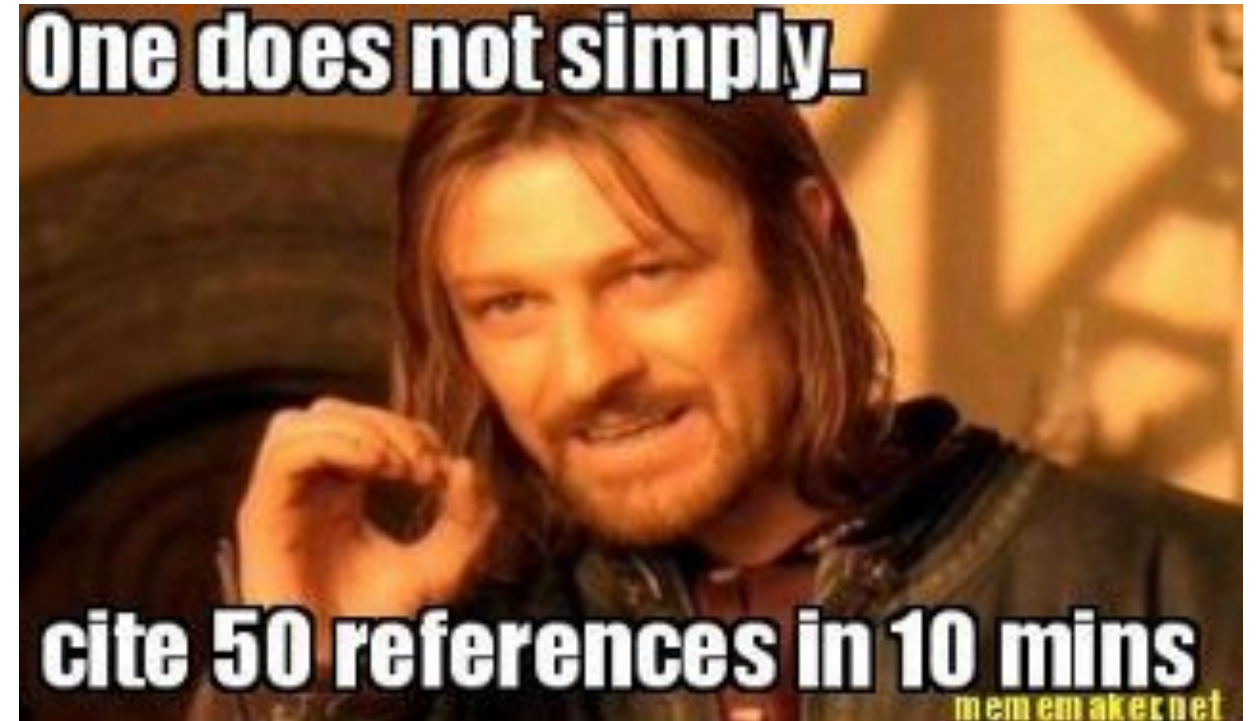
# Conference Rankings over Time



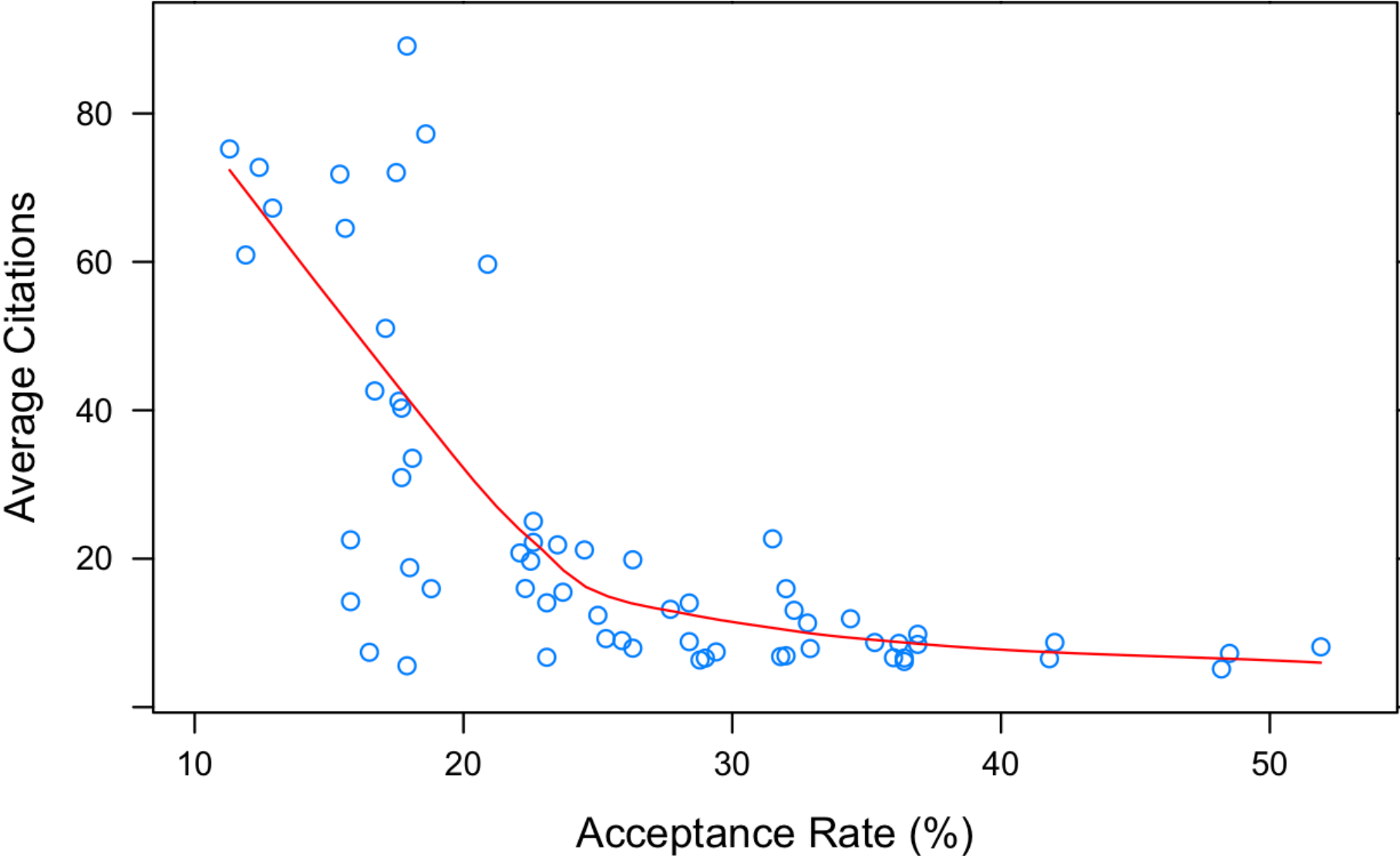


# How do people cite papers?

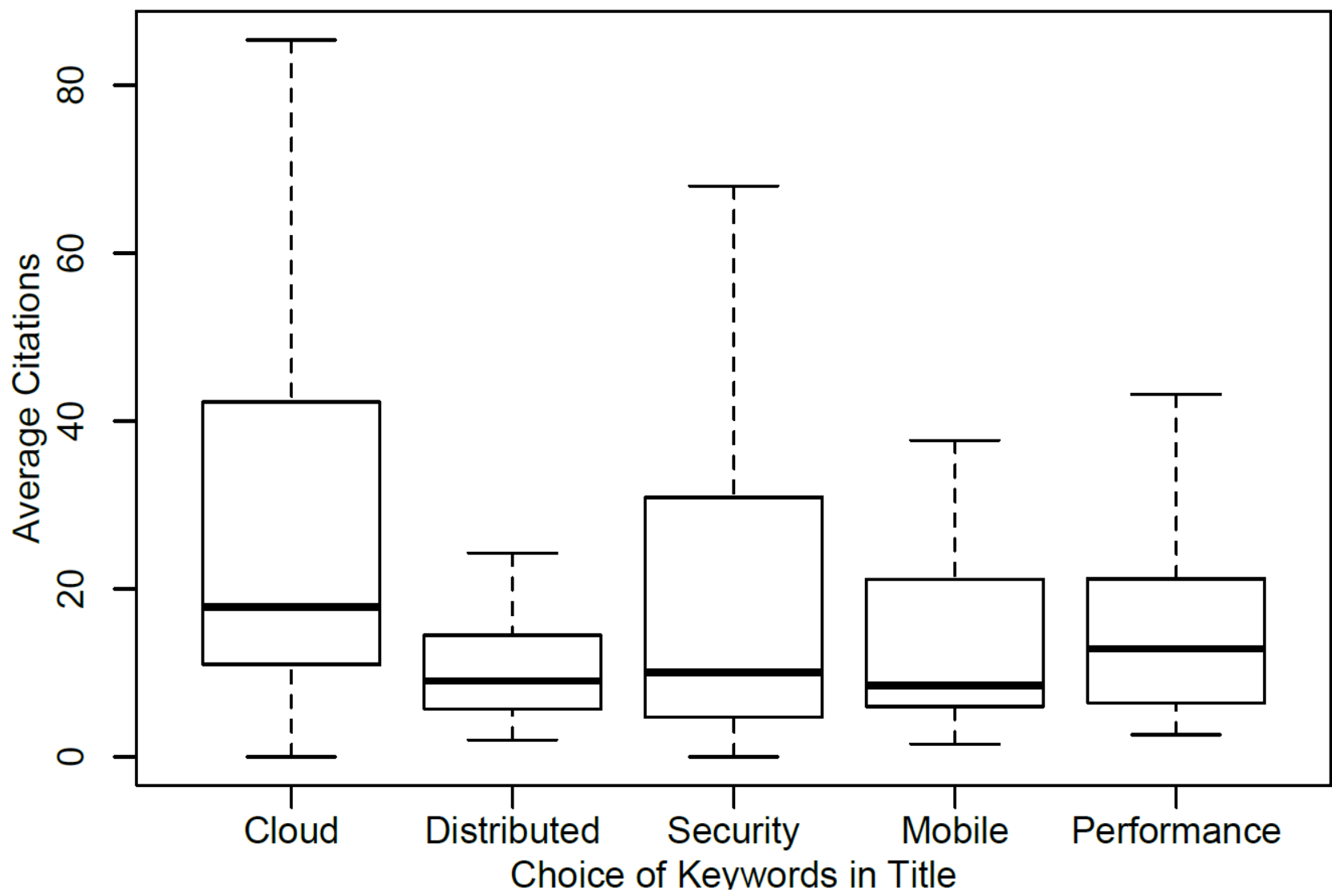
- Search papers from high quality conferences?
- Ask Google?
- Search papers from an year?



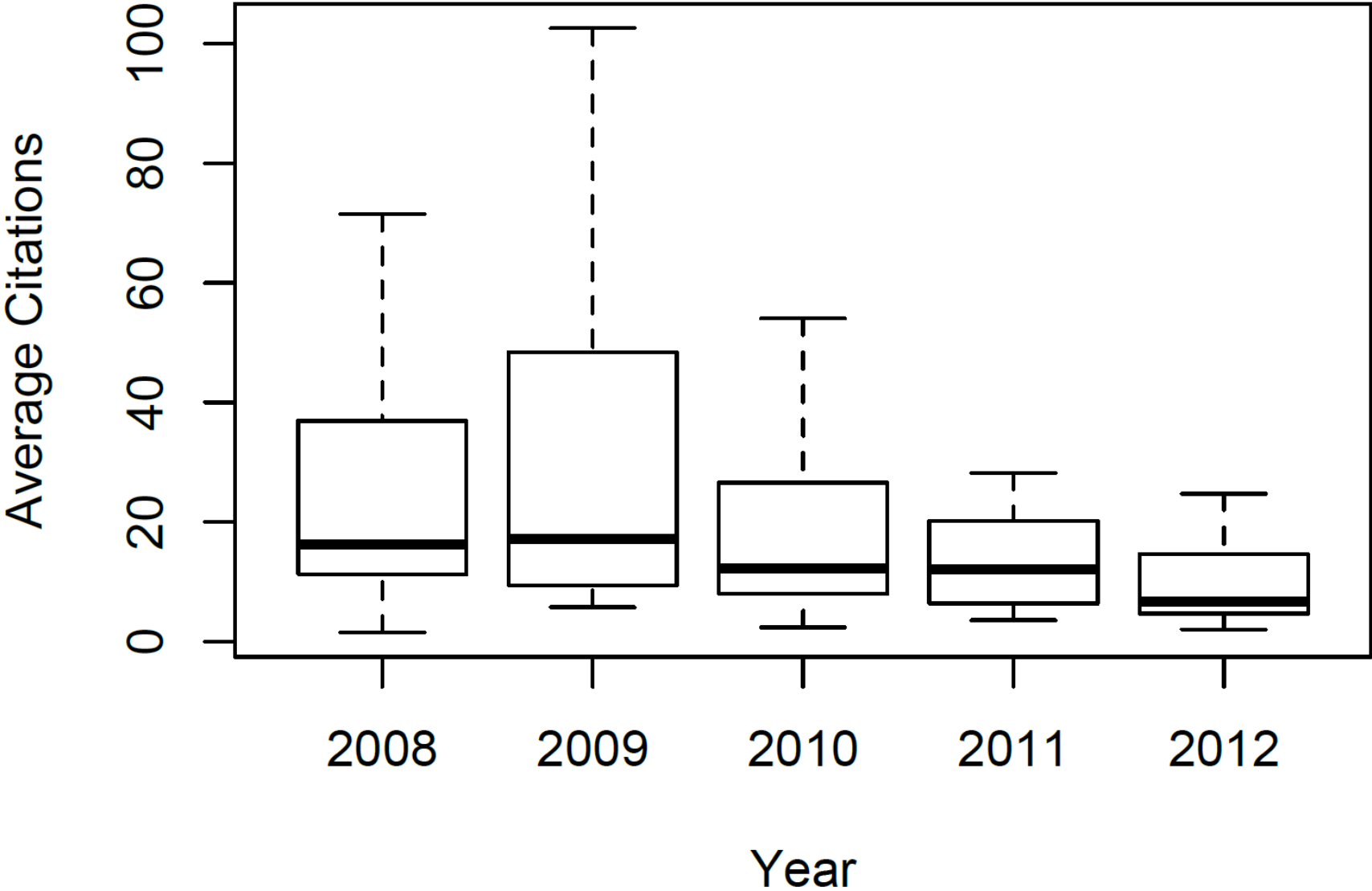
# Does Conference affect Citation Count?



# Does Paper Title affect Citation Count?



# Does Publication Year affect Citation Count?



# 3-Way Nested ANOVA



Conference Ranking															
	A					B					C				
Keyword/Year	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Cloud	494.2	297.2	155.5	48.8	27.6	95.5	106.3	30.1	18.4	9.5	75.2	24.7	26.5	16.4	7.8
Performance	57.3	43.3	50.9	21.5	17.6	15.4	16.4	19.8	15.9	5.8	10.5	12.1	7.8	7	4.5
Distributed	31	29.3	39.7	15.6	15.5	12.1	14.2	9.1	6.8	5.6	14.5	9.8	7.2	5.8	3.7
Security	42.8	61.6	67.3	38.3	15.7	4.7	45.9	27.3	6.3	4.7	15.2	9.8	9.5	6	3.5
Mobile	67.4	75	46.9	25.6	19.4	12.8	10.2	12.8	6	5.7	9.6	7.7	8.2	5.5	4.3

# 3-Way Nested ANOVA Contd...

```
> aov.out = aov(myDF$citations ~ myDF$rank + myDF$year + myDF$title + myDF$rank * myDF$year + myDF$rank  
* myDF$title + myDF$year * myDF$title + myDF$rank * myDF$year * myDF$title, data = myDF)  
> summary(aov.out)
```

	Df	Sum Sq	Mean Sq	F value	Pr(>F)	
myDF\$rank	1	44533	44533	19.137	4.35e-05	***
myDF\$year	1	30365	30365	13.049	0.000581	***
myDF\$title	1	31694	31694	13.620	0.000451	***
myDF\$rank:myDF\$year	1	17546	17546	7.540	0.007742	**
myDF\$rank:myDF\$title	1	17276	17276	7.424	0.008202	**
myDF\$year:myDF\$title	1	26315	26315	11.308	0.001279	**
myDF\$rank:myDF\$year:myDF\$title	1	17031	17031	7.319	0.008645	**
Residuals	67	155915	2327			

---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1



# Conclusion

- **Conference Ranking** affects citation count by **13%**.
- **Paper title** affects citation count by **9.3%**.
- **Publication year** affects citation count by **9%**.
- **Interactions** affect citation count by **23%**.
- **Unknown factors** affect citation count by **45.7%**.

# Conclusion Contd...

- What else could affect citations?

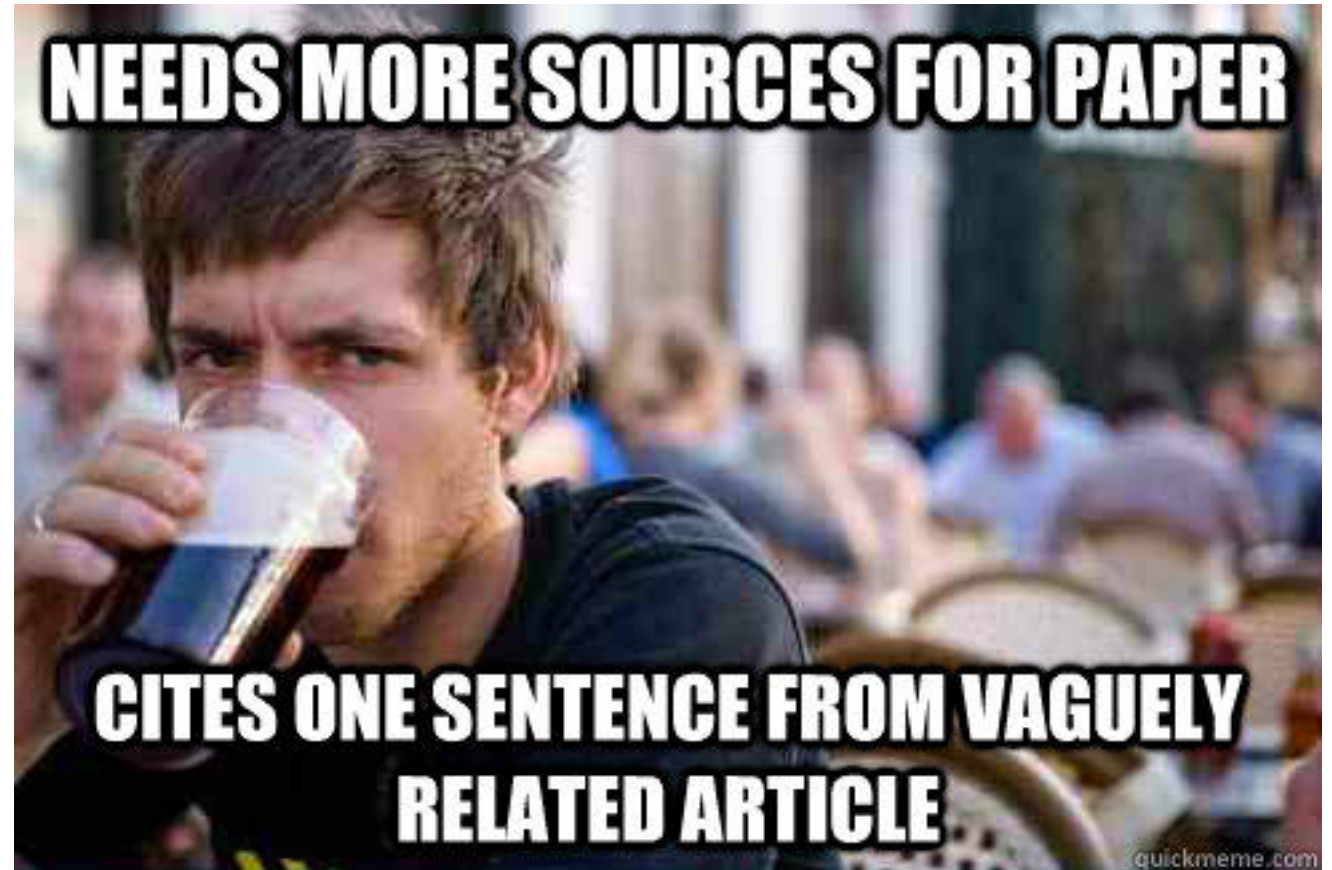
# Conclusion Contd...

- What else could affect citations?
  - Author popularity.



# Conclusion Contd...

- What else could affect citations?
  - Author popularity.
  - Paper relevance.



# Conclusion Contd...

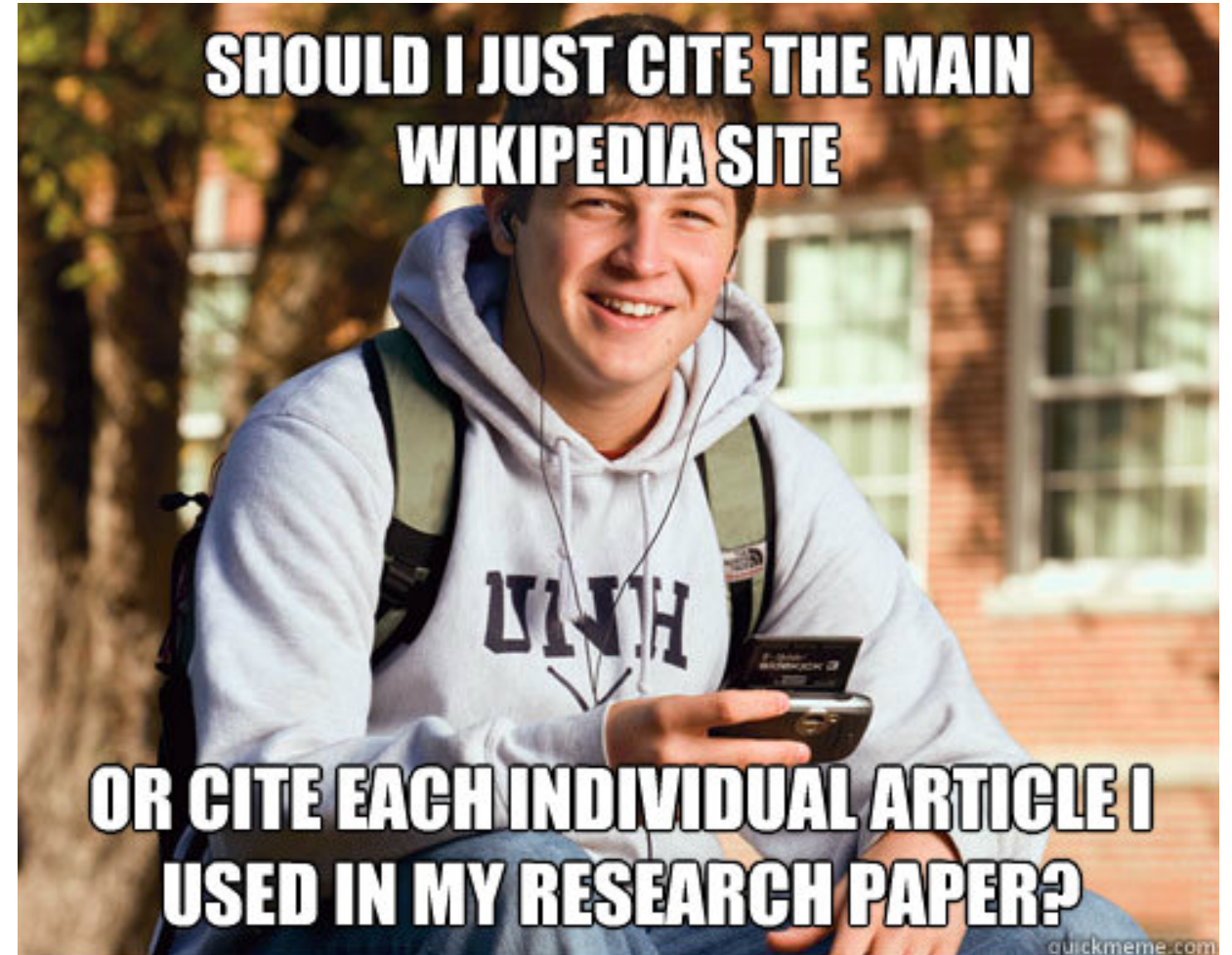
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  - Paper relevance.
  - Timeliness of paper.





# Conclusion Contd...

- What else could affect citations?
  - Author popularity.
  - Paper relevance.
  - Timeliness of paper.
  - Citation source.



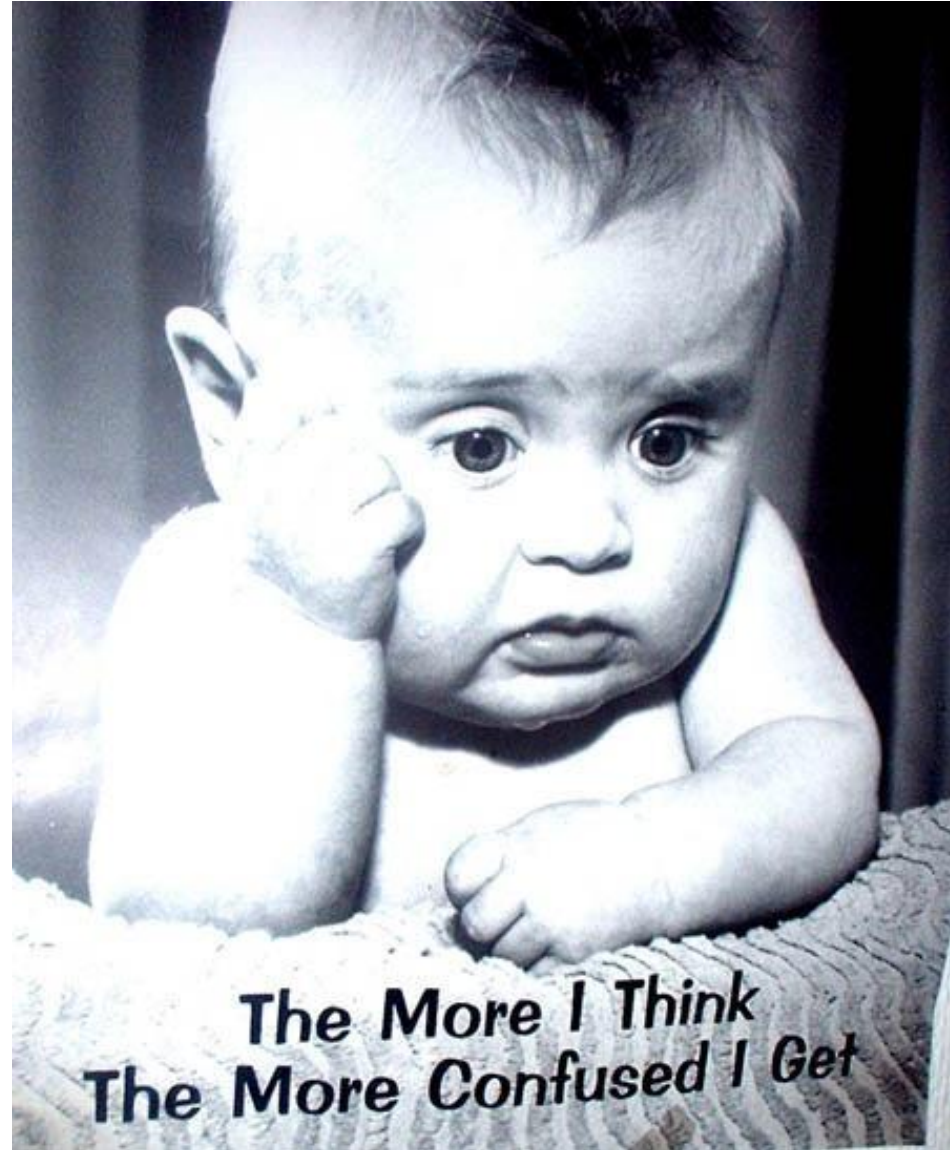


# Conclusion Contd...

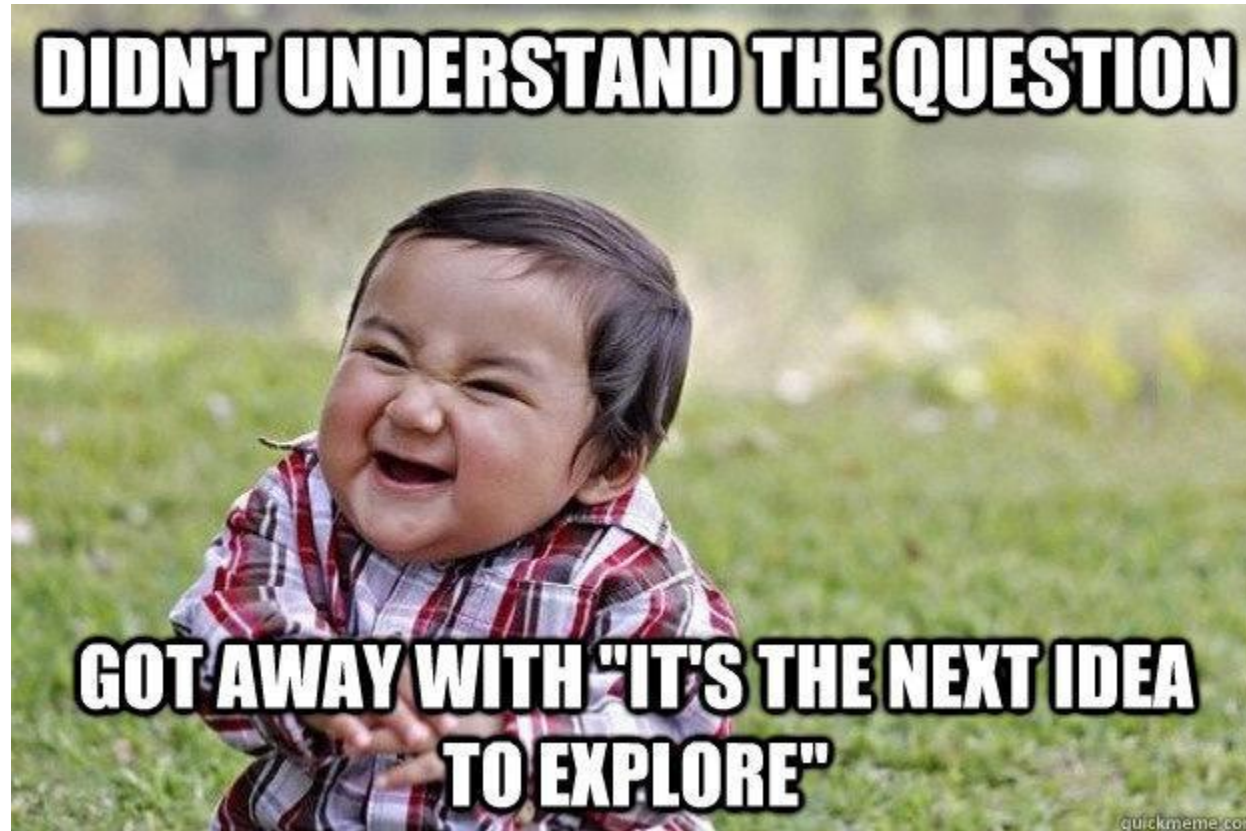
- What else could affect citations?
  - Author popularity.
  - Paper relevance.
  - Timeliness of paper.
  - Citation source.
  - Access to papers.



# Conclusion Contd...



# Thank You



Data and Code Available at:  
<https://github.com/ugoel/ESOF522>