Measuring Scientization

Using Altmetric and PlumX

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Measuring Scientization using Altmetric and PlumX

- **Scientization** → process
  - the increasing influence of scientific knowledge and expertise in various aspects of modern society.

- **Measuring scientization** → moving beyond citation counts

- **Altmetric** and **PlumX**
  - two popular alternative metrics for measuring online attention and societal impact of research outputs

Measuring Scientization using Altmetric and PlumX

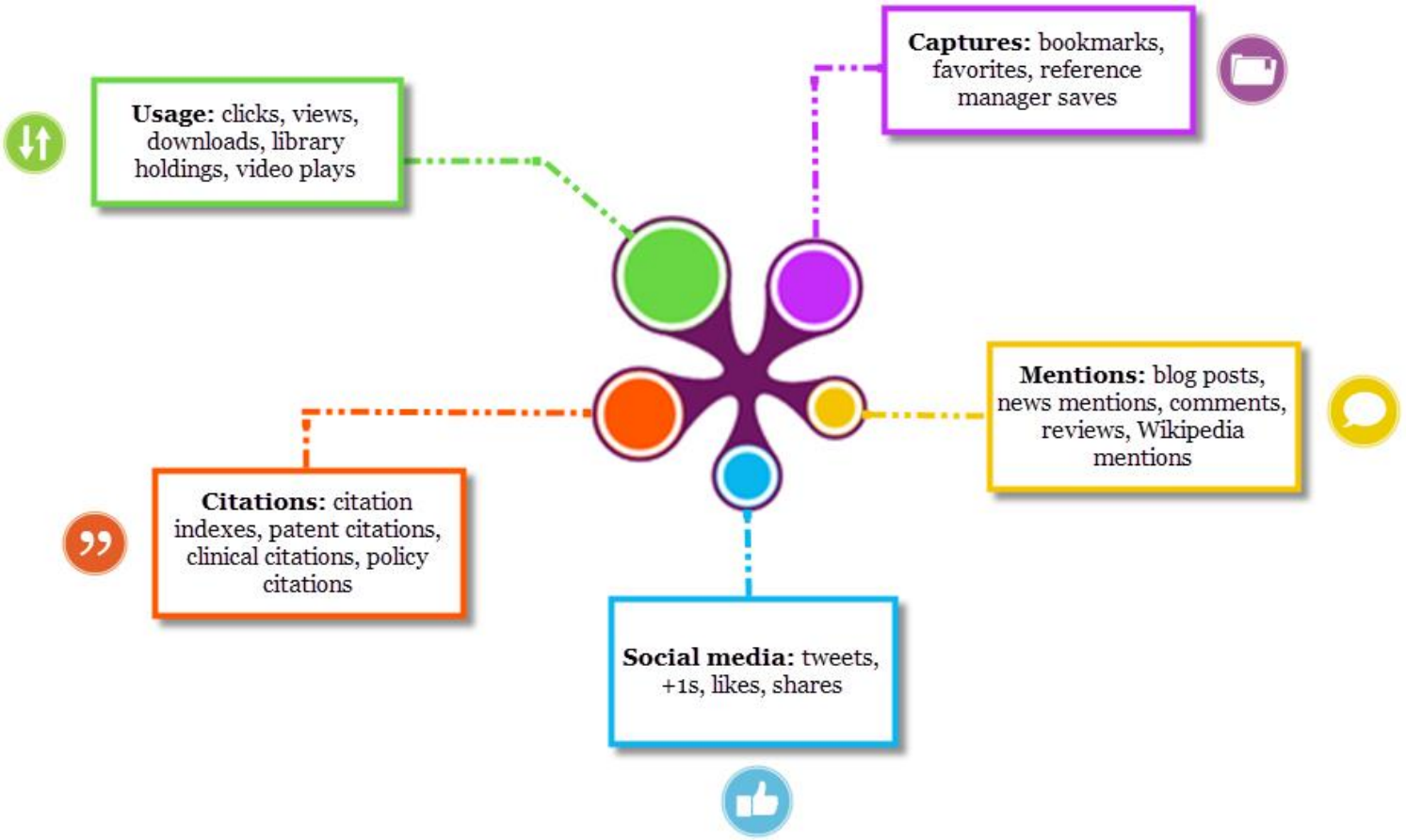
- Web-based services that track and analyze online activity (blogs, news outlets, social media, etc.) surrounding scholarly publications
- Altmetric ⟶ a unified weighted measure
- PlumX ⟶ five separate categories
- Indices ⟶ API ⟶ Component Data

Altmetric

The Colors of the Donut

- Policy documents
- News
- Blogs
- Twitter
- Post-publication peer-reviews
- Facebook
- Sina Weibo
- Syllabi
- Wikipedia
- Google+
- LinkedIn
- Reddit
- Research highlight platform
- Q&A (Stack Overflow)
- Youtube
- Pinterest
- Patents

PlumX


Usage: clicks, views, downloads, library holdings, video plays
Captures: bookmarks, favorites, reference manager saves
Mentions: blog posts, news mentions, comments, reviews, Wikipedia mentions
Citations: citation indexes, patent citations, clinical citations, policy citations
Social media: tweets, +1s, likes, shares

Altmetric and PlumX Data for the PISA Project

- DOIs (J.J.) → 879 total paper → 720 DOIs → Altmetric and PlumX
  - Altmetric search returned results for 418 of 720 papers
  - PlumX search returned results for all 720 papers

- Eyeball: Data quality of PlumX metrics superior to Altmetric

- **Problem:** Unique Metrics + Different results for common Metrics

- **Solution:** Combine Altmetric and PlumX

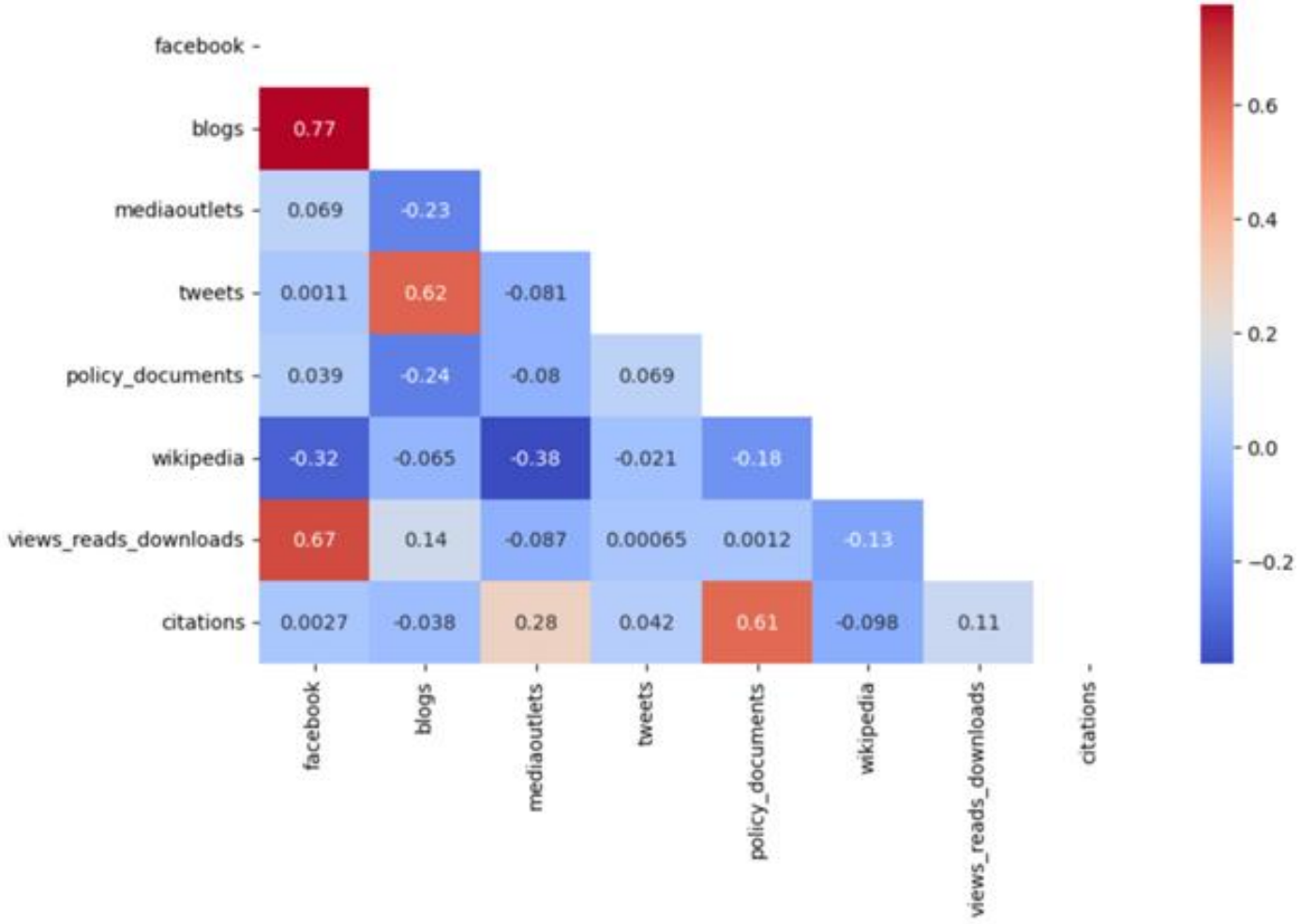
Sample Problem and Solution

	Altmetric Tweets	PlumX Tweets	Combined Tweets
count	235	206	252
mean	7.51	7.89	8.23
std	23.70	30.66	29.52
25%	1	1	1
50%	2	2	2
75%	5	5	5.25
max	271	395	395

Relevant Metrics

	facebook	blogs	mediaoutlets	tweets	policy_documents	qna_platfoms	wikipedia	views_reads_downloads	reddit_shares	citations
count	111	35	44	252	319	4	24	680	3	719
mean	482	1	4	8	5	1	2	1413	2	28
std	4768	1	5	30	10	0	2	3336	2	44
25%	1	1	1	1	1	1	1	162	2	7
50%	3	1	3	2	2	1	1	590	2	16
75%	21	2	4	5	5	1	2	1456	3	35
max	50259	4	17	395	109	1	12	50259	4	725

Correlation Matrix

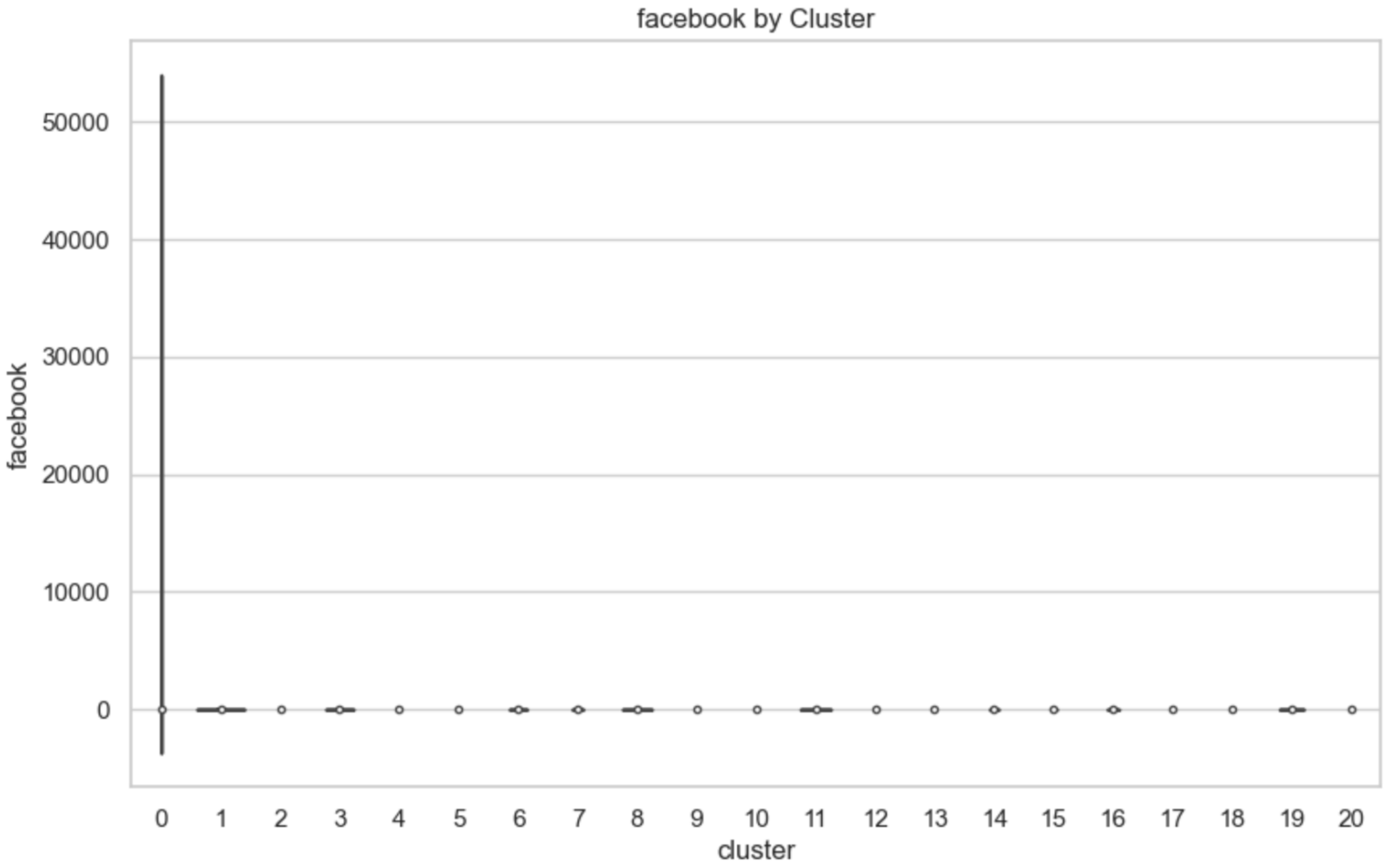


PISA vs. 20 Random Samples

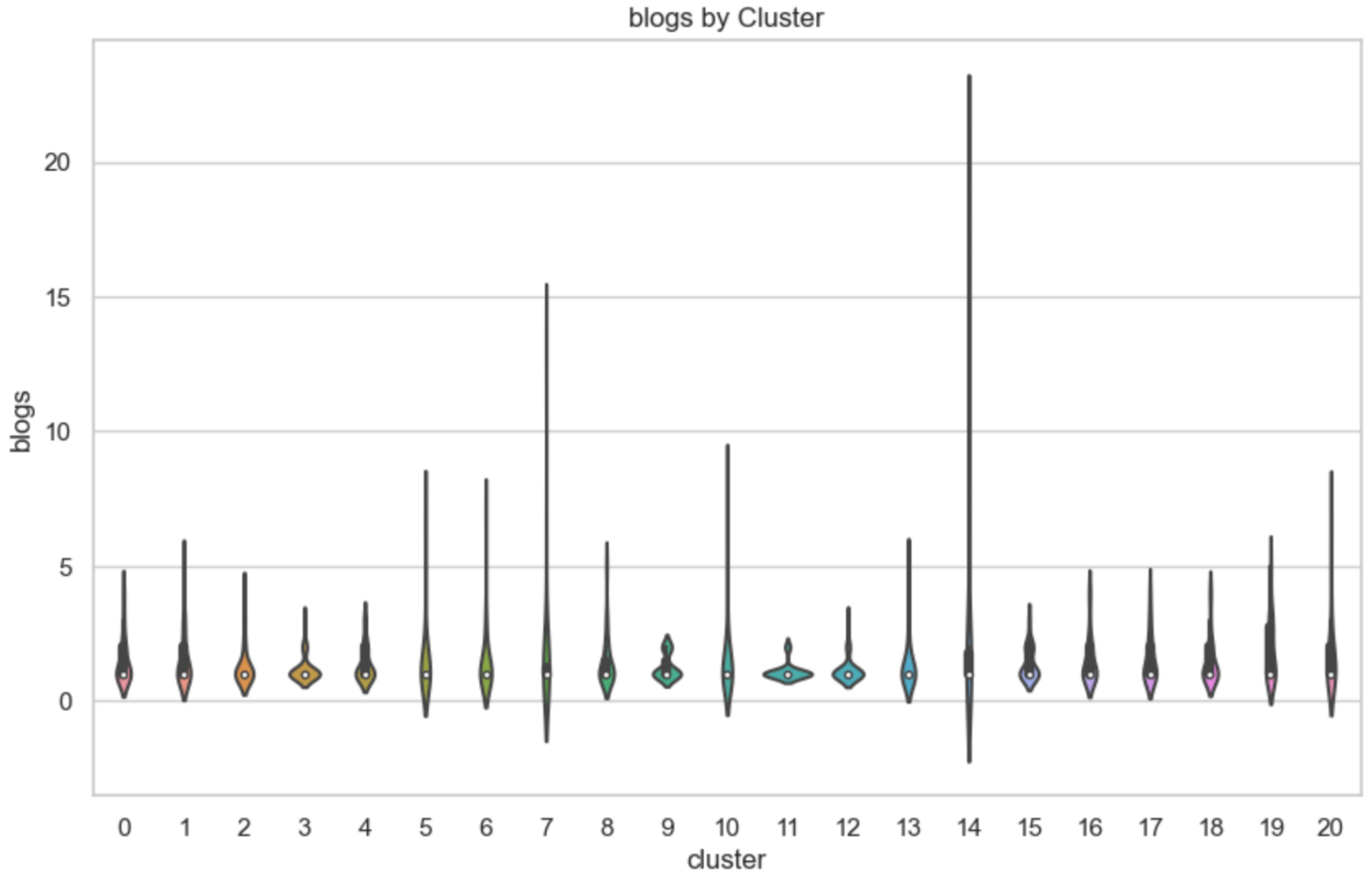
- 20 random samples of same size drawn from same journals
- Hypothesis: Scientization → PISA Papers > 20 Random Samples
  - Null Hypothesis: Comparable impact (measured through combined Altermatic and PlumX indicators) because all these papers are drawn from same fields and journals i.e., *PISA is not unique*.
- PISA is statistically more policy document citations and views, reads, and downloads than all other randomly sampled clusters.

Mean of PISA vs. 20 Random Samples on Select Indicators

PISA vs. 20 Random Samples on Select Indicators



PISA vs. 20 Random Samples on Select Indicators



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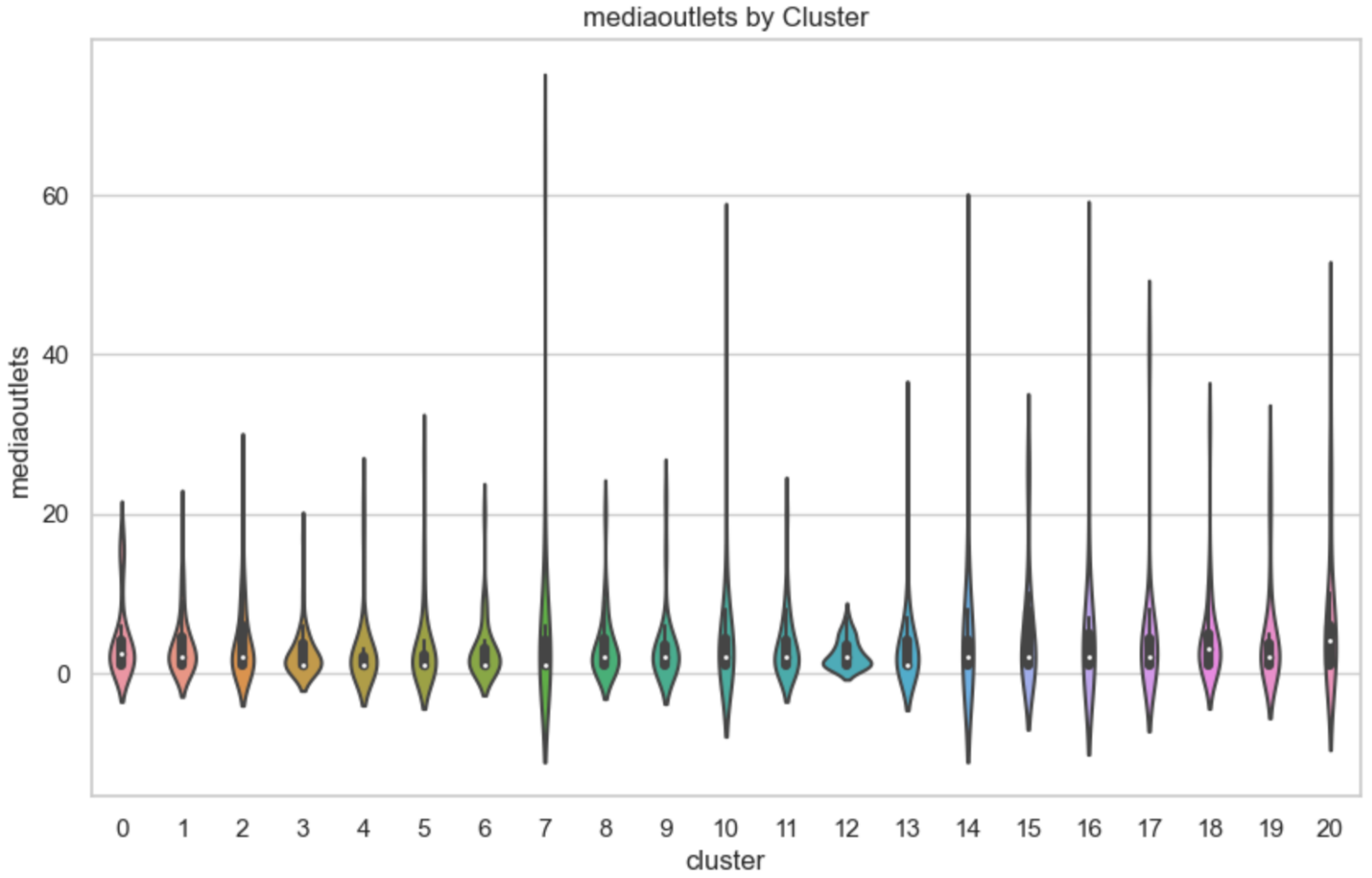

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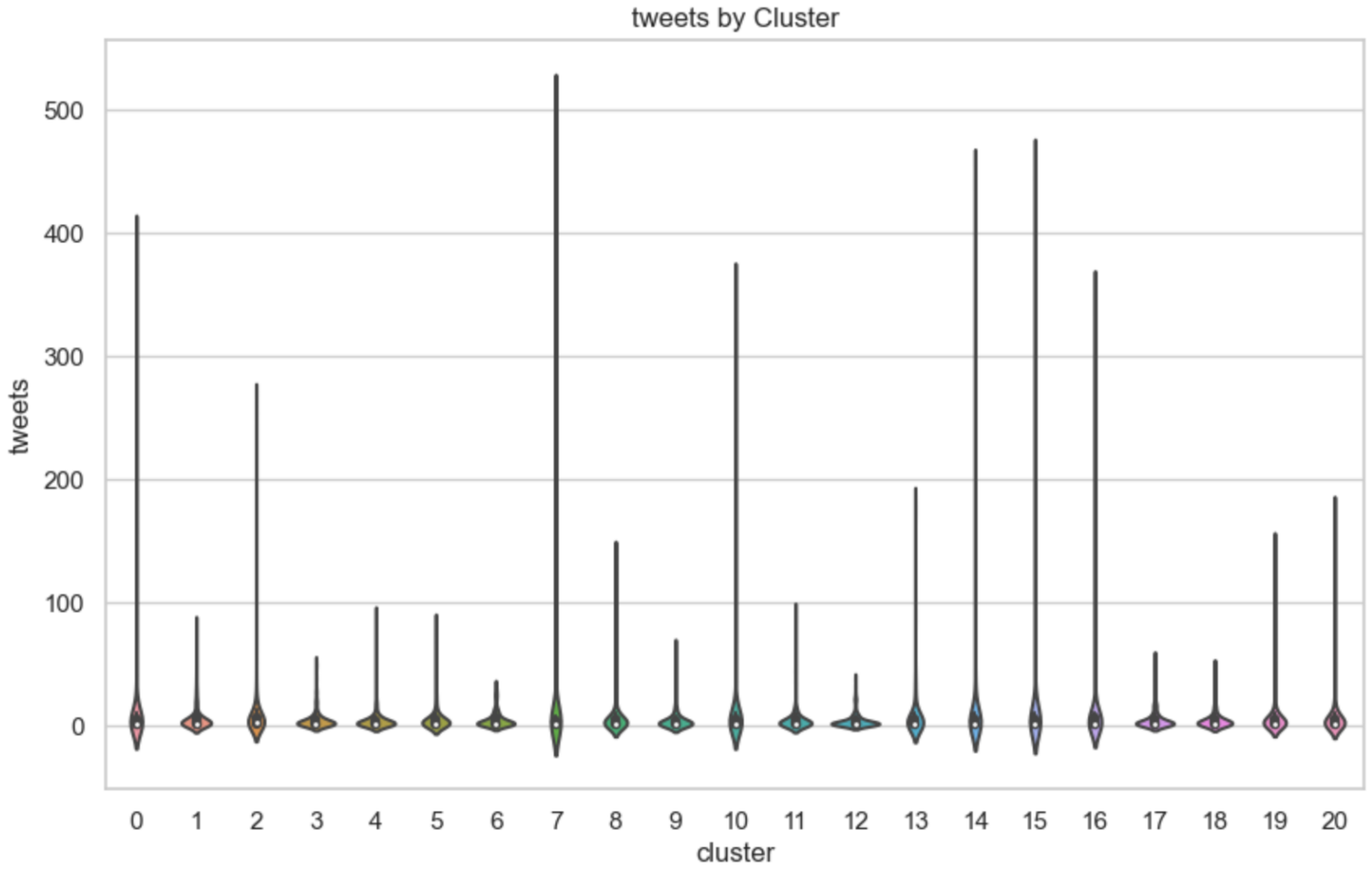

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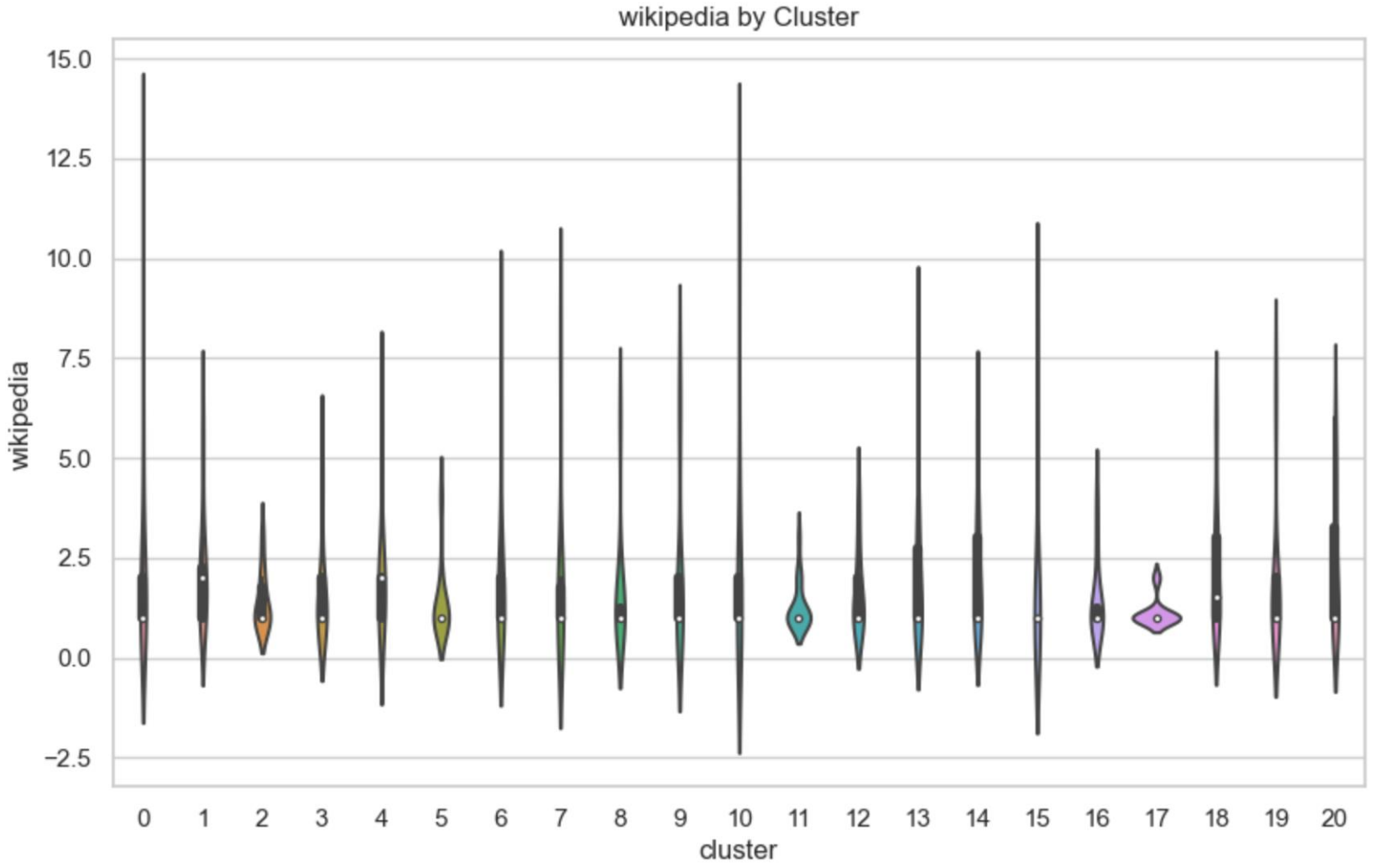

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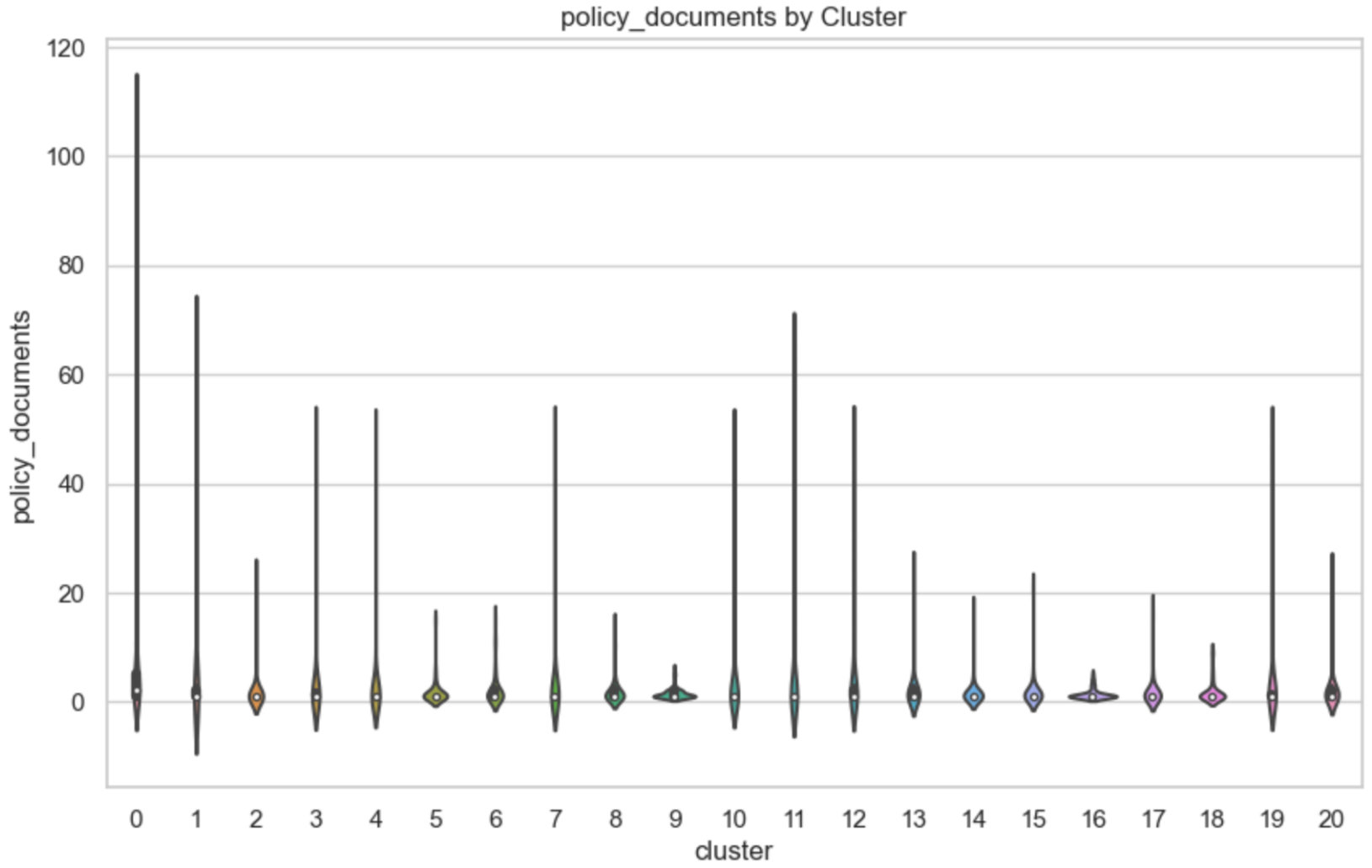

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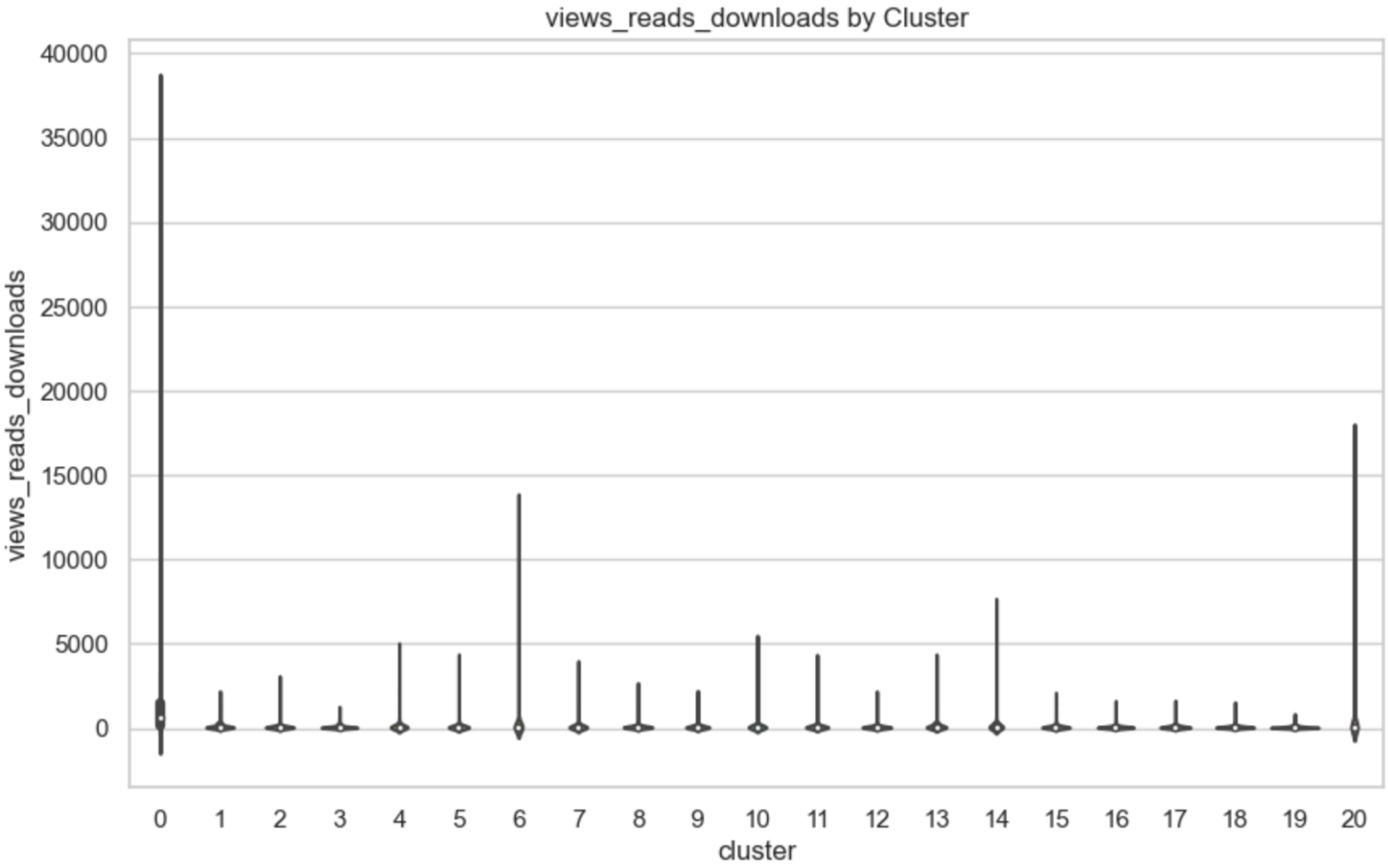
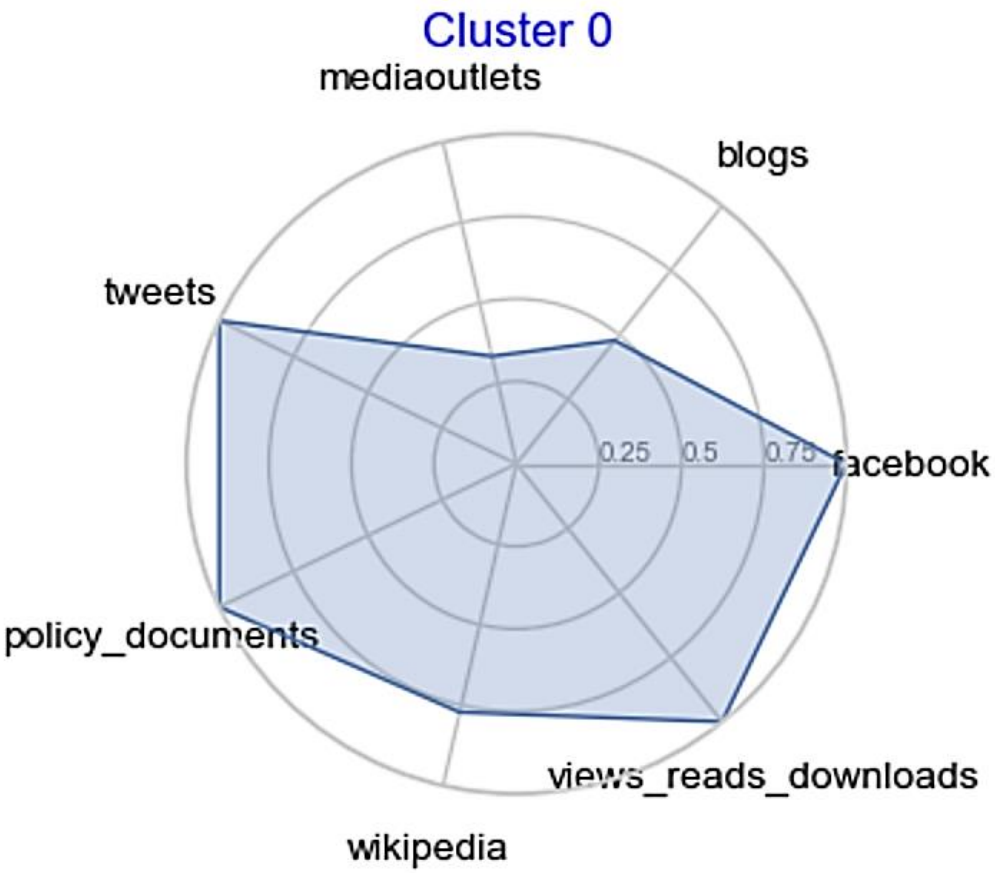
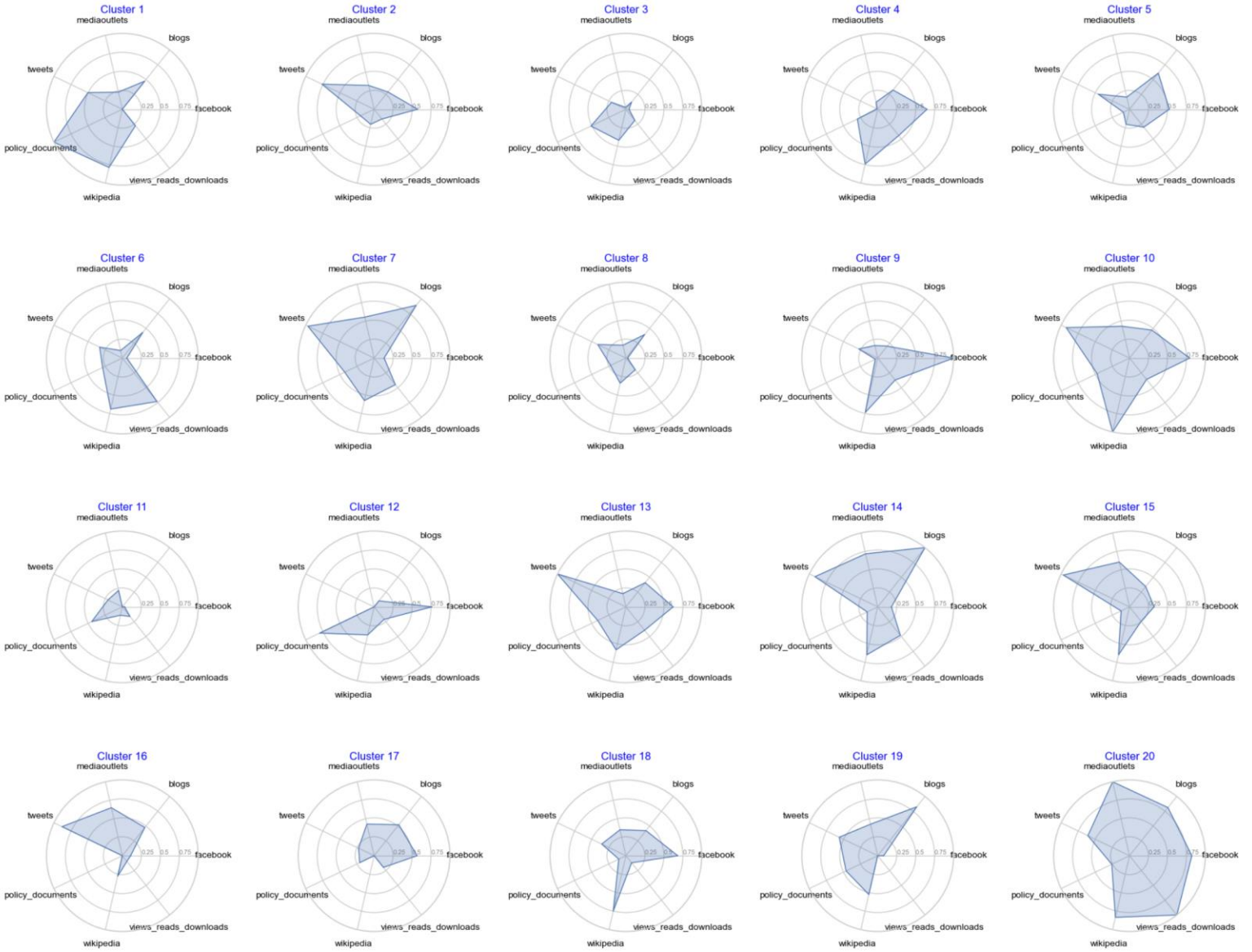
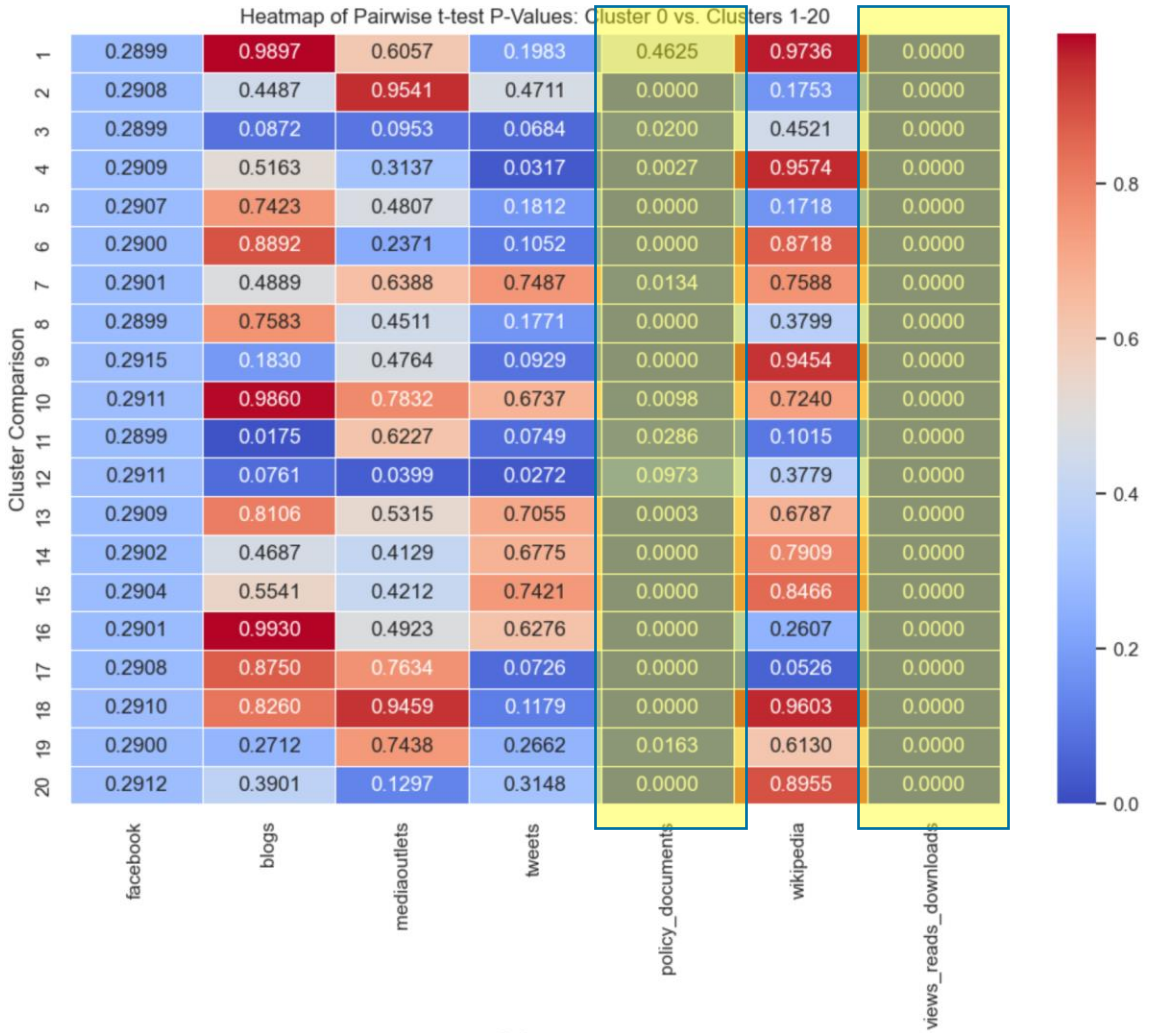






PISA Cluster vs. 20 Random Clusters

T-test - PISA vs. 20 Random Samples on Select Indicators



Thank You!

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