Disciplinary Differences in Citation Aging \& its Implications for Librarianship

Hansen, Sam https://dx.doi.org/10.7302/7030 https://hdl.handle.net/2027.42/175990 http://creativecommons.org/licenses/by-nc/4.0/

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Disciplinary Differences in Citation Aging & its **Implications for** Librarianship

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Data

- Web of Science 1900-2017
 - PostgreSQL database created from Clarivate XML files
 - Processed using code from CADRE^a
- Limited data to publications indexed as articles with at least one citation
- Web of Science Subject Categories
 - 254 Unique Subject Categories^b
 - Assigned at journal level
 - Not mutually exclusive

Methodology

- Citation age data was first aggregated by Subject Category and then by Year
- Descriptive statistics and metrics were generated from aggregated citation ages using Python and Excel

Metric Definitions

- Citation Half Life: Number of years it takes an article to reach half of it total citation count
- Oldest Citation Age: The maximum of all the citation ages for an article
- % of Citations Under X Years: Number of citations per article younger than X years divided by the citation count

^ahttps://cadre.iu.edu/

^bhttps://incites.help.clarivate.com/Content/Research-Areas/wos-research-areas.htm

Much of what we believe about old citation behavior is **WRONG**.

Citation Aging Metrics Overall Statistics

Metric	Median	Mean	Median Mean Sum	
Half Life	9	14.57	23.57	
Oldest Citation	26	30.96	56.96	
% Under 5 yrs	40%	46.59%	86.59	
% Under 10 yrs	63.33%	65.43%	128.76	
% Under 15 yrs	80%	76.94%	156.94	
% Under 20 yrs	90.91%	84.12%	175.03	
% Under 30 yrs	100%	91.65%	191.65	

Oldest Citation Aging Subject Categories

Motric	Median	Mean
IVIELIIC	iviculati	ivieali
Holf Life	L 2W/ 30 5	Biodiversity
		Conservation 41.14
Oldest Citation	Biodiversity	Biodiversity
	Conservation 57.5	Conservation 56.62
% Under 5 yrs	Engineering;	Biodiversity
	Geological 20%	Conservation 25%
% Under 10 yrs	Biodiversity	Biodiversity
	Conservation 31%	Conservation 36%
% Under 15 yrs	Mathematics 120/	Biodiversity
	Mathematics 45%	Conservation 45%
% Under 20 yrs	Mathematics	Biodiversity
	Ecology 50%	Conservation 51%
% Under 30 yrs	Ecology 66%	Biodiversity
	ECOLOGY 00%	Conservation 62%



Youngest Citation Aging Subject Categories

Metric	Median	Mean
Half Life	Physics; Particles	Physics; Particles
	Fields 4.57	Fields 4.34
Oldest Citation	Literary	Literature; African
	Reviews 11	Australian Canadian
		10.96
% Under 5 yrs	5 Subjects	Literature;
	with 100%	Romance 99%
% Under 10 yrs	18 Subjects	Biodiversity
	with 100%	Conservation 36%
% Under 15 yrs	37 Subjects	Literature; German
	37 Subjects	Dutch Scandinavian
	with 100%	100%
% Under 20 yrs	87 Subjects	9 Subjects
	with 100%	with 100%
% Under 30 yrs	191 Subjects	27 Subjects
	with 100%	with 100%

Implications for Librarianship

- Old Research \Rightarrow Out of Date Research
- A wide range of subjects regularly cite older articles
 - Many STEM fields regularly cite decades or century old articles
 - Humanities fields often cite the highest percentage of younger articles
- Short citation windows miss lot of research impact
- Selecting materials or publication outlets using metrics like Journal Impact Factor^c or CiteScore^d is problematic as their windows miss a majority of citations for most fields
- Materials being old is not a good enough reason to weed them, as researchers across a wide variety of fields use older materials
- There is little researcher behavior to back up stressing currency as a major aspect of evaluating sources when teaching information literacy

Limitations

- Web of Science indexes more STEM content than other subject areas
- Not all Subject Categories are indexed for whole period under investigation

^chttps://www.metrics-toolkit.org/metrics/journal_impact_factor/ ^dhttps://www.elsevier.com/authors/tools-and-resources/measuringa-journals-impact

