

Celebrity Earthquakes

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Earthquake Lites

Abstract

I discuss how much attention different earthquakes get in the scientific and nonscientific literature. For the former, all earthquakes above magnitude 7.5 appear in a scientific article, and the number of articles tends to increase with magnitude. For the latter, most shocks, even if damaging, become largely forgotten in a few decades, though some, such as the 1906 San Francisco earthquake, live on in popular memory.

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[Supplemental Material](#)

Introduction

One feature of being a seismologist is that many people who are not are nonetheless interested in our research. If, at a party, you say “I study earthquakes,” usually you will get interest and questions, whereas if you said “I’m an inorganic chemist,” your questioner is likely to discover that they need to get more hors d’oeuvres.

However, which earthquakes are people interested in? Put another way, which earthquakes are celebrities? As with human celebrities, the answer depends on who you ask: the stars of Hollywood are not those of Bollywood. Here, I look at earthquake celebrity (though perhaps notoriety would be a better term) among two groups: the American part of the English-speaking world and the community of seismologists.

Popular Celebrity

My own experience suggests that in the United States, the most famous earthquake, by far, is a wholly fictional event: the “Big One” which will, someday, devastate California. After all, this shock has been elaborately (if often ridiculously) depicted in more movies and television programs than any other.

For actual earthquakes, only a large-scale poll could determine their celebrity among the general public. Vasconcelos *et al.* (2017) conducted a poll in Lisbon to determine the awareness of seismic hazard. Lisbon was an especially interesting location because the 1755 Lisbon shock hugely impacted contemporary thought among educated Europeans and Americans (Kendrick, 1957; Braun and Radner, 2005). Even a century later, a poem by Holmes (1858) could assume that Americans would know about this earthquake. After 150 yr more, though, many residents of Lisbon did not.

I have used the Google Ngrams database (Michel *et al.*, 2011; Lin *et al.*, 2012) for a first study of earthquake celebrity over time. This database gives counts, by year, of phrases in a large collection of books scanned by Google, providing strong evidence on how much different earthquakes were mentioned at different times. Figure 1 (an extension and update of a plot in Agnew, 2018) shows the rate of mentions for some earthquakes that might be expected to be somewhat celebrated.

For two earthquakes predating the period shown (1755 Lisbon and 1812 New Madrid), the rate is about the same and is roughly constant but with decade-to-decade variations of factors of two or three.

This plot also shows the celebrity of three moderate California earthquakes that, being in urban areas, were damaging enough to be notorious. For all three, their celebrity decays exponentially, with a half-life of about 8 yr. The series for the 1925 magnitude 6.3 Santa Barbara earthquake shows a later peak from the magnitude 5.8 shock near this city in 1978. As might be expected, if an earthquake does little damage, it is not, for the general public, a celebrity: the 1992 Landers earthquake was the third-largest California shock in the twentieth century, but, being in the Mojave desert, got few mentions. At the other extreme, the real celebrity among United States earthquakes is the 1906 San Francisco shock, which since about 1920 has had a nearly constant rate of mentions but with peaks in 1990 (probably from this phrase being used for the 1989 Loma Prieta earthquake) and in its own centennial year.

To help appreciate what particular occurrence rates mean, we can compare them with the rates of mention of a single word; for example, the San Francisco earthquake, peaks aside, has been mentioned as often in American English as the word “anteater.” Figure 1 shows that the Lisbon and New Madrid earthquakes match the frequency of a similar but less commonly known animal: “pangolin”—though in 2019, this word, for unhappily obvious reasons, shot up to a level above even the three major urban earthquakes.

The decay of celebrity illustrated in Figure 1 shows that a major problem in seismic risk reduction is remembrance. As Douglas and Wildavsky (1983) and Stallings (1995) point out, risks are always prioritized, and maintaining awareness of long-term risks such as earthquakes is not easy. Most earthquakes lose their notoriety in a generation, becoming as little

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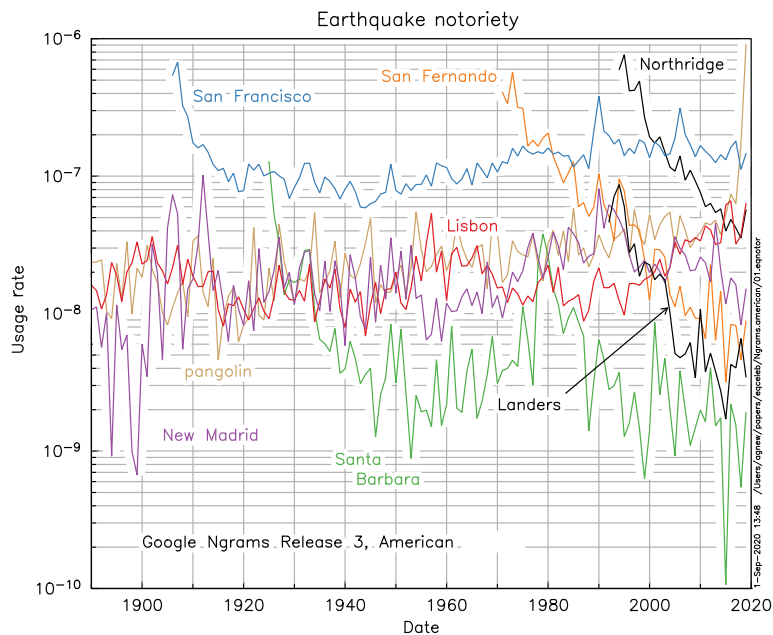


Figure 1. Relative frequency of phrases referring to different earthquakes, from the 2020 version of the Google Books Ngram database for American English texts. The result for the San Francisco earthquake includes the phrase “1906 earthquake,” and the Northridge earthquake result includes “Northridge earthquake.” All results include “earthquake” in both plural and singular.

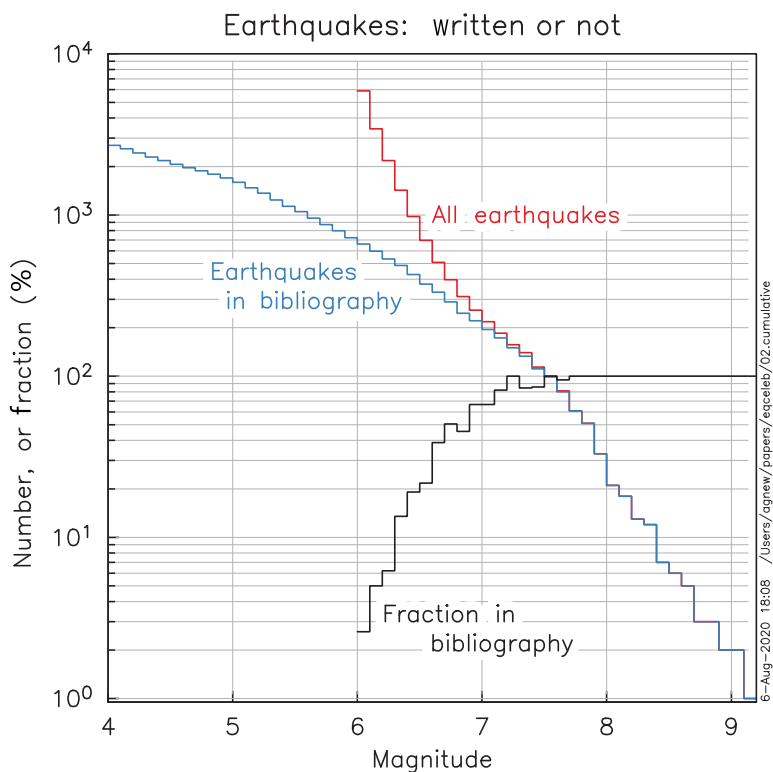


Figure 2. Cumulative distributions for all magnitude ≥ 6.0 earthquakes in the International Seismological Centre (ISC) catalog for 2000–2017 and for all such earthquakes referenced in the ISC bibliography. The black line shows the ratio in each magnitude bin expressed at percentage: 100% for magnitudes above 7.5.

known as pangolins used to be. Over the past few decades, historians have investigated how societies remember, forget, and reconstruct the past; see, for example, Gross (2000) and Misztal (2003) or the journal *History and Memory*. This literature all shows that effort is required to keep past events from being forgotten, including such natural disasters as flooding around the North Sea (Kempe, 2007) or Japanese earthquakes (Smits, 2014). Connerton (1989) argues that religions show most effective way of keeping memories alive: regular performances of liturgies that remind participants of past events. Therefore, such regular performances as the annual Great Shakeout (Jones and Benthien, 2011), with earthquake drills that are a kind of performative liturgy, are likely to be effective for maintaining the memory of earthquakes.

Professional Celebrity

What about earthquake celebrity among those (whether scientists or engineers) who study earthquakes professionally? For this community, it seems reasonable to equate “celebrity” with “number of articles published,” something easily found from the Event Bibliography of the International Seismological Centre (hereafter denoted by ISCEB). This “is intended to include those publications that are dedicated to specific seismic events” rather than catalogs. For any event, the articles listed include not just those focusing on that event but also those in which it is mentioned, for example, for comparisons: still a measure of celebrity.

The International Seismological Centre (ISC) Bibliography is at http://www.isc.ac.uk/event_bibliography/eventindex.php (last accessed July 2020). The ISC catalog is at <http://www.isc.ac.uk/iscbulletin/search/catalogue> (last accessed August 2020). The National Environmental Data Center (NEDC) Significant Earthquake Database can be accessed at DOI: [10.7289/v5td9v7k](https://doi.org/10.7289/v5td9v7k).

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References

- Agnew, D. C. (2018). Forgetting and remembering the New Madrid earthquakes, *Earth Sci. Hist.* **37**, 177–206.
- Braun, T. E. D., and J. B. Radner (Editors) (2005). *The Lisbon Earthquake of 1755: Representations and Reactions*, Voltaire Foundation, Oxford, United Kingdom, 342 pp.
- Connerton, P. (1989). *How Societies Remember*, Cambridge University Press, Cambridge, United Kingdom, 121 pp.
- Douglas, M., and A. Wildavsky (1983). *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers*, University of California Press, Berkeley, California, 221 pp.
- Gross, D. (2000). *Lost Time: On Remembering and Forgetting in Late Modern Culture*, University of Massachusetts, Amherst, Massachusetts, 199 pp.
- Holmes, O. W. (1858). The Deacon's Masterpiece, or the Wonderful "One-Hoss-Shay", *Atlantic Monthly* **2**, 496–497.
- Jones, L. M., and M. Benthien (2011). Preparing for a "Big One": The Great Southern California ShakeOut, *Earthq. Spectra* **27**, 575–595, doi: [10.1193/1.3586819](https://doi.org/10.1193/1.3586819).
- Kempe, M. (2007). "Mind the Next Flood!": Memories of natural disasters in northern Germany from the sixteenth century to the present, *J. Mediev. Hist.* **10**, 327–354.
- Kendrick, T. D. (1957). *The Lisbon Earthquake*, Lippincott, Philadelphia, Pennsylvania.
- Lin, Y., J.-B. Michel, E. L. Aiden, J. Orwant, W. Brockman, and S. Petrov (2012). Syntactic annotations for the Google Books Ngram Corpus, *Proc. of the ACL 2012 System Demonstrations*, Jeju Island, Korea, 169–174.
- Michel, J., Y. K. Shen, A. P. Aiden, A. Veres, M. K. Gray, and The Google Books Team, J. P. Pickett, D. Hoiberg, D. Clancy, P. Norvig, et al. (2011). Quantitative analysis of culture using millions of digitized books, *Science* **331**, 176–182, doi: [10.1126/science.1199644](https://doi.org/10.1126/science.1199644).
- Misztal, B. A. (2003). *Theories of Social Remembering*, Open University Press, Philadelphia, Pennsylvania, 130 pp.
- Smits, G. (2014). *When the Earth Roars: Lessons from the History of Earthquakes in Japan*, Rowman Littlefield, Lanham, Maryland, 208 pp.
- Stallings, R. A. (1995). *Promoting Risk: Constructing the Earthquake Threat*, Aldine de Gruyter, New York, New York, 248 pp.
- Vasconcelos, C., J. Torres, and J. Costa (2017). What happens to the boats? The 1755 Lisbon earthquake and Portuguese tsunami literacy, *Geosphere* **13**, doi: [10.1130/GES01205.1](https://doi.org/10.1130/GES01205.1).

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