A temporal analysis of the word 'impact' in titles published in *Current Science* between 1934 and 2015: to what impact?

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The other day, I was trying to retrieve an article I had seen in *Current Science* (*CS*) on impact factor and agricultural science publications. I needed it to support a point I was making in my own manuscript. Knowing that it had appeared in the last 2 or 3 years, I started searching for the article. I had no clue about the author or the title, except that it contained the word 'impact' in its title. I browsed the last 2 or 3 years of *CS* and even after a few tries, was not able to locate it. The only alternative left with me was to consider knocking-off the reference concerned in my manuscript, though this could considerably weaken my argument.

In a last swing effort, I went to the *CS* home page and entered in the global search prompt, the word 'impact'. Out spewed a torrent of finds of the word 'impact' carried in the titles of various papers published in *CS*. But what struck me was the dateline from when the finds were located. The first hit was to an article published in 1934. Readers would like to remind themselves that the journal started in 1932. Curiosity got the better of me and instead of searching the relevant years around the last 2 or 3 years, I started scrolling through the pages of finds starting at about when the world was getting ready for the Second World War through India's independence and my undergraduate days to now my imminent retirement. But no sooner than I had scrolled a few decades down, or should I say up the timeline, I noticed what might be the emergence of a pattern. The finds were getting shriller. This set me up for the evening to examine the pattern a little more closely.

The frequency of the finds for the word 'impact' in titles (the titles include all categories of submissions like research article, correspondence, research communication, editorial, etc.) of papers published in *CS* was indeed increasing exponentially (Figure 1).

However, critics being critics, would point to an obvious error in my plot. The error due to the differences in the number of papers (titles) published across the time axis. To correct for this, I looked to normalize the frequencies with the respective number of titles published in the respective years. Though doable, this would just eat away my entire evening.

Instead, I decided to normalize the finds to the total pages published in the respective years (this assumes that there is some correlation between the number of titles published and the total volume size of the journal for the respective years). Once again, the pattern was unmistakable (Figure 2). In other words, through the years, there seems to be an exponential increase in the appearance of the word 'impact' in articles published in *CS*.

How does one explain this pattern? Are authors increasingly questioning impacts and therefore the word seen in the title, or conversely, are authors demonstrating increasingly the impacts of their studies? But in either case, why should these reflect a temporal pattern? I decided to investigate this a little further, in trying to have a closer look at the frequency distribution of the finds and see if they are associated with any apparent objects of study.

Starting 1934 until 1995 the word 'impact' appeared only 38 times in the titles. But for the period 1996 until 2015, there were 259 occurrences. Of these, 48 were made exclusively with reference to discussion on impact factors. The decade of 1990s saw a heightened public interest in impact factors worldwide. In fact during this period, four *CS* editorials were devoted to discussions on the pros and cons of impact factor.

But casting away these 48 counts as aberrations, we still have just about 6 impacts per decade for the period 1935 and 1995 compared to about 105 for the period 1995–2015. Looking up the papers

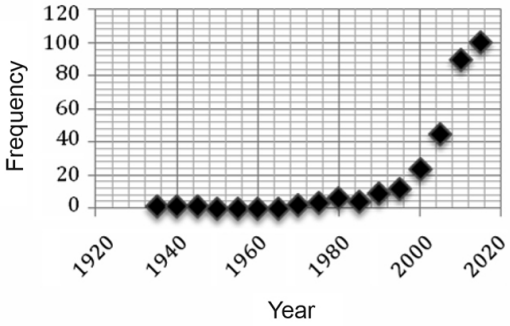

Figure 1. Frequency occurrence of the word 'impact' in titles of papers published in *Current Science*.

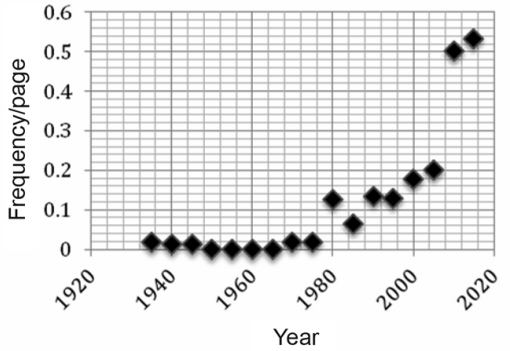

Figure 2. Frequency occurrence of the word 'impact' in titles of papers published in *Current Science* normalized to the total pages published in the respective years.

during the first six decades of the journal, I found that approximately a third of these were from physical sciences, with the rest from biological sciences. The pattern was nearly the same in the following two decades with physical sciences accounting for about 45% of the papers with 'impact' in the title. Thus, there does not seem to be any overt influence of any one branch of science growing excessively over others, to cause the observed increase in the use of the word 'impact' in the title.

What exactly does the word 'impact' convey to the readers? Let us take the following few examples of papers published in *CS*:

Raman, T. R. S., Impact of shifting cultivation on diurnal squirrels and primates in Mizoram, northeast India: A preliminary study. *Curr. Sci*., 1996, **70**(8), 747–750.

Purohit, A., Maikhuri, R. K., Rao, K. S. and Nautiyal, S., Impact of bark removal on survival of *Taxus baccata* L. (Himalayan yew) in Nanda Devi Biosphere Reserve, Garhwal Himalaya, India. *Curr. Sci*., 2001, **81**(5), 586–590.

Ravindranath, N. H., Joshi, N. V., Sukumar, R. and Saxena, A., Impact of climate change on forests in India. *Curr. Sci*., 2006, **90**(3), 354–361.

Fernando, P., Wikramanayake, E. D. and Pastorini, J., Impact of tsunami on terrestrial ecosystems of Yala National Park, Sri Lanka. *Curr. Sci*., 2006, **90**(11), 1531–1534.

Gadgil, S., Rao, P. R., Seshagiri and Sridhar, S., Modelling impact of climate variability on rainfed groundnut. *Curr. Sci*., 1999, **76**(4), 557–569.

Would replacing the word 'impact' with the word 'effect' significantly alter the message conveyed by the titles? Perhaps not. So why do authors prefer impact over effect?

The *Oxford Dictionary* defines the word 'effect' as 'a change which is a result or consequence of an action or other cause'. Some of its synonyms are result, consequence, upshot, outcome, outturn, sequel, reaction, repercussions, reverberations and ramifications. On the other hand, the definition of impact is 'a marked effect or influence or have a strong effect on someone or something'. Its synonyms are collision, crash, smash, clash, bump, bang, knock, jolt, thump, whack, thwack, slam, smack.

Though subtle, the difference is essentially of the magnitude of the consequence. Essentially, therefore, if effect is coffee, impact is strong coffee.

So why do authors prefer to use impact over effect? Probably to heighten their message with a jolt. But it could also be that they are dealing with issues not as routine as a monsoon storm, but a tsunami. Indeed issues like tsunami, global warming, climate change, and hydrology accounted for about 78 of 211 papers published with 'impacts' in their title in the last two decades. With publication spaces becoming competitive, one could only expect the titles to be become more shriller and assertive such that the articles crash-land on the editors' desk, and jolt them and the readers to attention.

Finally, consider the following two papers, again published in *CS*:

Rindani, T. H. and Valanju, N. N., Effect of castration on succinic dehydrogenase activity in male rat liver. *Curr. Sci*., 1957, **26**(3), 88–89.

Narayana, N. N., Tamarind and chillies – their effect on S. Indian diet. *Curr. Sci*., 1948, **17**(6), 186.

While I do not know about the effects being claimed in these papers, replacing effect with impact could have conveyed a greater sense of catastrophic consequences of the respective treatments. That in *effect* would have had a greater *impact*!

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