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SCIENCE AND SOUTH PARK, REDDIT AND FACEBOOK, LEONARDO DA VINCI AND THE VITRUVIAN MAN, AND MODERN FAIRY TALES ABOUT EMERGING TECHNOLOGIES: SCIENCE COMMUNICATION AND POPULAR CULTURE

"People seem to really enjoy the mix of humour and intelligence": science humour in online settings

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Abstract

This commentary considers the topics of humour and online settings. Both have received increasing attention amongst researchers and practitioners of science communication, and both raise numerous questions around the role of informality and enjoyment in the spread of information. However, online settings also provide a great range of data with which to address these questions. Here I suggest that close consideration of technical infrastructure plays an important role in this data collection. I shall do so using case studies drawn from two popular participatory websites, reddit and Facebook, which display contrasting attitudes towards using humour. I argue that these attitudes are partly products of the different tools provided by the pages for users to show appreciation, which affect the appearance of content on the websites. I also suggest that these tools allow users to appreciate jokes in multiple ways, and by extension might provide researchers with methods for assessing different forms of engagement.

Keywords

Public engagement with science and technology; Science and media

Introduction

I am looking at an image depicting a high-resolution photograph of Neptune, coloured a deep purple but in enough detail to see white streaks across the planet's surface. It marks the 2014 flyby of Neptune by the NASA New Horizons spacecraft and is credited with the label 'Neptune taken by NASA'. Underneath, a user has replied 'who THE F**K let NASA take Neptune'. Others take up this lead, adding 'release neptune', 'Free Neptune 2014', and 'WHAT. ABOUT. PLUTO'. A new image, combining both the original image and the comments thread, has since passed through numerous social media sites. An appearance on the popular blog site Tumblr earned it a spot in the 'best of Tumblr' gallery.[1] An appearance on Facebook was shared by nearly 160,000 users.[2] This image, among many others,

[1] http://best-of-tumblr.tumblr.com/post/95984128210/crowbara-jetgreguar-gaybabyrollins, accessed 5/12/2015.

[2] https://www.facebook.com/IFeakingLoveScience/photos/a.621016214586060.1073741826.367116489976035/1063851770302500/?type=1, accessed 14/4/2015.

raises questions around the role of humour in science communication. What role might humour play in attracting an audience, or maybe dividing audiences into in- and out-groups? Are there issues with information-poor but humorous messages attracting disproportionate attention? And how is the role of humour shaped by features of communication media?

This commentary is not the place to address these questions in full — though for some further discussion, see Riesch [2015]. Here I would like to focus on the third question, or more specifically the sort of data that 21st century websites offer to address the question. Over the few decades of its existence the internet has become an increasingly participatory space [Hughes, 2012]. The Usenet pages of the 1980s–early 2000s facilitated the rise of numerous online fan communities, maintained by a combination of knowledge-sharing practices and personal enthusiasm [Baym, 2000; Jenkins, 1995]. The twenty-first rise of social networking sites such as MySpace and Facebook has had profound implications for how we develop friendships and organise our social lives [Boyd and Ellison, 2007]. Most recently, media hosting websites such as YouTube and SoundCloud have allowed enthusiastic amateurs and networked collaborators to produce content which rivals professional outputs [Shirky, 2008]. This plethora of material provides a great many case studies for communication researchers; it also offers access to huge amounts of natural data, somewhat akin to observing real-time interactions in a museum or citizen's jury but on an enormous scale.[3]

However, rather than focus on the details of conversational interactions, in this piece I will focus on how conversations are structured by features of different online settings. I shall compare the relationship between humour and technical infrastructure — by which I mean the layout of pages, how material is selected to appear on a page, the buttons users can click, and suchlike — on the popular websites reddit and Facebook. Both provide a range of tools for users to show appreciation for posts. In my discussion of reddit, I shall argue that attitudes towards humour in scientific discussions are shaped to a fairly considerable degree by these tools. I shall then use the contrast with Facebook to further support this argument, and also develop the idea that these tools do not simply structure conversational data but can act as a source of data in their own right.

Reddit

Summarising reddit is a difficult task — even reddit's own 'about' page fails to provide a clear summary.[4] It is essentially a very large forum where users (identified only by pseudonyms) post content, and comment on others' content. From this basis springs a huge amount of diversity; reddit is divided up into over 9,000 'subreddits', which are distinguished both by topic and by expected styles of communication. In many subreddits, conversations start with users posting links to content from elsewhere on the internet. For example, in the subreddit r/science users post links to new scientific publications, journal articles, and similar.[5] In other subreddits conversations begin with questions, such as r/askscience where users post science-based questions for users with relevant expertise to answer.[6] For new

[3] Though, of course, with some key differences — see James and Busher [2012] and Powell [2012].

[4] https://www.reddit.com/about/, information correct as of 21/12/2015.

[5] https://www.reddit.com/r/science. With 9.9 million subscribers, r/science is quite likely to be the largest exposure such materials will get.

[6] https://www.reddit.com/r/askscience.

users unfamiliar with these norms, many subreddits offer rules/guidelines pages — a valuable resource for researchers trying to understand the communal commitments of a subreddit. Comparing the rules/guidelines of the larger science-based subreddits,[7] we see some notable shared preferences. These include being specific, staying on-topic, avoiding personal or medical stories, and using peer-reviewed literature as much as possible. Notably absent are any appeals to be simple or clear for non-expert readers. Also, importantly for the purposes of this commentary, the rules strongly discourage jokes. We could speculate that these rules attempt to create a pseudo-professional community rather than use reddit to widely disseminate scientific information — a view certainly felt by other corners of the internet, and by other reddit users who have created explicitly more informal alternatives.[8] This would tally with arguments that academics often try to minimise humour in written communication in order to preserve an image of detachment and professionalism [Heard, 2014; Watson, 2015].

However, we need not speculate too far — reddit provides other sources of data which suggest an alternative interpretation. Changes in rule pages are subject to 'meta' discussions, where moderators and users debate the desirability of rules.[9] On the meta discussions around larger science subreddits, the majority of comments which address the no-jokes rule are in favour of it. However, this is not due to any perceived opposition between jokes and expert discourse — many users suggest that, in theory, occasional jokes considerably improve discussions. Many also note that in practice jokes do sometimes appear in conversation without being reported to moderators. The problem raised is that users come to the subreddits looking for efficient access to scientific discussion, and jokes risk obstructing this. To understand this argument, we must consider the infrastructure of reddit.

In addition to initiating a conversation or writing comments, users can also show approval for a conversation or comment by 'upvoting' (or show disapproval by 'downvoting'). By default reddit displays comments and conversations with the most highly upvoted at the top of the page, which makes them very much more likely to be read. Across reddit, humour plays a vital role in achieving upvotes — the front page of the main reddit site is often dominated by humorous discussions. This makes for efficient entertainment, as users can quickly find the most amusing material. However this can cause problems for subreddits which are intended for sharing information or hosting debate, as good material can end up confusingly interspersed with amusing material (or even displaced right to the bottom of the page). This is particularly a problem for subreddits with a high volume of comments. It is precisely this concern, rather than any intrinsic tension between humour and science, which features in the meta discussions.

[7] These are r/science with 9.9m subscribers, and r/askscience with 7.0m subscribers — information correct as of 21/12/2015. Note that for the purposes of this piece I am only considering subreddits which focus on science conceived broadly, rather than specific disciplines — although the remarks I make are applicable to many of the discipline-specific subreddits. Also note that these subreddits are *considerably* larger than other science subreddits — the next largest non-discipline-specific science subreddit I have found is r/everythingscience, which has 56,000 subscribers. The size discrepancy is probably due to these larger subreddits appearing (now or in the past) in the default subscription list of new users, but that is a more complicated story than space permits.

[8] See, for example, r/everythingscience (https://www.reddit.com/r/everythingscience), r/softscience (https://www.reddit.com/r/softscience), or r/science2 (https://www.reddit.com/r/science2) — pages accessed 21/12/2015.

[9] Note that for ethical reasons I am not permitted to directly quote from these, or any other, reddit or Facebook discussions.

It must be noted that meta discussions are not as easily accessible as rules pages, which means many users may be unaware of the rationale for the 'no-jokes' rules. I mention this as it keeps open the possibility that the lack of humour results in a perception of professional or expert discussion, with potentially significant effects on audience composition. This question would require considerably more research to address. The point is that, on reddit, questions about humour in scientific conversations cannot be fully understood without attention to a technical infrastructure which exists independently of the concerns of science and humour.

Facebook and *I Fucking Love Science*

I Fucking Love Science (henceforth IFLScience) is a page on the social networking site Facebook. IFLScience was founded in March 2012 by the biology undergraduate Elise Andrew. In her own words the page "was never supposed to be more than me posting to a few dozen of my friends" [Hudson, 2012]. What happened instead was that the page accumulated 1,000 likes in the first day, 1 million by the six-month mark, and now stands at over 23 million — for comparison, the Facebook pages for New Scientist and Scientific American both have fewer than 3 million each, and Fox News has about 11.5 million.[10] According to the IFLScience media kit, in 2014 the IFLScience page was amongst Facebook's three "most engaged" pages, a measure based on how frequently and to what extent users interact with the page [IFLScience, 2014]. Andrew ascribes this extraordinary success to "the mix of humour and intelligence... it's nice for people to have a page where they can come and laugh but still know that everything they see is accurate" [Hudson, 2012]. As I shall illustrate below humorous posts do make up a significant proportion of the page's output, alongside reports on new research and comments on stories from other media outlets. In contrast to reddit, therefore, IFLScience presents humour as a tool to aid communication of scientific information.

Let us briefly consider exactly how posts work on Facebook. Similarly to reddit, users can post their own material, comment on others material, or show approval for material by 'liking' it. Dissimilarly to reddit, and in common with other social networking sites, how material appears on Facebook is determined by connections between users [Boyd and Ellison, 2007]. Every single Facebook user sees a unique homepage which combines updates on friends' activities, posts from pages they are subscribed to,[11] and suggestions of pages or events that Facebook deems of potential interest to that user. Exactly which of these appear on the homepage, and in what order, is determined algorithmically. Any of the material appearing on the homepage can be commented upon, and comments are arranged chronologically. The relationship between user interactions and the position of material on a homepage is therefore somewhat more complicated than in the reddit case of upvoting material to the top of a thread.

[10] https://www.facebook.com/IFeakingLoveScience/?fref=ts; https://www.facebook.com/ScientificAmerican/?fref=ts; https://www.facebook.com/newscientist/?fref=ts; https://www.facebook.com/FoxNews/?fref=ts. All information correct as of 21/12/2015.

[11] On Facebook subscribing is also confusingly called 'liking', though in this commentary I shall use 'subscribing' for clarity.

There are therefore various ways IFLScience can try to make their posts appear on users' newsfeeds.[12] Imagine two users, User1 and User2, who are friends on Facebook. User1 has subscribed to IFLScience, so *any* post made by the page automatically has some probability of appearing somewhere in User1's newsfeed. User2 has not subscribed to IFLScience; nonetheless, IFLScience' posts can end up on User2's newsfeed via User1:

- If User1 likes or comments on any IFLScience post then that post has a small probability of appearing in the User2's newsfeed as an example of 'things your friends are doing'.
- If User1 really wants their friends to see the post they could increase this probability by 'sharing' the post.
- If User1 specifically wants User2 to see the post they may 'tag' User2, which sends a notification to them.

If User2 also appreciates the post, they may like / comment on / share the post, potentially spreading it to their friends too. If User2 *really* appreciates the post (or perhaps regularly sees posts they appreciate from IFLScience) they may even subscribe to IFLScience. And so on, in a form of chain reaction. The question, therefore, is what role humour might play in this reaction. I will briefly address this question with reference to a dataset of the 158 posts made by IFLScience in March 2015. For the purposes of this commentary, I shall only subject these to a very brief analysis; nor should one month's worth of posts be treated as representative of IFLScience in general, as posts are often dependent on current affairs — posts from March, for example, are dominated by posts about female scientists to celebrate International Women's Day. I present the below information to raise questions for discussion, not as conclusive findings.

Of the March posts, twenty-four can be seen as humorous (interpreted as broadly as possible). These achieve a higher average number of likes than the overall average (128,000 vs. 95,000), and six of these appear in the top twenty-one posts when arranged by number of likes. A similar pattern holds for shares, comments, and number of tags. These posts also have a lower than average number of words per comment (5.99, against an overall average of 7.96). This is hardly a notable difference, and certainly not unique to jokes — many of the International Women's Day posts also receive many likes but only short comments, as do posts depicting pictures of cute animals. However, there are more interesting patterns. These humorous posts all hyperlink to other material and can be further subdivided into three types based on these links. The first type link to jokes which rely on scientific knowledge, such as a picture of a t-shirt reading '3.14% of sailors are pi-rates'.[13] The second type combine humorous headlines with links to the IFLScience blog website. Examples include an article about parasitic shrimp with the headline "it

[12] Note that users can also post material onto the IFLScience Facebook page, analogous to starting a new conversation on reddit. However these posts only appear in a very small box at the side of the IFLScience Facebook page — https://www.facebook.com/IFeakingLoveScience/?fref=ts — and do not appear on subscribers' home pages. The net result is they receive very little attention; the majority do not even achieve a single like.

[13] https://www.facebook.com/IFeakingLoveScience/photos/a.456449604376056.98921.367116489976035/1063416623679348/?type=1; Page accessed 14/4/2015.

was only a matter of time before shrimp figured out how delicious they are", and an article about what would happen if a person fell into a volcano headed "please don't try this at home, even if you happen to have a volcano handy".[14] The third type refer to controversial debates such as vaccination or creationism, mocking any view which runs counter to the scientific consensus.

The advantage of dividing up these three types is that we can see quite different patterns of interaction. Arranging the list by decreasing numbers of likes, the top is dominated by the first type (simple jokes) and the bottom by the second type (informational content). Alternatively, arranging the list by average number of words per comment puts the third type (criticism) at the top and jokes at the bottom. Finally, arranging by number of tags yields a third combination, with jokes at the top and criticisms at the bottom. These are all summarised in Figure 1.

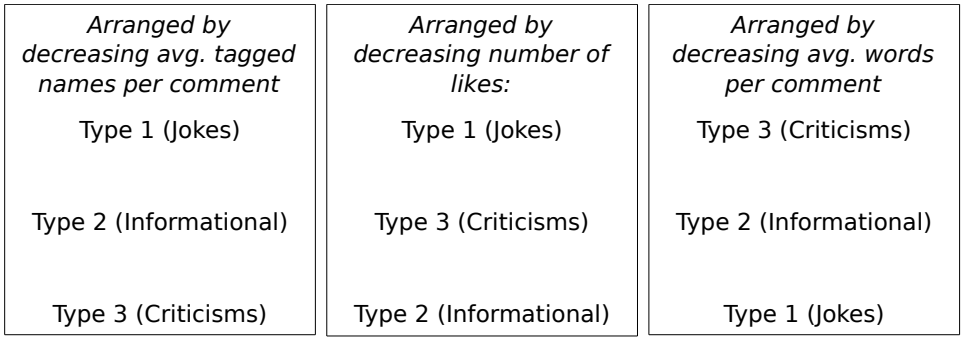

Figure 1. Different types of humorous content arranged by different forms of Facebook engagement.

The relevance of this for science communication is that the different tools available to users — liking, tagging, sharing, and commenting — can all be related to different forms of engagement. The observation that humorous posts achieve more likes might support Elise Andrew's earlier claim that humour builds larger audiences for science communication. However anyone who fears these audiences may be experiencing trivial encounters rather than real learning experiences may wish to investigate whether posts with informational content continually achieve less numerical success in likes and shares (and therefore less visibility) than straightforward jokes. Those interested in engagement with science as a form of identity construction [for example Fraser and Ward, 2009] may investigate the possibility of a Facebook 'like' being used as a public demonstration of self-identification with a topic, or investigate the importance of tagging particular people. And those interested in the role of dialogue in engagement [Lock, 2011] may wish to investigate the role of comments threads — does humour help create an informal and more welcoming space for discussion, or (as might be suggested by the above patterns) is humour more effective as a tool for solidifying boundaries between in- and out-groups?

Clearly none of these questions can be conclusively answered solely by counting numbers of likes or lengths of comments. Engagement such as reading a post and discussing it extensively offline would leave very few marks on Facebook; the

[14] https://www.facebook.com/IFeakingLoveScience/posts/1065681766786167; https://www.facebook.com/IFeakingLoveScience/posts/1064832796871064. Pages accessed 11/03/2016.

longest comment in my dataset is someone reciting pi to a large number of decimal places, which I doubt many would regard as in-depth engagement. The point is that technical infrastructure is not only a context underlying conversational data, but can provide useful data in its own right — allowing us to approach questions around different effects of humour, and indeed the differing receptions of other kinds of messages, on extremely large scales.

Conclusion

In this commentary I have considered the relationship between technical infrastructure and the use of humour in science-centred forums. Both the examples of reddit and Facebook corroborate the idea that humour plays a powerful role in the reception of a message [Riesch, 2015].

However, I would also suggest a greater attention to the "communicative context" [Secord, 2004] of a joke. Looking at the stand-up routines studied by Pinto, Marçal and Vaz [2015] I note a tendency towards using stereotype-based humour, often drawing on the performers' own background; by contrast, the examples in Heard's [2014] examination of humour in professional papers are notable for their brevity. To what extent do these styles of joke arise from the existing tradition of stereotype humour and self-deprecation within stand-up comedy and the word limits of academic articles? So while agreeing with Riesch [2015] that we need to understand "the wider social functions and effects of humour about science", I also suggest we must consider how these functions and effects derive from medium as much as from humour. As I hope I have shown above, online media provide an embarrassment of riches both for relating questions of information flow to questions of enjoyment, while simultaneously relating context to message and vice-versa.

To conclude, I want to extend this idea to suggest why the concerns of this commentary go beyond the familiar idea, due to Marshall MacLuhan, that "the medium is the message". As noted by Marres and Gerlitz [2016] there are important questions around how current scholarship imports offline methods into online studies, and to what extent we must develop research tools specific to digital settings. The rise of 'big data' and the growing prevalence of black-boxed research tools requires some computing expertise in order to understand and critique processes of data collection [Boyd and Crawford, 2012]; and as new forms and uses of digital media continue to diversify, scholars will need to engage with an increasing plethora of such technical considerations. Science communication scholars may need to develop closer collaborations with sources of technical expertise in digital environments, for example the Digital Research Methods Initiative.[15] But equally, science communication scholars can also act as sources of expertise around how audiences derive enjoyment, intrigue, and fear from encounters with unfamiliar technology. My central suggestion is that, in the online world, the somewhat abstract ideas of emotion and information are crucially related to quite mundane technical details of clicking buttons and arranging lists — and both can only be fully understood in the light of the other. As in the old joke 'there are only 10 kinds of people in the world; those who understand binary and those who don't', the connection between amusement and algorithm may be stronger than one might expect.

[15] https://www.digitalmethods.net/Digitalmethods/WebHome (accessed 21/12/2015).

Note added

As of February 2016, Facebook has broadened the like function on posts into a series of six reactions: 'like', 'love', 'haha', 'angry', 'sad', and 'wow'. At this early stage it is hard to analyse the effects of this change, as the familiar 'like' is still by far the most popular option and problems of distinguishing different uses of the reactions remain (in particular, the ironic use of 'wow'). However, there at least two questions worth future consideration vis-à-vis the issues outlined in this piece. Firstly, might the negative reactions ('angry' and 'sad') allow negative posts to achieve the sort of attention that humorous posts achieve through 'likes' — or perhaps a different sort of attention, if different groups of users start distinguishing between posts with different reactions? Secondly, what effect might the fact that comments can still only get a 'like' reaction have on distinctions between posts and comments — for instance, might more users post to the IFLScience wall instead of comments threads in the hope of attracting a certain kind of reaction?

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