Digital Rhetoric in Collaborative Knowledge-Making

Reading Answers and Super-Answers to Existential Questions on Quora

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Abstract. We examine the ways in which answers formulated in the Q&A community Quora are aggregated in a collaborative, computer-mediated body of knowledge. Readers' experiences are shaped by the answer ranking algorithm, a central rhetorical device on Quora. Answer visibility on page is strongly dependent on the number of upvotes, but also on recency and author popularity. Upvotes depend to some extent on wordcount, followers, and use of visual representations, but not on answer's age. This indicates that readers engage with Quora as a body of stratified information, rather than pursuing unlimited diversity of perspectives: engagement seems to be limited to the top answers, which represent, for practical purposes, Quora's persuasive statements.

Keywords: Quora, experiential knowledge, computer supported collaborative knowledge, answer ranking.

1 Introduction

Quora is a Q&A platform that aims to crowdsource experiential knowledge and use the power of social networks in order to provide meaningful answers to a wide variety of questions (Paul, Hong, & Chi, 2012; Wang, Gill, Mohanlal, Zheng, & Zhao, 2013). We look into a specific field of inquiry, examining six questions about "what does it feel like" to have different psychological conditions: depression, schizophrenia, ADHD, bipolar disorder, and OCD. We aim to understand the formulation and aggregation of knowledge on Quora: how do readers encounter this computer mediated, collaborative knowledge? To this purpose, we examine answer popularity and visibility, focusing on the 'super-answers' which stand out through intense reader reactions, in terms of votes and comments.

Quora readers who may want to find out about what does it feel like to have schizophrenia, for example, may reach this topic through the search bar. Once they find the question and click / touch on it, their reading experience will depend on whether

they are on a desktop or on a mobile device. The mobile app will only display the first answer, and the user has to click a second time on the question to read all answers. Desktop users will see all answers at their first click on the question. By default, answers are ranked through Quora's 'Magic' algorithm. Users have the option to sort answers according to the number of readers' votes or recency (Fig. 1).

Authors may post answers as anonymous, or under their signature – situation in which readers can click on their name to see their profile, which includes the number of followers, of people that they follow, and other metrics of their activity on Quora, as well as a list of recent activities.

Fig. 1. Reading Quora

The ranking algorithm influences significantly readers' experiences on Quora, especially for questions with large numbers of answers. Many readers will stop after a few answers – or, on mobile devices, maybe after the first one – although reading strategies are diverse, as told by contributors themselves in various places on Quora (Quora Collaborators, 2012). The ranking algorithm is not published, but Quora engineers have clarified some of its principles (Quora Collaborators, 2013), mainly stating that ranking takes into account votes in relation to the number of views the answer has received, and does not take into account recency. In this analysis we attempt to infer some properties of the ranking algorithm, through correlational analysis, and to discuss its consequences for readers' learning experience.

The distribution of upvotes for answers is strongly skewed, as illustrated in Table 1 and Figure 1.

Table 1. Overview of questions and answers included in analysis

What does it feel like [to have] …	No. of answers	Comments		Upvotes			Date of first published answer [by/mm/did]
		Avg.	Max.	Avg.	Median	Max	
…depression?	87	0.8	21	17	4	393	11/02/01
… ADHD?	52	1.6	12	20	8	200	11/04/26
… schizophrenia?	43	1.9	27	24	4	548	11/02/13
… bipolar disorder?	28	1.3	6	15	6	120	11/02/15
… OCD?	21	0.9	11	16	4.5	119	10/08/02
… to be depressed?	17	0.6	4	12	3	108	14/01/01
Total sample	**248**						

For the questions that we included in analysis, we observe that answers with 30 votes or more are relatively rare (Figure 2). Still, some answers receive more than 500 votes (our maximum is 548) even when posted anonymously. The number of votes correlates strongly with the number of comments, although comments are much lower in absolute numbers (see Table 1). The low number of comments indicates that reading and voting are the dominant forms of readers' engagement with knowledge on Quora. Commenting is rare, as well as assembling answer wikis.
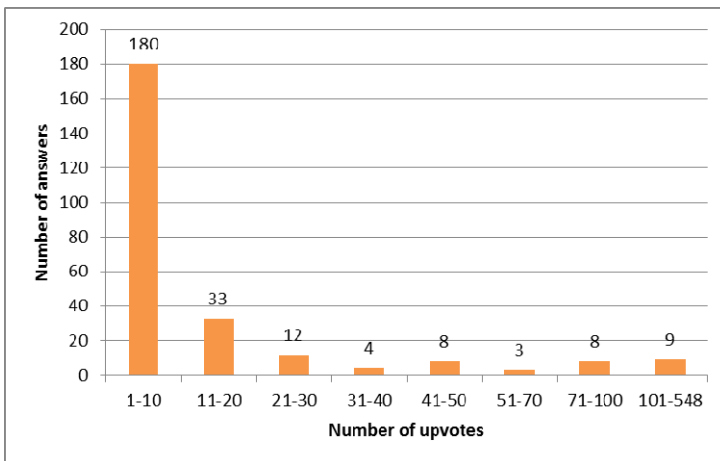

Fig. 2. Distribution of upvotes for answers about psychological conditions

There is a strong relationship between the rank on page (1st, 2nd answer etc.) and the number of upvotes of a given answer (Figure 3). The relationship is not linear, and it can be best estimated by an inverse function. We have thus used *visibility*, computed as *1 / Rank*, as our main dependent variable.
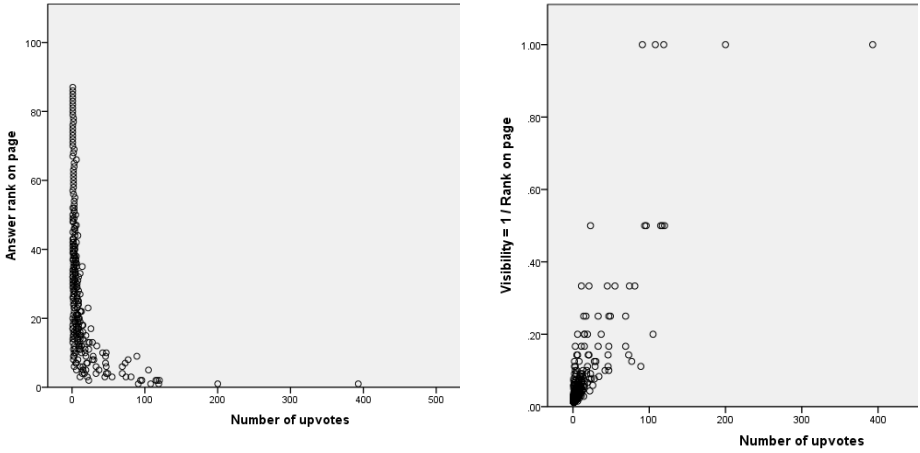
Fig. 3. Relationship between rank on page and number of upvotes or visibility (scatterplot)
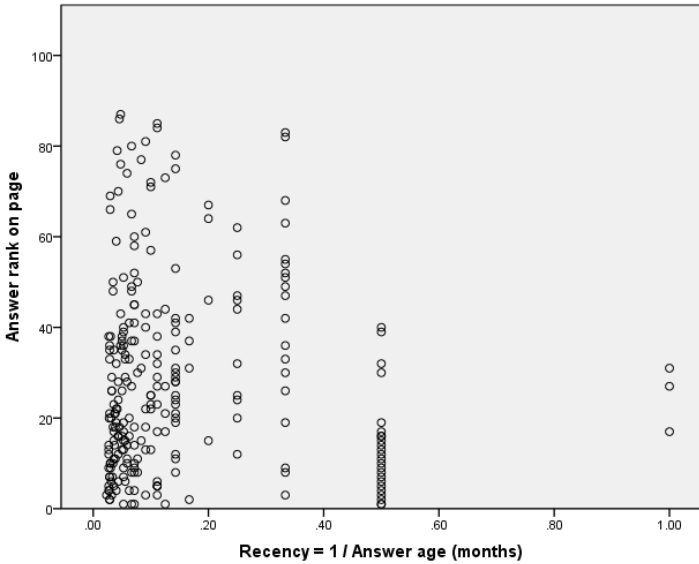

Fig. 4. Relationship between rank on page and answer recency (scatterplot)

Figure 4 indicates that there is a certain relationship between the answer age (measured as number of months since posting) and answer rank. Again, this is not a linear relationship – as illustrated in Figure 4, that plots answer rank against *recency*, measured as *1 / number of months*. A threshold is at a recency of 0.5 – that is, after 2 months of age the spectrum of ranks increases visibly. In our multivariate analysis we used a *binary measure of recency*, distinguishing answers of 2 months and less from those of 3 months and more.

Authors' popularity, as measured by their number of followers, also has a skewed distribution. Visibility on page is related to the number of followers, with the vast majority of answers grouped in the low visibility, low popularity corner.

A multivariate analysis of visibility on page indicates that the number of upvotes is the strongest predictor of answers' position on page, followed by recency and the number of authors' followers (even when controlling for upvotes). There is no penalty for anonymous answers (Table 2). These variables explain almost 70% of variability in answer visibility.

It is important to notice that *upvotes also depend on ranking*, since top answers have more opportunities to be read and to be experienced as novel information. After reading a few answers, users may stop reading altogether, or they can find some of the others redundant and thus may not upvote them. Therefore, ranking and upvotes are related bidirectionally.

Table 2. Visibility as linear function of upvotes, recency, followers, and anonymity

Visibility (defined as 1 / Rank on page) as linear function of…	Bivariate correlations		Multiple regression	
	Pearson correlation	Sig.	Standardized coeff. Beta	Sig.
Number of upvotes	0.790	0.000	0.761	0.000
The answer is recent (2 months or less) (1=yes, 0=no)	0.174	0.006	0.200	0.000
Number of author followers (Anonymous = 0 followers)	0.310	0.151	0.199	0.000
Answerer is anonymous (1=yes, 0=no)	-0.062	0.320	-0.066	0.070
			Listwise N=247 Adj.R Square = 0.693	

Given that visibility and upvotes are so tightly bound, how do answers acquire upvotes? The answer is far less clear, through quantitative lenses, since, unlike page visibility, the number of upvotes reflects human readers' preferences rather than a computer algorithm (Table 3).

Table 3. Number of upvotes as a function of recency, author and answer features

Number of upvotes as a linear function of…	Bivariate correlations		Multiple regression	
	Pearson correlation	Sig.	Pearson correlation	Sig.
Number of months since the answer was updated (at 01.03.14)	0.076	0.232	0.064	0.311
Recency = 1 / Answer age (months)	-0.070	0.269	N/A	N/A
The answer is recent (2 months or less) (1=yes, 0=no)	-0.031	0.627	N/A	N/A
Answerer is anonymous	0.075	0.235	N/A	N/A
Number of author followers (Anonymous = 0 followers)	0.151[*]	0.015	0.132[*]	0.038
Wordcount	0.209[**]	0.001	0.183[**]	0.004
Answer includes pictures or illustrations	0.145[*]	0.020	0.143[*]	0.024
Answer includes links to external documents	0.011	0.255	-0.018	0.776
			Listwise N= 246 Adj.R Square = 0.064	

We do find out, though, that upvotes do not accumulate significantly in time: recency is not associated with votes, no matter how we measure it. Votes depend somehow on the number of followers and wordcount (the higher the better), and also on using pictures or illustrations. Still, these variables only account for 6% of variability in upvotes (Table 3).

2   Conclusions

The fact that upvotes do not increase, on average, with time indicates that answers that lag in the lower regions of the question page will only be read by the most curious or dedicated readers. This also decreases their opportunity to receive upvotes. The typical reader engages with top answers – even more so on mobile devices, where the Quora app privileges the very first answer. Page ranking is strongly linked to the number of upvotes (in a bidirectional relationship, most likely), but also, to some extent, it favors recent answers (up to around 2 months) and popular authors. Popularity also influences upvotes, thus also having a mediated effect on ranking.

Given the strong coupling between answer visibility and votes, and evidence for readers' typical engagement with top answers only, we can conclude that the digital rhetoric on Quora produces a body of stratified knowledge, in which persuasion is clearly differentiated while scrolling down the page.

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