BELIEVING THE INTERNET: USER COMMENTS ABOUT VACCINE SAFETY

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Introduction

There is a popular perception that because of the Internet, misinformation spreads faster and farther than ever, presumably because information can be created, shared and accessed so easily that anyone can make or find support for anything they wish to believe (Keen, 2006). Somewhat contradictorily, the abundance of information on the Internet might also make it easier than ever to verify information (Floridi, 1996), while at the same time leading to echo chambers where Internet users encounter only information that confirms their beliefs (Sunstein, 2007).

Yet regardless of how much misinformation is created or how quickly it spreads, it does not misinform unless someone believes it. Indeed, in light of concerns about the social construction of knowledge, what constitutes misinformation is often determined by who believes it (Stahl, 2006). This suggests that the actual concern about misinformation in the digital age is a concern about how individual Internet users decide what to believe.

To explore this, this study investigates debates on the Internet about vaccine safety. The focus of the study has not been to determine the correctness or incorrectness of any particular belief, but rather to understand what people believe about vaccine safety, how and why they believe it, and the relationship between the Internet and those beliefs.

Methodology

Internet content was collected using Google searches for "vaccine safety" and "vaccines autism" and a supplemental snowball sample of relevant links found within the original search results. This collection approach attempted to approximate the search behavior of a typical Internet user researching the subject. The collected content totaled more than 1500 PDF pages, including formal websites of health organizations and advocacy organizations, blog entries, and news articles, as well as a significant corpus of user comments.

A content analysis of the collected material was coded in three rounds by the author. The first round highlighted passages that demonstrated either a belief about vaccine safety or evidence cited. During this preliminary round, two patterns emerged: 1) recurring categories of beliefs held, and 2) recurring categories of evidence used to justify beliefs. A second round of coding marked the data according to those recurring categories (detailed below), while also refining and expanding the category system. So, for example, if a passage articulated a belief that vaccine ingredients were toxic because of the number of shots given, it would be categorized as containing beliefs about toxicity and beliefs about the cumulative effects of vaccines. If the passage then related an anecdote about the commenter's child, it would be categorized as using personal experience to justify the beliefs.

A third round of coding confirmed the accuracy of the second round while identifying particularly illustrative quotations in the data.

The most interesting and illuminating data was found in the comments posted by readers in response to articles. Here, beliefs about vaccine safety are articulated and defended. This study makes the assumption that the evidence people use to justify their beliefs in a debate on the Internet is the same evidence that they themselves find compelling.

Findings

The most prevalent beliefs were about vaccine toxicity, the cumulative effects of vaccines, the integrity of vaccine research, the premise of immunization, civil liberties and civic responsibility. The most common justifications for those beliefs were risk-benefit negotiations, attributions to reason, references to personal and emotional experiences, and evaluations of authority.

Discussion

At the core of all evaluations of vaccine safety is a comparison of risks and benefits, as in the following quotation from the data:

> "One person out of a thousand died from an outbreak of measles? Those odds are a lot better than putting every kid at risk for autism."

To the extent that the Internet may play some role in such negotiations, we may presume that people researching vaccine safety would seek information regarding the degree of the respective risks. It is therefore notable that anti-vaccination websites have been found by other researchers to increase the perceived risks of vaccinating and decrease the perceived risk of not vaccinating (Betsch et al., 2012) and that such websites were over-represented in search results, especially when using generic search terms (Downs, de Bruin & Fischhoff, 2008). Hence the Internet may influence the core evaluation at the heart of vaccine safety.

This is underscored in the collected data by the exaltation of reason, on both sides of the debate, as an essential tool for evaluation that is presumed to reveal the "correct"

conclusion. The data provide some evidence of motivated reasoning, i.e. believers' tendency to evaluate information in a way that confirms what they already believe (Hart et al., 2009) and to resist correction (Nyhan & Reifler, 2010). Such behavior would account for the Internet's echo chamber effects, since confirmatory evidence may be easier to find than ever, and the easily-found refutation may never be sought. The data suggest this behavior spans the entire spectrum of vaccine beliefs.

Long-established psychology research has identified emotion as a principal motivator of reasoning (Haidt, 2001) and particularly of risk evaluation (Slovic, Finucane, Peters & MacGregor, 2004). Importantly, emotional, personal experiences are exceedingly common in the data:

> "Within 2 days [of the vaccine] our very content, happy little boy changed. He started screaming, bashing his head against the wall, hitting himself, biting me, kicking me and the list goes on."

Because the Internet's participatory tools enable user-generated content, the Internet increases access to and prominence of personal testimonials and emotional appeals (Betsch et al., 2012; Witteman & Zikmund-Fisher, 2012). The prevalence of this kind of data may enhance its influence, especially to those inclined to find the testimony of parents more trustworthy than official, traditional sources.

Indeed, a contrast between personal authority and medical authority dominates vaccine safety discourse on the Internet:

> "Strange how doctors' treatment of our children is driven by parental input of data — yet that empirical evidence gets reflexively downgraded to anecdotal if one reports vaccine adverse reactions."

Of course, the Internet's magnification of individual contribution and redefinition of expertise (Keen, 2006) both play directly into this conflict between established knowledge hierarchies and personal knowledge networks. In particular, the anti-establishment voice of vaccine-negative beliefs, elsewhere pushed to the fringe of mainstream discourse, easily finds its venue and community on the Internet (Witteman & Zikmund-Fisher, 2012). This may even exaggerate the appearance of consensus, as when a parent suspecting his or her child has been vaccine damaged finds corroborating anecdotes on the Internet.

Furthermore, since authority on many parts of the Internet is not established through traditional markers (Rieh, 2002), each person making a factual claim must establish his or her authority independently. Because of the ease of hyperlinking, the Internet provides the unique ability not only to refer to a source, but to provide it directly to someone else, therefore enabling a user to establish authority with a mere cut and paste, and to verify authority with a click. Internet research is so easy, in fact, that it seems to raise the expectation of evidence required on the web:

"Free-thinking mothers who do their own research are not fooled by this pathetic propaganda [sic], and to expect us to robotically accept these flat-out lies mixed with twisted "truths" is nothing short of an insult to our intelligence."

Here and in numerous similar quotes in the data, the Internet is seen as a platform for the discovery of previously unavailable truths, and for the airing of antiestablishment positions, where repressed testimony is at last being heard. For Internet users displeased with traditional sources of authority, the Internet's enabling of one's "own research" implies a truth now unobscured because of the Internet, there to be discovered as self-evident once one makes the effort to look.

Whether or not the Internet actually enables new breadth of evidence evaluation, Internet users in comments sections perceive that it enables it. Notably, while the Internet may mediate the experience of risk, reason, emotion and authority, it does so as one component of a holistic information environment with social and psychological influences, a complex digital imaginary often overlooked by technologically deterministic claims that the Internet is uniquely likely to misinform.

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