

The Coaxing Architecture of Reddit's r/science: Adopting *Ethos*-Assessment Heuristics to Evaluate Science Experts on the Internet

Devon Moriarty^{a*} and Ashley Rose Mehlenbacher^a

^a*English Language and Literature, University of Waterloo, Waterloo, Canada*

Author & Corresponding Author:

Devon Moriarty
Department of English Language & Literature
University of Waterloo
Waterloo, ON, Canada, N2L 3G1

email: devon.moriarty@uwaterloo.ca
phone: +1 519 404 8439
ORCID: 0000-0001-5840-6466
Twitter: @devmoriarty
LinkedIn: www.linkedin.com/in/devonmoriarty
Website: www.devonmoriarty.com

Author:

Ashley Rose Mehlenbacher
Department of English Language & Literature
University of Waterloo
Waterloo, ON, Canada, N2L 3G1

email: ashley.mehlenbacher@uwaterloo.ca
phone: +1 519 888 4567 x39135
ORCID: 0000-0003-3471-9008
Twitter: @watscicomm
LinkedIn: www.linkedin.com/in/ashleyrosemehlenbacher/
Website: <https://uwaterloo.ca/scholar/arkelly>

Devon Moriarty is a Ph.D. Candidate in the Department of English Language and Literature at the University of Waterloo. Her research examines political and science communication within online social-voting communities like Reddit.

Ashley Rose Mehlenbacher is an Assistant Professor in the Department of English Language and Literature at the University of Waterloo. She is the author of *Science Communication Online: Engaging Experts and Publics on the Internet* (Ohio State University Press, 2019) and the co-editor of *Emerging Genres in New Media Environments* (Palgrave, 2017).

Acknowledgements

This line is in appreciation of Tim Kenyon whose guidance was largely the catalyst for this work.

We would also like to thank the anonymous reviewers for their critical insights on earlier drafts of the manuscript.

Funding Details

This work was supported by the Social Science and Humanities Research Council of Canada under the Insight Grant program and the Talent program; Ontario Ministry of Research, Innovation and Science under the Early Researcher Award program.

The Coaxing Architecture of Reddit's r/science: Adopting *Ethos*-Assessment Heuristics to Evaluate Science Experts on the Internet

Concerned with how individuals assess scientific experts on the Internet, our research investigates the virtual r/science subreddit and their popular Ask-Me-Anything (AMA) series, where scientists engage with an audience for a question-and-answer forum focused on their research. We attend primarily to the Reddit architecture and social norms, examining their role in mediating *ethos* - that is, the scientist's performance of expertise. We argue that r/science AMAs promote the adoption of simple *ethos*-assessment heuristics that enable participants, with little cognitive investment, to presume the trustworthiness and credibility of participating scientists and therefore defer to their expertise.

Keywords: cognitive heuristics; expertise; *ethos*; rhetoric of science

Introduction

A functioning contemporary democracy is dependent upon expertise to support decision-making and policy-creation (Hartelius 2011b, 211; Holst and Molander 2017, 235). Scholars in various fields of science studies consider who is an expert, what makes an expert, how do non-experts assess the competence of experts, and, relatedly, when do individuals defer to the expertise of another (see, for instance, Collins [2014]; Fuller [2017]; Fuller and Collier [2004]; Jasanoff [2011]; Lyne & Howe [1990]; Maasen & Weingart [2005]). Scientific experts in particular, play a crucial role in contemporary culture as scientific research informs nearly every aspect of society, from public health and safety to economic prosperity. In this article we contribute to this area of inquiry by investigating how one assesses the *ethos* of a single scientist and, by extension, the research that they share with a broader public audience. We examine in particular how a single scientist might craft their credibility online with respect to what we call architectural affordances of a media. Put another way, we explore how the context for the scientist's communications online shape their reception. Understanding how *ethos* is established for individual scientists when they communicate with broader publics through online platforms is

important to understand as we increasingly see scientists taking to the web to share their research or advocate for science.

In this article, we examine an exemplary case of expert-public science communication online, namely the popular website Reddit.com's science subreddit, officially titled 'The New Reddit Journal of Science,' and more commonly referred to as 'r/science,' as a case study of how individual scientists work to establish credibility. Reddit's r/science offers novel opportunities for scientists to access a pre-established science community and for Internet-users to engage directly with scientists and their scientific research through the Ask-Me-Anything (AMA) series. The r/science AMA series is comprised of question-and-answer discussion forums where scientists introduce their research, and field questions from a participating public audience comprised of reddit-users (hereafter referred to as 'redditors'). The Reddit platform also invites the assessment of experts, coaxing many audiences to use different means of evaluating the expertise of a scientist through a systematic assessment of their *ethos*. The moderating screening processes, assignment of flair, use of hyperlinks, adherence to discursive norms, voting affordances and associated ranking algorithms, post points, and karma scores are all dependent on multiple participants feeding information into the Reddit architecture which then coaxes redditors to adopt *ethos*-assessment heuristics based largely on aggregate information. A scientist's *ethos*, as it operates in r/science, draws on an incredibly sophisticated and complex network of information and interactions but represents these complexities with simplistic numerical and visual signals of *ethotic* qualities including credibility, reputation, and trustworthiness, that allow redditors to use shortcuts to validate both epistemic and social trust, thereby reducing effortful evaluation of a scientists' expertise by any one redditor. Reliance on these *ethos*-assessment heuristics makes it easy for redditors to make snap-judgements about

whether a participating scientist is an expert, enabling them to instead invest their cognitive resources into comprehending the scientific discussions and arguments found in the AMA. Additionally, as we move further into the Reputation Age, intellectual deference becomes a fundamental mechanism for acquiring new beliefs, and since *ethos* is arguably the most powerful means of acquiring epistemologically sound justification for beliefs, efficient and effective *ethos*-assessment heuristics become a profitable and reliable way to determine if someone is a scientific expert worthy of epistemic deference.

In this article, we ask: how are *ethos*-assessment heuristics built into Reddit's architectural affordances, and how are these heuristics employed by redditors, and more specifically, the r/science moderators and public audience? Such heuristics, we argue, compress complex information about expertise into simple cues that allow redditors to quickly make sophisticated assessments about whether they are a recognized expert within the domain of Reddit. We first begin with a discussion of *ethos* and its relationship with expertise, then give consideration to cognitive heuristics¹ in the so-called 'reputation-age' made possible by the Internet. We then describe r/science before examining how this subreddit encourages different Reddit audiences utilize different *ethos*-assessment heuristics that make use of Reddit-specific affordances and actions.

Literature Review of *Ethos*, Expertise, and Associated Characteristics

We begin with the premise that how one *conveys* their expertise is rhetorically constructed (Lyne and Howe 1990). Such constructions can be understood through the rhetorical concept of *ethos*, which provides a helpful framework for analyzing expertise because, as Miller notes, 'reliance

¹ All heuristics are cognitive, and thus 'cognitive heuristics' is often simplified to 'heuristics'; in the cognitive science literature these terms are interchangeable and refer to the same concept (Metzger et al., 2010, 436).

on expertise is an argument from authority, and thus, in rhetorical terms, a signal that *ethos* is an important mode of appeal' (2003, 168). Aristotle's *Rhetoric* provides a useful way into thinking about questions of expertise, and the characteristics that it is aligned with (including credibility, reputation, and trust) through a tripartite theory of proofs that demands that a speaker appeal to *logos* (sound reasoning), *ethos* (character), and *pathos* (emotions) in order to persuade an audience. In this tradition, *ethos* refers to the ethical character of a speaker that makes us think of her, and by extension the content of her speech, as credible, and is devised of three components: practical wisdom or intelligence from experience (*phronesis*), strong moral character and trustworthiness (*arête*), and goodwill towards the audience (*eunoia*) (2007, 112). A rhetorical perspective on the complex concept of expertise is not limited to *ethos*, as even Aristotle recognized that one must use inartistic proofs (evidence that is not created by the rhetor/speaker) alongside other artistic proofs like *pathos* and *logos* to persuade an audience. Inartistic proofs include the technical substance of one's expert knowledge that is not created by an expert in their role as rhetor, and, because publics normally lack the technical knowledge to assess expertise on those grounds, they often rely on other means to determine one's expert status. It is how this role of the expert is performed, and how experts package up and present expert knowledge to persuade publics of their expert status that is our concern here. Aristotle observed that, in the absence of other forms of evidence, the *ethos* that a rhetor invents is the most authoritative form of persuasion (2007, 39). Thus, *ethos* is but one profitable way to investigate the rhetoric of expertise because '[e]xpert knowledge requires expert performance' (Hartelius 2011a 10); or as Collins argues, 'when it comes to professional expertise, it is not what you know but what others think you know that counts' (2014, 45, our emphasis). Hartelius further argues that the 'rhetorical success of expertise is intimately connected to *phronēsis*, *eunoia*, and *aretē*, which

are, in turn, intimately connected to one another; without those *ethos*-grounded qualities, experts cannot function' (2011a, 13). This is to say that those forms of knowledge we might describe as inartistic expert knowledges are important, but normally ineffective without the associated behaviours that allow one to comport them self and then operate as an expert. Although *ethos* is not equivalent to expertise, expertise, and therefore the qualities we associate with experts, do rely upon *ethotic* constructions as experts must navigate in social-discursive realities. Such a claim, echoing Aristotelian thought, is also consistent with theories outside the field of rhetorical studies. Consider John Hardwig's landmark 'The Role of Trust in Knowledge,' where he places a similar emphasis on *ethos* as a default mode of persuasion, arguing that 'trust is often epistemologically even more basic than empirical data or logical arguments: the data and the argument are available only through trust' (Hardwig 1991, 694). Approaches within the rhetoric and philosophy of science continue to examine *ethos* in varying discourse using terms like 'trustworthiness' and 'reputation,' suggesting Aristotle's *ethos* was as relevant to the Athenian *demos* out of which it was borne, as it is to the democratic modernity in which we are situated. This rhetorical framework then, provides a durable and rich means of investigating the construction and function of expert status. Indeed, for contemporary society which is more dependent than ever on specialized knowledge for technological and scientific advancement, deference to expertise, and therefore assessments of *ethos* are the *prima facie* tool for managing the otherwise overwhelming and often uncontextualized flow of information made possible by the Internet.

Two forms of deference to expertise are particularly notable for our concerns here: accredited and recognized. Accredited expertise requires institutional endorsement, say for example, a PhD in marine biology to speak on declining whale populations, while recognized expertise can be

acquired in a variety of ways and is, therefore, more complex (Dentith 2018). Dentith elaborates that ‘when we theorise [about specific claims] in the sciences we are engaging in a process attached to (although not necessarily occurring in) certain scientific institutions’ (2018, 199). While Fuller is pessimistic in his observation that our current epistemic climate is ‘breeding a culture of intellectual deference’ (2017, 577), we recognize that in a world where one cannot become an expert in every field - especially in the technical realm of science - deference is a necessity. As Hardwig, in making an argument for the value of trust and deference in scientific communities states, ‘finite minds can know many things only through epistemic cooperation’ (1991, 707). Unlike Hardwig we are not here concerned with how experts judge other experts when collaborating, but recognizing that even the most brilliant scientist must defer to other scientists is a synecdochal demonstration of the need for members of broader publics to use *ethos* as a filtering mechanism when determining whether to recognize the expert performance, and therefore the expertise of another. With this in mind, we look to how heuristics are used to govern credibility assessments of individuals, particularly when individuals make these assessments on the Internet, with sites that oft persuade them to pay attention to aggregate indicators of *ethos*.

The popular *Rotten Tomatoes* website does well to illustrate how heuristics on the web are deployed in the everyday activity of selecting a film to watch. The site aggregates reviews from both critics and general audience members and gives an approval percentage from each group paired with a graphic that summarizes those reviews, ranging from a tomato splat to indicate a majority of negative reviews to the esteemed ‘certified fresh’ tomato reserved for films with consistently positive reviews. The aggregation and representation of broad swaths of data is key here and is but one of the ways in which users employ heuristics to navigate information in

online environments. Metzger and Flanagin note the challenge of assessing credibility online, saying ‘Internet information consumers likely cope with the perceived costs of information search and overload by using strategies that *minimize* their cognitive effort and time, through the use of *cognitive heuristics*,’ which they understand to be ‘information-processing strategies’ that use ‘mental short cuts’ (2013, 214). Similarly, in discussing heuristics Taraborelli suggests that cognitively efficient epistemic deference by web users relies ‘on simple, effortless and automatic strategies over more costly processes’ (2008, 200). With the necessary adoption of these cognitive heuristics to sort an otherwise overwhelming amount of information, Origi claims that society is making the transition from the Information Age to a ‘Reputation Age’ (2012a, 40). ‘Likes,’ ‘retweets,’ rankings, and ratings have become the new currency of credibility allowing users, the argument follows, to defer to collective intelligence that is more ‘sophisticated and precise than. . . a single expert mind’ (Origi 2012a, 38). We now turn to a case where such markers are used to assess the credibility of scientific experts online by way of heuristics, and more specifically, heuristics that speak to the *ethos* of said experts.

Discussion: Reddit’s r/Science AMAs

Reddit is a social sharing and social voting website, with over 260 million unique visitors each month (‘Reddit Users’ 2018). On the site, all content can be up or down voted, which affects how prominently a link or comment will be featured (see: Ovadia 2015, 37). The site is composed of various topical communities called ‘subreddits,’ which appeal to a wide range of interests (e.g., r/worldnews, r/todayilearned), and among these is the popular r/science, with over

21 million subscribers ('Tracking the top 5,000 subreddits' n.d.).

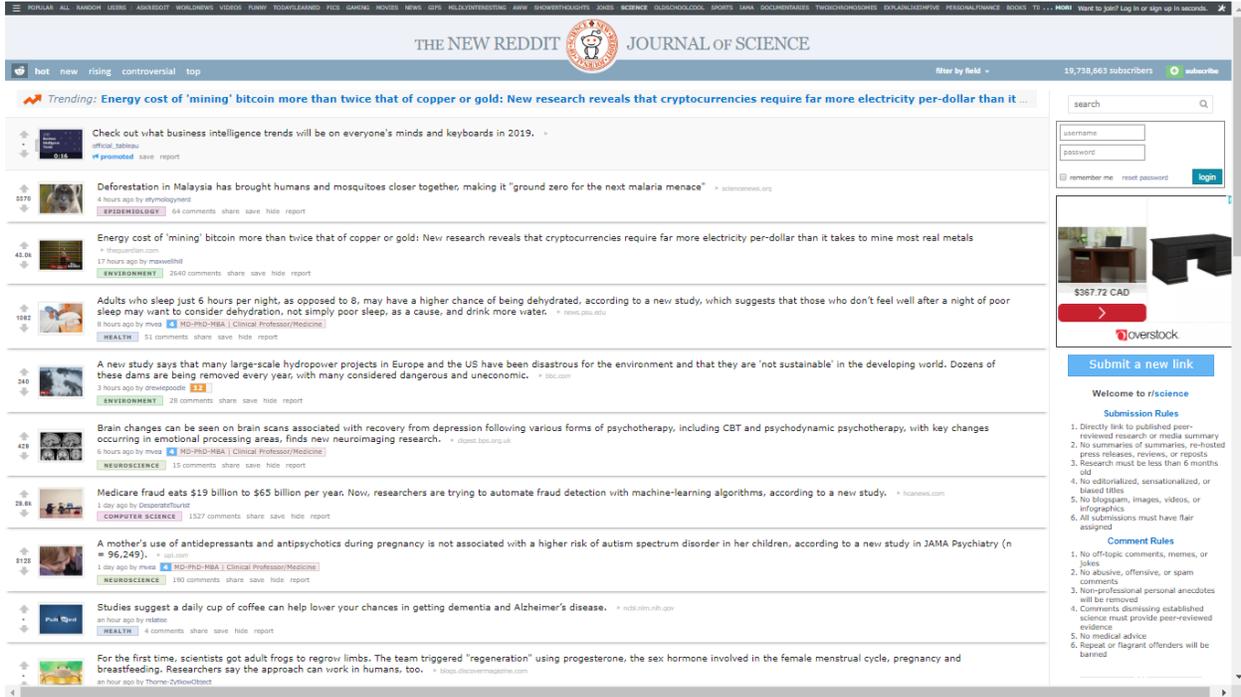


Figure 1

[Figure 1 about here; caption: 'Screen capture of the r/science page, featuring a list of links to science-focused newsworthy items, and also menu items for navigation within the subreddit as well as to other subreddits. Notable features also include the subreddit title *The New Reddit Journal of Science*, and also tags indicating different disciplinary foci and flair indicating verified disciplinary expertise.']

Users of r/science share stories about science (see Figure 1), ask questions, and, until recently, were able to directly interact with working scientists through a popular 'Ask Me Anything'

(AMA) question-and-answer forum.² Reddit's goal in hosting the r/science AMAs is to 'encourage discussion and facilitate outreach while helping to bridge the gap between practicing scientists and the general public' ('Science AMA Series' n.d.), and has become a popular forum for the public engagement with science experts that relies on participatory audience engagement through comment contributions and voting³. AMAs have attracted hosts such as the late physicist Stephen Hawking and geneticist Francis Collins, and have consistently recruited established scholars willing to host AMAs to discuss their research⁴; during its peak, the science subreddit 'was hosting an AMA almost daily, with the most popular posts gaining tens of thousands of upvotes' (Tracy 2018). Indeed, participation by established researchers carries its own suasive *ethos* through what Origgi terms the 'leaking of reputation' (Origgi 2012b, 410). Scientists hosting AMAs benefit from the leaky *ethos* of all those scientists who come before them. Scientists participation, paired with a highly engaged audience that actively participates in these public forums, makes these AMAs one of Reddit's more noteworthy achievements. The AMA series is an attractive forum for scientists to share their research because it taps into the largest pre-existing science community on the web (Tracy 2018) while the moderation team addresses scientist's worries regarding conversations derailing or messaging getting lost by moderating the AMA (Jones et al. 2019, 9). Thus, r/science presents a unique opportunity for scholars to attend

² Regrettably, the r/science AMA series was cancelled in May 2018, largely, it is contended, due to changes in ranking algorithms and the prohibition of post manipulation by moderators that resulted in 'AMA visibility drop[ping] off a cliff' (nallen 2018). 'How Reddit killed one of its most popular AMAs' documents the public disagreement between Reddit CEO Steve Huffman and head moderator for r/science, Nathan Allen, and the decision to cancel the AMA series. Both, however, express hope that the r/science AMAs will return (Tracy 2018).

³ Notable is that r/science itself does not typically employ the 'dialogue model' that emphasizes 'bidirectional communication between [. . .] active scientists producing research, and a lay public engaging with information about that research' except for in the form of the AMA series (Jones et al., 2019, 9). Indeed, r/science is not simply a 'lay audience,' but a diverse public comprised of credentialed and uncredentialed science experts alongside enthusiasts and non-experts. Users of r/science may apply for 'verified flair' which means one has to prove to r/science moderators that they are an expert in their scientific area, and redditors with verified flair are asked 'to limit their conversations mostly to their areas of expertise' (Jones et al. 2019, 9).

⁴ Another testament to the success of this series is r/science's partnership with the Public Library of Science to host an AMA weekly titled 'PLOS Science Wednesday,' featuring PLOS authors (see: 'Complete Schedule and Archive of PLOS /R/Science AMAs.')

to the actors and agents that are operating in these AMAs to consider what kind of cognitive heuristics redditor's are being coaxed into adopting to assess the expertise of scientists on the Internet.

The 'Science AMA Series Submission Guide' (n.d.) details the steps involved in the execution of an r/science AMA, and gives an overview of the application, scheduling, and execution processes involved in an AMA. The guide explains the application process that involves scientist's meeting particular eligibility criteria and being reviewed by moderators. It also describes what successful AMA applicants (now, the OP) can expect, describing how the moderation team schedules and promotes the event, specifying when redditors can pose questions, and explaining that during the actual AMA itself, the OP can answer questions for as long as they'd like (although the guide recommends 'roughly two hours' [3]).

The Reddit platform, r/science, and AMA vetting processes lend the host considerable credibility. Halloran (1982) suggests that *ethos* may have a collective meaning if applied to a group or culture (62), and r/science's scholar-esque official name, *The New Reddit Journal of Science*, (see Figure 1) borrows the form of traditional academic journal titles to suggest that the subreddit imparts credibility as do scholarly journals. Additionally, in their discussion of the 'reputation heuristic,' Metzger and Flanagin observe that 'when choosing between sources, people are likely to believe a source whose name they recognize as more credible compared to an unfamiliar source, even with little inspection of the actual content of the site or source credentials' (2013, 214). For those, then, familiar with Reddit as a whole, the subreddit serves as an already familiar community, a community in which AMA hosts are participating. While the title of the subreddit imitates the linguistic form of a familiar academic journal, the 'Science AMA Series Submission Guide' further corroborates the perception of r/science as an academic

forum by stating that the ‘community exists as a place on the internet for the discussion of recently published peer reviewed literature’ (n.d., 1). With the gesture to peer review, it is implied that the r/science community adheres to gatekeeping mechanisms by which individuals can partially assess credibility through a framework established within scientific communities. In the case of r/science, the gatekeeping functions by allowing participation only after an OP has published in a peer-reviewed journal; this requirement signals that their work has been vetted by their respective expert communities, further integrating the r/science community with broader scientific communities. This is a clear appeal to *phronesis* (practical wisdom), which ‘is the dimension of *ethos* that comprises the rhetor’s knowledge’ (Hartelius 2011a, 12), although it is a distinct form of knowledge from scientific or technical knowledge of a subject. In simply being allowed to host an AMA, r/science signals that an expert has been vetted by the Reddit moderators, which implicitly means that the host has experience publishing scientific research, and has therefore been deemed an expert within their own scientific communities. Because science is an ‘epistemic system’ that ‘houses social practices, procedures, institutions, and/or patterns of interpersonal influence that affect the epistemic outcomes of its members’ (Goldman 2011, 13), the rigor with which positive epistemic outcomes are sought and credibility granted to science as a discipline because of this rigor, leaks to r/science as it adopts canonized markers of scientific credibility as AMA host screening criterion. In this sense, r/science borrows credibility by emulating discursive and epistemic practices in science and thus creates a *phronetic* threshold for participation.

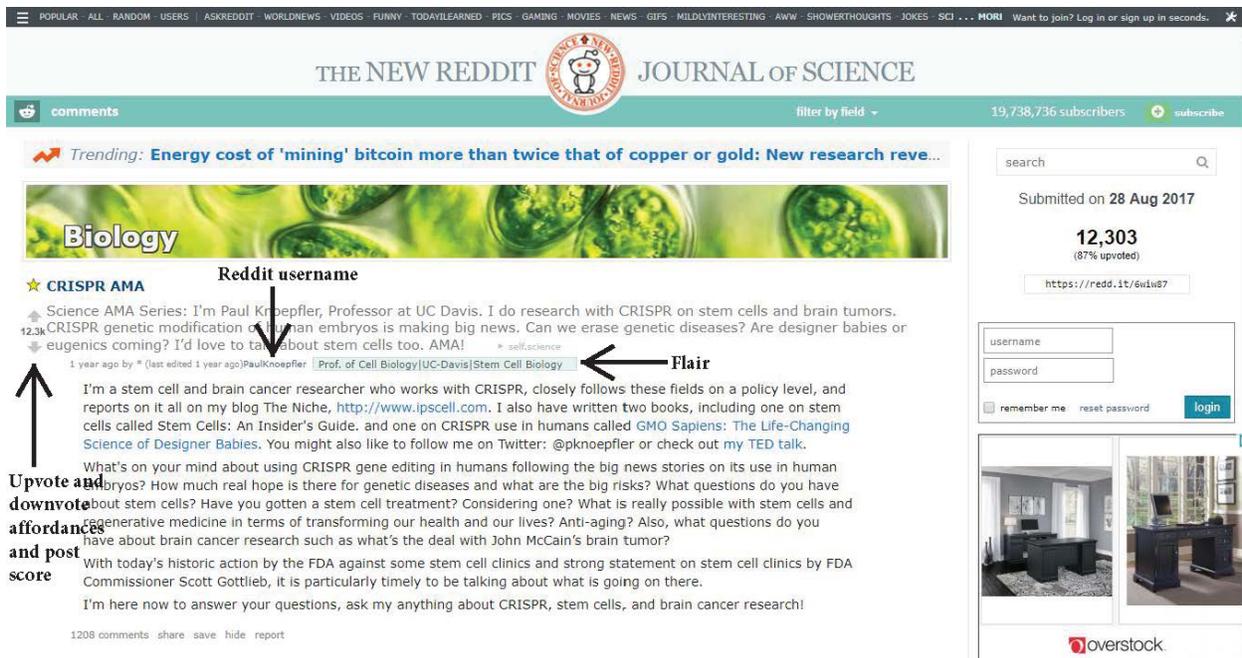


Figure 2

[Figure 2 about here; caption: ‘A screen capture of an example AMA from the r/science subreddit, indicating features to up and down vote, mark flair, and note the user’s name.’]

Moderators continue to have a hand in the construction of expertise via *ethoic* invention for the OP (Original Poster) after they are determined to be eligible to host an AMA by assigning colourful ‘flair,’ which signals expertise to the subreddit readership (this flair is a small banded seal that appears beside OP’s username, e.g., ‘NASA Official Account,’ or ‘Evolution Researchers | Harvard University’) (See Figure 2). Flair acts as a direct appeal to *arête* (trustworthiness) by embedding the OP in a network of associations crafted to classify and categorize the expertise of the OP within the Reddit community. While such social information does not argue for the empirical validity of their research, use of this heuristic does influence redditor’s intuitive judgements about the reputation of the poster. As Origgi remarks in her work linking trust and reputation, ‘[w]e use seals, scales, grades, indexes and classifications not only

to evaluate [people], but also to create valuable categories that allow us to classify reality’ (2012b, 411). For AMAs, not only does flair appear in the preview—where redditor’s can view the headline, username, number of points, etc.,—it also appears throughout the AMA itself each time an OP responds to a question, emphasizing their expertise with each answer.

While flair acts as an explicit seal of verified expertise, moderators are contributing to the rhetorical construction of *ethos* by requiring that OP’s adhere to a particular template in the headline that previews their AMA. r/science gives the following example of what a headline should look like:

Science AMA Series: I’m John Smith, a Professor of Scientific Outreach at
Reddit University in San Francisco, California. I do research on connecting
scientists to the lay-person and I’m here today to talk about it. AMA!

This formulaic introduction includes 1) the name of the OP, 2) their professional appointment, 3) a simple description of their work followed by 4), the signature, exclamatory ‘Ask Me Anything!’ The headline once again declares OP’s expertise by repeating their credentials, but adds a brief description of their work that they plan on speaking about resulting in a syllogistic construction of authority. The template thus provides a syllogistic formula for expertise, reasoning: I hold this position of professional authority, I research this topic which is related to my professional appointment, therefore I am an expert worthy of epistemic deference. But the innocuous ‘AMA!’ is not without its own persuasive power, acting as a *eunoic* (goodwill) gesture that situates the OP within the community of Reddit to establish social trust, which functions alongside recognized expertise.

While moderators are able to craft OP’s scientific expertise such that it is persuasive to the r/science community through the vetting process, addition of flair, and syllogistic headline

requirements, these features draw primarily on notions of accredited expertise as defined by the epistemic system and authority of science. But Aristotle claims that *ethos* must be created in every speech—or in this case, every AMA—with the OP constructing a particular kind of view of themselves that makes the audience favourably disposed to accepting their arguments (2007, 112). This claim has some utility for r/science AMAs. In these cases, *ethos* is not simply a measure of an individual speaker's expert status, or even said expert's claim to accredited expertise in the form of credentials, but rather one's ability to embody and espouse the values of the community in which one speaks to be deemed trustworthy. Thus, the way that a scientist communicates the same findings to their expert field and the r/science audience, will be framed very differently in order to be found equally persuasive (see, related to such transformations in argument, Fahnestock [1998]).

In distinguishing between *epistemic trust* – confidence that someone is a co-operative epistemic participant whose statements will give justification for beliefs – and *social trust*, which involves moral, personal and/or cultural dependability, McDowell claims that in the system of science, epistemic trust reigns supreme (2002, 54). Yet in the r/science subreddit, discussion of science is situated in the social realm and measures of social trust become as important as epistemic trust, acting as the precursor to epistemic deference. When participating as an OP in an AMA, scientists must package their empirical knowledge into ways of communicating that are found socially persuasive by adhering to the social norms of the Reddit community in order to appear trustworthy to the r/science readership, as socially untrustworthy behavior may result in epistemic untrustworthiness. An OP's success in establishing social trust is best observed by the heuristics that rely on redditors' voting behaviours and ranking algorithms.

As noted, redditor's can either upvote or downvote content, which results in a fluctuating score that is assigned to submitted content and is visible to all redditors based on a simple formula of upvotes minus downvotes ('Frequently Asked Questions' n.d.). By default, content in r/science is presented in descending order of popularity based on Reddit's 'hot' algorithm⁵ which takes into account the proportion of upvotes to downvotes, in addition to the age of the post. Thus, newer posts will rank higher than older posts, and posts with more upvotes will rank higher than ones that receive more downvotes. The hot algorithm also employs the sophisticated logarithm function, meaning that first votes are weighted more heavily than subsequent votes (Salihefendic 2015). What this means is that audience changes as an r/science AMA gains more interaction from redditors.

Because of the logarithm function, those first and most important votes will be from individuals who opt to sort content in the subreddit by newest first rather than the default hot setting; these redditors are often individuals who are in-tune with the subreddit, know the subreddit rules inside-out, and act as the informal gatekeepers who upvote what they consider good content and downvote what they consider bad content. Then, more casual r/science users who browse the subreddit based on the default hot ranking will encounter content that's quickly been upvoted by the informal gatekeepers; this much larger, but more casual audience has the opportunity to either reinforce the decision of early voters who deemed this 'good content,' or dissent by downvoting, but it is important to note that because of the logarithm function, more redditors will need to vote on the content to push the content up or down within the subreddit. The final audience is reached only if enough redditors from r/science quickly show interest in a

⁵ As of March 2018, Reddit has changed the front page default ranking to 'best,' for redditors that are logged in, thereby curating content specifically from subreddits that a redditor has frequented. The 'hot' ranking is still the default ranking for anyone who is not logged in, and remains popular for many redditors who express a preference for 'hot' over 'best' (see comment feed in cryptolemur).

post, and the post is upvoted to the front, and most visited, page of Reddit, which considers content from across all subreddits and displays the most viral posts as curated by the hot algorithm. This audience is less discerning than might be found in any one subreddit, instead relying on the discretion of voters in various subreddits to serve the best content up to the front page. Just as the audience changes—from informal niche gatekeepers, to a more general subreddit audience, to the broadest, most viral audience—so too do the *ethos*-assessment heuristics employed to rapidly assess OP's expertise.

The informal gatekeepers are likely to be the most rigorous in their assessments of social and epistemic reliability and relatedly, accredited expertise, as they must defer primarily to the content of OP's AMA introduction, rather than relying on a score or ranking to navigate expertise.⁶ As a result, these gatekeeper's assessment of *ethos* are likely to be the most rigorous in considering all three proofs. Hyperlinked content by the OP in an AMA introduction plays a significant role in shaping appeals to *phronesis* (practical wisdom) and *arete* (goodwill). It is common for hosts to hyperlink keywords and important assertions from their introductory AMA text to webpages outside of Reddit, perhaps in response to the 'Science AMA Series Submission Guide' that specifies that the 'introduction paragraph may link to articles, events or other promotional items which are related to the subject' (n.d., 3). Thus, a combination of links directing to personal websites, the homepage of one's department, institution, or organization, related events/talks/conferences, peer-reviewed journal articles, or articles written for the popular press are encouraged. While redditors are unlikely to review entire webpages, they can rapidly skim hyperlinked content to form an overall impression of OPs expertise by synthesizing assessments of source credibility: a researcher that links to their research profile at Harvard, their

⁶ In the early 'life' of content submitted to r/science, scores are not shown in previewed content for 60 minutes to prevent a bandwagon effect.

lengthy CV hosted on their personal website, a recent publication in peer-reviewed journal, and a public outreach piece written for *Time Magazine*, are granted expert-status without redditors having to comprehensively review the content of any of these links. At an even more reductive level, the domain names themselves (e.g., harvard.edu, nature.com, etc.) are the shortcuts that comprise the *ethos*-assessment heuristic, and an OP draws expertise that leaks from sponsoring sources. Thus, the compilation of a number of hyperlinked sources speaks to *phronesis* (practical wisdom) because it is evidence of OP's record of practically applying their expert knowledge. Additionally, redditors may rely on *aretic* proof (trustworthiness) by making assumptions about the rigour of sponsoring sources to assess and speak to the credibility and trustworthiness of the OP. These heuristics outsource expertise-assessments to sponsoring sources, while adopting the sources themselves as the assessment criteria within Reddit. And while this heuristic speaks more to establishing epistemic trust, this is only accessible if the style of the AMA introduction simultaneously establishes social trust.

Social trust is intuitively aligned with *eunoia* (goodwill) as it relies on the OP to create goodwill by speaking the language of the community that they're addressing. In fact, the 'AMA Submission Guide' recognizes the importance of *eunoia* when remarking, 'In our experience, cut-and-paste biographies and paragraphs written by public relations teams are easily recognized by the Reddit Science community and typically result in a poor reception,' while also specifying that the AMA 'is intended to be in the scientists own words and be relatively informal (a "cocktail talk" or "elevator" introduction)' (3). It is expected then, that the OP makes a display of goodwill by providing an introduction to their work written exclusively for Reddit. Their adherence to the use of informal speech common to Reddit and other popular social media streams, is judged by both the informal gatekeepers and general subreddit audience who readily

downvote content that they identify as being either repurposed, written by a public relations firm, or otherwise doesn't suit the norms of Reddit. OP's adherence to discursive norms of the community, is used as screening criteria to reinforce social trust by building on the tacit assumption of goodwill made by the OP in taking the time to host an AMA in the first place.

Final Remarks

The architecture of Reddit coaxes casual subreddit browsers to adopt heuristics that attend to the score and ranking placement of content within the subreddit. Unlike the informal gatekeepers, casual subreddit browsers encounter AMAs based on their visibility in the subreddit, and most often at a time when the post score is no longer hidden. These redditors do not need to invest cognitive resources into assessing epistemic trust, since by virtue of the post score, users may assume that a number of the informal gatekeepers have reviewed the content and deemed the OP an expert. A higher score and higher ranking within the subreddit translates to a more robust image of epistemic authority for the AMA, which is an interesting twist on the endorsement heuristic, initially described in Metzger et al (2010), describing how individuals tend to automatically trust 'sites and sources that are either recommended by *known* others, or that come from *unknown* persons in the form of aggregated testimonials, reviews, or ratings' (qtd. in Metzger et al 2013, 215; original emphasis). In the case of r/science, a general subreddit audience trusts the collective assessment of the informal gatekeepers who contribute to the aggregate data that comprises the score.

The act of voting on the part of all redditors further establishes both social and epistemic trust and positions the OP as worthy of deference by contributing to the OP's 'karma.' Redditors accrue karma from their posts and comments: when upvoted, the karma score goes up, and when downvoted, the redditor loses karma points. Karma is clearly visible to any redditor by simply

hovering over a username. This *ethos*-exuding score only has use and meaning within the sphere of Reddit and is particularly powerful when an AMA host has gathered karma prior to hosting the r/science AMA. Origgi posits that '[i]nformational items that do not come with some label, or seal of approval from the appropriate communities, are lost in the data deluge of the information age,' (Origgi, 2012b, 409) and thus karma becomes a reputational heuristic. Because only 'good' content and commentary are upvoted, this number *phronetically* (practical wisdom) signals trustworthiness by gesturing to previously established epistemic and social trust.

Finally, the architecture of Reddit encourages redditors who encounter r/science AMAs on the front page to employ different reputational heuristics than those who view content in the subreddit itself. While the AMA's score and position on the front page might be an indicator of the OP's credibility and trustworthiness, the assumption must be validated by the subreddit from which it originates. Because the front page populates viral posts from across all subreddits, the originating subreddit has its own reputation, and like flair, activates redditor's network of associations and encyclopedic meaning enabling AMA hosts to co-opt the reputation of the subreddit as evidence of their expertise. On the front page then, redditors rely on social trust cultivated by the subreddit community to infer that the AMA host is epistemically trustworthy and that redditors may indeed defer to their expertise. A viral r/science AMA that appears on the front page of Reddit then, is a reputational and credibility heuristic in its own right.

In our examination of how expertise is communicated through *ethos* in the r/science AMAs, we were not able to pay due attention to the defining feature of the forum: the actual engagement and discussion with redditors. Indeed, these AMAs are not so neatly packaged into existing genres of science communication precisely because of the way in which redditors interact with scientists and their research, which makes it a particularly complex research site

worthy of more sustained scholarly treatment. Given the popularity and positive reception of the genre-bending r/science AMAs, future research should aim to probe how expert knowledge was circulated, interacted with, and received in this liminal communication space to help chart what the scientific enterprise has lost with their cancellation.

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