**Warranted assertibility and the Internet: A theoretical model for an online proto-research
community**

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Abstract

In this paper, we suggest that research platforms on the present Internet should offer more diverse pathways for distributed communication, to cope with the idiosyncrasies of a post-truth society. Present platforms adhere to a *first-order cybernetic* approach, using rule-based systems and algorithms to guide the activity of researchers, and expose them to new research findings and articles based on their preferences. The larger Internet, however, supports communities such as Reddit, that offer opportunities for pragmatic problem-solving that mirrors the ideas of *second-order cybernetics*, but show much potential for incivility. We first test this assumption using 704 comments responding to 25 top posts pulled from the CoronavirusUS subreddit, using a Python script. Our analyses indicate that a substantial percentage of posts in the subreddit display higher-order reflectivity (what we label transformative critical reflection) which predicts the number of upvotes received by these posts. We also found that karma, or user reputation, is not predicted by interaction between high-order reflectivity and upvotes. This suggests that posts are gauged by quality rather than users' reputations. From these results, we infer that such communication can be mirrored in online proto-research communities, and streamlined by laying down regulations, appointing moderators, and using algorithms to guide distributed communication, and combat the propensity for chaos arising from emancipation. We lay out our design/vision for such a community, based on a dual-layered reformulation of the Open Source Educative Processes framework.

Introduction

Internet Platforms for research

Social scientists have long exchanged ideologies through intra/inter-institutional research, and avenues for criticism like peer-reviewed journals and conferences (Longino, 1990). In the Information Age, the Internet too, shows much potential to allow researchers to communicate methods and measurements they use, hypotheses they try to answer, and theories they develop. Presently, the Internet, in disseminating research, primarily supports recommendation systems and indexing software in association with Universities, corporations such as Google and other databases to allow scientists to search for and reference sources. RSS feed-type communities such as Researchgate and Academia also exist, supporting limited asynchronous communication pathways (Ovadia, 2014). These platforms provide social scientists with knowledge for uptake, with little opportunity to iteratively develop measurement methods and research questions to deeply understand social and mental differences in human functioning. This is known as a Public Engagement with Science model (Bromme & Goldman, 2014). We suggest that rule-based systems may stifle capacity for online critical reflection between researchers beyond proximal boundaries. RSS feeds run parallel to highly controlled environments like Netflix, using rule-based systems to mold user preferences (Chavalarias, 2016). In our previous work, we have called this the *first order Internet*, as it aligns with the ideas of first-order cybernetics, using command-and-control software to guide activity towards mandated outcomes through the creation of wide, shallow online communities showing little critical discourse (Tilak & Glassman, 2020).

However, the Internet is chameleonic. It also supports distributed communities. On platforms like Reddit, individuals with varied knowledge unite to ask questions about problems

they face and discuss ideologies non-hierarchically (Singer et al., 2014). Moderators are appointed through community agreement rather than pre-determined norms. Immediate solutions to emergent problems are constructed collectively, by carefully evaluating the nature of knowledge. Such platforms lie on what we have called the *second-order Internet* (Tilak & Glassman, 2020), as they allow users to reformulate insights with others in an unfolding online ecology through interaction with tools (an approach championed by second-order cybernetics). Unfortunately, civility is loosely moderated in these open online environments, often leading to harassment. A good example is the FindBostonBombers subreddit, made in response to the Boston Marathon bombings. Users accused innocents of the crime, leading Reddit to issue an apology while acknowledging the rhetorical construction of their platform (Potts & Harrison, 2013). While there is scope for chaos arising from second-order communication, the critical discourse it may spur points towards communicative rationality (Habermas, 1989/1991), which assumes that there are degrees of objectivity associated with knowledge that are collectively constructed, rather than an absolute truth (Longino, 1990). However, with some arguments, such as the shape of the Earth, there is absolute evidence to confirm the falsity of a position (i.e. the Earth is flat). Evaluating the nature of knowledge in a community setting may allow the rational negotiation of such absolute truths as well, through moderated discourse.

There is potential to mirror communication of the *second-order Internet* in online research communities; to offer opportunities for seamless communication between social scientists in crafting their inquiry. However, issues of ownership and concerns of disruption in open communities warrant creating standards to add control to unbridled distributed communication, calling to question whether such communication is meaningful. In this paper, we test this possibility through a mixed methods analysis of posts on Reddit (a loosely

moderated community), and wrestle with worries stemming from seamless online interaction to conceptualize a dual-layered online research platform, integrating rule-based systems and the distributed communication within scientific communities. In the context of social science, such a platform can assist pragmatic development of ideas to study human functioning in social systems. We suggest that such communication is necessary to equip researchers to deal with a post-truth society.

Research in a post-truth society

Heightened interconnectivity in the Information Age has led to the polarization of ideologies in the public sphere, culminating in a post-truth society, where interconnected trends can stifle the search for accurate knowledge (Barzilai & Chinn, 2020). Such disagreements about the nature of knowing have run across history. A good early example are Galileo's ideas about using the telescope that were strongly contested by his opponents, who claimed it brought fictitious objects into the visuospatial field. Similar disagreements are abundant in the postmodern age, and have amplified with the emergent Internet. Issues like climate change (whether it is a function of geological time, or a result of human interference) and effects of vaccines (whether they lead to developmental issues in children) have produced much dissent about what is 'true' in more recent times (Chinn et al., 2020). News sources in the United States with partisan affiliations often disseminate information as a function of ideology, leading to polarization at the sociopolitical level (Iyengar & Massey, 2019). Such dissent is expressed online, with pejorative name-calling being common in subreddits such as r/Politics (Marchal, 2020).

Just as information in the public sphere has multiplied at a blistering pace, ideas in the social sciences too have diversified since the 20th century, often leading to productive

argumentation between researchers. Bronfenbrenner's (1979) *Ecology of Human Development* is an exemplary text that reviews such conflicts between ecological research and randomized control trials in psychology. Several factors guide these arguments and the predominance of certain research frameworks across social science disciplines. Objectivity and scalability often serve as pre-conditions for viable scientific inquiry. Generalizability of research may determine funding, dissemination and replication across several social science domains (Klein et al., 2014). In the quest for evidence-based practices in fields such as education, social work, and political science, there has been widespread implementation of randomized control trials (RCTs) to ascertain cause-effect understandings of human behavior and thought. There has also been a body of work that argues against this idea, suggesting socially nested, phenomenological understandings of human functioning (Feuer, 2002; Mowat et al., 2018). The contrast between the quantitative 'how' and qualitative 'why' of research in human consciousness points to the classical argument between the quest for replicability, and the search for anomalies (Pokropski, 2019).

Since social science involves understanding how individuals and communities respond in environments offering varied affordances and limitations, variability is a hallmark of results in the field (Nosek et al., 2015). This inconstancy results in discrepancies associated with methods and perceptions of methods across disciplines (Podsakoff et al., 2012) producing the arguments we have outlined. The capacity for seamless digital communication across disciplines in the social sciences, and research institutes/universities may allow researchers to work out these tensions in a pragmatic manner as they observe unfolding social systems in real-time; what is known as *phronesis*.

Phronesis-driven online research communities

Researchers interact freely within their academic circles and in physical settings, and network with others at conferences and symposiums. The Internet offers ample opportunities to amplify such inquiry by virtue of heightened interconnectivity. However, at present, it offers few platforms to allow non-hierarchical sharing of ideas in scientific communities across theoretical approaches and disciplines. Since the social sciences promote understanding human functioning through varied competing approaches, adopting communicative rationality (Habermas, 1989/1991; 2006) in online settings can heighten potential for balanced critical discourse towards nuanced interpretations. This may assist understanding the idea that objectivity exists in degrees (Longino, 1990), rather than being a one-dimensional requirement.

Creating distributed online research communities may help research platforms move further towards a *phronesis* based approach, that intersects with Dewey's conceptualization of pragmatism. Phronesis is an Aristotelian concept focusing on practical, context-specific aspects of behavior, diving into moments of experience rather than striving for mandated, context invariant truth. Anomalies become focal points, as researchers eschew generalization of knowledge for a micro-perspective of human activity. Every research effort has warranted assertibility (Dewey & Bentley, 1960) where knowing is a continuous process determined by context (Deters, 2006). This supplements Dewey's (1903) notion that absolute falsity/truth are not features of the human condition, but a manner of asserting control over researchers, and attempts to match the certainty of religious organization centuries earlier (Dewey, 1988).

Phronesis suggests that valuable social inquiry proceeds within the bounds of local human behavior in small, adaptive steps (Bateson, 1972), and must involve interlocutors bringing in their own experiences to create new knowledge, and develop stronger degrees of

objectivity (Longino, 1990) based on incrementally developed research output. For, example, when testing the efficacy of a curricular intervention in a classroom, phronesis would involve dynamic teacher-researcher collaboration to adapt curricular materials to fit the naturalistic classroom. The ability to assert truth (in this case, efficacy of the intervention) would be dependent on success of solutions as they are implemented. Transferring malleable “truths” (warranted assertibility) on similar circumstances is dependent on experience; presented with the caveat that circumstances can change. One of the difficulties with adhering to warranted assertibility in research is that the first step of creating meaningful insights from socially situated knowledge requires non-hierarchical knowledge creation between researchers. Such communication shows much propensity for disorder and incivility. Moreover, the tendency for popular users to exercise their social power to mold value systems in such communities may lead such communities to become echo chambers (Lapsley & Chaloner, 2020), further polarizing paradigms of inquiry.

Moving towards research platforms of the *second-order Internet* may require standards to maintain equilibrium in open scientific communities, while allowing accessibility beyond niche scientific circles. Gee (2004) suggests employing such a combination of rule-based, top-down regulations and content with non-hierarchical communication in the creation of online spaces. However, in designing such communities, one must carefully balance the degree of control and autonomy. Too much autonomy and open membership may cause incivility arising from disagreements about the nature of knowing (Marchal, 2020). In our previous work, we have conceptualized online platforms that carefully balance open communication and infrastructures to guide distributed human-computer interaction; what is known as a *dual-layered* framework.

The Current Study

We tackle difficulties associated with creating a discursive proto-research community of the *second-order Internet*, and a dual-layered platform for researchers that can be viewed by larger audiences in the public sphere. Granting access to members of the general public to view published work in translatable forms and submit questions to researchers themselves would help achieve Public Understanding of Science through productive discourse, as opposed to a first-order public engagement model driven by RSS feeds (Bromm & Goldman, 2014) that merely allows the general public to uptake knowledge in shallow, wide communities (Tilak & Glassman, 2020). Our suggestions are based on the assumption that critical discourse is reinforced through user agreement on loosely moderated forums. We test this hypothesis through a mixed methods approach, using data pulled from the r/Coronavirus subreddit. Our literature review, and our results support the analogy between online forums and the potential to create research communities. Our results suggest that quality of posts in online forums predict productive distributed communication, rather than user reputation. A research platform mirroring such communication may equip researchers with useful online tools to assist humans in scientific problem-solving in a post-truth society (Chinn et al., 2020), where the effective use of new media to allude to sources supported by legitimate inquiry is imperative. In the next section, we test our assumption using data from Reddit.

Method

We tested our primary assumption using a mixed methods approach. We first qualitatively coded interactions in a loosely moderated online community, i.e. the *r/CoronavirusUS* Subreddit. On Reddit, user comments gain upvotes, and making several posts across forums has potential to inflate user karma, which summates total upvotes and downvotes. In the subreddit considered, users asked questions to gain information from wikis, links and others' experiences. Community members developed collective understanding about the Coronavirus, the availability of medical safety equipment, and "hacks" to cope with the mundanity of social distancing, rather than relying on media portals that skew and cherry-pick data in our post-truth society (Iyengar & Massey, 2019).

By analyzing communication in such open forums, where incivility may arise, we aimed to look at whether a majority of comments displayed critical reflection through online discourse despite such limitations, using descriptive statistics. Secondly, we investigated if higher levels of reflection predicted higher upvote metrics by employing a linear regression. Thirdly, we wished to see if user reputation or karma was predicted by the interaction of higher-order reflectivity with upvote metrics, to understand if reputation was a function of reflectivity, or whether it was inflated by the magnitude of user posts. By hypothesizing that not user reputation, but rather upvotes are predicted by higher-order reflection, we suggest that communities like Reddit involve non-hierarchical interactions supporting bottom-up agreement, rather than adhering to the knowledge provided by popular members. Such authority may present potential to create online echo chambers. We use insights obtained about communication on Reddit as a model to design an online proto-research community. Our analysis expands existing research done on user information on Reddit that has focused on the sentiments (negative or positive) (Manikonda et

al., 2018; Brett et al., 2019) and topics (Sowles et al., 2018) displayed and discussed within posts respectively, by looking at the quality of reflectivity displayed in user interactions.

Data

Posts were collected from Reddit using a script written in Python. In total, 744 comments from 25 of the top posts since the inception of the subreddit in March 2020, till February 2021 were pulled, along with their upvote and user karma metrics, to provide a quantitative measure of user reputation and post quality. Posts from deleted accounts and suspended accounts were excluded, leaving 704 posts to be qualitatively coded. Members of the research team dichotomously labeled comments using a four-part coding scheme.

Some of the authors of this study previously developed a qualitative instrument to analyze blog posts created by undergraduate students (Tilak et al., 2020). The scheme is based on the theory of transformative learning (Mezirow, 2003) and Habermas' (1989/1991) communicative rationality, which state that critical reflection is guided by productive discourse towards the creation of action plans to gain nuanced understandings of truth. These ideas fall into the wheelhouse of Longino's (1990) social basis of scientific communication. The coding scheme used is elaborated below, and examples of each level of reflection from the dataset are elaborated to provide a clearer idea.

Coding Scheme

Instrumental Understanding: This level represents an empirical understanding of a topic. Rather than critiquing a concept thoroughly, individuals reproduce data they read or come across to present factual matter. They accept perspectives presented by authoritative figures as absolute.

Example:

In this comment, the user responds to the masterpost in agreement rather than asking about a recipe or engaging in collaborative discourse. Hence, it was coded as displaying ‘instrumental understanding’.

Instrumental Critical Reflection: Habermas proposed two pathways for reflective discourse.

One of them is breaking down existing conceptions through rebellion. This is represented by instrumental critical reflection. Individuals criticize concepts rather than providing critique. They call for complete change rather than action plans for carefully executed transformation. Although complete change may align with social good, this form of communication may create turmoil within an online space.

Example:

The screenshot shows a Reddit post and a comment. The post is titled "When can normal people get the vaccine?" and is labeled as a "Discussion". It has 23 upvotes and 21 comments. The comment is from a user named "HealthLawyer123" and says: "At the current rate my county is going, it will take 2 years to get everyone vaccinated. CVS in my state is only giving appointments to 65 + and no other pharmacies have gotten doses yet." The comment has 8 upvotes and 1 reply.

Posted by ~~u/soundwave145~~ 11 days ago

23 **When can normal people get the vaccine?**

Discussion

21 Comments Give Award Share Save Hide Report

~~HealthLawyer123~~ 11 days ago

At the current rate my county is going, it will take 2 years to get everyone vaccinated. CVS in my state is only giving appointments to 65 + and no other pharmacies have gotten doses yet.

8 Reply Give Award Share Report Save

In this comment, the user responds to the masterpost and laments on the plight of affairs in their county. They do not, however, suggest a possible action plan to remedy the situation. Hence, the post has been labeled as displaying ‘instrumental critical reflection’.

Transformative Understanding: Transformative understanding is surface level understanding of why a concept needs to be changed. Aspects lacking include a critique of existing concepts, and reflection over implications in the social world. Therefore, transformative understanding maintains civility, it is not supported by a well-thought out intention to create change.

Example:

The screenshot shows a Reddit post and a comment. The post is by user /zedthehead 10 months ago, with 4.6k upvotes and 715 comments. The post text is: "I am glad that laid off workers are getting the extra \$600/week on top of base benefits, but it is an abomination that many of us still working full time will be earning less than that." The post is labeled "Discussion". Below the post is a comment by user PasGuy55 10 months ago, with 11 upvotes. The comment text is: "Not really. I have a job and I am glad. We have no idea when this is going to end, if it goes on for a while there will be a fight for a smaller amount of available jobs. So yeah, I say that exact thing to myself even as I am stressed."

↑ 4.6k ↓

Posted by /zedthehead 10 months ago 🗨️ 🏆

I am glad that laid off workers are getting the extra \$600/week on top of base benefits, but it is an abomination that many of us still working full time will be earning less than that.

Discussion

↩ ↘

💬 715 Comments 🏆 Give Award ➦ Share 📌 Save 🚫 Hide 🚩 Report

PasGuy55 10 months ago

Not really. I have a job and I am glad. We have no idea when this is going to end, if it goes on for a while there will be a fight for a smaller amount of available jobs. So yeah, I say that exact thing to myself even as I am stressed.

↑ 11 ↓ Give Award ➦ Share 🚩 Report 📌 Save

In this comment, the user reflects on the length of the pandemic and the possibilities associated with job security. However, while they account for their luck in having a job as well as the possible uncertainties, they do not suggest an action plan for those in the community that are vulnerable to unemployment. Hence, this post is labeled as ‘transformative understanding’.

Transformative Critical Reflection: This level of critical reflection involves taking diverse opinions and engaging in communicative rationality to negotiate them and come to a balanced conclusion. We believe that the bottom-up nature of Reddit communities spurs them to exhibit such high-order communication.

The screenshot shows a Reddit post and a comment. The post is titled "I'm terrified that we are going to reopen our economy too quickly at the expense of human lives." and is labeled as a "Discussion". It has 4.0k upvotes and was posted by user "u/Luma44" 10 months ago. The comment, by user "dactite", shares a personal story of living with Multiple Sclerosis and other health issues, expressing fear about the economy reopening and the impact on their family. The comment has 28 upvotes.

↑ Posted by Luma44 10 months ago

4.0k ↑ **I'm terrified that we are going to reopen our economy too quickly at the expense of human lives.**

Discussion

773 Comments Give Award Share Save Hide Report

dactite 10 months ago

I'm 50, been living with Multiple Sclerosis for almost 24 years now and take an immunosuppressant drug to treat MS, I have Coronary Artery Disease, Kidney Disease and I only have 1 & 1/2 lungs and my 26 year old daughter has asthma and Psoriasis and takes Taltz which suppresses her immune system. We are both scared. My son stopped doing his job so he didn't bring the virus home. Luckily my husband is able to continue working from home, however they did have to adapt his job so he could do so. We are fortunate, our income hasn't changed THUS FAR.

I am scared. Even when there is a vaccination, I may not be able to take it as I can't even get most of them currently without stopping MS treatment for up to a year. Only if it is a non-live virus in the drug could I take it. I (we) will continue staying at home unless we are wearing a mask and social distancing big time, using pickup for my groceries or delivery if I have to, until we do have a vaccine or herd immunity (if that ever comes).

I pray everyone's families stay safe and healthy during this difficult time.

↑ 28 ↓ Give Award Share Report Save

In this comment, the user responds to the masterpost and applies the arguments made to their own lives, and recounts their experiences, suggesting for everyone to stay protected. They also ruminate over the pros and cons of vaccinations, and the possibilities of herd immunity, thus bringing in several arguments related to the economy and ways to restart it. Thus, this post has been labeled as displaying 'transformative critical reflection'.

Results

Posts were coded dichotomously for each of the four levels of reflection (0 for absence, 1 for presence). Interrater reliability was conducted on 141 comments to test the reliability of the coding scheme. The double coded posts were loaded in SPSS, and crosstabs were created to compute reliability. A Cohen's Kappa of ($\kappa = 0.841$) was obtained, indicating high levels of agreement. Descriptive statistics were calculated for variables considered. Posts received an average of 65.48 upvotes, and average user Karma was seen to be 56615.9 (Table 1). We first calculated the magnitude of posts displaying each level of reflection in the dataset through binary coding, and found that Transformative Critical Reflection was displayed in 37.64% of posts, followed by Instrumental Understanding (30.82%), Instrumental Critical Reflection (24.01%), and Transformative Understanding (7.53%) (Table 2).

Table 1

Descriptives for user karma and upvotes.

		Std.			
	N	Minimum	Maximum	Mean	Deviation
Upvotes	704	0	889	65.48	106.785
User Karma	704	25	4953726	56615.94	211180.207
Valid N	704				
(listwise)					

Table 2

Percentages of each level of reflection displayed in scraped posts.

Reflectivity	Frequency	Percentage
Instrumental Understanding	217	30.82%
Instrumental Critical Reflection	169	24.01%
Transformative Understanding	53	7.53%
Transformative Critical Reflection	265	37.64%

We then tested our hypotheses. First, we wished to see whether posts displaying transformative critical reflection garnered higher upvotes, using a linear regression model (Table 3). It was seen that transformative critical reflection predicted 0.8% of the variance in upvotes, owing to the small fraction of data we pulled from Reddit. Posts displaying transformative critical reflection had significantly higher upvotes ($B=19.298$, $t=2.38$, $p=0.02$). Such significance was not observed for the other three levels of reflection, namely Instrumental Understanding, Instrumental Critical Reflection, and Transformative Understanding.

Table 3

Linear regression for relationship between transformative critical reflection and upvotes.

Model	B	Std. Error	Beta	t	p
1 (Constant)	58.219	5.081		11.459	.000
Transformative CR	19.298	8.281	.088	2.330	.020

a. Dependent Variable: Upvote Metric

To further test whether the interaction between transformative critical reflection and upvotes predicted user karma (the sum total of upvotes/downvotes), we ran a moderation model (Table 4). It was seen that posts showing transformative critical reflection did not necessarily result in high karma ($B = 35108.480$, $t = 1.804$, $p = 0.926$). Moreover, both upvotes ($B = 100.927$, $t = 0.93$, $p = 0.926$), and the interaction between reflectivity and upvotes ($B = 150.426$, $t = -0.622$, $p = 0.534$) did not correspond with significant increase in karma. This further suggests that user reputation may be inflated by the sheer number of posts made by an individual, and may not necessarily be a result of high-order reflectivity. From our analyses, we see that reflectivity displayed is the main marker the acceptance of knowledge as valid by the wider community via upvotes.

Table 4

Moderation model investigating if reflectivity and upvotes interact in predicting karma.

	Model	B	Std. Error	Beta	t	p
1	(Constant)	49197.367	10971.077		4.484	.000
	Transformative CR	28670.507	16475.977	.066	1.740	.082
	Upvote Metric	-51.519	74.806	-.026	-.689	.491
2	(Constant)	46746.037	11662.408		4.008	.000
	Transformative CR	35108.480	19465.251	.081	1.804	.072
	Upvote Metric	-9.413	100.927	-.005	-.093	.926
	Transformative CR x Upvotes	-93.535	150.426	-.036	-.622	.534

a. Dependent Variable: User Karma

Our results, which analyze a small subset of data from a socially salient Reddit community suggest that the quality of second-order communication in open platforms is often gauged carefully by members. While such spaces are loosely moderated, and susceptible to disruption, our results may point to the fact that such communication can be mirrored in a research community that balances emancipation and moderation through what we call a dual-layered approach (Tilak & Glassman, 2020), that relies on elements of Glassman & Kuznetcova's (2020) Open Source Educative Processes framework. In the next section, we provide an envisioned design for our dual-layered proto-research community.

Suggestions

Based on our results, we suggest that the type of bottom-up communication reflected on open Internet communities can be mirrored in a digital research community. However, there must be rules and guidelines set into place to prevent the disruptions and incivility that often emerges in such spaces. In this section, we outline our proposed design for a proto-research community of the *second-order Internet*. Our proposed framework is based on Glassman & Kuznetcova's (2020) Open Source Educative Processes framework, which suggests that online spaces can either be treated as "cathedrals" where powerful interlocutors or experts provide knowledge for uptake, or as bazaars, where individuals with different experiences communicate to craft advanced insights and exchange ideas, much like precious commodities of collective value. Since second-order communication in highly open communities shows propensity for chaos, we suggest incorporating aspects of both cathedral and bazaar in designing our proto-research community, adopting a dual-layered approach (Tilak & Glassman, 2020). The two layers of our platform adhere to the functionalities of rule-based systems championed by *first-order*

cybernetics, and distributed platforms facilitating knowledge creation favored by *second-order cybernetics*.

Layer 1: The Cathedral

To set out parameters to control and moderate activity on our affinity space, the first layer of our dual-layered framework is top-down, and follows a rule-based, *first-order cybernetic* approach that allows adding structure to open communication. We use the following measures to ensure stability:

Membership Guidelines: All researchers choosing to enroll on our envisioned platform need to be affiliated with a research institution. This information will be verified upon logging in. This would allow discussions between researchers of varied expertise to be conducted without barriers and scope for interruption.

Viewership for non-members: Non-hierarchical research communities run the risk of becoming echo chambers when membership is limited to those actively partaking in scientific inquiry. However, allowing open membership beyond the bounds of research communities may divert research due to vast difference in priorities and goals. We thus invite non-researchers to have view-only access to work being ideated on our platform, use their email IDs to submit any questions they may have for researchers, and view results and theories translated into relatable formats. This can allow open communication and accessibility, while also maintaining common agency driving the proposed community.

RSS Feed: Similar to existent research communities of the *first-order Internet* such as *Researchgate*, we envision an RSS feed functionality to allow researchers and guest viewers to access translated and full-text articles by entering Boolean search terms. Articles can be found through a search function on the mainframe of our platform. In terms of translation, we promote

opportunities for researchers to abridge their work, and make simplistic summaries of their research available as web-copy on our platform to be featured on the RSS Feed. We suggest that a reformulation of research for public consumption provides greater opportunities to expand the understandings of scientific practice that society possesses.

Layer 2: The Bazaar

Our approach incorporates varied modes of second-order communication to amplify the scope for critical discourse between researchers. Both synchronous and asynchronous interactions would be supported on the mainframe of the platform, and through accessing a communication dashboard feature on the menu. This second layer of our platform suggests that human computer interaction using distributed platforms can facilitate higher-order reflection, aligning with the ideas of *second-order cybernetics*.

Synchronous Interaction

Voice & Video Channels: On our suggested platform, we propose providing capability for voice and video interactions beyond proximal boundaries, allowing researchers to organize meetings across universities and cultural contexts with ease and tap into larger parts of their online networks. We envision synchronous communication occurring on a dashboard that can be accessed from the mainframe via a click, featuring channels that users can join based on their interests, similar to platforms such as Discord (Mock, 2019) and Microsoft Teams. Each channel would appoint a moderator based on community agreement on a rotational basis, bi-yearly.

Group Messaging: The dashboard we suggest would also allow opportunities to follow other researchers, and create direct messaging groups or dyads to advance emergent discussions on channels about measurement methods, theoretical approaches and research findings beyond the confines of distinct channels.

Asynchronous interaction

Discussion Posts: To prevent communication from being limited to the communication dashboard and to channels that researchers choose to join; we suggest incorporating the ability to post discussion prompts and questions (displayed in reverse chronological order rather than through a recommendation system, much like Reddit) for others to respond to asynchronously on the RSS feed. This would allow researchers to engage in immediate communication within the channels they choose to join, and also partake in discussions they may not voluntarily expose themselves to.

Data Visualization: To allow mapping of ideas in simplistic formats between teams of researchers, we suggest incorporating a mind-mapping feature that uses text boxes and lines/arrows to connect concepts on our communication dashboard. We envision that this can be accessed via a click on any group chat of more than 2 individuals. This would allow researchers to save ideas they develop collaboratively in concise formats, and also envision new models and frameworks.

We are in the process of developing the envisioned platform. Our framework takes the RSS feed model presented by portals such as Researchgate and Academia and adds a second layer to activity and communication, that mirrors open forums such as Discord and Reddit. The addition of this component allows seamless communication in dyadic and group contexts, the organization of members into channels, and the usage of educational tools to visualize complex ideas. While piecemealing existing platforms (Discord, Reddit, Researchgate, and Knowledge Forum, for example) to create stronger connections between researchers may be a possibility, it may create porous, fragmented networks between isolated spaces. Integrating different forms of

communication into one central platform may present much potential to create the phronetic paradigm of social science research we envision.

Limitations

In this study, we draw from a small subset of data on Reddit, amongst the vast labyrinth of information it hosts. While 704 user responses may not be indicative of generalizable activity on the platform, the salience of the Coronavirus and the high upvote/karma metrics suggest the silent presence of several other users' opinions nested within the posts considered. Our desire to adopt a phenomenological approach supplemented by mixed methods warranted careful, manual coding, preventing a large scale data-mine. The racial and ethnic makeup and socioeconomic index of users whose posts were considered has been left to question owing to anonymity. However, the power of the sample in terms of upvote metrics and viewership of the subreddit may suggest diversity. Since the goal of this study involved looking at the nature of distributed human-computer interaction on a large online community in the Information Age, individual factors played a small role; the idea of a common truth based on joint values or goals was stressed. We suggest that such problem-solving can be mirrored in the proto-research communities of the *second-order Internet*, where theoretical and methodological possibilities constantly morph and evolve in real-time, across distal boundaries.

How can such communities be protected from descending into disorder? The classical argument between *first-order* and *second-order cybernetics* is resolved through a dual-layered non-contradictive unity, allowing users to moderate communities at the grassroots level within the infrastructure of the platform, effectively governing distributed communication. This may guide and emancipate individuals in the use of technology. Issues of technology access come to the fore when discussing platforms of this nature, especially if they are designed to be viewed by

larger audiences. Moreover, the success of scientific communication on such platforms is driven by grassroots level agency. Creating distributed platforms may motivate users to expand their networks, and work beyond the boundaries of their institutions, while providing new avenues to publicize peer-reviewed research. Heightened interconnectivity may better equip us with the armaments needed to traverse a post-truth society, but tapping into its potential requires distributed action; a cybernetic potential we are just beginning to understand. New media presents possibilities to augment communication and construct ideas to match an evolving external environment, for social scientists, policymakers, and the societies they aim to assist.

Conclusion

In this paper, we have employed an inferential process, suggesting that unbridled communication and critical reflection in open online communities can be effectively applied to a digital research platform using a dual-layered approach. In such communities, guidelines, algorithms and moderators streamline distributed second-order communication between scientists. As we have previously outlined, there is a scarcity of such platforms on the Internet, that align with the true ethos of social science; to follow human consciousness and functioning nested within dynamic sociocultural contexts. Using the Internet towards such a potentiality requires a careful adoption of the ideas of *second-order cybernetics*, which suggests that humans interact with technology in an ever expanding web of trails, incrementally discovering nuances about the areas of life they choose to investigate. With the rapid development of varied theoretical approaches, measurement methods, and avenues for criticism, a central command center to diversify the social networks of researchers, and encourage immediate communities holds several untapped potentials.

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