The Coronavirus Conversation on Reddit: A Mixed Methods Approach

ILIR RAMA

1. **Affiliazione Autore / Authors' information**
University of Milan, Italy

2. **Contatti / Authors' contact**
Ilir Rama**:** ilir.rama[at]unimi.it

Informazioni aggiuntive / Additional information

Culture e Studi del Sociale

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Ilir Rama

University of Milan, Italy
E-mail: ilir.rama[at]unimi.it

Abstract
This article engages in a methodological discussion on how to consider affordances in the context of digital environments, focusing on the r/coronavirus community on Reddit. To underline how affordances might affect social interaction, Reddit and its voting system offer a privileged ground to observe how social dynamics intersect with technical features to guide expression. I will consider a vast dataset of comments, including those deleted by their own authors, through non-participant ethnographic observation and automated text analysis. It is shown how the r/coronavirus community fluidly negotiates social norms by enforcing them through affordances, that are employed to sanction social behaviour that does not conform to broader situated cultural norms. This intertwines with moderation practices, as they concur to define what is considered socially proper within an environment, as well as functioning as discursive tools to legitimise a specific view of the world. Based on this experience, the implications of a mixed methods approach for the study of online communities are briefly presented, underlining how it might aid reflexivity for researchers embedded in their research environment.

Keywords: Affordances, Digital platforms, Mixed Methods.

Introduction

Affordances are a constant presence in the research on social media platforms – and beyond. They are used to refer to specific socio-technical characteristics such as the like button, as well as to higher level dynamics that platforms enable, such as "searchability" (Boyd, 2011). Regardless of this ever-increasing popularity applied to the digital, the concept has been used into the fields of design, communication studies, human-computer interaction, sociology and more. Despite - or because of - their ubiquity, the conceptual boundaries of the term are uncertain not only across fields, but within them: affordances might refer to macro-scale effects or be used to point at objects, they might simply mediate interaction or strongly constrain it, and they might refer to the physical or to the digital (McGrenere & Ho 2000; Davis et al. 2017, Nagy & Neff, 2015; Evans et al. 2017). Social media research is not exempt from this plurality of interpretations (Bucher & Helmond 2018): affordances are used in virtue of their ability to mediate between the social and the technical, and to address the complexities arising at the crease between digital environments and social agency.

In this article I will consider a methodological approach to consider affordances in the context of Reddit, by drawing on the relationality between agent and environment, on intersubjective meaning, and by partially forgoing the socio-technical approaches that characterize social media scholarship. To this end, affordances have two functions: they concur in defining contextual social norms, as well as being means through which different forms of sociality can be enacted. A similar approach would be to consider the number of *likes* on a Facebook comment

not only, amongst other, to represent what is socially acceptable - and conversely what is likely to be socially sanctioned - but represent a way in which a groupnegotiates and enforce their vision of the world by making it visible.

1. Affordances

The noun "affordance" has been introduced by ecological psychologist J. J. Gibson (Gibson 1966). In its original conception, it links an environment to an actor. Here, affordances are a relational property, one that exists between a living actor and its surroundings: the environment is not perceived as it is, as a finite element, but is perceived through the possibilities for action that it provides. Gibson refers to the environment as being measured in relation to the actor who inhabits it: different species have different possibilities, and perceive only those upon which they can, in different ways, interact. Action is based on the context, the environment and an actor's perception and intentionality.

Affordances will then be picked up by Donald Norman (1988) and recontextualized for design studies, paving the way for its application, years later, in relation to digital environments. The result is a concept less focused on the interdependence of an actor and its surroundings, and leaning more on the agent (user) and the abilities of an object to project its potential uses. Despite reframing most of the intuitions that popularized the original concept, both concepts offer meaningful insights when considering its application to digital platforms: a relational approach is useful in alleviating the tension between human and machine, while Norman's emphasis on designed cues neatly fit the move to digital environments and social media. Mostly, however, the focus on perception that characterised first conceptualization of affordances is useful to understand how they can affect social action.

1.1 Affordances and sociality

Sociality has historically been present in the conceptualization of affordances, as "the richest and most elaborate affordances of the environment are provided by other animals and, for us, other people." (Gibson, 1979, p. 126). Such a conception on social interaction will drive two parallel schools focusing on *social affordances*: one follows the tradition of ecological psychology, where they are intended as cues from individuals to which an actor reacts (e.g. body language, or slamming a door, Loveland, 1991); the other is rooted in Human-Computer Interaction and Design where, following the intuition put forward by William Gaver (1996), they will come to represent "the relationship between the properties of an object and the social characteristics of a given group that enable particular kinds of interaction among members of that group" (Bradner, 2001).

Social affordances as such fill the gap with previous conceptualizations to consider digital media, where have been used to refer to the relationship between technologies, interaction and social context: to point at how social norms, knowledge and media literacy can affect interaction (Bradner, 2000; Kreijins, 2002; Hsieh, 2012); to consider how the technological features of a communication medium can be employed by users in a socio-instrumental way (e.g. globalized connectivity fostering long distance relationships; Wellman et al. 2003); or implemented as the cues of social environments (Hogan, 2009).

Attempts to conceptualize sociality and affordances, however, were not limited to the tradition of social affordances, and were certainly not rare. In fact,according to some scholars affordances might lean too much on the social, while undermining technological and structural constraints. This is true for what concerns communication theory, where "affordances, ironically, most frequently refer to what users and their sociality get from a technology" (Nagy & Neff, 2015). Similarly, sociologist Ian Hutchby slightly pushes back against social constructivism, arguing that we can "become too fixated on the social shaping of technology at the expense of an equally pressing, though differently framed, concern with the technological shaping of social action" (Hutchby, 2001).While these represent aptly aimed critiques at the intersection of sociality and technology, they are arguably nested in a context which tendentially privileges broader conceptualizations (e.g., macro level) and more theoretically driven approaches, while considering technology as central. Rather, a subjective point of view and an empirical focus might prove more useful in considering sociality, especially when compared to approaches that overemphasize technology or distribute agency, be it to other human actors (such as designers, see Cirucci, 2017) or non-human actors (e.g., Actor-Network Theory, see Callon & Latour, 1981). This tension between sociality and technology will become apparent in the study of digital platforms.

1.2 Affordances and social media

Bucher and Helmond identify two main uses of the concept: high-level and low-level, with the former describing "dynamics and conditions enabled by technical devices, platforms and media" (Bucher et al., 2018), the latter considering technical features of a platform and its interface, such as Twitter's feed. This fragmentation is partly due to different objectives: a high-level conception allows to extend findings, going over a specific platform (Ellison & Vitak, 2015), while a conception of affordances as features allows to delve deeper into uses, norms and individual understanding of mediated social action (Hayes et al., 2016). Danah boyd points at high-level affordances of social networks such as persistence, replicability, scalability, and searchability (Boyd, 2011); conversely, a low-level approach sees discrete features as affordances (e.g., Twitter hashtags; Rathnayake & Suthers, 2018). Different scopes have been considered as well, such as organizations (Treem & Leonardi, 2013; Wellman, 2001), or the macro-level effects of mobile media (Schrock, 2015). Concerning individuals, different use of affordances led to the focus on different aspects,for example in relation to gender (Schwartz & Neff, 2019), ethnicity (Cirucci, 2017) and geographical and cultural contexts (Costa, 2018); following a micro approach, the concept developed towards a focus on practices (Costa, 2018) and first-person accounts (McVeigh-Schultz and Baym, 2015). When factoring in culture, Nagy and Neff (2015) propose the concept of *imagined affordances*, which takes into consideration the expectations, beliefs, emotions, and perceptions built around technologies by actors. Focusing on perception allows them to consider for a peculiarity of digital environments, their dynamicity: "users need to explore mediated environments socially, culturally and cognitively before they can use them effectively" (ivi, p. 6). At a more general level, affordances have their own imagery surrounding them and guiding their use (Bucher, 2017; Nagy & Neff, 2015): they have a discursive and social power (Beer, 2017), in turn affecting social practices (Airoldi, 2020; Shepherd, 2020).

Considering the contribution of affordances inguiding social action and

practices provides a powerful tool to understand interaction in digital spaces. Let us consider Reddit: in this instance metrics, algorithms, and groups construct an intersubjective social reality; a subreddit creates an audience, while algorithms and metrics order and quantify the "feed"– for both content and comments – effectively creating a ranking. In a platform that is difficult to navigate, with a set of intertwining rules differing from the broad website to clusters of communities, and down to norms of specific subreddits (Chandrasekharan et al., 2018), socio-technical features provide a way to navigate this complexity. Users leverage features such as a content's score to understand the social and cultural norms of a mediated social context (i.e., they concur to a definition of the situation), for example by adapting to which type of self-presentation is deemed most appropriate in a specific page (Kennedy et al. 2016; Horne et al. 2017). Concurrently, other features such as upvotes and downvotes are employed to promote content deemed as worthy of visibility (Gaudette et al., 2020) or push what is deemed unworthy into oblivion (Bucher, 2012). When taken together this might lead, for example, to the intersubjective negotiation of an ideal body type in communities dedicated to personal image sharing (Kennedy et al., 2016).

Focusing on a social view of affordances then provides a useful methodological tool to delve deeper into the Coronavirus subreddit, and into how users define and manage social norms within it; this means focusing on how features such as the karma system allows to express social action, making it tangible, and guiding collective behaviour.

2. Reddit and self-censorship

Reddit is a digital platform or, more specifically, a content aggregator. It is comprised by thousands of different communities, *subreddits*, that are created, managed, and moderated, by its 430 million monthly users (Reddit Inc. 2020). These subreddits contain a plethora of content: from links, videos, and images to textual posts, and more, with each submission having its own comment section. The sorting of every piece of content and of every comment is determined by a score (the *karma* score) displayed next to it: this score is determined by users voting, who collectively determine the visibility (or invisibility) of content. This voting system affects what is displayed on the feed of the website and is therefore pivotal in managing the flows of information that constitute the platform.

The combination of its affordances allows for a consistent operationalisation of shared cultural values and norms, both guided by and guiding social action; this is exemplified by idiomatic expressions and neologisms that signal and foster membership among its users and might therefore be promoted (or *upvoted*) by the community. Affordances can then build and manage cultural boundaries, as well as engendering "a space in which alternate viewpoints are discarded" (Massanari, 2015a, p. 92). Following, I will briefly expand on two of the platform's central affordances: the subreddit and the karma system.

2.1 The subreddit

Subreddits are digital spaces, created and managed by users. Users create, moderate, and personalise these communities: as long as they adhere to broader rules and terms of service imposed by the website, they have a discrete autonomy.

More than 130.000 communities form the platform, widely ranging in size, topic, and approaches to content or moderation (Reddit Inc. 2020): memes and digital culture, mental health, pornography, politics and news, and more. Despite this multiplicity of topics, subreddits retain a collective imprint, an identity with shared norms and sensitivity that connect it to the platform as a whole (Singer et al. 2014), like a diffused "geek sensibility" (Massanari, 2015b); however, they retain different and often contrasting values: the platform, for example, has been the host of *r/the_donald,* a community of almost 800.000 Trump and alt-right supporters (McLamore, 2020), as well as the 500.000 members of *r/sandersforpresident*, supporting Bernie Sanders' candidacy in the 2020 US democratic primaries. Thematically close subreddits might differ in audiences, content and culture, based on goals (self-help versus news in transsexual subreddits, Triggs et al, 2019), moderation policies (strongly moderated and lightly moderated LGBT communities, Gibson, 2019), and might have similarities and differences despite covering tangent topics (e.g., different approaches to mental health, Park et al., 2018). This balancing of contexts and norms occurs across different communities as well, leading to self-censorship of information that would clash with established, situated, social norms.

The subreddit is then considered as a main affordance, both for the identity of the platform and the relevance in selecting audiences, contents, and their salience; subreddits have different social and cultural norms, often conflicting with one another. The same user might have to navigate opposing contexts, using multiple strategies to adapt to the situation, with one of these strategies being self-censoring based on a subreddit's perceived norms (Triggs et al. 2019).

2.2 The Karma System

The karma system is central to Reddit's functioning and identity. Users can vote positively (*upvoting)* or negatively (*downvoting)* on every comment and submission: this manages the visibility of content, as the platform promotes popular content as established through this voting system. Subreddits' content is sorted through a series of factors, including the karma score, with the most popular submissions reaching the *frontpage*: the feed situated on the homepage of the website.

Aside from regulating the flows of information on the platform, this feature has a social function: every user has a *karma score* visible on their profile, a cumulative score quantitatively tracking the social interactions through voting. This poses as an incentive for users to maximize their karma, for example by reposting previously popular content or by sticking to opinions that are perceived as dominant (Massanari, 2015b). This intertwines with the subreddit, as different communities sanction or reward contrasting points of view and different modes of expression, exerting tangible pressure by leveraging on the karma system.

Affordances then affect the production of content: users express by adhering to context-specific cultural codes (van der Nagel, 2013), as informed by the karma system; furthermore, this score has a herding effect, reinforcing collectively shared social norms (Muchnik et al., 2013; Weninger et al., 2015) and amplifying the reach of the content supported by cohesive groups of actors (Sheperd, 2020). Contextual norms drive what gets threatened by algorithmic invisibility (Bucher, 2012), as the audiences socially sanction users by downvoting comments that do not fit contextually situated cultural norms (Zhang, Keegan, Lv, & Tan, 2020).

The karma system and the subreddit keep digital interaction flowing by simultaneously informing and being informed by contextual social norms. Users accumulate karma and it has a tangible value, both as a cumulative score and as a symbol of acceptance for specific comments or submissions; as mentioned above, its value is underlined by the efforts to gain karma by manipulating the system and adhering to norms (Massanari, 2015a, p. 117). Conversely, users might avoid situations in which they might be socially sanctioned by not expressing an opinion, changing the venue in which they do so, or withholding information that clashes with subreddit-situated norms (Triggs et al. 2019); furthermore, they might withdraw expressions that get consistently sanctioned. Considering these behaviours as self-censorship allows an additional entry point into the social function of affordances.

2.3 Self-censorship

Self-censorship can be understood as a tool employed by individuals to avoid sanctions or reap social benefits, for example by altering a position based upon social influences (Kuran, 1997) or avoid expression if it does not conform to hegemonic narratives (see also Noelle-Neumann, 1974).

In the context of digital media, and specifically of platforms, self-censorship manifest as a series of behaviours: the decision to not express at all, or the removal of content prior to its publication, for example starting to type a reply to then delete it (see Das & Kramer, 2013); the removal of content after its publication, fully or partially (i.e., edited messages); the fragmentation of audiences and expression across multiple spaces. Concerning the latter, Marwick and boyd use the term 'context collapse' to refer to the ways in which Twitter affordances coalesce different publics, considering how users navigate this imagined audience; that is, how the understanding of one's public influences expression (Marwick & boyd, 2010). Following this line, individuals use affordances to self-censor in response to specific contexts: to multiply them, by segmenting audiences using fake profiles on Instagram (Dewar et al., 2019), by leveraging on pseudonymity (Chen, 2018; Triggs et al., 2019) or through private groups on Facebook (Costa, 2018).

Self-censorship, then, is actuated on different platforms in disparate ways, as based on available affordances. The perceived support for one own's opinion might affect expression (Wu & Atkin, 2018; Askay, 2015): therefore, affordances that explicit this perception (i.e., Reddit's karma score) might be central in guiding the understanding and possibilities of social action. This is especially relevant when considering how self-censorship still occurs when considering clearly segmented and specific audiences (Das & Kramer 2013).

Reddit and self-censorship, then, can be considered through an approach leaning on affordances: the subreddit participates in establishing contextual norms, that in turn are negotiated and collectively enforced through the karma system; consequently, other affordances allow to save face or to avoid social sanctions by self-censoring, for example by editing or removing comments, by withholding expression, or by segmenting audiences.

3. Methodology

To consider these dynamics it is required to focus on a single subreddit, given

the differences among them. The subreddit considered is *r/coronavirus*, centred around discussion on the COVID-19 pandemic. Emerging and gaining prominence during the pandemic, the r/coronavirus space quickly gained popularity; it is a young subreddit, to some extent exogenous and unlinked from the broader themes of the platform (Massanari 2015a). It focuses on the discussion on COVID-19, the diffusion of the pandemic, and potential economic and societal impact. Growing from less than 1000 subscribers at the beginning of 2020, as of May 2020 it counts more than 2 million users; the community is one of the many sprouting and rapidly growing around the issue, and while it is the biggest for what concerns the topic, it is far from reaching the 28 million subscribers of r/gaming. Similarly to some scientifically oriented communities on Reddit, r/coronavirus is strongly moderated: among the moderators, several have a scientific or medical backgrounds, and only trustworthy media outlets and sources are accepted; furthermore, to avoid misinformation, purely political posts and comments are banned, and automated tools flag for approval racist and xenophobic posts (Solon & Glaser, 2020). It fosters divulgation by interviewing experts (through Q&A sessions) and key actors in the field, as well as collating useful resources in its sidebar. Other subreddits treating the same topic have other declinations, such as less strict moderation around sources and political speech (r/chinaflu), a focus on academic publications (r/covid19) or on location-based discussions (e.g., r/coronavirusUK).

The choice of this subreddit follows months of non-participating observation and an exploratory analysis of digital data from different communities on the platform, with an eye to regulation (i.e. moderation rules and tools) and size: entertainment, scientific, finance, general-purpose communities and more have been considered. However, a young community has the advantage of not having a crystallised culture: privileged ground to observe how norms are fluidly negotiated.

3.1 Ethnography and Topic Models

Ethnographies in digital environments require first and foremost a reflection about the object of study. Designing a subreddit as a community entails a series of difficulties, as it does not consider actors and their practices (Postill and Pink, 2012), the fragmentations of spaces, or the circulation of the object (Caliandro, 2017). However, the focus of this research is not the community *per se*, but rather the cultural norms that are enforced within a *digital space*: to this end, we follow the medium (Rogers, 2013) to collect data, exploiting native features of the website such as the subreddit.

Non-participant observation of the platform and the chosen communities has been carried out in the context of the research, thoroughly and with extensive field notes; however, I am also a long-term (10 years) Reddit user: while this allows to consider the cultural dynamics of the website as an insider (Clifford & Marcus, 1986) it is necessary to consider that subjectivity might affect findings. I actively participate on the website, albeit not extensively, by commenting and submitting content to various subreddits; while these interactions were non-systematic and unrelated to the context of this research, they still reflect the observations of a researcher embedded into a community.

Aside from naturalistic observation of the subreddit following platform logics, in-depth observation followed the object of the research – affordances, and specifically the karma system and the imagery around it, by following Caliandro's approach to ethnography in digital spaces (Caliandro, 2017), in turn informed by

digital methods (Rogers, 2013), multisited ethnography (Marcus, 1995) and Actor-Network Theory (Latour, 2005). The purpose is to reconstruct the imagery around affordances by deconstructing discursive practices; more than metrics, following how social actors negotiate and enforce a specific view of the world through first person accounts (Boltanski and Thévenot, 2000).

It is difficult to have a comprehensive overview of Reddit. The production on the website is as complex as it is vast, with billions of comments scattered across hundreds of thousands of spaces. This unprecedented flux of data is common to all social media platforms and concurred to an increase in the use of computational methodologies in the social sciences (Conte et al., 2012), such as quantitative text analysis, the application of statistical methods to analyse textual data. This allows to draw statistical inferences from a text population and is especially useful when a corpus is too large or complex for qualitative analysis (Roberts, 2000).One of the computational tools increasingly used for the analysis of social media data is that of the topic models. Topic models are unsupervised machine learning approaches, meaning that they require no prior manual annotation, and can discover the themes underlining unstructured datasets (Blei, 2012). Such themes – or topics – are mixture of words, with each word having a probability of belonging to a topic; similarly, documents are a collection of topics in various proportions, as based on the words in it. Topic models have been employed in a variety of contexts, for example to empirically consider cultural influences on news coverage (Di Maggio et al., 2013) or to supplement qualitative analysis (Nikolenko et al., 2017). Topic models are not exempt by a fair share of criticism, aimed at the number of qualitative decisions required from the researchers (Chuang et al., 2014). Data must be pre-processed, to consider which words and how they should enter the algorithm; furthermore, the number of potential topics must be manually set.

Varying these parameters, for example by considering only words which appear more than once or changing the number of topics, can radically alter the output of the model (Sbalchiero & Eder, 2020).

To circumvent some of the limitations of topic modeling, scholars have harmonized it into comprehensive mixed methods approaches, where iterative research designs and researchers' interpretation can mitigate its inherent weaknesses (Wallach et al., 2009). This takes a variety of forms: topic models can aid in analysing open-ended responses and estimate treatment effects (Roberts et al., 2014), or be harmonized into more comprehensive mixed methods approaches (Chakrabarti & Frye, 2017), for example by finding lexical patterns and perform a "computationally guided deep reading of the text" (Nelson, 2020, p. 6). Paired with ethnographic approaches, then, topic modelling can validate findings or underline overlooked topics, aid reflexivity, and balance emic and etic perspectives (Ophir et al., 2020).

Following these approaches, I focused on naturalistic observation first, to then move on discursive practices around the object of research; computational analysis has been implemented iteratively, following qualitative analysis as well as prompting further observation.

3.2 Data collection

The timeframe for ethnographic data collection runs from the end of February 2020 up until June 2020, comprised by almost daily browsing of the platform and the subreddit. Computational data collection focused on the month of March and

consists in almost 2.800.000 comments on r/coronavirus.

The data has been collected by leveraging on Reddit APIs and on a data-platform collecting all of Reddit's comments at time of production, Pushshift (Baumgartner et al., 2020). This combination allows to obtain the original text of the comment as well as its status: if it is online or it has been removed (by a moderator or by its author). Pushshift removes comments from the dataset only if manually prompted by the user or due to server errors.

Data has been processed to remove comments by moderators, bots, and recurring messages (e.g.,r/coronavirus reporting daily cases by country with a standardised format). Furthermore, for self-deleted comments all deleted profiles have been removed, to isolate comments removed manually from mass-removals coinciding with the deletion of an account. Finally, the month of march has been queued to obtain all the comments mentioning affordances revolving around the karma system: *upvote, downvote,* and *karma*. The final data set consists of 3 parts: 122.233 comments removed by users, the same amount (randomly sampled) of online comments, and 14.763 comments mentioning affordances. While all three served as a point of reference and underwent in-depth analysis, only the first two underwent computational analysis.

The algorithm employed for computational analysis is that of the Correlated Topic Model (Blei & Lafferty, 2006), implemented through R and its STM package (Roberts et al., 2019). Comments have been pre-processed, (i.e., removing HTML markers and URLs, numbers, punctuation, symbols, stop-words, and tokenised), and some words have been removed based on frequency to remove additional stop-words and misspellings. The number of topics must be set manually, and it intertwines with the type and length of documents (Sbalchiero & Eder, 2020); while topic can be evaluated using semantic coherence (Mimmo et al., 2011) or exclusivity (Lucas et al., 2015), following some sociological applications (Nelson, 2020; DiMaggio, 2013), topics were chosen through human interpretation, based on the avoidance of similarity among groups and their univocity (Wallach et al., 2009). Given the type of data, results are not as solid as with longer documents, since aggregating texts is not feasible (Alvarez-Melis & Saveski, 2016): however, results still provide valuable insights.

4. Analysis

The conversation on the r/coronavirus subreddit is varied and is constituted by submissions and comments. Even before that, however, it is influenced by its moderating practices, which aim at promoting what is dubbed as high-quality posts and discussions. An emphasis on the quality of the conversation is reflected by the broader ecology of subreddits, with some, such as r/chinaflu, welcoming more controversial content: when compared to said subreddit, r/coronavirus focuses more on negotiating what submissions conforms to the subreddit's standards of quality (Zhang et al., 2020). This was the core focus of the subreddit, as user leveraged quality often, to upend situated cultural norms across three main areas: data and sources, politics and policies, foreign countries.

> *"I upvoted you because you're adding to the discussion in a thoughtful way."* (user1)

The value of quality is reflected discursively into an apparent respect for data: institutional and academic sources, figures, and statistics, are evoked by users to

justify their position. However, such an approach is supported mainly when it fits a specific narrative: comments that do not conform to hegemonic positions are often met with caustic reactions, even when reasonable points of view are expressed and backed by data and sources. Conversely, the push against what is perceived as a violation of broader social norms is strongly supported regardless of content: personal attacks were preferred to figures, when this concurred to sanction perceived violations. This often creates mismatches into the expectations of users, as they might get downvoted after posting what is perceived as factual information backed up by data: *"This has been backed up by so much data and you get downvoted this subreddit is bonkers"* (user2).

This pattern is stable across the subreddit and the different themes considered. Furthermore, downplaying the seriousness of the virus, or praising the US management of the crisis, were often met with downvotes. Despite the ban of political content at a subreddit level, comments still refer to political figures, parties, and bills, as they relate to events concerning the pandemic and its consequences, such as the stimulus package announced in the US on March 2020. Overall, this seems to reflect the liberal bias that Adrienne Massanari identified at a platform level (Massanari 2015a), which coalesces into a broader support for local and federal measures (e.g., lockdowns) and state-mandated financial intervention (e.g., stimulus checks). For example: *"You can't even give the slightest inclination that the Trump administration isn't to blame for something, or you'll get sent to karma hell."* (user3).

This relentless criticism of the US management of the pandemic intertwined with a praise for other countries and their own management of the issue. As the virus spread over the world, several countries entered the conversation; however, the country featured the most is China. While the presumed responsibility of the country in spreading the virus is debated, their management of the epidemic is praised; attempts to downplay their containment efforts are downvoted and criticized, for example when mentioning a possible manipulation of the number of cases in the early days of the pandemic. By some this is perceived as being part of a broader propaganda effort by "CCP shills". This is a recurring pattern, as users refer to external forces, such as shills or coordinated efforts, when opinions that are considered opposed to that of the subreddit as a whole obtain some form of support (e.g., pro-Trump comments).

> *"Based on these evidence, I can confidently trust China over USA over my dead body"* (user4)

> *"The entire tone and tenor of this subreddit has changed 180 degrees this morning. What the fuck is with all these shills upvoting low quality comments. Do we suddenly trust anything coming from the CCP?"* (user5).

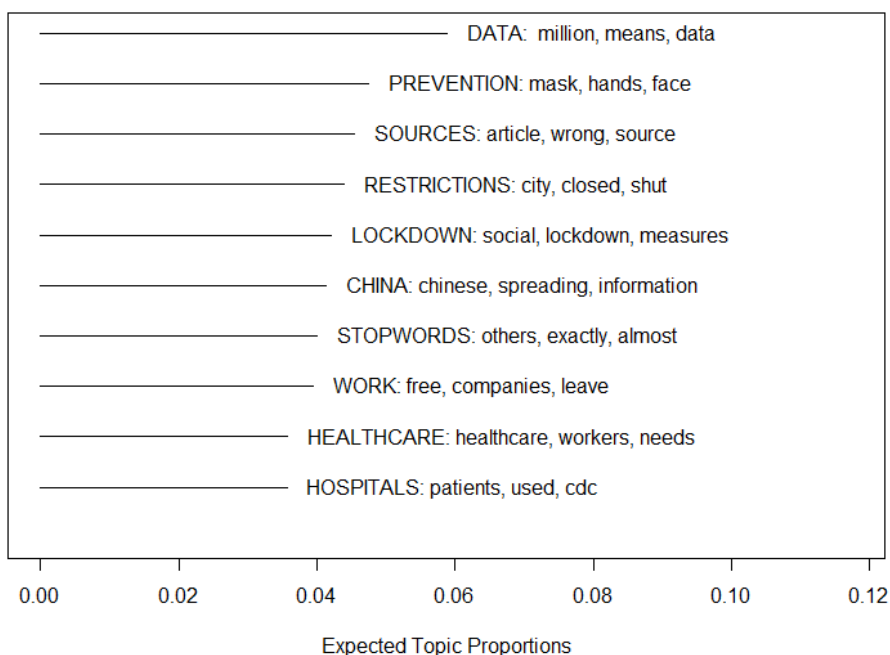**Top 10 topics by proportion for online comments (K = 30)**

Figure 1 - Topics by proportion of documents in which they appear. Online Comments. Expected topic proportions as fraction.

Computationally generated categories seem to resemble ethnographic observation (figure 1). The most discussed topic, spanning roughly 6% of the documents, captures a discussion of the pandemic from an epidemiological point of view that leverages data, figures and indicators; the most influential text in the category compares the case fatality ratios (CFR) of South Korea to estimate the potential number of cases in the United States: *"Based on reported 3.5% CFR which is likely inflated due to lack of testing and south korea's 0.6% reported CFR and how well they're doing on testing, we can probably extrapolate to say the number of cases in the US is 5x what is reported. Of course this is a crude estimation so take it with a grain of salt"* (user6). This is linked to the third most discussed topic, which refers to sources, articles, and the broader negotiation of quality in the subreddit, especially for what pertains the quality of indicators and their origin.

In the case of restrictions to movements and broader containment measures, the model is able to capture different facets of the same phenomenon: as geared towards a higher level of abstraction, with a focus on lockdowns and their social and epidemiological implications, as well as a focus on the physical restrictions applied to cities and freedom of movement (figure 2). The focus on China is split between the representation of the country on US media and on how China controlled the flows of information pertaining the spread of the pandemic.
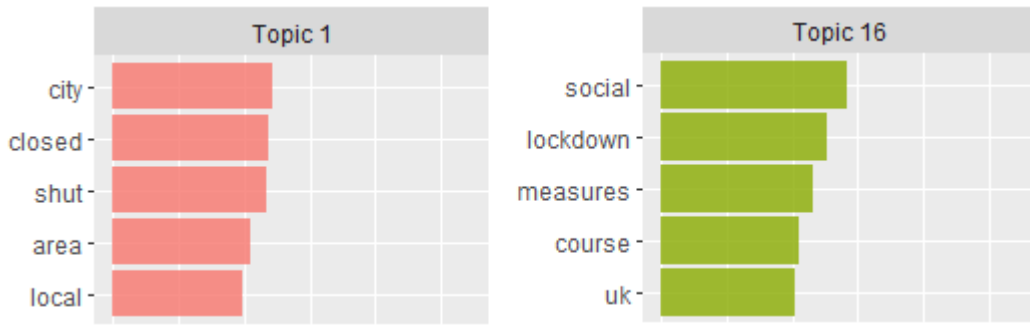
Figure 2 – Topics referring to lockdown and restrictions of movement. Top 5 word probability distribution per topic.

Comparing online and self-removed topics did not underline any relevant differences, as major clusters vary slightly in words but not semantically. This seems to point at themes being constant among the comments removed by users to those that were still online. However, topics from the self-deleted dataset underline a category related to right and left leaning politics. Further investigation, consistently with subreddit guidelines, pointed at a mistrust in both parties: more than a liberal bias, then, a rejection of political discourse as a whole seems to be dominant in the community - or at least a balance among parties.
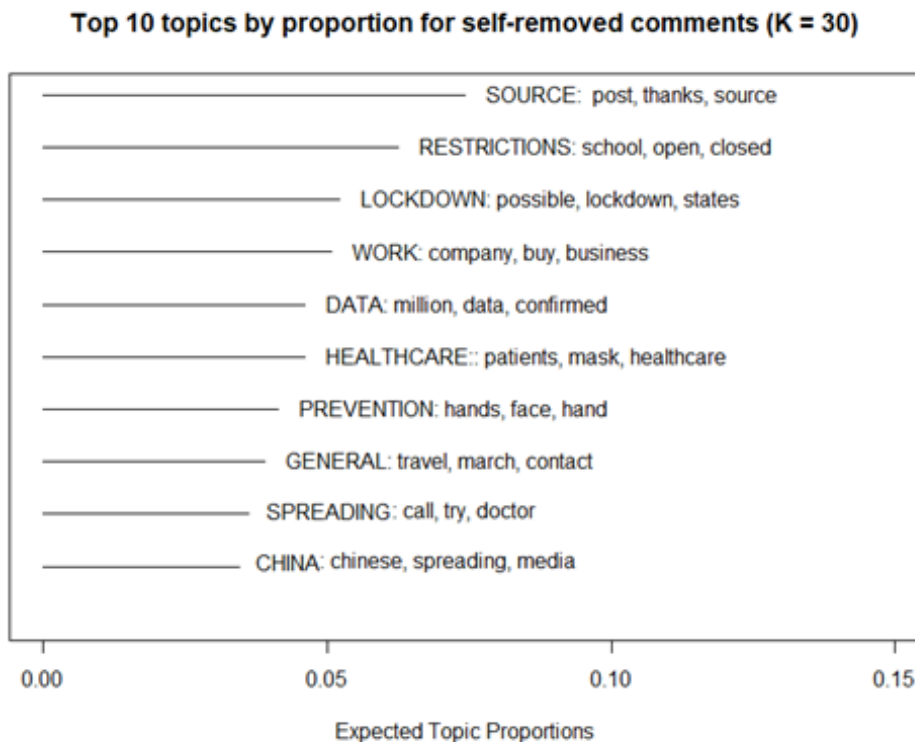

Figure 3 - Topics by proportion of documents in which they appear. Self-removed comments.

Conclusions

Some subreddits are created and maintained based on guidelines and explicit rules, that are enforced through moderation practices to various degrees. In the case of the r/coronavirus subreddit, perhaps the most relevant guideline is that of quality: an emphasis on the quality of content, of data, and of sources. This is enforced by moderators and is reflected by the broader ecology of communities, as testified by the presence of COVID-19-focused subreddits with looser rules and moderation practices.

These guidelines concur to structure the cultural climate of the subreddit, that in turn influences naturally emerging social norms; however, these norms are enforced by users, that often use rules as discursive devices to reify and legitimate specific cultural codes. The focus on quality, then, becomes a way to sanction content and users that do not adhere to situated, unwritten norms, that naturally emerge (i.e.: bottom-up rather than imposed by moderation) rather than a focus on the quality of content as per rules. Affordances play a role in this mechanism: comments, upvotes, and downvotes were used in conjunction with guidelines to enforce specific views pertaining to an array of topics both directly and loosely related to the pandemic (e.g.: lockdown, restrictions, spread of the virus, and politics, countries, work).

The plethora of references to affordances such as downvotes and upvotes seems to point at aware users, that collectively and fluidly negotiate and enforce these norms across the community. When a comment breaks what are perceived as established norms, for example by praising the Chinese effort, and is not sanctioned as expected but instead supported (i.e.: upvoted), it is pointed to as the evidence of the work of shills. Furthermore, while rules are often perceived as being specific to the subreddit, the general dynamics that regulate expression are frequently reconducted by users to Reddit's karma system, demonstrating an awareness of the role of affordances in managing the flows of information on the platform (Shepherd, 2020) and its accumulative logic (Muchnik et al., 2013). Individuals often invoke the pressure given by collectively negotiated social norms and are aware of how it can affect expression (Massanari, 2015a): this hints at platform-level dynamics and how those intertwine with more granular social formations as based on perception. Overall, affordances are central to this process: the subreddit allows for the creation of communities situated into the broader ecology of the platform, each with their own rules and norms (Horne et al., 2017); then the karma system more directly manages a community's culture by punishing socially deviant expressions and promoting comments conforming to situated social norms, intertwining with rules and moderating practices.

Notably, there seems to be no overwhelming difference between online and removed comments. This seems to point at the lack of mechanisms of self-censorship, and it might be influenced by a multitude of factors: social desirability, awareness of the norms of the community and of the potential punishment for breaking them (van der Nagel, 2013), concerns around privacy, or due to the segmentation of audiences across spaces (Triggs et al., 2019).

While this research points at the connection between rules and norms in online groups, such an approach has limits. While an observational ethnographic approach is invaluable to peek into cultural dynamics of groups, interviews would provide useful data concerning self-censorship and the perception of social norms. Furthermore, it would mitigate the problem of dealing only with active users, and an emphasis on engaged and aware actors, giving more weight to users that do not

comment or actively participate in the subreddit.

These concerns are to some extent mitigated by a mixed methods approach: pairing naturalistic observation and computational methods allowed to consider not only the distributive logics of the platform, and therefore widespread comments, but also comments that were less popular or visible. Considering both dimensions allowed for a more systematic view of the intertwining of culture and visibility, especially relevant in this case.

Considering cultural factors, iteration among components proved useful into guiding the reading of data; for instance, by disaggregating what was ethnographically perceived as a single topic (e.g.: lockdown and movement restrictions), or by prompting additional reading of the same data through a different lens (e.g.: disentangling politics and policies). Iteratively, this took place at different points, guiding the analysis and providing grounds for additional data collection. A mixed methods approach allowed for a comparison among different datasets, providing a ground of reflexivity for the researcher embedded into the environment; unpacking contextual factors from cultural and social norms adopted throughout the platform made it possible to consider the characteristics of Reddit at large, while taking into account the peculiarities of a smaller fraction of it, r/coronavirus.

Considering affordances socially allows to consider not only how social action is enacted and perceived through them, but how they concur to create, foster, and manage social situations made of broader social and cultural norms. By applying it to Reddit, it points at how individuals are aware of the social pressure affordances exert, how their meaning is negotiated in a fluid way, and how it is nested in a broader environment; this intertwines with the dynamics of the platform, underlining the specificities of different social formations in negotiating their culture. The crystallised rules of a digital environment intertwine in complex and layered ways with the social norms that naturally arise in a group, as their authority is used to reify situated views of the world.

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