Twitter Issue Response Hashtags as Affordances for Momentary Connectedness

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ABSTRACT
Online activity is commonly conceptualized in social media studies using theoretical frameworks defined for offline contexts, such as public sphere, publics, and communities. Although this approach has its merits, especially in terms of providing theoretical foundations to describe new phenomena, this approach limits conceptualization of online activity to offline behavioural patterns. This paper responds to calls for conceptual departures by theorizing Twitter issue-response hashtags as instances of ‘momentary connectedness’, topical structures of momentary connectivity that include original tweets, retweets, ‘quote tweets’, reply and mention clusters, sharing via direct messages, and liking. Most of these forms of uptake in Twitter issue-response spaces involve imagined audiences, making it difficult to situate them in concrete conceptual categories, such as publics and communities. Further complicating the public-private distinction, tweets that are public can enter the private realm via the option of direct messaging. Momentary connectedness accepts the multifaceted nature of Twitter hashtag networks by seeing them as constructed through multiple forms of uptake and being situated in private and public domains, thus providing a more natively digital conceptualization that recognizes the permeability of online communication across boundaries. These concepts are illustrated with a case study.

CCS Concepts
- Human-centered computing→Collaborative and social computing theory, concepts and paradigms
- Human-centered computing→Social media

Keywords
Hashtags; Twitter; Publics; Communities; Momentary connectedness.

1. INTRODUCTION
Scholars who examine collective behaviour on social media commonly frame online activity within theoretical perspectives developed to describe offline phenomena, such as groups, communities, and publics. While this approach has its merits in terms of its ability to provide a theoretical foundation for a relatively new field of study, its potential of describing online phenomena is limited due to differences between online and offline spaces. Scholars such as Fernback [14] and Yuan [51] have raised this issue, highlighting the need for novel conceptualizations of online activity. As the shift from industrial to post-industrial societies demanded new concepts, a vocabulary, and new theories, the rise of networked societies also demands new conceptualizations. While the majority of social media studies borrow concepts and measures from offline contexts, there is a growing body of literature that conceptualizes new media platforms by considering their architecture, affordances, and novel ways in ways in which technical elements restructure communication among different groups of users (e.g., [6, 8, 10, 19, 33]). The field, however, requires more work that conceptualizes the use of specific social media platforms, as the design of each platform and the way tools are used can result in nuances in dynamics of communication.

Twitter, the popular micro-blogging platform that was once considered a source of “pointless babble,” has evolved into a disaster communication tool, event-following machine, a dataset accessible via the US Library of Congress [39], and more recently, a means for presidential communication. This transformation indicates the significance of Twitter as a communication platform, as well as a source of data that can provide interesting insight into technologically embedded social phenomena. Twitter use has been subject to substantial investigation across a broad range of perspectives. As the vast majority of Twitter studies explore how the tool is used for various purposes, such as politics (e.g., [21, 22]), cultural conversation (e.g., [7]), and cultural performance (e.g., [15]), the number of studies that conceptualize the act of tweeting itself remains insufficient.

Studies conducted by several researchers provide a starting point to conceptualize Twitter use beyond offline theoretical foundations. For instance, Licoppe and Smoreda’s notion of connected presence [28] describes how communication technologies have enabled interstitial or phatic communications that support quasi-continuous forms of togetherness at a distance. Moreover, Litt’s [29] work showed how Twitter use is characterized by users’ imagination of their audiences, Marwick and boyd’s [33] study discussed imagined audiences using the notion of context collapse, and Gruzd, Wellman, and Takhтеyev’s [18] work on imagined communities focus on dynamics of ‘tweeting’ itself, rather than purposes for which people tweet.

The body of literature surrounding the use of Twitter is represented by two main analytical approaches. The attribute-based research approach examines the nature of content exchanged and the purposes for which such exchange occurs (e.g.,
Scholars who take this approach pay more attention to tweets themselves or attributes of Twitter users, rather than how users are connected to each other through the act of tweeting. Scholars who study Twitter from a relational perspective pay more attention to interactional aspects, such as mentions and retweets (e.g., [13, 20, 21]). There is a gap of research that examines the act of tweeting in its totality, considering all the aspects of tweeting (tweets, replies, retweets, direct messages, and liking).

Use of hashtags- short strings of text preceded by the symbol “#”- is a common practice in social media. Social media hashtags should be understood as a unique phenomenon with its own dynamics, rather than a reflection of offline activity, since this is a new form of behaviour enabled by social media affordances. The objective of this paper is to suggest a theoretical approach to describe how publicness is constructed by means of Twitter issue-response hashtag networks as a state of momentary connectedness within the acts enabled by affordances of the platform. Accordingly, we conceptualize Twitter hashtags as affordances of the platform that organize instances of momentary connectedness into networks. We discuss these instances at levels of mediated communication, including original tweets, utterances that take up expressions of others (retweets and quote tweets), expressions that can initiate interactional exchange (replies and mentions), direct messages, and acts of liking.

2. PUBLICNESS THROUGH TWITTER HASHTAGS

The need to problematize current conceptualizations of publicness on Twitter arises from a dearth of theoretical perspectives that move beyond frames provided by the study of offline behaviour. Current new media literature includes a substantial number of studies that draw on three offline phenomena to describe online interaction: 1) public sphere, 2) publics, and 3) communities. We examine these theoretical lenses to identify their ability or limitations in describing nuances in social media platforms, and stress the need for novel conceptualizations.

2.1 PUBLIC SPHERE

A large number of studies employ the notion of public sphere, a space which is characterized by interaction among citizens, formation of public opinion, rational-critical discussion, and public monitoring of state authority, to describe online social phenomena. For instance, research on Austria’s national public sphere [3], Australia’s networked public sphere [9], and Colleoni, Rozza, and Arvidsson’s [12] work on political homophily, are framed within the notion of public sphere. Some scholars seem to apply public sphere to identify certain domains of online activity, conceptualizing online ‘spheres’, such as blogosphere (e.g., [1, 49]). In an interview with the Financial Times [23], Jürgen Habermas, the political philosopher who conceptualized the notion, seemed skeptical about the potential of the Internet to help create a new public sphere. He accepted the communicative potential of the Internet, however, he claimed that the structure of the web is not appropriate for simultaneous opinion formation among members of a dispersed public.

Several scholars critique Habermas’ view of the potential of the Internet in forming a public sphere. Geiger [17] suggests that the question: “what is the role of the Internet-based discourse communities in the constitution of the public sphere?” is more appropriate than “is the Internet (part of) a new public sphere?” Highlighting the role algorithms play in the new space, Geiger notes that the blogo/public sphere operates via Habermasian discourse on a micro level, while the macro level structure is constructed by algorithms, which in turn can be more powerful, invisible, and uncontestable. Boyd [6] also notes that underlying structures and the network-caused reorganization of information flows and interaction differentiate networked publics from their offline counterparts. Boyd describes how the notions of the public and the public sphere have taken different forms, ranging from a local or broader collection of people, and a group bounded by a shared text, to an imagined community. This polymorphism, we argue, calls for a new theoretical framework that can capture the nuances in the converged public, quasi-public, and private online spaces; rather than seeking answers developed in offline contexts governed by a different logic.

2.2 PUBLICS

Researchers have explained the interactive space enabled by the Internet, envisioning it as a domain for ‘publics’ redefined by the logics of networked technologies. Tremayne et al. [49] ‘cast’ the network of Iraqi war blogs as an ‘issue public’, a group comprised of highly educated, professional, male bloggers that does not resemble the general population. Maireder and Schlögl [31] identify the hashtag ‘#aufschrei’ as an ad hoc public that emerged within 24 hours and transformed into a public discourse. Rather than considering the entire population that used the hashtag as a public, Maireder and Schlögl identify multiple publics involved with the topic. Examining online engagement in oppressive contexts, Shklovski and Valtysso [42] argue that various types of publics (e.g., issue, mundane, and counter publics) can foster social change emerge online even in authoritarian contexts. In general, online issue publics have well-defined boundaries compared to the broad masses of Internet users identified as public spheres.

Some scholars have captured nuances of computer-mediated communication in their definitions of online publics. For instance, Boyd [6] defines networked publics as “publics that are restructured by networked technologies” that are “simultaneously (1) the space constructed through networked technologies and (2) the imagined collective that emerges as a result of the intersection of people, technology, and practice.” She further notes that new possibilities for interaction can lead to new dynamics that shape participation. Arguably, it is this very set of new possibilities that problematize the notion of publics itself when applied to online contexts. Specifically, the fluid nature of online communication blur the boundary between the private and the public, and allow for interactive, quasi-interactive, as well as non-interactive expressions simultaneously, causing a fragmentation of the online space and weakening our confidence in identifying clear ‘networked publics’.

2.3 COMMUNITIES

The notion of communities has been used to explain relatively smaller groups of social media users. For instance, Rosen, Lafontaine, and Hendrickson [40] see crouchsurfing.com as an online community where members coordinate activity and gather via social media. Similarly, Velasquez [50] identify www.lasillavacia.com as an online community characterized by the presence of user profiles, information on the number of posts (comments and stories), points systems based on site contribution, short bios, and private messaging. Stommel and Koole [44] view an online support group on eating disorders as a community that has normative requirements, which new members are expected to subscribe to. They identify a clear distinction between two related parties (the forum and the newcomer) and describe how the forum
acts as a group when establishing interactions with the new member. Albrechtslund’s [2] work on online communities is centered around a World of Warcraft guild, where narratives play a central role in creating a sense of community and collective identity. According to these studies, online communities display more cohesion, interaction among members, and collective identity than publics.

Application of the notion of communities in online settings is as problematic as the idea of online public spheres. While this concept may be appropriate to discuss various online groups examined by some of the studies mentioned above (e.g., [2, 40, 44, 50]) in which users work together in specific settings, this concept may not be appropriate in other contexts. Ren, Kraut, and Kiesler’s [38] observation that communities evolve as members influence the structure of and interaction in online platforms may not be valid in some contexts. Those who respond instantly to social/political issues or natural disasters via means of communication enabled by social media affordances, such as hashtags, may not interact long enough for community features to evolve. Furthermore, several scholars identify the need for new approaches to understanding online spaces. Yuan [51], for instance, argues that application of online communities does not adequately conceptualize culture. He also suggests a conceptual departure, noting that media-enabled communities may serve as a starting point for examining nuances in technology and social change. Fernback [14] claims, the “community metaphor placed on virtual social relations is inadequate and inappropriate.” This is due to the fact that this metaphor describes only a few qualities of community (fellowship, respect, and tolerance). Fernback also suggests a conceptual departure from the concept and notes: “rather than asking whether or not cyber community is or isn’t real community, a long-term perspective on the cultural significance of cyber community focuses on how some users of online technology have created meaningful constructs of social interaction in the online arena.”

In general, many scholars consider concepts of public sphere, publics, and communities as capable of adequately describing online activity involving groups of Internet users. While these concepts help examine dynamics of online activity, they may not fully capture nuances in online activity. This happens for at least two reasons. First, online and offline spaces offer different communicative affordances (e.g., Clark & Brennan’s [11] “grounding constraints”), and are ruled by different logics; some rules valid for offline activity may not make much sense online. Framing studies of online contexts within frames developed for offline phenomena may limit the potential for new conceptualizations. Second, contemporary social media function as platforms for different types of activity, and different behavioural practices can emerge on the same platform. For instance, hashtags are a unique aspect within social media that take Twitter users beyond their follower/friendship networks to a more global level of connectivity. Explaining this instant connectivity using offline phenomena may be difficult.

### 2.4 Novel Conceptualizations

While questions of whether or not online collective constitute online public spheres or communities are crucial for our understanding of the networked society, it is important to look beyond these concepts and find natively digital ways of conceptualizing online activity. In this section, we describe novel approaches that capture nuances in online activity, and identify the need for a natively digital conceptualization of Twitter issue-response hashtags.

Holmes [19] discusses the notion of ‘public sphericules’ - spheres of assimilation with their own dynamics- a concept originally suggested by Todd Gitlin, as an alternative to the conventional public sphere. Holmes notes that individuals using modern communication platforms are in a process of constructing publicness, rather than participating in a given public sphere. This view of fragmented partial publics seems more appropriate to describe the dynamics of online communication. It is also consistent with Latour’s [27] dictum: “no groups, only group formation.” Rather than argue about what constitutes a public, we should examine the ongoing activity by which participants construct and sustain ‘publicness’ (see also the Fernback quote, previous section). Social phenomena are not fixed entities, but rather are constantly being constructed by participants’ actions. However, though fragmented and contingent, people engaging in online activities may perceive being in a larger collective. Marino [32] discusses ‘digital togetherness’, a sense of belonging and identity based on sharing personal and private experiences (e.g., being online, being native of a particular country, speaking a common language, and having a common ground like being an immigrant). As Rathnayake and Suthers [37] found, those who use a hashtag may be locally active, having their interactions limited to a small cluster, but may be globally connected in their imagined affiliation with others through the hashtag. This global-local coexistence needs more ‘socio-technically established’ inquiry.

Though a considerable number of researchers examine hashtag networks, studies that conceptualize hashtags themselves are relatively scarce. Bruns and Burgess [8], and Bruns and Moe [10] conceptualize Twitter hashtags as ad hoc publics emerging from within the Twitter community. This conceptualization is based on the view that hashtags act as “discursive communities around a central shared interest.” Bruns and Burgess claim that Twitter issue publics can correspond to issue publics in related areas, such as politics. This conceptualization is valid if the population of users within the hashtag is engaged in discursive communication, displays special interest, and shows expertise in the issue. As Kim [24] shows, issue publics in the information environment develop patterns of information acquisition and enhance domain-specific knowledge that results in changes in their engagement in the issue. However, a group of social media users that uses a viral hashtag may not necessarily fall into this category of issue publics, as hashtag networks are broad and are formed in response to the issue rather than expertise, domain specific knowledge or special interest. Yet, issue public groups may exist as subsets within the population that used the hashtag.

#### 2.5 Imagined Audiences

Schmidt [41] argues that Twitter use has resulted in personal networks, a new form of public formed on the level of follower networks characterized by personal relevance of content exchanged, presence of an audience consisting of network ties, and a conversational mode of information exchanged. This view can also be problematic when applied to issue response hashtag networks. For instance, some users who tweet with an issue-response hashtag may not necessarily engage in a direct conversational mode of information exchange relating to the issue. This view can be supported through imagined audiences [29] and imagined communities [18], a mental conceptualization of the audience, rather than an actual audience, that can shape a user’s communication via social media. Marwick and Boyd’s [33] work on imagined audiences of Twitter users show that while some users have strategic audiences, such as fan bases, some users...
tend to use Twitter as a diary or a record of their lives; suggesting that public rejection of audience exists within Twitter use. Moreover, Litt, and Hargittai’s [30] work show that more than 50% of users do not think about specific audiences as they share information on social network sites. Litt and Hargittai identify this as ‘abstract audiences’.

The above discussion points to the need for concepts that can describe the highly fluid nature of Twitter communication. The ubiquity of abstract audiences [41] and Marwick and boyd’s [33] observation of public rejection of audience indicates in particular that there should be a concept that describes an action in a collective context (i.e., tweeting with a hashtag) that does not necessarily have a transactive (other-directed) communicative intent, though it may have the possibility of responses from others, such as retweets. We now examine how publicness is constructed as instances of momentary connectedness via the broader variety of interactive relationships that are afforded by Twitter issue-response hashtags.

3. MOMENTARY CONNECTEDNESS
Sending tweets with an issue-response hashtag is a momentary act that brings users to a topical structure of connectivity. That, however, is not necessarily an indication of user intention to form or interact with well-defined communities or publics. This structure of connectivity is a combination of non-other directed expressions and mere repetition of messages, as well as clusters of active users engaged in the issue. The term ‘momentary connectedness’ captures the emergence of these structures of connectivity in hashtag networks as constructed by uptake organized around a hashtag. Hashtag networks as instances of momentary connectedness are enabled by the affordances of the platform. The # character followed by a topic name, as interpreted by Twitter’s technological infrastructure, functions as a tool for mobilizing and focusing collective activity. It does so by serving as a prompt, inviting response on the indicated topic. The hashtag brings the contributions of those who take up this invitation into a mutually visible space. In these ways a hashtag functions as an “immutable mobile” [26]. The affordances enable different layers of mediated communication, such as tweets not targeted at any user, as well as retweet, reply, and mention clusters, and acts of liking and private messages.

Scholarly work along several dimensions is necessary to situate the theoretical construct of momentary connectedness in empirical settings. In the following discussion, we take a generalized relational perspective to substantiate momentary connectedness, highlighting the role that types of audiences play in momentary connectedness.

3.1 A GENERALIZED CONCEPTION OF INTERACTION
We use the notion of ‘uptake’ to situate our conception of interaction between participants in a more natively digital context. Uptake is the most fundamental element of collective action. Originally conceived of as “acts in which one participant takes up another’s contribution and does something further with it” [45] the concept was generalized and defined more formally as “the relationship present when a participant’s coordination takes aspects of prior or ongoing events as having relevance for an ongoing activity” [47], in order to encompass a broader and media-independent conception of interactional relationships. Uptake is a broader phenomenon than ‘transactivity’, an element of interaction that Stahl [43] defines as “the reasoning of one utterance building on another utterance’s reasoning.” While the focus of transactivity is limited to contributions explicitly directed at others, uptake allows analysis of situations where interactions can occur without the necessity of either actor knowing who the other is. Accordingly, taking up needs not be directed at another actor. Also, uptake abstracts from media-specific relationships such as “reply to post” or “adjacency pair,” and thus can capture participatory structures within multiple media or even that cross media [46]. This concept is appropriate to discuss the fluid nature of Twitter communication. Networked instances of momentary connectedness can be constructed from a variety of other-directed and non-directed forms of uptake.

3.2 DISSECTING TWITTER HASHTAG EXCHANGES
Current literature on Twitter hashtags pays attention to three main elements of Twitter affordances: 1) tweets, 2) retweets, and 3) replies. However, the current architecture of Twitter allows nuanced options for communication. For instance, the sharing (private messages) feature allows private messages among users. Retweeting can also take two forms: 1) mere retweets, and 2) quote tweets (retweets in which users can add their comments and mention other users). Twitter also includes a heart-shaped like button that users can use to indicate their interest in the message. Several scholars, such as Marwick and boyd [33], and Litt and Hargittai [30] discuss the imagined audiences aspect of tweeting. We argue that the notion of imagined audiences is intrinsically connected with most of these options. Figure 1 conceptualizes communication via Twitter hashtags in terms of actual sender-receiver interactions as well as the possibility of imagined audiences.

![Figure 1. Elements of Hashtagged Exchange on Twitter](image-url)
The above model suggests that hashtag networks constitute a population of users who directly select audiences for their messages and imagine other audiences, as well as those who do not target their tweets at any other user or imagine audiences at all. Accordingly, Twitter hashtags constitute a domain characterized by aspects of connectivity that include undirected (non-transactional) expressions (with or without a conceptualization of imagined audiences), active interaction (via retweets, quote tweets, mentions, and replies), acts of liking, and hashtagged messages entering the private domain by using private messages. Accordingly, the communicative spaces created by hashtags are dynamic instances of connectedness rather than well-organized publics or communities. Users in issue-response hashtag networks do not have a clear conception of the size and the boundaries of the communicative space enabled by the hashtag.

To establish momentary connectedness empirically, researchers need to examine twitter hashtags from multiple perspectives, such as imagined audiences in issue-response contexts, other directness, as well as explicit relational aspects. Research that focuses on imagined audiences could benefit from methods that examine psychological aspects of tweeting, such as surveys and interviews. Transactivity can be assessed by a content analysis of the tweets. Moreover, relational aspects can be captured by examining the structure of retweet/mentions networks.

4. EXAMPLE: #NepalEarthquake

This paper is primarily theoretical. However, to illustrate empirical relevance we present evidence of two aspects of momentary connectedness: 1) absence/presence of transactivity in non-other directed messages, and 2) relational structures within momentary connectedness. First we briefly characterize the data source used for examples. Then we take a descriptive approach to show the blurry nature of other directedness in Twitter issue responses. Finally, we use a community detection approach to demonstrate how twitter hashtags enable interactional structures that display different purposes. This analysis helps establish the notion of momentary connectedness as it shows how non-other directed expressions as well as clusters of users with different orientations co-exist in hashtag networks.

4.1 DATA SOURCE

We use a Twitter hashtag network dataset representing #NepalEarthquake, a viral hashtag used in response to the April 2015 earthquake in Nepal, to illustrate the construct of momentary connectedness. This dataset was collected during the first week after the earthquake using the Twitter API plugin in the NodeXL template. The 15,118 nodes in the dataset represent those who tweeted, retweeted, or replied with the hashtag. Data obtained via NodeXL has three types of edges, two of which represent aspects of mediated communication in hashtags. Edges that represent retweets and @replies form connectivity in the network (16107 edges in our data). For instance, a retweet creates an edge from the sender to the user whose message was retweeted. Similarly, a reply creates an edge from the sender to the person who is replied to in the tweet. Original tweets have self-loops, the third type of edge, which are removed from our analysis. There were 1898 original tweets.

4.2 Tweets

Original tweets (those that are not retweets, quote tweets, mentions, or replies) are considered non-other directed messages. Regarding an interactional perspective, by not mentioning other users in a space that is possible (and is a common practice), original tweets indicate less interactive intent than retweets or @replies. This is particularly the case when users do not imagine audiences or imagine broad audiences beyond their reach. However, a tweet has interactional intent when it is projected into the future expecting responses from one’s network. From a strict relational viewpoint, original tweets do not contribute to a conversational structure until other users in the network take up the message (for retweeting or quote tweeting). Therefore, compared to replies, mentions, retweets, and quote tweets, original tweets do not reflect direct collective action. According to this view, it is reasonable to view them as utterances that are more compatible with imagined audiences or communities [29, 33]. It is possible that users who send tweets with a hashtag imagine specific audiences, broad audiences, or even real online communities. On the other hand, it is also possible that users do not imagine audiences at all as tweeting may be a habitual action or tweeting itself may provide a gratification for the user. For instance, one of the subjects of Marwick and boyd’s [33] study mentioned that tweeting is not directed any body and he/she does it “to do it.” This, however, does not mean that those utterances happen in a non-communicative space. As Marwick and boyd note, those individuals do not tweet to a void as they are bound by follower-followee relationships.

A reasonable number of original tweets in the #NepalEarthquake were either prayers or thoughts in the form of tweets. The collection of tweets included the word pray in some form (e.g., prayers, praying, sendingprayers) 2012 times. Arguably, unless organized as a public event (e.g., candle vigil or a group prayer), prayers are private, or at least non-transactional activities. Prayers do not require imagining Twitter audiences as they are often undirected. However, Twitter hashtags still shift the sender from a private to a more connected state.

The following tweets indicate transactivity. However, they are directed at those who were affected by the disaster, rather than another Twitter user. Arguably, it is possible that the primary function of these tweets is to express thoughts rather than talking to a follower network.

“I hope everyone from #Nepal is ok This is the pray for you from #Myanmar #NepalEarthquake #instagram”

“#NepalEarthquake God will bless you all! Everything is gonna get better, just be faithful.”

The following tweets show some directedness, but display lack of identification of a specific audience. The absence of a direct target receiver for these messages situates them in the realm of messages aimed at imagined audiences.

“Lets PRAY for the victims. #NepalEarthquake”

“Let's pray for the victims and their families in Nepal... #NepalEarthquake #PrayforNepal”

“Plz pray for the people in Nepal that are still trapped under the rubble from that massive earthquake. #NepalEarthquake”

Lack of explicit interaction via mentioning names, spreading messages (via retweeting), or replying, as well as the blurry nature of audience in original tweets make it difficult to put the tweets in strict conceptual categories, such as issue publics or online communities. Therefore, original tweets (excluding retweets and @replies) should be situated in a broad conceptual category that does not necessarily include an actual audience. One way for such conceptualization is to view them as indicative of a state of connectedness where users shift from communication within their follower networks to a topical structure of connectivity. This view...
is consistent with the claim that Twitter imagined communities are both collective and personal at once [18] as users make these non-other-directed utterances in a space defined by a common topic (the hashtag) and a population of users using the platform in response to the disaster.

4.3 RETWEETS, QUOTE TWEETS, MENTIONS AND REPLIES
From an interactional point of view, a retweet is a form of uptake that indicates the relevance of the tweet for the ‘retweeter’. Accordingly, re-tweets begin to form collective interactive structure. While the uptake action of retweets is interactional in nature, a retweet may or may not lead to further conversation. Moreover, senders of retweets may or may not imagine audiences.

As shown in Figure 1, those who ‘quote retweet’, reply, or mention the names of other users can direct their message to two types of audience: 1) audiences directly mentioned in the (quote) tweet, and 2) imagined audiences. Quote tweets, mentions, and replies (@replies) directly mention another user’s name, and can serve as invitations for engagement. At the same time, those who mention other users’ names may also imagine other audiences (within their follower networks) as they tweet.

Retweets, mentions, and replies result in conversational sequences and show explicit and traceable interaction. Therefore these elements are important when examining collective activity in hashtag networks. As imagined audiences is a main aspect of communication via retweets and replies, Twitter users in retweet and reply structures navigate between real and imagined audiences, making it difficult to identify clusters of users in those structures as corresponding to concrete offline groups, such as communities and publics.

Community-based approaches to define online collective action are framed in contexts of shared objectives and interactions among members (e.g., [2, 40, 44]). A stricter approach to identify issue publics is characterized by topical relevance, expertise, and engagement (e.g., [24]). Social network sites are different as their affordances enable new forms of connectivity (e.g., @replies, tagging, and the use of shared textual attributes, such as hashtags). Therefore, networked user groups formed through these forms of connectivity can include clusters that may not necessarily fall into the category of communities. This is the reason why Bruns and Burgess [8] are hesitant about using the term ‘communities’ to refer to online groups. They note that Twitter users may not always have shared interests, awareness, and intention to engage as hashtags networks are constructed based on a shared textual attribute. This issue arises due to the fact that online platforms are governed by a different logic than offline spaces. Therefore, an affordance-driven perspective is more appropriate to identify collective phenomena that emerge as result of hashtags.

4.4 STRUCTURES OF MOMENTARY CONNECTEDNESS
We now examine snapshots of Twitter clusters within the #NepalEarthquake network to illustrate the variety of structures of momentary connectedness. Within social network analysis, “community detection” refers to methods of finding cohesive subgraphs of networks [16], not to be confused with sociological concepts of community. These algorithms can uncover more broadly conceived forms of connectivity emerging in online environments, including hashtag-enabled user clusters. This is an important capability, as new media affordances enable collective behaviours that may display properties different from those of offline publics or communities. Modularity, a measure of the extent to which a partitioning of a network identifies clusters that have strong internal connectivity [36], forms the basis for several algorithms. One such algorithm is the Louvain method [5]. Although other methods are also available, the Louvain method performs well on benchmarks [4], and can identify clusters that are interpretable in terms of social activity [48]. The partitions in this section were generated using Gephi’s implementation of the Louvain method. We selected three partitions to illustrate diverse forms of momentary connectivity within the #NepalEarthquake network.

4.4.1 FAN CLUSTER
The first cluster we examine (Figure 2) has an average degree of one and it included 947 nodes and 949 edges. The node with high degree in the middle of the visualization is One Direction, the London based English-Irish boy band. Most of the individuals who are connected to One Direction via edges retweet a message sent by the band immediately after the incident (e.g., “ava_barry22 RT @onedirection: To help those affected by the devastating earthquake in Nepal text: DONATE5 to 70008 and give £5. Thank you #NepalEarthquake”). This cluster is made possible by the fact that all the nodes around the central node are fans of One Direction and they use the hashtag in their retweets. The fact that fans themselves are not connected (transitivity and average local clustering coefficient within the partition are both 0) shows the absence of inter-member communication within the cluster. However, it still performs a public function in response to the disaster, i.e., spreading the message of a group of celebrities in support of those who are affected. These messages may have been projected to real or imagined audiences within users’ follower networks. They may also be mere habitual retweeting actions that are not intended for any audience.

Clusters of this nature are temporary and made possible by the ability of Twitter affordances to create topical momentary connectedness. Moreover, they may not correspond with off-line issue-response groups, as hashtag-based clusters of fans living in distant parts of the world would not have been possible in the absence of Twitter affordances. Accordingly, clusters like this fan community should be identified as unique, and technology-enabled, issue clusters. The main function of clusters of this nature is to uptake a powerful message and spread it among follower networks. Celebrity-fan relationships can be long term as fans follow their celebrities on Twitter. Hashtags enable momentary topic-centered connectedness, allowing emergence of a subset of fans out of long term follower relationships forming clusters like this in response to the disaster. This cluster is temporary, non-interactive, and quite possibly may not perform any common function beyond retweeting the message.

1 Another strong contender, InfoMap, produces a similar but finer grained partition. It is similar in that InfoMap partitions generally break down some of the Louvain partitions. The normalized mutual information between the two methods on our data is 0.88. It is finer grained due to Louvain’s resolution limit and InfoMap’s horizon limit. We prefer the coarser partition because it shows larger connected structures, but the conclusions of this section are not affected.
4.4.2 NON-PROFIT CLUSTER
The following partition (Figure 3) includes 619 nodes and 873 edges and had an average degree of 1.41. An average local clustering coefficient of 0.366 indicates some concentration of interaction. Nine of the top fifteen nodes (by degree) in this partition were non-profit organizations, such as World Vision Australia, Australian Red Cross, UNICEF, and Nepal Red Cross Society. This partition also included several other non-profits, such as Save the Children and Caritas Australia. We also observed that eight out of top 10 nodes in this partition were located in Australia. Arguably, this cluster may resemble an offline issue public within which clusters of users have become momentarily connected online around the #NepalEarthquake topic. It shows interaction around messages sent by non-profit organizations, and those who represent non-profit organizations as well as those who follow them via Twitter are likely have a special interest in disaster relief activity. We argue that the cluster is organized based on special interest, topical relevance, and expertise, which can (loosely) meet criteria for issue publics. This, however, does not mean that this cluster works exactly the same way as offline issue publics, as replies and retweets may navigate between real and imagined audiences.

4.4.3 NEWS CLUSTER
Figure 4 shows a news-rewet cluster in the #NepalEarthquake network. This cluster has 505 nodes, 690 edges, an average degree of 1.366, and average local clustering coefficient of 0.1. Most of the central nodes in this cluster are news organizations or news-related nodes, such as The Hindu, Indian Express, Times Now, Ani_news, abpnewstv, and headlines today. The cluster mainly includes star-shaped local groups that retweet messages sent by news organizations or individuals associated with them (e.g., “maretstella RT @TimesNow: UN Secretary General Ban Ki-moon thanks first responders of the #NepalEarthquake”). News sharing is indeed a common response to a disaster. Therefore, this cluster may correspond to typical public behaviour after a disaster. Clusters similar to this may play several functions in momentary connectedness. For instance, users can become part of a network that spreads breaking news regarding the issue to their follower networks. However, as retweets may involve different types of audiences, there are at least two aspects of communication in this cluster. First, a user’s friend network receives the breaking news. Second, the sender may navigate between real and imagined audiences as they retweet the news; although it is possible that retweeting news is merely a habitual action. Therefore, this cluster is different from offline news discussion. In either case, the primary communicative function of actors in this cluster is to choose the tweet to spread, rather than providing critical news to a targeted audience (see also Kwak et al. [25]). Accordingly, this cluster is primarily driven by the motive to take up breaking news, rather than discussing news. Arguably, clusters like these are driven by the ability of Twitter to allow a sense of being connected to others via retweet-based uptake, rather than the actual social impact of the cluster.
The above discussion suggests that tweets containing issue-respond hashtags are situated in the social space in multiple ways. There is explicit uptake, through retweets (non-transactive) or replies (potentially transactive). There is also projection to potential uptake in some social entity. There are some nuances on what this social entity might be: an imagined audience or community; an issue public; a public sphericule. Accordingly, the notion of momentary connectedness is an overarching theoretical construct that constitutes a dynamic state of being connected via Twitter.

5. CONCLUSIONS

This paper attempts to answer calls for new conceptualizations of online activity, such as how users have created useful constructs of social interaction online [14] and the ways in which we construct publicness online [19]. Conceptualizing contemporary social media is difficult as these platforms facilitate various types of communicative actions that are appropriated by users in different ways, rather than being tools that serve specific purposes. New forms of engagement emerging from the interaction between platform design and users demand socio-technical readings of online activity. This paper situates the act of tweeting in a relational context, providing a window to understand original tweets in comparison to @replies and retweets. Accordingly, we suggest that Twitter issue-response hashtags can be seen as affordances for momentary connectedness enabled by how the platform handles visibility. Tweets that display broad and vague audience dimensions, as well as clusters with very different orientations within the same topical network, show that hashtags are affordances for momentary connectedness in which different communicative aspects can co-exist. This domain is multifaceted in nature, as it is a structure of connectivity enabled by the hashtag where users may potentially navigate between real and imagined audiences. Subsequently, we claim that hashtags both afford actual (enacted) uptake and project to potential future uptake. Momentary connectedness can have a phenomenological meaning (i.e., the user’s experience of feeling connected, as well as the network of associations, including both explicit uptake and projected uptake, that merit having this experience). Momentary connectedness is in part a structural claim about connectedness. At the same time, it is a claim about the psychological state of those who tweet. In other words, the structure is in part phenomenological.

From an overall point of view, this paper provides a novel perspective to understand hastagged exchanges that does not depend on offline metaphors. This conception situates the act of tweeting in the domain where individuals move back and forth between public and private spaces. We chose to use the concept of “uptake” [47]- the fundamental relationship between actions out of which interaction (and ultimately social ties) is constructed- as the analytic unit because it is independent of media and assumptions of transactivity [46]. This enables us to develop conceptions of technologically embedded social phenomena that are not derived from offline analogs. Uptake encompasses transactive relationships (e.g., replies), nontransactive relationships (e.g., retweets), and the potential for future relationships when a tweet is projected into an issue-topic hashtag space. Participants enact these various forms of uptake through the affordances of hashtags to construct networks of momentary connectedness that meet their needs for expressing responses to catastrophes and other events in the context of actual and imagined collectives.

The fact that Twitter served as a platform for thoughts and prayers shows the importance of having a platform that enables momentary connectedness in times of catastrophe. Momentary connectedness can exist in harmony with other novel conceptualizations, such as connected presence [28, 34], online public sphericules [19], and digital togetherness [32] as it serves as an overarching conceptualization that does not exclude such phenomena. Further work may focus on how these phenomena (e.g., public sphericules) could exist within momentary connectedness. The fact that users send the prayers as tweets indicates that while users do not necessarily look for interactive communication they expect connectedness in the times of disaster. Accordingly, the interaction between Twitter affordances and the social norm of using hashtags perform a useful function in times of crisis by creating a connected space for users- who would otherwise not be able to engage- to express their thoughts and feel connected with a population of users who pay attention on or engaged with the issue. We do not exclude the possibility of formation of collectives online that correspond with offline publics as Bruns and Burgess [8] suggested. However, detection of such publics should be supported by a concrete analysis of personal relevance of the topic to the members, expertise of stakeholders involved, and temporal development of activity.

6. FUTURE RESEARCH

The notion of imagined audience serves as a foundation for the theoretical construct we developed in this study. Demonstration of the imagined audience in the context of #NepalEarthquake requires further work, possibly interviews, that examine imagined audience aspects of tweeting in issue-response contexts. Imagined audiences in the context of social network sites have already been confirmed by substantial scholarly work (e.g., [18, 29, 30, 33]). However, future work can test the link between direct relational aspects we demonstrated in the analysis and imagined audiences. Such an inquiry requires combining analysis of structure with phenomenological investigations.

There are several areas of analysis that can help solidify the claims made in this study. For instance, interaction within news and non-profit clusters should be subject to further investigation to identify the nature of the messages spread through retweets or conversations occurred using replies. Similarly, an analysis of the nature of actors in each partition and interactions among them can strengthen our findings. Such an analysis can reveal the extent of special interest and expertise within clusters, especially in the non-profit cluster. Although our Twitter model (Figure 1) included direct messages and liking, we did not examine these in this study. This opens a line of inquiry for future studies. Arguably, hashtags can enter the realm of private messages (when a message with a hashtag is uptaken for private conversation via direct messages), making the boundary between private and public permeable. This should be examined in future as it can further expand the scope of momentary connectedness. Moreover, liking should be examined considering how certain messages may attract more engagement than others. Such an analysis can prove that message characteristics can trigger momentary connectedness.

Although discussed in the context of disaster response hashtags, the notion of momentary connectedness can be applied to other types of issue-response hashtags. However, further work is necessary to examine the compatibility of this notion with other types of hashtag networks. More broadly, other social media also provide affordances for momentary connectedness, and await further investigation.
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