Microblog Analysis as a Programme of Work

PETER TOLMIE, University of Warwick
ROB PROCTER, University of Warwick
MARK ROUNCEFIELD, Lancaster University
MARIA LIAKATA, University of Warwick
ARKAITZ ZUBIAGA, University of Warwick

Inspired by a European project, PHEME, that requires the close analysis of Twitter-based conversations in order to look at the spread of rumors via social media, this paper has two objectives. The first of these is to take the analysis of microblogs back to first principles and lay out what microblog analysis should look like as a foundational programme of work. The other is to describe how this is of fundamental relevance to Human-Computer Interaction's interest in grasping the constitution of people's interactions with technology within the social order. To accomplish this we take the seminal articulation of how conversation is constituted as a turn-taking system, A Simplest Systematics for Turn-Taking in Conversation (Sacks et al, 1974), and examine closely its operational relevance to people's use of Twitter. The critical finding here is that, despite some surface similarities, Twitter-based conversations are a wholly distinct social phenomenon requiring an independent analysis that treats them as unique phenomena in their own right, rather than as another species of conversation that can be handled within the framework of existing Conversation Analysis. This motivates the argument that microblog Analysis be established as a foundationally independent programme, examining the organizational characteristics of microblogging from the ground up. Alongside of this we discuss the ways in which this exercise is wholly commensurate with systems design's 'turn to the social' and a principled example of what it takes to treat the use of computing systems within social interaction seriously. Finally we articulate how aspects of this approach have already begun to shape our design activities within the PHEME project.

1. INTRODUCTION

This paper has two primary objectives: 1) to constitute microblog analysis as a foundational programme of work; 2) to further articulate how this is of foundational relevance to Human-Computer Interaction and related matters of understanding how people use social media; in particular, how people are seen to attend to the challenges of making the use of social media orderly.

This work has been motivated by the PHEME project and its central interest in the detection of rumors in social media and their subsequent assessment and handling according to the veracity or otherwise of the information they are disseminating [Bontcheva et al., 2015; Zubiaga et al., 2015a]. A core part of this endeavor has been the identification of rumorous tweets on Twitter and the annotation of those tweets in terms of features that might ultimately lend themselves to system recognition and machine learning. It seemed reasonable to us that, if you are going to try and handle tweets in this way, you had better first of all understand what kinds of things you are dealing with as human socially-constituted phenomena. To do this, we initially brought to bear the analytic apparatus of conversation analysis as first laid out by Harvey Sacks and his colleagues in the 1960s and 70s, inspired as it was by the ethnomethodological approach advocated by Harold Garfinkel [see Garfinkel, 1967, for its primary articulation]. We did this because it

The research reported in this paper is supported by EC FP7-ICT Collaborative Project PHEME (No. 611233). www.pheme.eu

Authors' addresses: P. Tolmie, R. Procter, M. Liakata, A. Zubiaga, Department of Computer Science, University of Warwick, Coventry, CV4 7AL, United Kingdom. M. Rouncefield, School of Computing and Communications, Lancaster University, Lancaster.

1 http://www.pheme.eu/
eschews pre-theoretical judgments regarding what kinds of phenomena one might be looking at and instead seeks to uncover empirically how talk-based phenomena are the methodical production of the parties to that production. In this way, we figured we might be able to bring out the methodical features of tweets that provide for their character as rumors (or anything else) in social interaction and that these methodical features would give a handle on what one might want to label when engaged in annotation [Zubiaga et al., 2015a]. However, it quickly became apparent to us that to just apply the apparatus of conversation analysis and seek to identify phenomena already identified within its canon was not wholly satisfactory. Tweeting, for all of its conversational characteristics that people are happy to point to [Honeycutt & Herring, 2009], is not conversation.

So, this paper is about the important distinctions between conversation and ‘microblogging’ (to take the term that has been applied to a variety of very similar forms of interaction using social media), what a suitable approach to analysing it might therefore need to look like, and what the implications of that might be for other kinds of work such as annotation. Building on this, we propose a programme of microblog analysis that is better suited to microblogging. At the end of the paper we demonstrate some of the ways it might then be used by looking at how we ourselves have begun to use it to handle Twitter threads that potentially incorporate rumors. The importance of this particular enterprise we briefly outline below.

2. RUMORS IN SOCIAL MEDIA

Social media such as Twitter provide a constant flow of information that is used by many as a news source, especially in cases of emergency situations or at the start of an event, when traditional media have not yet been able to deploy reporters on the ground. The value of social media in coping with the aftermath of natural disasters is well documented [Bruns et al., 2012; Tonkin et al., 2012]. Equally, events such as the 2011 Arab Spring have been heralded as evidence of how social media can strengthen the capacity of citizens to challenge and overcome social and political repression [e.g., Khondker, 2011], though subsequently, some commentators have begun to question its importance [e.g., Weaver, 2010]. Journalists and analysts of various backgrounds now monitor social media to identify new stories or gain insights on events unraveling or other areas of interest. Moreover, social media provide a mechanism for people to broadcast their own viewpoint and thoughts, constituting a powerful means for individuals to exercise influence and even mobilize crowds [Procter et al., 2013a; Khondker et al., 2011].

However, the advent of streaming information broadcast by a multitude of sources comes with one large caveat, that of being able to establish the veracity of a statement, distinguishing between a corroborated fact and a piece of unverifiable information. Indeed, research suggests that social media provides an extremely fertile ground for rumors and misinformation [Mendoza et al., 2010], especially during crises, when unverified statements may sometimes be picked up and given credibility by mainstream media reporting or government agencies such as the emergency services [Procter et al., 2013b]. During an earthquake in Chile, for example, rumors spread through Twitter that a volcano had become active and there was a tsunami warning in Valparaiso [Mendoza et al., 2010]. Twitter has also been used to spread false rumors during election campaigns [Ratkiewicz et al., 2011]. The challenges communities face from rumors in social media is well-illustrated by the 2011 riots in England, which began as an isolated incident in Tottenham, London, on

---

1 We note that Twitter’s user interface and tweet metadata have evolved in such a way to suggest that its conversational features have become steadily more significant.
the 6th of August but subsequently quickly spread across London and to other cities in England [Lewis et al., 2011].

It is this problem of verifying information posted in social media that has motivated the PHEME project [Derczynski et al., 2015]. In this paper we focus on closely examining Twitter as a socially constituted phenomenon. This has been a necessary step towards developing an annotation scheme [Zubiaga et al., 2015a; 2015b] for tweets that the project will be using to train natural language processing and machine learning techniques that will assist in the rumor verification process. Whilst it may be tempting to think that one can simply find a way of looking at isolated tweets and see within them already the necessary constituents that might make them a rumor, individual tweets are made into rumors by people and the ways in which they are responded to, articulated and spread. These are social processes through and through and can only be understood by understanding the social order that underpins them. To unravel the social order in play one needs the right kinds of tools. Conversation analysis was attractive to us because it sets aside any theoretical preconceptions regarding the phenomena in play and examines the ways in which social phenomena are constituted in situ through the sequential production of inter-related utterances, which would seem to capture what Twitter-based conversations, rumorous or otherwise, look like. However, there is a risk involved in even just taking conversation analysis as the frame because such a use would rest upon an assumption that tweeting works the same way as conversation. This was not an assumption we could comfortably make. Rather it seemed important to understand tweeting on its own terms. We therefore examined the ways in which conversation analysis was conceived as an analytic programme within the foundational work of Harvey Sacks to see if this could provide us with insights as to how to proceed in the same way when handling how people use Twitter.

3. TWITTER, HCI AND THE CONVERSATION ANALYTIC FRAME

Twitter is a microblogging site that was set up in 2006, which allows users to post messages (‘tweets’) of up to 140 characters in length. Unlike social media platforms such as Facebook, Twitter's friendship model is directed and non-reciprocal. Users can follow whomever they like, but those they follow do not have to follow them back. When one user follows another, the latter’s tweets will be visible in the former’s ‘tweetstream’. It is not necessary, however, to follow another user to access tweets: Twitter is an open platform, so by default tweets are public and can be discovered through Twitter search tools. The one exception to this is the direct message (DM), which is private, and can be seen only by the follower to whom it is sent. Users can also reference another user through the mention convention, where a user name, prefixed with '@', is included anywhere in a tweet. A user, thus referenced, will see the tweet in their tweetstream. A user can also opt to make their account private, in which case the user can approve who would be able to read their tweets.

A number of other important conventions have emerged as Twitter use has evolved. One is the retweet option, usually referred to as RT, whereby users can forward tweets from other users to their own followers. This works by either clicking on the retweet button available on the standard Twitter user client, or by copying the original tweet and putting ‘RT @username’ in front of it, the latter giving the option to accompany the original tweet with their own comment. In this way, tweets can propagate through users’ follower networks. Another convention is the hashtag, which is distinguished by prefixing a string of text with the hash sign, ‘#’. Hashtags
provide a way for users to assign a label to a tweet, thereby enabling the co-creation of a fluid and dynamic thread within the tweetstream that facilitates information discovery: anyone searching for or using the same hashtag can see what everyone else is saying about this topic. Yet another convention is the reply option, which, as the name suggests is a mechanism for responding to a specific tweet. As such, it is a specialisation of the mention convention in that the username of the poster of the tweet being replied to is prepended to the new tweet. Unlike a mention, however, only users (other than the sender and the recipient) who follow both the sender and the recipient will see it in their tweetstream. Finally, favoriting a tweet is a way of letting the tweet’s poster know that you liked the tweet. The usage patterns of each of these conventions differ and in the case of hashtags there is recent evidence that their appeal is diminishing [Rahimi, 2015].

If one looks at studies of Twitter both within and beyond HCI what one finds in abundance are studies that look in one way or another at the content of tweets and how that content might be seen to relate to a variety of other matters. Thus we find treatments of the content of Twitter-based conversations in:

- the course of political campaigns [Bekafigo & McBride, 2013; Burgess & Bruns, 2012; Choy et al., 2011; Hong & Nadler, 2011; Park et al., 2013; Sanjari & Khazraee, 2014; Stiegltz & Dang-Xuan, 2012; Tumasjan et al., 2010], or in other political contexts [Cheong & Lee, 2010; Jungherr & Jurgens, 2014; Roback & Hemphill, 2013; Sæbø, 2011; Small, 2011; Veenstra et al., 2014];
- the aftermath of natural disasters [Chatfield et al., 2014; Mandel et al., 2012; Miyabe et al., 2012; Toriumi et al., 2013] or as a feature of other kinds of emergencies or security scares [Cheong & Lee, 2011; Heverin, 2011; Hughes & Palen, 2009; Hui et al., 2012; Kostkova et al., 2014; Li et al., 2011; Purohit et al., 2013; Spiro et al., 2012; Sreenivasan et al., 2011; Varol et al., 2014; Vieweg et al., 2010];
- the context of major news events [Bruns & Burgess, 2012; Gupta & Kumaraguru, 2012; Hu et al., 2012; Yardi & Boyd, 2010];
- specific settings such as conferences [Gonzales, 2014; Weller et al., 2011], learning environments [Borau et al., 2009; Ha et al., 2013; Johri et al., 2014; Kelling et al., 2013; Stepanyan et al., 2010; Tiernan, 2014; Ulrich et al., 2010], or the workplace [Bougie et al., 2011; Ehrlich & Shami, 2010; Zhao & Rosson, 2009];
- particular communities such as athletes [Hambrick et al., 2010] or political groups [Park, 2013] or other broader communities with shared interests [Cook et al., 2013; Morris, 2014; Zappavigna, 2011];
- different kinds of interpersonal communications and relationships [Bak et al., 2012; Chen, 2011; Hofer & Aubert, 2013; Kim et al., 2012; Lee & Kim, 2014; McGee et al., 2011];
- personality assignations [Davenport et al., 2014];
- the impact of different kinds of lifestyle [Coursaris, 2010];
- self-improvement activities [Kendall et al., 2011; Murnane & Counts, 2014; Sleeper et al., 2015];
- in the context of certain kinds of leisure activities such as tourism [Satiriadis & van Zyl, 2013], playing games [Magee et al., 2013] and watching television [Abisheva et al., 2014; Doughty et al., 2011; McPherson et al., 2012], or work activities such as journalism [Messner et al., 2011] or software engineering [Singer et al., 2014];
- in relation to economic considerations such as advertising [Greer & Ferguson, 2011; Park & Chung, 2012; Zhang et al., 2011];
• engagements with formal and informal organizations such as governments, charities [Phethean et al., 2014], and public services [Kim et al., 2012];
• and in relation to other grand topics such as privacy [Mao et al., 2011; Sleeper et al., 2013].

Another body of work seeks to step beyond the cherry-picking of ‘interesting’ content and to take the constitution of tweeting as conversation as its topic of interest. Materials here are nowhere near so abundant but can be seen to include:

• studies looking at how to identify specific conversations or groups of conversations and the actors within them [e.g. Cogan et al., 2012; Ediger et al., 2010; Procter et al., 2013; Larodec & Laroden, 2014; Schantl et al., 2013; Ventura et al., 2012];
• the identification of conversational actors more broadly [De Choudhury et al., 2012];
• considerations of how to identify trending or persistent topics [Alvanaki et al., 2012; Becker et al., 2011; Benhardus & Kalita, 2013; Bernstein et al., 2010; Cataldi et al., 2010; Ferrara et al., 2013; Inches & Crestani, 2011; Jackoway et al., 2011; Mathioudakis & Koudas, 2010; Osborne et al., 2012; Sakaki et al., 2013; Shamma et al., 2011; Zubiaga, 2011];
• the relationship between Twitter conversation and influence [Cha 2014];
• how to identify and model specific kinds of conversational acts [Huang et al., 2010; Naaman et al., 2010; Ritter et al., 2010];
• the extent to which people make errors in Twitter conversations [Furniss et al., 2012];
• matters of conversational address and coherence [Honeycutt & Herring, 2009];
• conversational role [Tinati et al., 2012];
• how to find the topics of Twitter conversations and the related participants [Inches & Crestani, 2011];
• how Twitter conversations are topically organized [Lai & Rand, 2013; Sommer et al., 2012];
• topic preference [Chen et al., 2011];
• how to analyse the structure of tweets in terms of conversational frameworks [de Moor, 2010];
• how to identify conversational replies [Bruns, 2012];
• the dynamics of conversation on Twitter [Kumar et al., 2010];
• and how to analyse interactions on Twitter as a form of discourse [Zappavigna, 2012].

Other authors, as in a sense we do here, concern themselves more with how to analyse Twitter- and microblog-based phenomena, for instance:

• purely with respect to content [Dann, 2010; Lewis et al., 2013] or specific features such as hashtags [Laniado & Mika, 2010; Posch et al., 2013] or retweets [Boyd et al., 2010; Mattson & Aurigemma, 2014];
• in linguistic terms [Danescu-Niculescu-Mizil et al., 2011; Eleta, 2012; Mendes et al., 2014; Wang et al., 2014; Weng et al., 2011; Zhao et al., 2011];
• in terms of metrics [Bruns & Stieglitz, 2013];
• in social terms [Cha et al., 2010; Rossi & Magnani, 2012; Schoenebeck, 2014; Stibe et al., 2011];
• with regards to user behaviour [Barnes & Bohringer, 2011; Chang, 2010; Chen & She, 2012; Priem & Costello, 2010; Song et al., 2012];
• with regards to information-need [Chang et al., 2013; Zhao & Mei, 2013; Ramage et al., 2010];
• the transmission of rumor [Qazvinian et al., 2011; Zhao et al., 2015];
• in relation to economic considerations [Stringhini et al., 2013];
• in terms of motivation or interest [Alonso et al., 2013; Azman et al., 2012; Java et al., 2007; Naveed et al., 2011];
• in terms of emotion, sentiment, or mood [Agarwal et al., 2011; Arias et al., 2013; Celli & Rossi, 2012; Kim et al., 2012; Marcus et al., 2011; Roberts et al., 2012];
• with regards to user background [Weerkamp et al., 2011] or user location [Cuevas et al., 2014];
• in terms of personality [Hughes et al., 2012];
• how Twitter conversations make visible social networks [Gabrielkov et al., 2014];
• with respect to cognitive load [Alloway & Alloway, 2012; Goncalves et al., 2011];
• or even with regard to how Twitter has transformed as an object of study [Rogers, 2013].
However, what all of the above approaches engage in at some level is an assumption that we all know what Twitter is as a social phenomenon (and, in a sense, as ordinary users, we already do): it’s tweets about threats and troubles; about unfolding events; about who has said what or who is doing what; about things you’ve accomplished; about things that have piqued your interest; and so on; it’s conversation with identifiable speakers using the same turn-taking system you might encounter in any body of talk. We feel that there is a mistake in this assumption that we all just know how to handle Twitter use as a phenomenon. The understanding evinced in current studies is indexed upon our commonsense understanding of what Twitter is about, and what kind of a thing we might want to describe it as, without ever digging into the grounds of that commonsense understanding itself. Thus, just as with the problem Garfinkel was seeking to address in his early work regarding an overwhelming propensity in social sciences to speak of society but to leave the actual accomplishment of society untouched, we are confronted here with a similar tendency to set the actual accomplishment of tweeting as a social phenomenon aside and to instead simply work with its products, i.e. how the content is used. Thus there is an ongoing absence in the literature regarding the nature of the technology3 that is being brought to bear and its impact on social interaction and what that interaction therefore looks like.

Taking seriously the early work of Sacks, Schegloff and Jefferson [1974] regarding just what the organizational properties of conversation might look like as an effective system for getting the job of co-situated talk done, we argue here that there is a similar need with Twitter and other similar phenomena (characterized here as microblogging) to go back to basics and look at their organizational characteristics and that this is the only effective way of being able to handle them as social phenomena.

---

3 We use technology here in its grandest sense, incorporating not just the computing technology required for its production but also the technical apparatus whereby such interaction might get done, just as the turn-taking system for conversation outlined by Sacks et al. [1974] is a technical apparatus for getting talk done, even if, on occasion, it might involve the use of specific technologies such as the telephone.
It's some time now since HCI, and specifically systems design, first took its ‘turn to the social’ (see Crabtree et al. [2012] and Button et al. [2015]) as famously instantiated in the works of Suchman [1987] and Grudin [1990]. As pointed out in Button et al. [2015] a part of this turn was what might be seen as a rather problematic flirtation with social science theory – postmodernism, post-feminism, queer theory as well as the cultural, linguistic and textual ‘turns’ [Bardzell & Bardzell, 2011; Light, 2011; Rode, 2011] and so on – where it was assumed that this could simply be imported wholesale from social science into systems design. It is not our position here to critique the progress or results of this frequently less than happy, or productive, interdisciplinary endeavour, other than to point to Anderson and Sharrock’s comment that: "the alignment of sociological theory and design specification remains intractable. ...designers and especially members of the HCI research community have continued to advocate incorporation of forms of social and sociological theory into design but with very little substantive success" [Anderson & Sharrock, 2013]. However, another and perhaps rather more fruitful part of ‘the turn to the social’ was an equally willing embrace of social science methods to reveal, document and evaluate aspects of user experience etc. Conversation Analysis was, of course, one of these methods and its use has, in fact, played a quite significant role in HCI over the years (see, for instance, Heath & Luff’s [1991] analysis of interaction in control rooms for the London Underground and Ruhleder’s [1999] analysis of communication breakdowns in video-mediated communication across remote sites). We would also point out that another strand of ‘social’ research in HCI that has been of some moment is an attention to the use of technology for the production of text in interaction, such as Grinter and Eldridge’s work on the use of SMS by teenagers [2001] and Curtis’s work on social interaction in MUDs [1992]. This paper can therefore also been seen as a continuation and development of these kinds of lines of enquiry, considering the intimate connections between the technology and the talk/text in social interaction, but with a more specific and detailed emphasis upon a proper consideration of exactly what an appropriate methodology for such undertakings might need to look like.

This being the case, we set aside here the assumption that we know already how to analyze Twitter feeds, even if we regularly process such content both as users and researchers. We similarly set aside the assumption that tweeting is just conversation, even if conversation is a label that is often apparently convenient to use. Instead we set about here trying to establish from the ground up what an appropriate framework for analyzing Twitter feeds might look like, and how that is in fact quite distinct from the conversation analytic enterprise that we first thought we might use.

4. METHODICAL PRACTICES AS SOLUTIONS TO ORGANISATIONAL PROBLEMS

Harvey Sacks, in some profoundly significant remarks regarding the way in which any orderly organizational apparatus geared towards the accomplishment of a coherent social order would have to operate, noted that such an apparatus needs to be available to just any member of society such that they could make use of it without much fuss or bother or the need to engage in extensive formal training or the accumulation of multiple examples of its use. It is the spirit of these remarks that can be seen to inhabit the seminal work he undertook along with Emmanuel Schegloff and Gail Jefferson in specifying some of the fundamental organizational characteristics of the turn-taking system in conversation [Sacks et al., 1974].
What can be seen in this work is a recognition that the bringing about of a particular aspect of social order takes, first of all, seeing that order as a ‘problem’ that requires the application of a method to be addressed. The notion of order being a problem is not to set aside its mundane and wholly unremarkable character, to be found for the larger part wherever one looks. Indeed, the very sense of it being unremarkable is itself an accomplishment. Instead, the approach is one of seeing that order does not just arise as if by magic wherever people chose to go and whatever people choose to do. Rather, it is accomplished by people in regular, methodical ways such that they don’t have to keep learning new methods to make their way around the world. So, the simplest systematics takes turn-taking in conversation to be an elegant and simple solution to a wholly mundane problem that people are confronted with whenever they engage in social interaction. If they all talk at once none of them will be understood because the human biological apparatus is simply not capable of disambiguating multiple streams of sound, however semantically rich they may be, in that way. The simplest systematics therefore unfolds as an articulation of just what the accomplishment of turn-taking needs to look like to be a workable and coherent system. But what Sacks et al. also accomplish in doing this is the demonstration of a programmatic approach to the description of a social order that is, even up until now, largely undescribed.

In that this current work seeks to establish microblog analysis as a programme of work it seeks to proceed along the same lines as the simplest systematics (and other contributions to the ethnomethodological and conversation analytic canon) by taking, in the first instance, the phenomena associated with microblogging to be methodically constituted solutions to arising organizational problems in the work of communicating in that way. In that case it will be seeking a) to uncover just what those organizational problems might be and b) to describe in methodological terms how microblogging phenomena represent ways in which those problems are being recurrently addressed.

As a note of clarification, the term microblogging has been adopted here in order to capture a set of rather similar communicational phenomena to be found across a range of social networking sites and in certain kinds of forums. The original term used to cover these kinds of short text-based phenomena was ‘tumblelogs’ [Kottke, 2005], but by 2006 ‘microblog’ had become the preferred term. It was used to cover a variety of services such as Twitter, Tumblr, FriendFeed, Cif2.net, Plurk, Jaiku, identi.ca, PingGadget and Pownce [Barnes & Bohringer, 2011; Honeycutt & Herring, 2009; Huang et al., 2010; Java et al., 2007; Kaplan & Haenlein, 2011; Lai & Rand, 2013; Naaman et al., 2010; Oulasvirta et al., 2010; Zappavigna, 2011; 2012]. More recently the term has come to also cover the status update features of social networking sites such as Facebook, MySpace, LinkedIn, Diaspora*, JudgIt, Yahoo Pulse, Google Buzz, Google+ and XING [Archambault & Grudin, 2012; Chen & She, 2012; Gilbert et al., 2013; Larodec & Larodec, 2014]. The specific worked through case here is that of Twitter. More than this, our focus here is upon aspects of Twitter that are open to description as ‘conversations’. This is because of our specific interactional interest in the promulgation of rumors. However, we recognize that tweeting (and microblogging) can be about much more than just conversational type interactions. It is therefore to be expected that a range of other kinds of specific organizational problems will lead to other unique kinds of solutions both within Twitter and across other microblogging domains and that these will also require similarly detailed investigation and explication as part of a larger programme of microblog analysis that stands beyond the remit of this current paper. Here we are only addressing part of a much larger enterprise which is to understand what tweets and tweeting might amount to as organized social phenomena in their own right.
across the board rather than just in the context of Twitter conversations. Nor is there any assumption here that what can be said for Twitter can be said for all in all regards and significant further work would need to be undertaken in each separate microblogging domain to fully capture their organizational characteristics.

Suffice to say that here ‘microblogging’ is designed to capture a specific kind of text-based exchange where contributions to the exchange are relatively short and constrained. They are articulated within textual confines even if they contain other kinds of media, produced with the prospect (if not the expectation) of others being able to respond, and with related contributions to the exchange being open to being produced asynchronously. They are also produced, at least in the first instance, in a single largely undifferentiated stream that is temporally organized with the latest contribution being placed at the top of the list. This description provides for a variety of social networking sites in particular to be analyzed in a similar fashion.

5. A SIMPLEST SYSTEMATICS FOR THE ORGANIZATION OF TURN-TAKING FOR CONVERSATION

At the very heart of conversation analysis, as laid out by Sacks et al. [1974], is the observation that talk is organised such that only one speaker speaks at once. This is seen as a fundamental premise of social order because any other system would frequently render talk completely ineffectual. On the basis of this, and probing just how it could be that this is systematically provided for in interaction, Sacks et al. elaborated what they called the ‘turn-taking mechanism’. It contains some primary features that together serve to underpin most other kinds of conversational phenomena. So there are: speakers (recognizable individuals who produce utterances); speakers who talk first, and other speakers who may also talk as a conversation unfolds; mechanisms whereby a current speaker may select who talks next; and mechanisms whereby speakers may select themselves to be the next person to produce an utterance.

Sacks et al. note that human action and interaction is replete with examples of turn-taking, so:

“Turn-taking is used for the ordering of moves in games, for allocating political office, for regulating traffic at intersections, for serving customers at business establishments, and for talking in interviews, meetings, debates, ceremonies, conversations etc.” [Sacks et al., 1974: 696].

A key feature of their approach to turn-taking in conversation is that, in their view, “it is of particular interest to see how operating turn-taking systems are characterized as adapting to properties of the sorts of activities in which they operate” [ibid]. Thus “an investigator interested in some sort of activity that is organized by a turn-taking system will want to determine how the sort of activity investigated is adapted to, or constrained by, the particular form of turn-taking system which operates on it.” [ibid]. It is this spirit of trying to understand the organizing properties of tweet exchange in Twitter as a system in its own right that motivates this current body of work.

Previous studies of Twitter have (perhaps naturally) concentrated on content and used whatever methodological devices were to hand, such as Conversation Analysis, in order to examine that content. However, to treat Twitter as just another example of conversation is to overlook the fact that Twitter is, and tweets are, constituted in
ways that are both similar and different to conversation and that any analysis needs to start with an understanding of what Twitter/tweeting is instead of just taking that understanding for granted. So, our initial turn to Conversation Analysis and its foundation in the simplest systematics as articulated by Sacks and his colleagues here is based upon the fact that there are aspects of Twitter which retain the formal character of a turn-taking system, most notably Twitter conversations. What we are not doing here is turning to the simplest systematics as a vehicle for telling us what turn-taking in Twitter looks like or how it works. Instead our interest is based upon how the simplest systematics provides a model for how one might proceed to examine turn-taking systems and uncover their organizational features. Thus the simplest systematics is being used here to examine how it might be instructive for proceeding with a different programme of work: establishing the organizational characteristics of turn-taking on Twitter. This concern is foundational: it is to provide the grounds of a methodology. We are not looking to use the simplest systematics as a resource – as the recipe for conducting analysis – in its own right. What we do examine here are ways in which the turn-taking systems in Twitter and in everyday face-to-face conversation may either share similarities or prove to be entirely different. As we shall see, the extent to which the systems differ is bound up with the extent to which they are addressed to solving different ‘problems’ of social interaction.

5.1 The Simplest Systematics

On the basis of a number of years of close examination of conversational data Sacks and his colleagues assembled a highly robust model of turn-taking in conversation that can be seen to have a number of key strengths. One of the most important aspects of all is that the proposed model is able to be simultaneously ‘context-free’ but also exceptionally ‘context-sensitive’. So you can dip into whomsoever, wheresoever and find the same system in play, with the same key operational characteristics. At the same time, the system can be endlessly adapted to meet the particularities of local need without having to step outside of the system itself [Sacks et al., 1974: 700].

The more specific observations Sacks et al. make regarding the actual workings of the turn-taking system for conversation are of varying degrees of applicability to our own interest in tweet exchange in Twitter. As indicated above, these are illuminating with regard to both the contiguities between microblogging practices and conversation and the important differences between them. As part of our foundational aim to examine what Twitter looks like as a turn-taking system we are going to take each of these observations in turn so as to highlight the distinctiveness of microblogging as a domain of human action. We will then use these observations to begin to articulate some of the core aspects of using Twitter as an organizational phenomenon in its own right. Here, then, are Sacks et al.’s observations [1974: 700-701] and our own commentary upon them:

“(1) Speaker-change recurs, or at least occurs”.
“(2) Overwhelmingly, one party talks at a time”.
“(3) Occurrences of more than one speaker at a time are common, but brief”.
“(4) Transitions (from one turn to a next) with no gap and no overlap are common. Together with transitions characterized by slight gap or slight overlap, they make up the vast majority of transitions”.

These first four characteristics of the turn-taking system in conversation are, in large part, managed within Twitter by its technical configuration so function more at the
level of given constraints than situated accomplishments. Let’s take each of them in turn:

1) In the case of speaker (or tweeter) change, this is a direct function of who is being followed, the frequency with which they tweet, and the presence of other factors such as promoted tweets. It is conceivable that someone might follow just one other party in which case tweeter change would be rare. However, promoted tweets usually result in some extraneous tweets appearing on anyone’s tweetstream throughout the day. More importantly, in view of the fact that even in 2012 the average number of people being followed for Twitter users was 102 [beevolve.com, 2012] and Twitter has expanded since then, tweeter change is a characteristic of most people’s tweetstreams and, for the larger part, two or more tweets concurrently by the same person is infrequent though it certainly occurs.

2) It is in the nature of Twitter that people can be composing tweets at the same time as one another or at widely spaced intervals, with the appearance of the tweet on people’s tweetstreams being a function of the time they are registered by the system. Thus a) it is entirely possible for two parties to be composing tweets in overlap, even in Twitter conversations; but b) it is a feature of Twitter that the tweetstream is organized in independent tweets that do not appear in a simultaneous and overlaid fashion and that do not overlap. Thus the individual actions and their representation are potentially disjoint but this disjuncture is never made visible to recipients.

3) As indicated above, Twitter does not represent overlaps of articulation, even if they are occurring at an individual level. The consequence of this is that within the tweetstream each turn appears to be tightly independent and consecutive.

4) In the case of Twitter temporal gaps between the appearance of one tweet and another do routinely occur. However, these do not manifest themselves as ‘gaps’ in the tweetstream but rather as delays in updates. Once again the extent to which delays in updates occur is tightly bound up with the number of people being followed and the frequency with which they tweet. Broadly speaking, though, temporal disjuncture between tweets can be considered to be a routine feature, making gaps in interaction an unremarkable feature of Twitter use that is not oriented to by users as problematic or subjected to efforts to repair. This goes hand-in-hand with describing exchange systems like Twitter as being both ‘synchronous’ and ‘asynchronous’, but it does also immediately render it as something quite distinct from face-to-face conversation.

Moving on to Sacks et al.’s other observations [1974: 701-702]:

“(5) Turn order is not fixed, but varies”. For conversation the observation here relates to the fact that it is not continually ordered such that speakers have set and allotted turns, e.g. Speaker A / Speaker B in interrogation, but rather it is clear that speaker changes cannot be predicted in advance of the ongoing turn, and even then which speaker goes next is not always fully decided prior to the transition point between turns. This feature of face-to-face conversation is entirely concordant with

---

4 Of course, as it does not involve co-presence or spoken language, microblogging differs from regular face-to-face conversations in other ways as well. For instance in Twitter there are no available non-linguistic conversational cues, though emoticons and equivalent symbols and abbreviations are sometimes used to do some of the same work, often borrowing heavily upon the established ways of going about this in text messaging.
the organization of tweets in Twitter where which tweet falls next in the tweetstream is not predictable in advance. Thus one can get the following kind of pattern where a whole set of distinct tweeters all respond individually to an initial opening conversational gambit without any predictable relationship between them (Figure 1).

Figure 1: A typical tweetstream.

A point we return to later is that the fact that the turn order is not fixed results in a potentially indefinite number of people self-selecting to tweet in response to a prior tweet, the only constraint in operation being the size of the cohort of followers of the person who tweeted initially (with retweeting creating scope for endless extension of this cohort to other users’ followers). Looking beyond Twitter conversations self-selection is clearly entirely routine, potentially in ways that are occasioned by matters wholly outside of Twitter, and without it being clear that parties producing originating tweets are necessarily oriented to any overt responses from their followers at all. The number of potential self-selecting next speakers in face-to-face conversation is tightly controlled both by the limits that exist on the number of people who can be co-present and in range to hear, and by a range of incumbent rights and obligations that exist as a feature of the relationship between the people who are co-present. So, the fundamental observation here is that, just as in ordinary conversation, turn order in Twitter is not fixed. As we shall see below, there are ways in which next turns can be implicated in Twitter, just as one can observe in ordinary conversation, with people being accountable for their production. So there are both self-selection and next tweeter selection techniques. Some important differences, however, are that a) next tweeter selection does not necessarily provide that next tweeter responding as the next tweeter in the conversation’s tweetstream. Responses can happen after a number of other people have chipped in. Furthermore, b) many self-selected tweets do not implicate a continuing conversation anyway. In this case conversations evolve by respondents finding within the tweets the grounds for their production.

---
5 The annotation entries in this tweetstream relate to the annotation scheme we have developed. We shall discuss this in the concluding part of this paper. For a full explanation of how the annotation scheme works see [Zubiaga et al., 2015a; 2015b].
6 Indeed, the occasioning of first tweets is potentially a whole further job of research that has yet to be undertaken in any thoroughgoing or empirical way. It presents unique research challenges in that it requires situated observation of tweeters in whatever environments they may be happening to tweet from.
7 This is not to say, however, that tweets are not ‘recipient-designed’ [Sacks, 1992]. On the contrary tweeters remain accountable to their followers for just what they tweet and in what way as we shall examine further on our discussion regarding repair. It should also be noted here that responses from followers in Twitter can take other forms apart from textual replies. One such response is ‘re-tweeting’, another is ‘favouriting’. Neither of these have clear conversational parallels; though re-tweeting does have some superficial similarity to reported speech.
own self-selection. So, whilst Twitter may be asynchronous and public facing it is unlike online fora and question answering websites because the goal of a post is not necessarily to start a conversation.

“(6) Turn size is not fixed, but varies”. Sacks et al. comment with regard to this particular feature that other turn-taking systems can be quite distinct from conversation in how it is handled. So in debates, for instance, one can see that the length of turns is quite tightly pre-specified. With regard to this Sacks et al. suggest that there is a strong relationship between turn size and the ways in which turns get allocated in the first place. Thus there is "... a structural possibility: that turn-taking systems, or at least the class of them whose members each preserve 'one party talks at a time', are, with respect to their allocational arrangements, linearly arrayed. The linear array is one in which one polar type (exemplified by conversation) involves 'one-turn-at-a-time' allocation, i.e. the use of local allocational means; the other pole (exemplified by debate) involves pre-allocation of all turns; and medial types (exemplified by meetings) involve various mixes of pre-allocational and local-allocational means". This being the case they further suggest that there is a relationship between turn size and allocational means. Local allocation results in an orientation to possible completion points and short, sentence length turns (excepting special cases, e.g. stories). Pre-allocation provides for potentially much longer turns [Sacks et al, 1974: 725-6]. An important aspect of Twitter here is that, whilst the exact length of a turn may not be pre-specified, its maximum length is very tightly constrained at 140 characters, although strategies can be adopted that result in something akin to an extension of the turn. One such strategy is the linking of posts (see Figure 2).

Figure 2: Linked posts in a tweetstream.

Another is the completion of the turn over multiple posts, using the convention of three dots at the end of each post to indicate that there is more to come (see Figure 3).

Figure 3: Linking with dots.

And yet another way of linking posts is by numbering them, so that it is previously announced how many more posts are coming (Figure 4).
However, it should be noted that in the context of the tweetstream, as it is encountered by recipients (or, to be more accurate, ‘followers’), these strategies still result in separate posts that look to all intents and purposes like separate turns. This needs especially to be borne in mind in view of how tweets like this may appear on a follower’s tweetstream separated out by other posts, even if they are produced consecutively by the tweeter and appear adjacent in the capture of the conversation alone. Figure 5 shows a way in which the connection can be further emphasized in some cases by including additional elements such ‘Cont’ before the dots and a reiteration of the last part of the previous post in the subsequent one.

In view of the difficulties of maintaining cross-post coherence that these strategies are oriented to, in relation to traditional conversation analysis they can be seen to resonate more as topic reference markers (e.g. like ‘but as I was saying before’, ‘with regard to…’, ‘coming back to…’, etc.) in that there is a maker external to the actual content to be provided that makes evident to recipients the presence of a connection. The foundational observations to be made here are that: i) there is a sense in which turn-size is pre-specified in Twitter, or at least absolutely constrained; ii) there are techniques whereby turns can be extended; iii) there are also techniques for re-establishing topics which might otherwise have been set aside.

“(7) Length of conversation is not specified in advance”. An important distinction Sacks et al. make between naturally-occurring conversation and other kinds of turn-taking talk-based phenomena is that the unfolding talk is not, in principle, constrained to some specific duration. This should be contrasted to certain other kinds of talk exchange systems with turn-taking arrangements such as meetings, debates, or even to some extent in informal but temporally-constrained phenomena like chatting between co-travellers on public transport, where the talk has to unfold within a pre-specified period of time and where turn-lengths, available topics, speaker-selection, etc. may all be relatedly constrained to meet the organizational requirement of the talk closing down after a certain amount of time. Thus, and by the same token, because ordinary everyday conversation does not operate within these kinds of constraints, turn length, potential scope of topic, who may be allowed to speak, and so on, does not have to be pre-specified in any way but can rather be allowed to unfold within the confines of the specific situation. This is not to say that the conversation has no projectible conclusion, no controls over length of turns, no control exercised upon the choice of topic, no constrained rights to speak, etc., but rather to acknowledge that this is something that is locally managed within the course of the talk itself, rather than something that is imposed upon the talk by other external considerations. It should be noted that conversations on Twitter share this characteristic with naturally-occurring conversation, though not with quite the same
organizational outcomes in all regards. Thus we have already seen that the length of turn and management of topic within Twitter-based conversations have some quite distinct organizational characteristics imposed upon them by the nature of the technology and the rigid limit placed upon the number of characters available for use in any one turn.

We shall also see below that the routinely asynchronous character of Twitter has distinct consequences for how conversations may unfold. Nonetheless, as with ordinary conversation, Twitter-based conversations are not subject to any particular kinds of external constraint upon the amount of time within which they may unfold. More than this, Twitter-based conversations, because of the scope for participants to join and leave the thread over extended periods of time without any pre-defined preference for temporal contiguity, can unfold over the course of a day or even days as people encounter relevant tweets within their tweetstream at convenient moments within their own external routine.

Against this, there has to be set another standard technological and organizational feature of Twitter. On its mobile phone-based application Twitter routinely excises tweets from the stream going back more than a couple of hours previously and just glosses their presence with the words ‘load more tweets’. Users can click on this and display the missing tweets from the stream, but the fact that they are not displayed as a matter of course has clear implications for what people may most readily engage with. Additionally, because the tweetstream is relentlessly chronological in its display, at least upon first encounter, going back through the stream to older tweets you may have missed on any interface is physically laborious and may involve significant amounts of scrolling down the page to get at them, depending on the number of people being followed, and this too has implications for what may more readily be encountered and acted upon as a conversational turn. The upshot of all this is that people are less likely to engage with tweets over a certain age so the scope for a conversation to be sustained across a group of interested parties is limited by the scope that exists for related tweets to be encountered.

Certain mechanisms such as mentioning and favoriting provide a way for contributions by others to be highlighted within a user’s own interface, and the use of hashtags provides a way in which users may at least return to a specific topic and explore what has lately been said. Furthermore, the topic reference markers we noted above as well as other strategies such as retweeting, can all be seen as ways in which people may attempt to enter or even reanimate conversations at a later stage. Nonetheless, the fact remains that the structure of Twitter promotes engagement with tweets that are more recent within the overall stream and works against engagement with an unfolding conversation that has lapsed such that no contributions are visible from anyone you follow within the past few hours.

Centrally it can be observed that the length of Twitter conversations is not pre-specified. Furthermore, a range of techniques exists whereby conversations can be engaged in asynchronously and extended (potentially indefinitely) over time.

“(8) What parties say is not specified in advance”. The purpose of this observation is to distinguish conversation from scripted talk-based phenomena (such as pieces of theatre) or ritualized talk-based phenomena (such as religious rites) where turn-taking occurs but there is little scope to vary what is said. There are some specific utterances in conversation that are relatively prescribed in character such as
greetings and openers and closers in telephone-calls [see Sacks, 1992]. In practice, however, variation does exist and can be witnessed regularly, so the accountable production of appropriate greetings and openers/closers is a matter of orientation rather than pre-specification. Twitter shares this feature with conversation. Additionally, Twitter conversations do not typically exhibit any systematic production of greeting, parting, opening or closing phenomena. Note that in conversation these kinds of phenomena do the job of establishing talk prior to the establishment of a specific topic and also serve the purpose of speaker selection and establishing rights to talk. In that turns in Twitter are understood and oriented to as productions that recipients will encounter as and when they themselves choose to inspect the tweetstream there is no need for work to be undertaken to establish a specific and contiguous space for the turn within ongoing interaction – it is provided for by a presumption of unspecified asynchronicity. Additionally, because Twitter has an in principle right for self-selection when producing turns there is little work for greetings and partings to do, unless direct address to a specific follower or groups of followers is undertaken (Figure 6a & b).

Figure 6a & b: Openings and closing directed to specific recipients.

Furthermore, as we noted above many tweets are not produced with a built-in assumption that they will be productive of conversations anyway.

The key organizational feature to be noted here is that, along with many non-scripted turn-taking systems, Twitter exchange has the characteristic that the content of tweets is not specified in advance, even if certain elements (such as retweets and mentions) may be governed by certain conventions when they arise as part of the content.

“(9) Relative distribution of turns is not specified in advance”. Sacks et al.’s point here was that conversation does not work in terms of ‘it’s your turn, now it’s your turn, now it’s your turn’ in an equal way or following some kind of agreed and pre-specified pattern. Just who gets to say what, and how much, and over how many turns is something that is managed through the ongoing production of turns. The upshot of this, as most of us would recognize, is that one can have conversations where everyone may seem to be equally engaged and contributing, and one can have conversations where just one or two parties dominate and others hardly take a turn at all. This is a direct result of the ways in which speaker selection occurs and people work to minimize gaps and overlaps. If the same people keep getting selected or self-selecting at the appropriate transition points they are going to keep on getting turns, regardless of who else may be present or what they may also have to say. The interesting thing with Twitter conversations is that the ‘all-comers’ mode of self-selection and the modes of selection and address that are available such as mentions provide for a similar effect in that one can inspect Twitter conversations and see
systematically that the number of turns different contributors make can vary but without there being any evident externally imposed pattern. Instead you get people all jumping in separately to respond on occasion, just one or two on other occasions, even across the same groups of followers. Sometimes direct mentions and topical coherence will shape a conversation in such a way that it is, to all intents and purposes, purely dyadic. The critical thing to note here is that, even though there is a sense in which the systematic features of conversation that have arisen to handle the problem of gaps and overlaps, and to ensure that you only get one speaker speaking at a time are used to equal effect in Twitter, it is in fact the case that the technology itself overrides any possibility of overlap and continually imposes gaps. Thus there is an orientation to managing an unfolding series of turns in microblogging that works as much as anything because of its to-hand nature (in that everyone already knew how to do conversation before any microblogging came on the scene) and its ready intelligibility to just anyone else.

The foundational observation here, in that case, is that there is no pre-defined distribution of tweets and turns at tweeting on Twitter. An important outcome of this feature is that, because of the technological constitution of Twitter and how this renders contributions to the tweetstream available to other viable recipients, Twitter conversations have a fragmented and non-contiguously paired appearance to recipients that makes them quite unlike face-to-face conversation.

“(10) Number of parties can vary”. One other feature of naturally-occurring face-to-face conversation that Sacks et al. point to as systematically significant is the way in which the number of people involved in it is not pre-specified and can vary across the duration of a single conversation. So, whilst pragmatically speaking conversations tend not to have more than a certain number of parties involved the upper limit is systematically constrained only by the scope for matters such as audibility and selection techniques to operate. More than this, the cohort of available speakers and active participants can change as a conversation unfolds. Some parties may leave, others may arrive, some may start speaking at one point in the conversation and then busy themselves with other matters at another part, whilst others who were otherwise engaged at the outset may complete or set aside what they were doing to speak instead. This obviously has ramifications for speaker selection and who might prospectively take a turn. It can also ramify for topical coherence in that those who were present when a topic was introduced will have a different understanding of what might constitute a reasonable turn to those who have only just encountered the conversation. This characteristic of conversation is something that can be set against certain other kinds of spoken turn-taking systems

8 In fact, in a later work [Sacks, 1992, Part II, Lecture 8, pp129-131] Sacks notes that there is a strong tendency for multi-party conversations to regularly devolve to two-party conversations, regardless of how many participants there might be: “The reason you have to end up with two-party conversations is that two-party conversations are stable in a way that multi-party conversations are not. If a two-party conversation is going ... then nobody has the business of joining them. If a three-party conversation is going then anybody may be able to join it and also, anybody maybe able to leave it. Furthermore, it's much harder for either parties in a two-party conversation to get out of it than it is for any party to get out of a multi-party conversation – or indeed, than it is to get into a two-party conversation”. The fact that Twitter is by nature multi-party rather than two party in orientation (outside of direct messaging) amounts to an important structural difference for exactly the reasons Sacks has identified here regarding accountably appropriate ways of proceeding. You can just drop in and out of a Twitter conversation regardless of who you are because it is a structural feature of conversational turn-taking that you can proceed that way.
where the number of parties who may participate can be very tightly specified, for instance during legal proceedings, during scripted activities such as rituals or theatre pieces, even during traditional telephone conversations where interactions are strictly dyadic, and similar kinds of two-way radio-based interactions.

Looking at Twitter in relation to these observations it can be seen that the number of parties can again vary systematically and without pre-specified. The only potential exception here is direct messaging where the conversation is dyadic in much the same way as it is for telephone calls etc. Indeed, just as telephone-based interaction can be observed to have some specific organizational features that set it apart from other kinds of conversational turn-taking, so one might say that direct messaging in Twitter (or in other microblogging domains) is a specialization of more general microblogging systems. Thus, just as in naturally occurring face-to-face conversation, one can see in Twitter conversations that remain more or less dyadic even though they are putatively public (an example of a dyadic Twitter conversation can be seen below in Figure 8), and on other occasions conversations that have exceptionally large numbers of contributors. A single recent conversation about the color of a dress on Twitter, for instance, attracted more than 650,000 responses. In fact, whilst the operating constraints of audibility and witnessable speaker selection serve to place a definite upper limit on the number of participants in ordinary face-to-face conversation, in the case of public microblogging domains the potential number of participants is constrained only by the extent of the follower network of the contributors to the conversation, making the possible upper limit potentially millions if a conversation involves a number of people with very large numbers of followers. Furthermore, it is clearly the case that on Twitter you can catch up on a conversation at any point (the tweets are there and you can read them at any point after a conversation has started). In spoken conversation, if you miss the beginning the scope to participate is extremely limited. The extent of visibility of Twitter conversations and the scope to contribute obviously also has implications for the possible transmission of rumors in public microblogging domains in that it can be systematically appropriate for large numbers of people to take a turn.

The foundational point to make here is that the number of potential parties involved in Twitter conversations is both varied and constrained only by the network of followers who might encounter a tweet (either in its original form or as a retweet). Thus there is an implicit understanding when one tweets that all followers may potentially respond. So, unless you are direct messaging, you cannot initiate a Twitter conversation with any assumption of it being dyadic. As we point out elsewhere in this paper, there are speaker selection techniques available such as replying and mentioning but these do not close down the scope for other contributions in at all the same way as they would in face-to-face conversation. Instead the dominant mechanism for speaker selection in Twitter is self-selection. Furthermore, it should be stressed here that the strong counterpart to the right to self-select in Twitter conversations is that one may also choose not to self-select. That is, one may encounter tweets and conversations yet not produce any kind of response. People do, of course, ‘sit in’ on face-to-face conversations in which they have no interests and may, for the larger part, ‘zone out’ of those conversations and play no part in them. However, in that they are present and can be understood to have heard what was said, they may nonetheless be accountably called upon to contribute, something most people have experienced from time to time with much accompanying embarrassment. No such accountable presumption is in play on Twitter and, across most microblogging sites, non-selection is by far the most common phenomenon.
“(11) Talk can be continuous or discontinuous”. Twitter is, by nature, synchronous or asynchronous in terms of response, with it usually being the case that a large number of unrelated tweets appearing moment by moment within the stream and with tweets addressed to the same topic being potentially widely spaced apart. A temporal consequence of this characteristic of Twitter is that the time spans over which respondents may address themselves to a topic without loss of coherence are much greater in the case of Twitter than they are in face-to-face conversation.

In ordinary conversation, as most speakers will readily recognise, failure to address oneself to a topic quickly enough means that another topic will be floored and addressing oneself to the original topic becomes much more difficult and accountable. Conversation analysis has looked closely at how ‘change of topic markers’ is handled in conversation. Part of this also relates to ‘return to topic markers’ such as ‘but as I was saying...’, ‘but going back to what you were saying earlier about...’, and so on. Thus, there are ways of managing topic preservation over more extended periods in spoken conversation. The temporal organisation of Twitter means that there are certain distinct but equally systematic ways of marking out topic relationships that people will use in various sophisticated ways in order to manage coherence across more extended conversational threads. Re-tweeting is one obvious way in which this is accomplished.

Another more specific technique can be the use of the mention convention, which has the dual effect of both indicating the presence of a topic relation to all witnessing parties and of ensuring that the person specifically addressed sees one’s tweet (Figure 7).

The organisation of conversation around topics, topical coherence, and shifts of topic is a central focus of the conversation analytic literature. Clearly responding to other people’s tweets and using mentions as in the above, commenting upon embedded tweets being retweeted, and simple retweets all exhibit certain features of topical coherence, and Twitter itself also reflects this understanding in its grouping together of connected tweets in this way as ‘conversations’. Grosser degrees of topical relation may also sometimes be encapsulated within the use of hashtags. There are other indicators of ‘on topic’ / ‘off topic’ that can be seen to have a clear continuity with methods used in face-to-face conversation. For instance, note the use of ‘btw’ in the following and how the respondent handles both continuation of topic and the transition that has been proposed (Figure 8).

Key observations regarding Twitter here are that tweets can be simultaneous, synchronous or asynchronous in terms of their composition, but are always either synchronous or asynchronous in their presentation on the tweetstream, with
asychronicity being the norm. Key outcomes of this are that topical coherence has less dependency upon adjacency than it does in face-to-face conversation. Nonetheless, Twitter also retains topic reference markers one can find in face-to-face conversation (e.g. ‘as I was saying’, ‘btw’), as well as a number of more specialised techniques (e.g. the use of mentioning and hashtags).

“(12) Turn allocation techniques are obviously used. A current speaker may select a next speaker (as when he addresses a question to another party); or parties may self-select in starting to talk”. Despite its largely asynchronous character and the potential interleaving of a number of distinct sequences of tweets on Twitter there are ways in which similar kinds of turn allocation techniques can be observed. Tweets are composed and arrive as distinct units within global Twitter feeds. With regard to any one particular topic there is a ‘first speaker’ in terms of there being an originator, there are subsequent parties who may be implicated as respondents within the original tweet, and there are parties who select themselves as respondents to a tweet in some way. Differences here particularly relate to other matters such as: ‘co-placement’, where responses to a specific tweet may not be sequentially directly adjacent to that tweet within a feed (because, in principal, all comers may respond to all tweets, so next up in a feed may be an entirely unrelated response to a different topic); and ‘rights of response’ in that any recipient of a tweet may respond to it or retweet it, whilst this is clearly not the case in face-to-face conversation, where just who gets to speak is a very tightly managed affair.
“(13) Various ‘turn-constructional units’ are employed; e.g. turns can be projected ‘one word long’, or they can be sentential in length’. Sacks et al. make much of the projectable character of just where a turn in talk might end. Typically turns consist of whole phrases or sentences but they can be much shorter and, on occasion, not even full words, e.g. mm-hm. What is critical for an effective turn-taking system that serves to ensure that people get both turns at talk and minimize the gap between their turns is that they be able to judge the up-and-coming end of a turn and be able to already be ready to talk as the turn ends. Sacks et al. call these places turn transition points and examine their significance in some depth. Sacks also examines in his Lectures on Conversation [1992] the ways in which turns that are going to take more than one phrase or sentence to complete require special signaling, construction and placement in the flow of talk. You cannot simply launch into a multi-sentence utterance without the risk of others cutting in as you get to the first potential transition point.

In relation to this observation we can see that Twitter is quite distinct in a number of ways. First of all, because turns are usually already asynchronous, there
is no need to provide for minimizing the gap between turns. At the same time, as we have already observed, there is an absolute length of 140 characters that constrains how long any ‘constructional unit’ might be. However, at same time if you can fit more than one sentence in your 140 characters that’s absolutely fine and not a matter that is called to account by others. The example in Figure 9 is just the originating tweet we saw in Figure 1. Reference to Figure 1 will show a number of other multi-sentence turns in that particular conversational stream.

Figure 9: A multi-sentence turn.

This scope for multi-sentence turns has structural consequences. For a start there is no need to project the ending. Recipients can see the whole turn as it has been crafted over any possible amount of time between previous postings. Additionally, recipients also understand that, without other indicators (such as we saw above regarding connected tweet markers), a tweet counts as the whole turn at talk and can be treated accordingly. Originators are thus accountable for its production and it is accountably appropriate to treat it as a complete turn even if it was posted prematurely by mistake. The fundamental point here is that turn-constructional units in Twitter are individual tweets, even if linking strategies are adopted. Furthermore, there is no scope for retrenchment, modification and repair within the tweet itself, something that happens routinely in face-to-face conversation as potential responses are foreseen and headed off before they become manifest. The matter of repair is important and Sacks et al. also had observations to make about this.

“(14) Repair mechanisms exist for dealing with turn-taking errors and violations; e.g., if two parties find themselves talking at the same time, one [or both] of them will stop prematurely, thus repairing the trouble”. With regard to this Sacks et al. discuss a variety of ways in which repair of troubles in the turn-taking system can be undertaken, including questions, apologies, repeats, stopping things dead before completion, and so on. They also make the observation that: “A major feature of a rational organization for behavior which accommodates real-world interests, and is not susceptible of external enforcement, is that it incorporates resources and procedures for repair into its fundamental organization.” [Sacks et al., 1974: 720]. An important implication of this is that, whilst it may differ in certain aspects of its realization, the organizational arrangements of tweet-exchange should also exhibit procedures for bringing about repair. Clearly some of the technical aspects of the production of tweets are managed by the technology and not susceptible to user intervention or repair. A certain number of accounts and repair mechanisms are also directed at this characteristic of Twitter. For instance accounts may be directed to machine activity over which one has little control (Figure 10).

Figure 10: Apologising for errors beyond one’s control.

Other accounts, however, are framed in terms of user errors of one kind or another, typically relating to either simple absence, as in the following which
provokes a further suggestion from the user that the absence of response is deliberate (Figure 11),

Figure 11: Missing a post and being understood to be ignoring a complaint.

typing errors (Figure 12),

Figure 12: Being pulled up on keying errors.

or lack of competence, such as the misuse of the mention facility (Figure 13),
or erroneous retweeting (Figure 14).

A further focus of accountability of action and repair is directed at the moral probity of a tweeter’s actions. In this case Twitter is quite clear about the rights of users to effect a sort of repair by removing or deleting a tweet.

“Did you tweet something and then change your mind? Don’t worry! It’s easy to delete one of your Tweets. Please note that you can only delete Tweets that you have made, you cannot delete other users’ Tweets from your timeline.” [Twitter Help Center: ‘Deleting a Tweet’]

However, Twitter also makes the following observation:

“Note: Deleted Tweets sometimes hang out in Twitter search, they will clear with time.” [ibid.]

Additionally, there is nothing to stop users saving and then re-posting your deleted tweet (although, on occasion, Twitter may treat the re-posting as a violation). This can result in the attempt at repair being unsuccessful (Figure 15).
Figure 15: Broadcasting a deleted tweet.

It should also be noted that Twitter does operate mechanisms for flagging offensive tweets which may then be removed by Twitter itself [see Twitter Help Centre, The Twitter Rules\(^9\)]. Of course, there are occasions when users attempt to repair directly misunderstandings that may have arisen regarding their posts (Figure 16).

Figure 16: Trying to account for an ‘inappropriate’ retweet.

And on some occasions tweets are called to account by others but nonetheless left to stand, such as an accusation of plagiarism provoking no response (Figure 17).

\(^9\) https://support.twitter.com/articles/18311
Figure 17: Leaving a call to account unanswered.

An inspection of Twitter shows that great many calls to account go unanswered in this way. The scope to override calls to account and expectations of repair in Twitter massively differs in this turn-taking environment from instances of face-to-face conversation. In face-to-face interaction calls to account are implicative for the production of the required account in the very next and adjacent turn. Failures to produce accounts under such circumstances have the same kind of impact as questions that are left unanswered more generally. Typically they provoke a reiteration of the call to account in more terse terms. If the account is still not provided it is not considered inappropriate for the person demanding the account to become irate. Complete rejection of a call to account can lead to the ascription of various other moral characterizations to the person who has not responded, such as being ‘rude’, or ‘unpleasant’, or ‘arrogant’, or ‘pig-headed’, depending on the kind of account that is being called for. There is, then, an apparatus for generating accounts, and the consequences of ignoring calls to account are not typically embraced by conversationalists. For this reason they are termed in the conversation analytic literature ‘dispreferred’. There are some foundational things to note about all this: 1) There remains an understanding of how appropriate turns should be produced in Twitter; 2) There is a manifest orientation on the part of users to call other users to account when this commonsense order is breached in some way; however, 3) The strong orientation to therefore producing what in face-to-face conversation would be an expected second part in terms of an account or a repair of some kind is not similarly present. In consideration of this we should remind ourselves of the ways in which the turn-taking mechanism as described by Sacks et al. is powerfully constructed around the need to manage co-present talk so as to avoid unnecessary gaps or overlaps and an effective distribution of turns. We have already noted that Twitter’s asynchronous character and absolute limit on the size of a possible turn, together with general rights of response, renders these kinds of management concerns redundant. As adjacency-pair type structures [see Sacks 1992], where the production of a first part, such as a calling to account, is tightly paired with the expected production of a second part, such as the account that was called for, are intimately bound up with the turn-taking management of face-to-face conversation where the production of the second part is expected to be, indeed, adjacent to the first part (rather than in 5 minutes and after who knows how many other turns of talk in-between), it is hardly surprising that the breaching of expectable adjacency of related turns in Twitter is likely to have an impact upon how the production of putative
second parts plays out. If the calling to account is not coming from people with whom you are engaged in interaction here and now, the understood ramifications of non-response visible in face-to-face conversation are clearly not so likely to manifest themselves. As Twitter conversations can also occur between people who are otherwise strangers to one another and who may never have another reason to interact, the scope for future face-to-face calling to account is also minimal. Thus ignoring one’s accountability for the turns one produces is much more likely to occur. This, too, has implications for how dispreferred actions such as the spreading of rumors may be more easily enacted via Twitter than in other more temporally-tied forms of turn-taking system.

Sacks et al. used the above observations about the organizational characteristics of conversation to arrive at a specific turn-taking model, or ‘simplest systematics’ for conversation. It consists of two components:

1) the ‘turn-constructional component’, and
2) the ‘turn-allocation component’; and

a set of rules relating to exactly what might happen at a ‘transition relevance place’ (i.e. ‘speaker selection’, failing that ‘self selection’ or failing that the current speaker may continue speaking through to the next possible ‘transition-relevance place’) [Sacks et al., 1974: 702-704].

As we have already intimated in our discussion of repair mechanisms above, a crucial difference between the model Sacks et al. came up with and the situation regarding Twitter, that speaks to the nature of the phenomenon being addressed itself, is the point they make about the minimization of gap and overlap. Conversation unfolds in co-present and linearly conjoint interaction such that gaps and overlaps are disruptive to the effective realisation of conversational talk. Tweets, by contrast, are textual productions that are, by virtue of the technical apparatus that enables them to be produced, both contiguous and without overlap. Thus this is not a problem to which the construction of tweets needs to be addressed. What one does encounter in Twitter, in particular in the context of what might be assembled by Twitter itself as a conversation, are phenomena such as: ‘the complete absence of a turn’, that is to say a turn by a certain party may be projectible but not forthcoming; ‘the conjoint production of largely unrelated turns’, that is to say, two (or more) followers may set out to respond to an immediate prior simultaneously in distinct ways, with the construction of Twitter resulting in their posts being assembled in the tweetstream consecutively even though they have no relation at all to each other but only to the prior turn. In Figure 18 below we can see how both @jawadmnazir and @flyhellas respond in very quick succession after the posting from @flightradar24 but in quite distinct ways. Furthermore, @flightradar24 only chooses to respond to the tweet from @flyhellas even though the questions posed by @jawadmnazir might be seen to be equally implicative.

10 Whilst it is organizationally different from this in a number of respects, Sacks et al [1974: 712] do observe that the model they are proposing is foundationally geared to turn-taking in dyadic conversation with just two parties and that the addition of other parties can ramify. One of the ramifications they point to is that, when there are four or more parties, the talk can split up into more than one concurrent conversation with divergent talk happening at the same moment in time.
Figure 18: Consecutive disjunction but mutual address to a preceding Tweet, together with disregarded implicativeness in Twitter.

It thus falls to the recipients of the conversation to disambiguate the relationship of the various turns to one another without the availability of their sequential production standing as a resource for such disambiguation (as it would in conversation), outside of the gross fact that certain turns can be seen to precede others and that a turn will, by necessity, be addressed to some other turn that precedes it rather than to one that comes after it in the tweetstream.

The importance of this distinction between Twitter-based conversation and actual co-present conversation needs to be stressed. When Sacks et al. [1974:715] delve into part of the issue of why talking at once might be a problem and how the turn-taking system provides an economical method for handling that problem, they discuss in particular how the model, by providing for the analyzability of a turn of talk over the course of its production, might be impaired if turns were allowed to overlap, making projection of completion difficult to accomplish. Twitter has effectively obviated the need for the turn-taking system in operation to handle this kind of problem by making it technically impossible for there to be overlapping turns.

However, in that Twitter use has moved beyond the original conceptualization by its originators of something that was largely designed to effect information exchange, and towards something that is oriented to as a device for specific user-to-user interaction over extended turns (as is recognised in the way Twitter now clusters related posts as conversations), the preceding observations also present a unique challenge to Twitter as it is currently constructed and the extent to which it can

---

11 In relation to, and in support of this they note that one kind of overlap is routinely acceptable in conversational exchange: “With regard to the ‘begin with a beginning’ constraint and its consequences, a familiar class of constructions is of particular interest. Appositional beginnings, e.g. well, but, and, so etc., are extraordinarily common, and do satisfy the constraints of a beginning. But they do that without revealing much about the constructional features of the sentence thus begun, i.e. without requiring that the speaker have a plan in hand as a condition for starting. Furthermore, their overlap will not impair the constructional development or the analysability of the sentence they begin. Appositionals, then, are turn-entry devices or pre-starts, as tag questions are exit devices or post-completers.” [Sacks et al., 1974: 715]

12 It should be noted that this feature of Twitter is still very limited in its application and we have uncovered numerous examples of clearly associated and ‘conversationally-bound’ tweets in our own research that were never actually represented as conversations within people’s tweetstreams.
really be seen to operate as a conversation. This is a point to which we shall later return.

There is another aspect of the simplest systematics that is crucially bound to the production of conversation in co-present interaction. This is the ongoing analysability of an utterance in the course of its production for its projectible point of completion\(^{13}\) and for the kind of work that is being done, such that a next speaker can be identified, can know when it is appropriate to speak, and can know what kind of a thing their own turn might need to accomplish\(^{14}\). Indeed, Sacks et al. go so far as to suggest that the organisation of the turn-taking system may even key on all turns of talk having “points of possible unit completion ... which are projectible before their occurrence” [1974:716]. They justify the proposed importance of people’s orientation to this by, on the basis of the empirical materials they have accumulated, saying that:

“Examination of where ... ‘next turn starts’ occur in current turns shows them to occur at ‘possible completion points’. These turn out to be ‘possible completion points’ of sentences, clauses, phrases, and one-word constructions, and multiples thereof”. [Sacks et al., 1974: 717]

Clearly, recipients of tweets are able to engage in a post-analysis of the whole turn at their leisure, even to the point of re-examining it multiple times, before they complete their reasoning about such matters, and without the pressure of needing to step straight in when up-and-coming completion of an utterance is recognised. This lack of in situ pressure to analyse and respond also renders tweeting distinct from certain other kinds of text exchange such as live chatting\(^{15}\).

In consideration of the methodological character of turn production one further very important aspect of the observations made by Sacks et al., that points to the status of any such project as an analytic enterprise, is the following:

“... while understandings of other turns’ talk are displayed to co-participants, they are available as well to professional analysts, who are thereby afforded a proof criterion (and a search procedure) for the analysis of what a turn’s talk is occupied with. Since it is the parties’ understandings of prior turns’ talk that is relevant to their construction of next turns, it is their understandings that are wanted for analysis. The display of those understandings in the talk of subsequent turns afford both a resource for the analysis of prior turns and a proof procedure for

\(^{13}\) Thus Sacks et al. [1974: 709] also note how variable turn-length is itself partly constituted by the nature of sentential constructions, which may themselves be extended through the inclusion of sub-clauses etc., and, in addition, comment that: “Sentential constructions are capable of being analysed in the course of their production by a party/hearer able to use such analyses to project their possible directions and completion loci.”

\(^{14}\) Here Sacks et al. [1974: 710] point to the fact that, whilst ‘what parties say is not specified in advance’, certain kinds of turns do pre-figure what may thus be done with a subsequent turn, even if its exact content is not pre-specified. They additionally note that this feature can have an impact upon speaker selection in that certain types of turns pre-figure who the next speaker might be and what it is incumbent upon them to do.

\(^{15}\) Nonetheless, some Twitter exchanges do resemble live chatting with tweets passing to and fro in rapid succession. Although these clearly retain the structural features we are discussing there is obviously a need to respond to each other’s tweets quite quickly or risk being understood to have ‘left the conversation’. Thus it can be seen that there are actually a variety of different kinds of tweet exchanges on Twitter with different kinds of organizational expectations attached to them. These kinds of distinctions are one of the many things that an unfolding program of microblog analysis will need to encompass.
professional analyses of prior turns - resources intrinsic to the data themselves.”
[op cit: 725].

In other words, the local analysis of a prior turn that is made visible in a subsequent
turn is itself a resource for our own analysis. It tells us what the participants to a
course of interaction understand to have been done themselves at every step of the
way. In the case of rumor analysis, then, what counts as a rumor is what is
manifestly taken to be a rumor and handled that way in the turn that follows what is
seen to be the source of the rumor in the first place. Thus there is no point in looking
to any one turn and seeing it as amounting to a rumor in any free-standing way. It is
the turns that follow that will be seen to matter. So, in Figure 19 the initial item of
‘breaking news’ would remain just that – ‘news’ – without the subsequent 112
retweets and various comments upon it that themselves make it a piece of putative
information that is being shared with other people. And the clinching point is the
moment when its status as something other than ‘just news’ – ‘not according to what
I’ve just heard on CTV’ – makes it open to being recognized by other parties as
something unverified and therefore possibly ‘just a rumor’.

Figure 19: An unfolding rumor.

This insight, that rumor is by necessity a collaborative production that unfolds across
multiple turns in any exchange system, has been central to our own development of a
suitable annotation system for handling rumor production in Twitter. This is the
foundational point we would want to make here: one needs to examine the
organizational characteristics of how specific phenomena unfold in social interaction
to understand how they work as social phenomena. It is only by examining how
tweeting (or microblogging more generally) is socially organized, in its own terms,
that one can begin to understand how any social phenomenon enacted through it is
realized, including rumor. The insight derived from Sacks et al, is not an insight
about conversation, even though Sacks et al were concentrating upon conversational
phenomena at the time. It is an insight about turn-taking systems in general. They
are organized to be implicative; to allow interaction to unfold over time. This means
that focusing upon any one isolated turn is very limited with regard to what it can
tell you about how things are socially meaningful. This matters as much for Twitter
as it does for face-to-face conversation. And it matters as much for rumor as for any
other socially recognizable phenomenon in Twitter (joking, teasing, arguing,
promising, requesting, telling, sharing, ranting, suggesting, and so on). As a
concluding exercise we will therefore begin to outline some of the ways this approach
has begun to be used specifically with regard to the production of rumors on Twitter, and how that in turn has begun to inform certain aspects of systems design.

6. APPLIED MICROBLOG ANALYSIS: EXAMINING RUMOR

We appreciate that the above discussion is heavily centered around sociological concerns and sociological analysis. In this final section we want to briefly illustrate that, despite the sociological emphasis, our interest is very much bound up with a desire to inform and assist systems design and commensurate with concerns that are at the heart of Human-Computer Interaction as a domain. It is worth reminding the reader at this point that our core aim in examining Twitter as a socially constituted phenomenon has been to inform the development of an annotation scheme that we may then use to help solve the challenges of early detection and veracity evaluation of rumors in social media. The sociological exercise has been one of setting that endeavor upon a sound and rigorous methodological footing. To do that has entailed going back to first principals because we found existing schemes of analysis not yet quite fully attuned to the uniqueness of Twitter as a domain of social interaction.

Whilst there is much still to be done on both the analytic and design front, there are certain foundational elements we have already begun to pull out of the above observations and embed within our ongoing development of a suitable annotation scheme. These particularly relate to the following features of Twitter use:

- That it is sequentially ordered
- That Twitter conversations involve topic management
- That there are important accountability mechanisms in play

Additional features that are alluded to in the closing example above, which relate more specifically to our interest in rumor production, include matters such as:

- Agreement and disagreement
- The ways in which tweets are rendered trustworthy and believable through the production or otherwise of evidence

More specifically our CA motivated annotation scheme for rumorous conversations reflects sequential ordering by providing for the annotation of triples of original and reply tweets, where the original tweet is visible as a topic reminder in nested replies. The relation between the tweets within such a triple are annotated in terms of agreement or disagreement, how the latter is supported by providing evidence and the level of confidence in expressing the agreement or disagreement. For a more detailed description of the annotation scheme the reader is referred to [Zubiaga et al., 2015a; 2015b]; what we would like to underscore here through the examination of a couple of examples of Twitter conversations is the scope for the kind of analysis we have been articulating here to inform rich annotation of microblog materials towards a variety of ends where there is a need to understand people’s situated practices, reasoning and methods for using microblogs.
Figure 20: Example of a rumor where the truth status of the original post is not brought into question.

The short conversation in Figure 20 refers to a post releasing a set of photos taken from an eyewitness video of the Charlie Hebdo attacks in Paris. Here we see how the validity of the original post is not brought into question and the remaining posts take the form of commentary upon it. This first example demonstrates the extent to which people can self-select in order to respond to prior tweets. Another point of interest is how the tweeters involved are aligning to subtly distinct matters of topic, distinctions that are not wholly commensurate with the post relationships themselves. What we can see are three related but different concerns being addressed by the parties. Some are concerned to assign a moral ascription to the matter overall, e.g. ‘terrible’. A second set of posts concern themselves with the identity of the wounded man as a police officer. The third set is focused upon utterances shouted out by the attackers. A further level of topical richness is present in the way that one of the tweeters, @AwakeDeborah, is actually addressing both the identity of the wounded man and what was shouted out. One post, by @Glusguglielmi, also looks at the prospective actions to be taken to capture the attackers.
The tweetstream in Figure 21 tackles a prospectively rumorous post from a variety of perspectives, displaying a number of ways in which accountability mechanisms may be visibly brought to bear upon unfolding content of this kind. Ultimately, it turns out that the foundation of the post as a ‘false’ rumor hinges upon a confusion of events. The initial post cites the New York Times as saying the Canadian soldier shot in the Ottawa shootings has died. Responses to this initially don’t bring it into question and instead align with content in ways that are similar to the example in Figure 20. However, a post by @CharleyPride78 then enters the tweetstream saying that a Canadian TV station is reporting that the soldier is alive. There are then numerous posts aligning with this post, some of which call the original tweeter to account for having posted false information. It is only towards the end that a post by @NatricieR suggests the possibility that there has been a confusion of events with the death of the soldier referring to an earlier event in Quebec instead.
The primary cohering feature in this second example is the mention throughout of the original tweeter, @DaveBeninger. Groups of tweets within the exchange, however, then cohere around a range of other mentions, not all of whom are even visible within the tweetstream, possibly because they simply retweeted the posts of others, e.g.: @cherylnorrad; @frednewschaser; @big rudo; @bebeasley; and so on. A matter of potential importance here is the kinds of considerations being brought to bear by people when they use mentions within conversational streams like this. Another feature of interest within this example is the way in which disalignment and dispute of the original tweet gets marked out within the textual realization of the response. This echoes our observation of how speakers will mark out dispreferred responses in conversation, such as disagreement, in unique ways that provide for the seeability of the up-and-coming response and giving the original speaker an opportunity to engage in repair.

Clearly, there is much still to be done with regard to both the development of microblog analysis and attached design endeavors such as the annotation scheme relating to rumors. This paper should not be understood as more than an initial foray into the landscape that attempts to lay out some of the most important foundational considerations and organizational features, exploring the most effective means for what Garfinkel [1967] calls finding ‘the animal in the foliage’. Hopefully, the reader can begin to see here that understanding how any of the technological components of Twitter can have any kind of social import or meaning turns upon understanding how Twitter is a socially organized production. This social organization is to be found in the detail of just how Twitter exchanges are brought about and subjected to ordinary everyday assumptions and reasoning. And this body of reasoning has to be understood in its own right, not simply as a subspecies of face-to-face conversation. More than this, we have already outlined above how sociological analysis of this kind is not simply an arcane pursuit but rather at the very heart of Human-Computer Interaction and the use of studies of human interaction to inform systems design. The work we have begun on the discovery and annotation of rumors is an instantiation of exactly this concern with embedding systems design in a rigorous understanding of how the social world is accomplished. This, we argue, is especially important for digital technologies that are inherently social such that users are in a position to play a critical role in shaping them; that is they are ‘co-produced’ by the activities of their users.

7. CONCLUDING REMARKS: ‘THE MEDIUM IS THE MESSAGE’?

“The medium is the message” is a (frequently misunderstood and misinterpreted [Federman, 2004; Strate, 2012] phrase famously coined by Marshall McLuhan [1964:7] and generally held to suggest the idea that the form of a (technical) medium influences how the message is perceived and interpreted, and, importantly, that in unpacking communication and interaction we need to pay attention to both medium and message because: “it is only too typical that the ‘content’ of any medium blinds us to the character of the medium.” [1964: 9]. In trying to develop a ‘simplest systematics’ for Twitter interactions, we are similarly trying to draw attention away from a conventional and simplistic consideration of the content or ‘message’ of Twitter feeds – what people ‘say’ – towards a more ‘foundational’ focus on unpacking exactly how and in what ways Twitter interactions are accomplished. Like McLuhan we are trying to bracket an interest in the obvious, in the content of specific Twitter feeds or tweets, in order to try and develop a method that facilitates a more general understanding of how all tweets ‘get done’: trying to understand the medium as a way of understanding the various content and interactions that are spawned. Where we differ from McLuhan is in our interest in establishing the actual methodological
foundations of using Twitter as a pre-theoretical matter that is open to empirical investigation, rather than trying to turn our observations into some kind of overarching theory concerning ‘what Twitter is really all about’.

In this paper we have therefore sought to present the way in which we have turned to the social scientific disciplines of conversation analysis and ethnomethodology in order to begin to enrich a simple annotation scheme for rumor with a deeper body of understanding of real-world social practice and interactional methodologies. We have also outlined how the accomplishment of this turns upon moving beyond just using conversation analysis as a frame and involves instead taking microblogging and the use of Twitter as a discrete domain of practice that requires analysis in its own terms, exploring some critical differences between the organization of ordinary situated conversation and the organization of microblogging activities, in particular, the use of Twitter. In order to develop this foundational analysis and explicate this further we have looked systematically at a range of significant objects of interest in the conversation analytic literature and how the handling of these needs to be reconfigured in order to make it speak properly to microblogging as an organizational phenomenon in its own right.

On the back of this we have begun to articulate more specifically what might be termed the organizational characteristics of microblogging and how it might operate as its own unique kind of turn-taking system within human practice. Our original interest in pursuing this line of investigation arose out of a need to develop a more socially-nuanced scheme for annotating tweets in relation to the articulation and spread of rumor. This has formed a backdrop to the paper and has informed our selection of examples so that we can make clear the specific relevance of microblogging analysis to the undertaking of such a task. In so doing, we have identified subtleties of interchange that evade capture in the current annotation scheme, indicating areas in which there is scope for further work.

Clearly, such analysis can be extended much further and there is a need to further refine our understanding of the organizational characteristics of Twitter-use, but already it can be seen that valuable progress in this direction has been made. We believe that the development of our general approach and the identification and documenting of such subtleties and fine-grained analysis can have significant pay-offs for both HCI research and design of micro-blogging platforms such as Twitter through the provision of sensitizing studies; the elaboration of requirements; the explication and testing of assumptions and the overall process and promise of evaluation.

ACKNOWLEDGMENTS
The research reported in this paper is supported by the EC FP7-ICT Collaborative Project PHEME (No. 611233).

REFERENCES
Omar Alonso, Catherine C Marshall, & Marc Najork (2013). Are some tweets more interesting than

Marta Arias, Argimiro Arratia, & Ramon Xuriguera (2013). Forecasting with Twitter data. 


Linguistics.
Gina Masullo Chen (2011). Tweet this: A uses and gratifications perspective on how active Twitter use gratifies a need to connect with others. Computers in Human Behavior, 27(2), 755-762.
Junting Chen & James She (2012). An Analysis of Verifications in Microblogging Social Networks--Sina Weibo. In Distributed Computing Systems Workshops (ICDCSW), 2012 32nd International Conference on (pp. 147-154). IEEE.
Computing Veracity—the Fourth Challenge of Big Social Data.


Kate Ehrlich & N. Sadat Shami (2010). Microblogging Inside and Outside the Workplace. In ICWSM.


Emilio Ferrara, Onur Varol, Filippo Menczer, & Alessandro Flammini (2013). Traveling trends: social butterflies or frequent fliers?. In Proceedings of the first ACM conference on Online social networks (pp. 213-222). ACM.


Amanda Lee Hughes and Leysia Palen (2009) Twitter Adoption and Use in Mass Convergence and


Ravi Kumar, Mohammed Mahdian, & Mary McGlohon (2010). Dynamics of conversations. In Proceedings of the 16th ACM SIGKDD international conference on Knowledge discovery and data mining (pp. 553-562). ACM.


Lin Tzy Li, Seungwon Yang, Andrea Kavanaugh, Edward A Fox, Steven D Sheetz, Donald Shoemaker,


Rob Procter, Jeremy Crump, Susanna Karstedt, Alex Voss, & Marta Cantijoch (2013b). Reading the riots: what were the police doing on Twitter? Policing and Society, 1-24.


Jacob Ratkiewicz, Michael Conover, Mark Meiss, Bruno Gonçalves, Alessandro Flammini, & Filippo Menczer (2011). Detecting and Tracking Political Abuse in Social Media. In ICWSM.


Harvey Sack (1992) Lectures on Conversation, Blackwell


Conference on Software Engineering (pp. 211-221). ACM.
Sarah Vieweg, Amanda L Hughes, Kate Starbird, & Leysia Palen (2010, April). Microblogging during two
natural hazards events: what twitter may contribute to situational awareness. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1079-1088). ACM.


Matthew Weaver (2010). Iran’s Twitter Revolution was exaggerated, say editor, Guardian. Available at www.guardian.co.uk/world/2010/jun/09/iran-twitter-revolution-protests


Wayne Xin Zhao, Jing Jiang, Jianshu Weng, Jing He, Ee-Peng Lim, Hongfei Yan, & Xiaoming Li (2011). Comparing twitter and traditional media using topic models. In *Advances in Information Retrieval* (pp. 338-349). Springer Berlin Heidelberg.


