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Through a glass, darkly: tactical support and symbolic association in Twitter messages commenting on Stuttgart 21

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Political actors increasingly use the microblogging service Twitter for the organisation, coordination and documentation of collective action. These interactions with Twitter leave digital artefacts that can be analysed. In this article we look at Twitter messages commenting on one of the most contentious protests in Germany's recent history, the protests against the infrastructure project Stuttgart 21. We analyse all messages containing the hashtag #s21 that were posted between May 25, 2010 and November 14, 2010 by the 80.000 most followed Twitter users in Germany. We do this to answer three questions: First, what distinguishes events that resulted in high activity on Twitter from events that did not? Second, during times of high activity, does the behavior of Twitter users vary from their usual behavior patterns? Third, were the artefacts (retweets, links) that dominated conversations during times of high activity indicative of *tactical support* of the protests or of *symbolic association* with it?

Keywords: collective action, social media, Twitter, computational social science, digital methods

Through a glass, darkly: the online traces of collective action

Political actors use the microblogging service Twitter increasingly to organise, coordinate, document or comment on collective action, such as issue campaigns, protests or strikes. In these contexts Twitter enables, or at least facilitates, collective action and serves as a space for participants and bystanders to communicate about the events itself and corresponding issues. While Twitter clearly has practical value in the coordination, organisation and documentation of collective action, it is also a communication space where the meaning of issues, campaigns or events is negotiated between participants, sympathisers, critics, political elites and bystanders. The nature of this space therefore leads to the formation of issue publics on Twitter, which can be clearly identified by specific hashtags. Through the actions of participants in these issue publics (e.g. retweets, links to external content) artefacts (e.g. tweets, links) rise in prominence and even come to dominate a communication space. In this paper we use the term *communication space* to refer to all messages referencing a common topic (e.g. Stuttgart 21) on one Internet service. We do this to differentiate from the term *sphere*, which focuses on all communication on a device or service (Rogers 2013, 33), and the term *issue public*, which could refer to communication on a given topic on multiple devices or services. We use the term communication space in this paper to refer to all communication commenting on Stuttgart 21 on the Internet service Twitter. The aggregate behavior of users in a communication space becomes a filter, through which artefacts emerge that are of collective relevance to the participants in an issue public. Twitter thus becomes a tool for the organisation and tactical support of collective action, the public negotiation of

meaning and a space in which the aggregate behavior of participants emphasises artefacts of collective significance.

When examining how Twitter is used for collective action we can identify two general uses. Firstly, there are users who use Twitter for the coordination and organisation of protests. These users also link to outside sources, informing other users about the reasons and contexts of the protests. Users may also take to Twitter for documenting protests as they are unfolding by linking to alternative media or photographs. We think these uses qualify as *tactical support* of collective action. Other users use Twitter for public association with protests, phatic commentary, or for the publication or linking of satirical and ironic content. We consider these uses as forms of *symbolic association* of Twitter users with collective action. Depending on the dynamics of specific campaigns, protests or discussions one or the other usage practice may dominate the online public discourse, or there might be a mix of both usage practices.

We will show that both these usage categories were simultaneously present during different phases of the protests in our case study. Furthermore, we demonstrate how their respective prominence changed when specific events led to a sudden increase in public attention. Considering these changes, we will work off the preliminary hypothesis that, the two uses are connected to different user types. *Tactical support* seems a usage pattern more prominent among core supporters of a protest. Core supporters are actively concerned with the success of the protest and thus disseminate potentially crucial information. We will call these users *digital core supporters*. Meanwhile, *symbolic association* seems to be a usage pattern more prominent among users who sympathise with the protests, but are not necessarily actively involved in the organisation and

coordination of protesters. These users frequently choose the format of phatic or satirical commentary to express their emotional or symbolic association with the protests. We call these users *digital bystanders*.

In this paper we analyse Twitter messages commenting on one of the most controversial protests in recent German history, protests against the infrastructure project *Stuttgart 21*.

We analyse all messages containing the hashtag #s21 posted by the 80.000 most followed Twitter users in Germany between May 25, 2010 and November 14, 2010. With our analysis we aim to answer three questions: First, what distinguishes events that resulted in high activity on Twitter from those events that did not? Second, during times of high activity, does the behavior of Twitter users vary from their usual behavior patterns?

Third, were the artefacts (retweets, links) that dominated the communication space during times of high activity indicative of *tactical support* of the protests or of *symbolic association* with it?

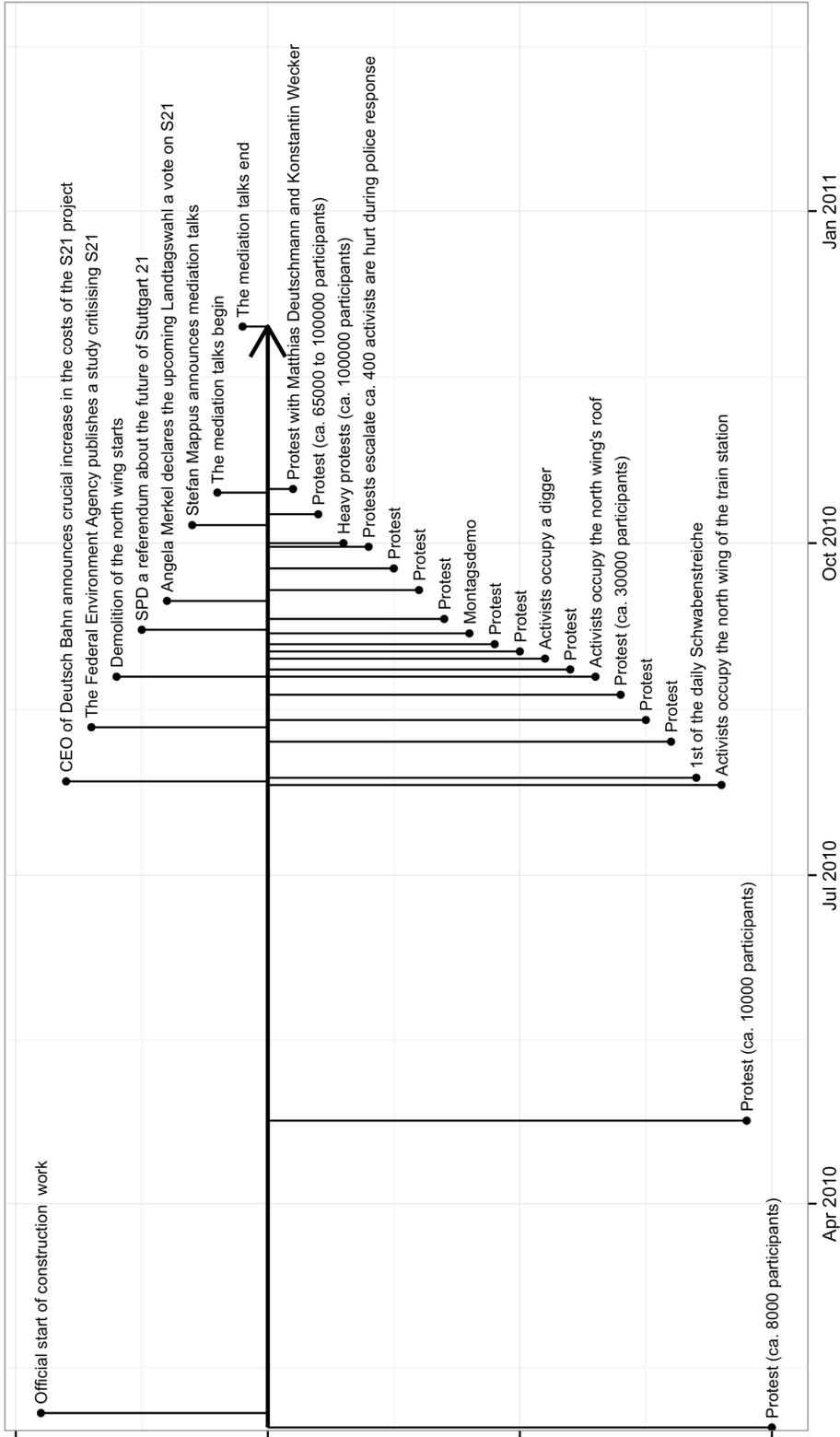
Stuttgart 21: the protests and their relevance

Stuttgart 21 is an ambitious infrastructure project in Germany's south-west. Since the autumn of 2010 the term is also synonymous with one of the longest series of heavy protests in Germany's recent history. In cooperation with federal, state and municipal governments, Germany's biggest railway company (*Deutsche Bahn*) planned an overhaul and extension of its railway network in the region. One of the project's keystones was the partial demolition and reconstruction of the railway station in Stuttgart, the state capital of Baden-Württemberg. The project and the construction works on Stuttgart's railway

station were highly controversial. Critics pointed out that the project would foreseeably run over budget, with the taxpayer likely being coerced into picking up the tab. Another highly emotional point of contestation was that, in order for the construction of the new segments of the railway station to go ahead, old trees in the immediate proximity of the construction sight had to be cut down. These issues led to month-long protests in Stuttgart. During this period, established political actors and parties positioned themselves in support or opposition of the project. The protests reached a high point on the night of September 30 to October 1, when violence between police and protesters escalated. Roughly 400 protesters were hurt that night in clashes with the police. A public outcry that followed condemned the police response and the perceived role Baden-Württemberg's state government in the violent escalation of the dispute.

Figure 1 shows a detailed timeline of the major events of Stuttgart 21 between February and December 2010 (all graphs in this paper were produced using R, R Core Team 2012 and ggplot2, Wickham 2009). This account of the events is based on newspaper reports and activists' websites. The planning stages of Stuttgart 21 go back to the 1990s. For much of the time the project was controversially discussed and sometimes even actively protested against. In 2010 these protests regularly counted participants in the tens of thousands. The protests gained national attention in July 2010, when the construction work at Stuttgart's train station proceeded to demolish the station's north wing and cut down adjacent trees. The protests escalated on September 30. After the events of September 30, mediation talks between opponents of the project and developers were scheduled and lasted from late October to early December 2010. The results of the talks were seen as largely backing the developers and supporters of Stuttgart 21, while

Figure 1. Key events during the protests against Stuttgart 21



exhausting public interest in the project and the accompanying protests. The following year a state wide referendum was held in Baden-Württemberg in which the supporters of the project won (Gabriel, Schoen and Faden-Kuhne 2013). We will focus on Twitter messages commenting on Stuttgart 21 from May 25 to November 14, 2010, thus documenting the early phases of the protests, the escalation on September 30 and the direct aftermath.

The Internet played a significant role in the organisation, coordination, documentation and the crafting of the public narrative of the on-sight-protests against Stuttgart 21. Activists used the Internet and Twitter as tactical tools for the coordination of the protests. For example, activists at the construction site in Stuttgart regularly used Twitter to inform supporters when the construction workers prepared for new stages of the construction process (e.g. the arrivals of diggers to demolish the station's north wing or the preparations to cut down trees). In response to these updates activists mobilised to block or protest these developments. Activists also used Twitter to link to live video streams documenting the protests. Thus Twitter became an access point to alternative media, information sources that activists used to document the protests from their own point of view, bypassing the selection process of traditional media (Atton 2002; Couldry and Curran 2003; Poell and Borra 2013). Also the Internet, and specifically Twitter, was an important tool for non-participants, *digital bystanders*, to follow the events in Stuttgart and comment on them. Media stories about the protests often included references to their nature as grassroots, bottom-up or Internet-enabled, and went on to elaborate on the role of the Internet for the organisation of the protests (Kuhn 2010; Mader 2010). Stuttgart 21 must also be seen as a crucial step in the evolution in Internet-enabled activism that we

have seen in other political arenas in Germany in recent years (Jungherr and Schoen 2013).

Twitter in collective action: a tool for curation, tactical support and symbolic association

Twitter is an online service that allows the publication of short text messages (up to 140 characters in length). This encoded restriction quickly led to the emergence of usage conventions that enabled users to interact and to establish the context of their messages without using many characters. These conventions (e.g. @message, @mention, retweet, hashtags, link shorteners) enable researchers to identify usage patterns by automated text analysis. Some of these usage conventions can be connected to functions of Twitter for collective action. Also, researchers have shown that usage patterns of these cultural conventions systematically differ depending on the type of topic or event Twitter users are commenting on (Bruns and Stieglitz 2012, 2013; Lin et al. 2013). Differences in usage patterns have also been documented during different phases of an event that was commented upon (Segeberg and Bennett 2011). In Table 1 we document how we connect these usage conventions to various functions of Twitter for collective action.

Table 1. Functions of Twitter based on usage conventions

function	usage convention	description
curating	@message, @mention, retweet, hyperlinks	<i>curating</i> is an ongoing collective process by which Twitter users' individual decisions to post messages addressing specific individuals, retweet messages or links lead to the prominence of users, messages and links in the aggregate communication space of a hashtag
tactical support	content of tweets, destination of hyperlinks	<i>tactical support</i> is the use of Twitter in direct support of collective action (i.e. messages that contribute to the organisation, coordination or documentation of collective action)
symbolic association	content of tweets, destination of hyperlinks	<i>symbolic association</i> is the use of Twitter for the symbolic association of users with collective action (e.g. public claims of association, phatic or ironic commentary or links to corresponding content)

On Twitter users can anchor their messages in a given context by using topical keywords and by preceding them with a hashtag (#) sign. The service can be searched for all messages with a given hashtag. Thus users can read messages by others on given topics and, if they choose, interact. These attributes of the platform lead to the emergence of issue publics that constitute communication spaces.

In these communication spaces users, messages or linked content can rise to prominence.

This is the result of a collective filtering process by the aggregate use of @messages,

@mentions, retweets and links by participants in a given issue public. If many users retweet a given message, this indicates that they see the message as relevant to the issue public and thus want to spread it. The same goes for prominently linked content. This collective filtering process has also been called curating, gatekeeping or gatewatching (Bastos, Raimundo and Travitzki 2013; Bruns 2005; Meraz and Papacharissi 2012; Papacharissi and de Fatima 2012; Segerberg and Bennett 2011). Regardless of the label one chooses to apply, this is a highly relevant practice since it determines which messages and links come to dominate the Twitter discourse on a given hashtag and thus influences heavily how participants and outsiders perceive this discourse.

Several studies have shown that the volume of Twitter messages commenting on a given political topic rises when events relevant to the topic are happening (Jungherr and Jürgens 2013a; Jungherr and Jürgens 2013b; Segerberg and Bennett 2011). There seems to be a correlation between collective action events offline and Twitter coverage. Still, as of now this correlation has not been shown to be deterministic. Some political events lead to high activity on Twitter while others do not.

In this paper we will be looking at the events in the #s21 communication space that resulted in high activity on Twitter and identify shared characteristics. We approach this analysis informed news-value research, an approach that identifies key characteristics of news and events that attract media coverage and audience attention (Donsbach 1991; Eilders 1997; Schulz 1976). Like modern news-values research, we understand these characteristics to mirror the criteria of relevance that Twitter users employ before tweeting on any given topic.

In a next step we will analyse those messages and links that dominated the #s21 communication space during times of high activity. We thus rely on the collective curating process described above to find messages that held collective meaning for the participants in the communication space. We focus on the content of the most retweeted messages and the destinations of the hyperlinks that were used most frequently during time intervals of high activity. For categorisation of these messages, we introduce two concepts for Twitter use in issue publics commenting on collective action: *tactical support* and *symbolic association*.

One of the characteristic functions of Twitter and other ICT for collective action is their support in the organisation, coordination and documentation of campaigns and protests (Bimber 2003; Bimber, Flanagin and Stohl 2005, 2012; Earl and Kimport 2011). Twitter has been identified as a tool for political organisations and activists to distribute information (Howard and Hussain 2011, 2013; Lotan et al. 2011), to widen an active audience for collective action (González-Bailón, Sandra and Moreno 2013; González-Bailón et al. 2011) or as a tactical tool for the coordination of collective action (Gerbaudo 2012; Segerberg and Bennett 2011; Verma et al. 2011). We collect these uses under the term *tactical support*. To identify this usage pattern in our data we analysed the content of messages and links that were dominant in the #s21 communication space during time intervals with exceptionally high message volume.

Another function of Twitter for collective action is the *symbolic association* of Twitter users with issues, campaigns or protests by attaching topically relevant hashtags to their tweets. By using hashtags related to collective action users can voice support, critique or comment on the issues in question. In doing this they do not necessarily become

supporters or active participants of an organisation, issue, campaign or protest but they publicly interact with it, be it in support or in opposition. We call this usage pattern *symbolic association*. Similar practices have been called in other contexts *active spectatorship* (Kreiss, Meadows and Remensperger 2013), *connective action* (Bennett and Segerberg 2012) or the *personalisation of collective action* (Bennett 2012; Bennett and Segerberg 2011). To identify this usage pattern in our data, we analysed the content of the messages and links that were dominant in the #s21 communication space during time intervals with exceptionally high message volume commenting on Stuttgart 21.

The data set

The observations discussed above seem to hold strong potential in the analysis of Twitter messages commenting on Stuttgart 21. The case offers a unique hashtag, related to the protests that was used over a period of several months. During this time the protests underwent various transformations and gained significant public attention.

Our analysis is based on Twitter messages posted by the 80.000 most followed Twitter users in Germany. Of all the messages these users posted, we concentrated only on the messages commenting on Stuttgart 21 (messages were identified by their common keyword #s21). To generate our original sample of users we queried Twitter's streaming API for random messages. These messages were checked against a series of tests (i.e. locations, timezones, presence of letters typical to German) to determine whether their authors were posting in German or from Germany. Based on this initial sample we collected the accounts these users subscribed to (in Twitter parlance: followed) or were

subscribed by. The resulting list of accounts was ordered based on the number of their followers. Thus, we collected a sample of the 80.000 Twitter users who, based on their follower counts, were the most popular users in Germany during the time interval in question (Jungherr and Jürgens 2013b; Jürgens 2010).

We used automatic as well as manual analysis procedures to examine the data. The calculation of total message counts and the use of different communication conventions (@messages, @mentions, retweets, hyperlinks) was done by computational procedures. The content of the most popular retweets and the destination of the most popular hyperlinks were coded manually.

Tactical support and symbolic association in the Stuttgart 21 communication space

Of the 80.000 users in our sample 12.916 used the hashtag #s21 at least once during this time span. These messages are the basis for the following analysis. In Table 2 we document the conventions used in messages containing the hashtag #s21.

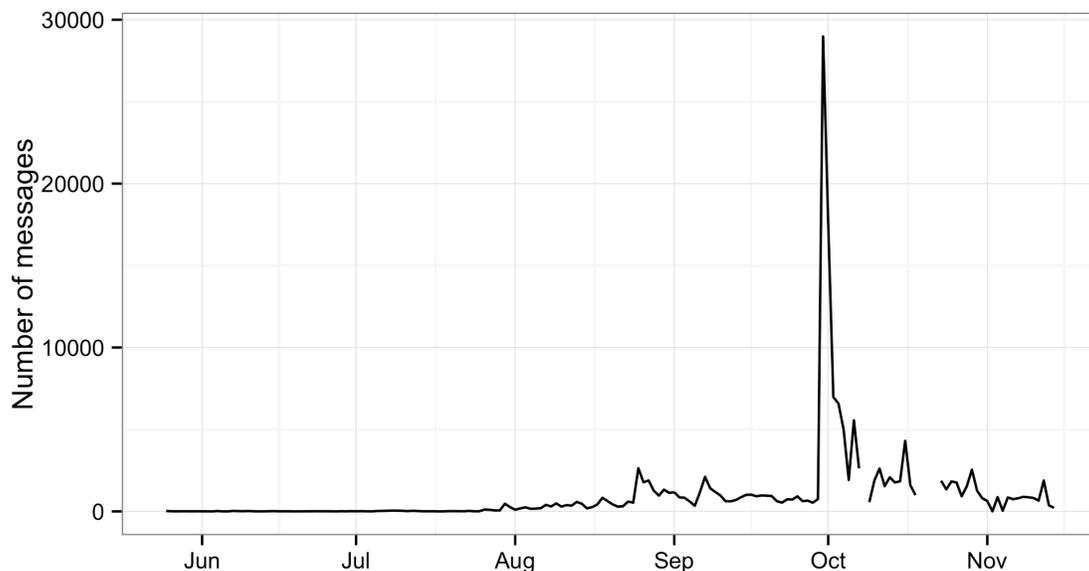
Table 2. Conventions in use in messages containing s21 between May 25, 2010 and November 14, 2010

usage convention	counts
messages	165.059
users	12.916
messages containing URLs	78.777
unique URLs	26.272
URLs not identifiable	203

retweets	97.982
@messages	20.147
@mentions	9.403

Figure 2 shows the distribution of messages per day; we see that messages containing #s21 appear in clusters centered around a few prominent dates, the most obvious being September 30 and October 1 when 46.546 messages were posted containing #s21. Nearly 30% of all mentions of #s21 over nearly six-months periods occur in a time span of just two days. Other obvious spikes are visible between August 25 and September 1 (12.163 messages), September 6 to September 9 (58.77 messages), October 2 to October 7 (28.658), and October 10 to October 17 (17.636 messages).

Figure 2. Number of s21 messages per day



Another perspective on the events of Stuttgart 21 and the distinct phases of the protest offers the analysis of when individual users used #s21 for the first time. Figure 3 shows how many users started to use #s21 on any given day. We identify four distinct phases of

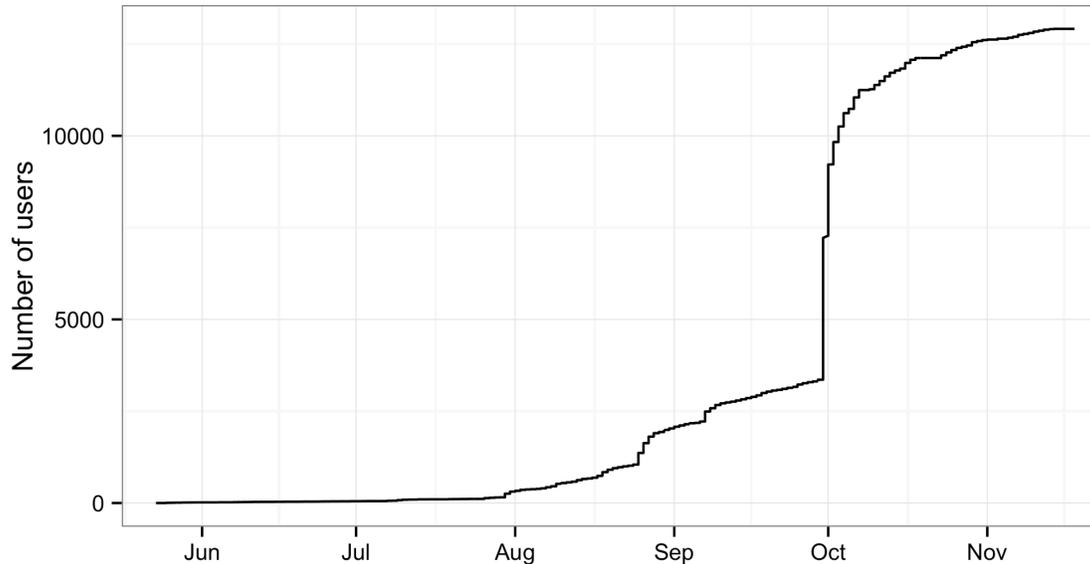
the protest: May to late July marks the beginning of the protests. By August 1, only 311 Twitter users had used the hashtag #s21 in their tweets. From August to September 30, we observe a significant increase of users joining the conversation: between August 1 to September 29 another 3.058 users had used #s21. On September 30 and October 1, the day and the direct aftermath of the clashes between police and protesters, 5.821 users used the hashtag for the first time. The last period in our graph between October 2 and November 14 is marked by a steep increase of users posting the hashtag #s21 for the first time followed by a somewhat flattened increase from late October onwards. These phases correspond with the phases apparent in the events themselves as shown in Figure 1. Up until August the protests found little public attention. This started to change between August and September, when the protests rose in number and frequency. When the events in Stuttgart finally escalated on September 30 and October 1, the protests became a topic of highest media attention and national interest. Figure 3 shows these phases.

These data indicate a significant change in the composition of the communication space initiated by the events of September 30. Before September 30, Stuttgart 21 was a topic that generated some interest on Twitter. The events of September 30 massively increased the activity on Twitter as the media picked up on the escalating events in Stuttgart. It is safe to assume that users commenting on #s21 on this day for the first time were differently motivated than users tweeting about the events before this. Users contributing to the #s21 communication space before this date did not need massive media attention to be active participants. For us, this is an indicator that these users were motivated by the events themselves. They are *digital core supporters*. Users contributing on September 30 for the first time to the communication space #s21 reacted to media and online attention

and voiced their support or critique of the protests. They are *digital bystanders*. The difference between these user groups can also be seen in their ongoing participation in the #s21 communication space after October 1.

The sudden increase in users tweeting about Stuttgart 21 on September 30 and October 1 raises the question of whether these new users, who were clearly attracted to the topic by the sudden increase in traditional media and online coverage, continued to actively comment on Stuttgart 21 after the first wave of public attention ebbed. Of the 5.821 users using the hashtag #s21 for the first time on September 30 and October 1, only 42 percent posted at least one message using #s21 during the remaining days in our data set. In comparison, the 3.359 users who had used #s21 prior September 30, as well as on September 30 and October 1, roughly 61 percent continued to do so after October 1. While the events thus led to a significant increase in users actively commenting on Stuttgart 21 the initial attention of most of the users gained on September 30 and October 1 did not translate in prolonged activity in the communication space.

Figure 3. Number of users posting s21 for the first time per day



Let us now focus on four points on the timeline of the protests that led to heavy activity on Twitter. August 25 and 26 (4.415 messages), September 6 and 7 (3.280 messages), September 30 and October 1 (46.546) and finally October 16 and 17 (3.849 messages). We identified these days by comparing the day-to-day volume of messages containing #s21 and looking for sudden volume increases. In order to determine the composition of the communication space during these time intervals with greater accuracy, we included the day directly following each day that showed sudden increase in volume in our analysis.

As expected, on all days with high activity in the #s21 communication space events took place on sight that were clearly connected to the protests in Stuttgart. Two of these events are connected to crucial moments in the protests. August 25 was the day of the demolition and subsequent occupation of the station's north wing; September 30 was the day of heavy clashes between protesters and police. On both these occasions big offline

protests translated to high activity on Twitter. The other two events are also connected to the protests, but on- and offline-significance online does not correlate as clearly as in the two cases before. On September 6, a regularly scheduled demonstration took place in Stuttgart. During this protest an altercation between a policeman and a protester took place, resulting in an alleged beating of a woman by the policeman. Also a member of the local Pirate Party was arrested. Both these events had no greater significance for the protests at large but created strong reactions online. On October 16, protesters barricaded themselves in the south wing of the train station. The police had to break down a metal door that blocked the area occupied by the protesters. This event was documented by video, images and ironic commentary online and thus generated high activity on Twitter. Again, the relevance of these events for the overall protests against Stuttgart 21 is negligible, yet they triggered very high online activity.

The discussion of these four events shows that the analysis of messages with hashtags connected to collective action allows for qualified assessment of the corresponding offline events; yet these assessments do not provide us with a complete picture. For instance, if we compare Figures 1 and 2, we observe that virtually no step taken by officials in response to the protests against Stuttgart 21 resulted in strong online reactions. Also, not every protest event found a strong echo on Twitter. While patterns in online data are therefore clearly connected to offline events, significant offline events are not necessarily echoed by high activity online.

What do the events, that triggered strong reactions online, tell us about the criteria of relevance that led to high activity in the #21 issue public? Each of the events offered new and surprising escalations of the protests, on August 25 protesters physically blocked the

beginning of the demolition works, on September 6 the conflict between police and protesters escalated by the alleged beating of a woman by a policeman, on September 30 large scale clashes between police and protesters made the events in Stuttgart a national media event and October 16 offered surprising pictures of policemen breaking down a metal door protesters were trapped behind. Beyond that, each event offered pictures or testimonies of individual protesters clashing with police forces, with protesters sometimes even suffering injuries. Many of the messages referring to these key episodes linked to related images and offered phatic or ironic commentary on the events. The events that led to heavy activity on Twitter all shared attributes that are also very influential in the decision of media consumers to select news items: surprise, harm, controversy and personalisation (Donsbach 1991; Eilders 1997; Eilders and Wirth 1999). In the case of #s21 Twitter data offer no unbiased account of events as they happened, but instead document a version of the events, an edited view guided by the collective attention of participants in the issue public with a bias that allowed for strong emotional responses, visualisation (Ruhrmann et al. 2003) and ironic commentary.

What about the user behavior during these events? Was it roughly similar, or can shifts in user behavior tell us something about the nature of the events Twitter users were commenting on? Table 3 shows that August 25/26 and September 6/7 show roughly comparable activity in the #s21 communication space. As was to be expected, September 30 and October 1 show much higher activity. On October 16/17, the activity ebbs somewhat, but is still higher than on the days before the events of September 30. Table 3 documents the frequency in which communication conventions were used during the different time spans under examination. Here strong difference in usage patterns become

apparent between September 30/October 1 and the other three time spans under examination. First of all, we see that the average number of daily messages that users posted is massively higher during the time spans of peak activity when compared to the average as calculated over the whole time span. Second, we see that September 30 and October 1 showed still higher average activity when compared to the other three time spans. On those days retweets made up a much bigger percentage of all messages posted than during the other three time spans. Also, @messages and @mentions were much less common than during the other time spans. These patterns show that on September 30 and October 1 the #s21 communication space became much more active, more focused on distributing information and less focused on interaction between users than during other time spans. This observation coupled with the sudden influx of new users commenting on Stuttgart 21 on September 30 and October 1 makes it save to assume that on these days the sudden increase in attention led to a significant change in the composition of users participating in the communication space. In the following section we will examine whether this shift can also be seen in the content analysis of the tweets contributing to the #s21 communication space.

Table 3. Usage patterns during different time spans

usage convention	total	Aug. 25/26	Sept. 6/7	Sept. 30 / Oct. 1	Oct. 16/17
average number of daily messages per user	0,1	2,3	2,1	3	2,2
percentage of messages containing hyperlinks	47,7	33,6	45	35,5	44,9
percentage of messages being retweets	59,4	57,4	61,3	71,1	57
percentage of messages being @messages or @mentions	17,9	20	18,5	11,7	14,6

In the next step of our analysis we focus on those artefacts that through a selective curating process came to dominate the #s21 communication space during the four time intervals of high activity. To do this we selected the 100 messages that were retweeted most often and the 100 hyperlinks that were linked to most often during the time intervals in question. We then examined the content of these messages and the destination of these hyperlinks for evidence of *tactical support* and *symbolic association*.

In this analysis we made two choices that have to be justified. First, we focused only on popular retweets and links and second, we restricted our analysis only to the 100 most retweeted tweets and posted links. In concentrating on retweets and links we only cover the content of messages in the #s21 communication. Alternatively, we could have also

used @messages or @mentions to determine users that were frequently referred to or mentioned and code the content of their messages. This approach would have allowed us to assess the role that *tactical support* and *symbolic association* of #s21 would have played in the content of their messages. Instead of this user-centric approach, we focused on the content of messages and links that dominated the #s21 communication space. For us retweets and hyperlinks are strong indicators that users posting them on Twitter at least implicitly thought their content or their sources relevant to their followers. Thus coding their content allows us to assess which type of content—*tactical support* or *symbolic association*—emerged as relevant through the collective curating process. Furthermore, the choice of our cut-off point at 100 messages and hyperlinks might seem somewhat arbitrary. However, closer examination showed that by coding the top 100 artefacts in each category during each of the four time intervals we could account for a significant portion of all retweeted messages and all posted hyperlinks during each interval. Our rationale for choosing this approach was to focus on those artefacts that rose to prominence through the collective curating process; in this manner we could determine whether messages and hyperlinks that participants in the communication space thought relevant could be characterized as *tactical support* and *symbolic association*. The trade-off is that, we cannot offer an analysis of the relation between the two uses in all messages by all users but only of their relation in those messages that came to dominate the #s21 communication space during the time intervals in question.

We coded these artefacts by hand for indicators of *tactical support* and *symbolic association*. In coding the most retweeted messages we differentiated between tweets based on whether they contained information about the protests or their cause, calls for

the coordination of the protests, evidence of artefacts documenting the proceedings of the protests or disinformation. These uses we took as evidence for *tactical support*. If messages in our sample contained phatic commentaries on the protests, claims of association and solidarity with the protesters or satirical and ironic content we took the messages as indicators of *symbolic association*. Table 4 documents our results. We also coded the URLs most prominently linked from the tweets in our sample. In doing so, we followed the above described coding patterns adding information on the authors of the sources of these linked content. We differentiated between links to content provided by activist organisations, traditional political organisations (e.g. political parties, government sources, websites of the project developers, unions), traditional media (e.g. newspapers, TV stations), new media (e.g. websites, news blogs, wikis) and alternative media (e.g. video or audio streams by activists, personal blogs commenting on the events, tweets, images taken by participants of the protests). We document these results in Table 5.

When examining the tweets dominating the communication space during the four time intervals (i.e. those messages that were retweeted most often) we indeed find a change in the ratio between retweets coded as *tactical support* and *symbolic association* (see Table 4). We found that the most retweeted messages on August 25/26 and September 6/7 were predominantly indicative of *tactical support*. This ratio declines sharply on September 30/October 1 and October 16/17. On these days we find much more messages indicative of *symbolic association*. When examining the usage practices more closely we see this increase largely driven by tweets with satirical or humorous content referencing the events. This is an interesting result, since—as we showed above—on September 30 and October 1, a significant amount of new users started using the hashtag #s21, effectively

expanding the corresponding issue public. This increase seems to have led to a change in the nature of the messages gaining prominence in the communication space.

Table 4. Retweets

	Aug. 25/26	Sept. 6/7	Sept. 30 / Oct. 1	Oct. 16/17
use				
tactical support	69	75	54	39
symbolic association	31	25	46	61
usage practice				
information (tactical)	14	17	23	15
coordination (tactical)	28	12	9	3
documentation (tactical)	27	46	16	21
disinformation (tactical)	0	0	6	0
association (symbolic)	6	3	3	8
commentary (symbolic)	16	17	24	16
satirical/ironic (symbolic)	9	5	19	37

When analysing the hyperlinks most prominent in the communication space during the selected time intervals we see much more stable usage patterns (see Table 5). In all four time intervals *tactical support* is clearly the dominating usage pattern. Although its prominence somewhat falls during the run of the protests. Hyperlinks in messages containing #s21 largely led to outside sources that contain background information about the protest and related issues and sources that document the developments of the protest itself. This is also visible if we look at the creators of these linked sources. We see here

that sources dominate that come from traditional media (e.g. newspapers, TV stations) and alternative media (e.g. photographs by activists, video streams by the protesters). Fluctuations in their presence in the communication space seem unrelated to the different phases of the protests.

Table 5. Hyperlinks

	Aug. 25/26	Sept. 6/7	Sept. 30 / Oct. 1	Oct. 16/17
use				
tactical support	91	82	76	72
symbolic association	2	9	11	19
n.a.	7	9	13	9
usage practice				
information (tactical)	53	43	45	47
coordination (tactical)	0	5	9	3
documentation (tactical)	38	35	22	23
association (symbolic)	0	3	1	2
commentary (symbolic)	2	2	4	1
satirical/ironic (symbolic)	0	3	6	15
n.a.	7	9	13	9
creator of linked source				
activist organisations	8	16	4	6
traditional organisations	5	10	9	1
traditional media	35	26	37	35
new media	3	14	16	10
alternative media	42	25	21	39
n.a.	7	9	13	9

In analysing the messages and hyperlinks that dominated the #s21 communication space during four distinct time intervals, we showed that both uses—*tactical support* and *symbolic association*—were prevalent. Large changes in the usage patterns during different phases of the protests were only visible with retweets. Thus the use of retweets in communication about collective action seem much more sensitive to changes in the communication space. The use of hyperlinks remained much more stable and was clearly biased toward the use of *tactical support*.

What has been shown, what remains to be seen?

In this paper we asked three questions: First, what distinguishes events that resulted in high activity on Twitter from those events that did not? Second, during times of high activity, does the behavior of Twitter users vary from their usual behavior patterns? Third, were the artefacts (retweets, links) that dominated the communication space during times of high activity indicative of *tactical support* of the protests or of *symbolic association* with it?

The first part of the analysis showed that during times of high activity on Twitter offline events happened that were connected to the protests against Stuttgart 21. The reverse was not true. Many events that were relevant to the protests did not result in heavy activity on Twitter. Spikes in online activity seemed to correspond with events offline, but offline events did not necessarily find an echo online. Furthermore, when examining the events that resulted in heavy activity on Twitter we found that they all shared attributes like surprise, harm, controversy and personalisation. Also, these events allowed for strong

emotional reactions, visualisation and ironic commentary. Thus, in the case of Stuttgart 21, Twitter data offer no unbiased account of events, but instead document a view of the events guided by the collective attention of participants. There is significant research potential in establishing the determinants for this relationship. What are the necessary characteristics of an offline event to lead to an online echo? Is online activity only dependent on characteristics of the event referred to (comparable to the news-value of news items) or are other mediating factors (e.g. media coverage, early comments by online multipliers etc.) important in determining the scale of online reactions to offline events? So while it seems evident that there is a relationship between offline events and online activity the rules and mediating factors determining this relationship remain unclear.

Second, we looked at shifts in the behavior of Twitter users during different phases of high activity on Twitter. Here we found that there were indeed interesting differences. During these phases the average number of messages per users rose significantly when compared to the whole time period. Also we found that on the August 25 and September 30 (days of heavy protests) the number of messages containing hyperlinks dropped.

Maybe this decline is an indication that users tweeted more about the events itself and did not refer to outside sources as strongly as normal. These pattern shifts are interesting and can be interpreted after the events. Still, these pattern shifts seem not stable enough to allow for the systematic detection of specific events during the protests. The most stable pattern seems to be the sudden rise in the average number of daily messages posted by users.

With regard to the question if Twitter was predominantly used as a tool for *tactical support* or *symbolic association* by users publicly commenting on Stuttgart 21, the results show that both uses were prominent in the messages and hyperlinks dominating the #s21 communication space during the four time spans examined by us. We found that most artefacts, be they messages or hyperlinks, dominating the communication space could be described as products of *tactical support*. They contributed to the organisation, coordination or documentation of the protests. Especially hyperlinks linked predominantly to content on the web that fulfilled this function. Still, messages and hyperlinks, were also very visible that could be best described as products of *symbolic association*. Their authors associated themselves publicly with supporters or critics of the protesters and they contained phatic or satirical comments. These communication artefacts did not contribute to the organisation or coordination of the protests and thus served little function to the protesters, instead they served a function for their authors. These messages worked like traditional buttons with which people could symbolise their support of a party, candidate or cause. This usage pattern was much more visible in retweets than in hyperlinks. The strong presence of both usage patterns shows that it is probably reductive to speak of Twitter as a medium of either tactical importance for the organisation of collective action or a medium for the simple expression of symbolic support or critique by social media users. Recent research studies on political uses, functions and effects of the Internet have begun to conceptualise the Internet as a *hybrid medium* with various, potentially contradicting, mechanisms and effects (Chadwick 2013). It might be beneficial to explore this approach further with regards to collective action.

Our analysis focused only on the content of messages. We thus were able to determine whether the content of a message could have counted as *tactical support* in the organisation, coordination or documentation of the protests. We have no information on whether these messages actually fulfilled these intended material functions. Just because someone tweeted about the appearance of the police in a certain area does not mean that the organisers of the protest were actually using this information to coordinate protesters accordingly. The real tactical support Twitter provided for protesters has to be examined differently. This offers vast research opportunities for case studies focusing on the actual social media usage patterns among the organisers of collective action, participating protesters and supporting activists (Tufekci and Wilson 2012).

This limitation is also true with regard to *symbolic association*: We could show that this use of Twitter is very visible in the messages and hyperlinks dominating the communication space at different times. What we do not know, however, is what motives or expectations the individuals posting these messages connected with them. Also, potential effects on their readers cannot be accounted for. Here more research is needed to understand which role this symbolic association with collective action online plays in the participation repertoires of these users. Is this a form of *personalised politics* (Bennett 2012) potentially leading to traditional political participation further down the line? Or is this a form of politicised *active spectatorship* (Kreiss, Meadows and Remensperger 2013) where the *eyes of the people* (Green 2010fk)—or at least of those people with a Twitter account—find an outlet to signal political elites and activists that they are watching and are evaluating their actions? If true, this would make Twitter, and other social media tools, public arenas in which an interested and vocal part of the audience of collective

action would comment on, link to or debate about the actions of those directly participating in collective action. Twitter, social media or the Internet in general would thus become another public stage, on which the meaning and norms of political events and processes would be negotiated between political elites, activists and onlookers. Political events generating high public attention online, like those in Stuttgart on September 30 and October 1, and the reactions to them in social media channels could be seen as *new media events*. Events that, like the *big media events* (Couldry, Hepp and Krotz 2010; Dayan and Katz 1992) of old, focus public attention and serve a crucial function in the political life of a society by the public documentation and negotiation of the meaning of political events.

Part of gaining a deeper understanding of the role of online services for collective action lies in the analysis of data created by the interactions of users with the respective services. As shown in this paper, these data hold potential for the analysis of user behavior online but also on the development of the events or topics offline that users chose to comment on. The connection between online data and offline events is far from deterministic, but there is a connection. It remains to be seen whether mechanisms and mediating factors influencing this correlation can be defined more closely in the future. A deeper understanding of the relationship between online data and offline phenomena seems crucial; otherwise researchers looking for the reflections of offline events in online data might only see their own reflection through a glass darkly.

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