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# TO FOLLOW OR TO UNFOLLOW: MOTIVES FOR THE ACADEMIC USE OF TWITTER

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## Abstract

Twitter appears to be a popular social media service for academics, especially computer scientists. While some studies have begun to examine motives for academic Twitter use, little is known about academics' considerations for following and unfollowing other users. Based on the uses and gratifications theory and prior research, we conducted an online survey among 54 computer scientists. Results show that academic Twitter use is generally characterized by information motives as well as by various social considerations. As the main reasons for using Twitter, we identify dissemination and, to a lesser degree, collection of information. However, users are also motivated by community development considerations. Accordingly, when following an account, users do not only look for content that is informative, interesting, of high quality, and current. They also tend to follow an account whose owner shares similar research interests, is an important researcher in the field, and that is personally known and liked. Unfollowing, while rather ubiquitous, is largely driven by considerations of content. To summarize, we find that academics' subjective considerations oscillates between content and personal aspects, with content aspects driving usage, but personal aspects also shaping following decisions. These insights contribute to the current state of research on motives of academic Twitter usage finding that information and community development motives play central roles in the ensuing communication behavior and structures.

Keywords: Motives, Twitter, following, unfollowing, academic use of social media, uses and gratification approach.

## 1 INTRODUCTION

Social media allow for more diverse, timely, and flexible forms of scholarly communication and facilitate networking and community development [1] [2]. As a result, some believe that the scientific process will become digitized with large parts of scholarly interaction moving to online spaces (cyberscience), and some propose that science will become more networked, cooperative and international, more open, transparent and accessible [3] [4] [5].

Of course, the effect of social media on the scientific process ultimately depends on how academics employ these platforms. Based on the uses and gratifications theory [6], we argue that motives play a key role in determining usage. More specifically, gratifications sought by academics affect not only the intensity but also patterns of their social media usage. Based on this argument, our study explored general motives for the academic use of the social media platform Twitter (<https://twitter.com/>) among computer scientists. Twitter is a so-called "micro blogging" platform, that is, a web-based service that allows users to broadcast short messages to their followers. Content distribution is driven by the "following" feature that allows Twitter users to flag or "follow" accounts of other users. Subsequently, they will receive the messages those accounts broadcast to their followers. Twitter appears to be a relatively popular social media platform among academics [7] – with previous studies showing that computer scientists tend to be rapid adopters of social media in general, and Twitter in particular [8] [9].

Based on prior research on motives for academic social media use, we will analyse a comprehensive set of general motives for academic Twitter use. We then proceed to analyse networking behaviour of academics, focusing on following as well as unfollowing other researchers. Analysing motives for Twitter use and following behaviour in greater depth will enable a better understanding of the adoption of social media in academia and their potential influence on the research process.

## **2 THEORETICAL BACKGROUND**

### **2.1 Motives for Social Media Use in Academia**

We base our study on the so-called uses and gratification theory (U&G), a well-established approach for understanding subjective motivations for media usage. U&G is based on the basic assumption of an active user that chooses from different media and media contents for different subjective purposes (motives). Originally, U&G was developed by Katz, Blumler and Gurevitch [10] for television viewing and the use of traditional media. Nowadays, more elaborate iterations of U&G have been applied successfully to interactive media and Web 2.0 platforms [11] [12]. Relating to the usage of social media, six main motives have emerged from U&G research as especially salient [11]: information, entertainment, social interaction, community development, self-expression, and self-actualization.

A framework proposed by Shao [11] relates these six key motives to three separate but interrelated forms of media use: Consuming (for information and entertainment), participating (related to social interaction and community development), and producing (for self-expression and self-actualization). Accordingly, the importance of specific motives can vary by use context. For example, academics' motives for private versus work-related use of the same media can substantially differ [13]. Interviews with frequent Twitter users regarding professional use in the field of economics showed that they mainly follow other researchers to receive information on new articles, conferences, and other scientific activities [13]. Similarly, the perceived informativeness of a Twitter account has been shown to reduce the likelihood of unfollowing [14]. Recent research has developed more detailed conceptualizations of motives for the professional and academic usage of social media [15] [16]. For example, based on an online survey among members of three professional social science organizations, Gruzdt and Goertzen [16] identified distinct motives for social media usage such as "keeping up to date with topics", "following other researchers' work" and "discovering new ideas or publications". Lupton [17] conducted a study among an international interdisciplinary sample of 711 academics about their usage of social media. She found that perceived benefits included connecting and establishing networks with other academics as well as non-academic audiences, promoting openness and sharing of information, publicizing and development of research, and giving and receiving support. Another study by Linek and colleagues [15] showed that (strategic) politeness can also be part of work-related community development and academic networking on Twitter.

To summarize, previous research provides some insights on motives for social media usage in academia. Most studies focus on information and networking/community building gratifications and find the information motive to be more salient [16] [17]. A recent study highlighted that both motives may be connected, with information being an important driver for establishing connections [15]. A study by Neier and Zayer [18] on social media usage of students in higher education showed that social interaction and information motives frequently go hand in hand when it comes to the use of social media in an education context.

### **2.2 Networking of Academics on Twitter**

Overall, Twitter has been shown to provide multiple benefits to academic users: it serves both as an instrument to stay informed and as a tool for relationship management [19]. Research has highlighted the importance of networking dynamics when using Twitter during scientific conferences [20] or when linking scientific articles in Tweets [1] [21]. However, few studies have analysed researchers' motives for using Twitter in much depth, with even fewer delving into reasons for following or unfollowing other users.

Recent research on following and following back among academics that are active on Twitter showed the influence of the academic hierarchy on their following behaviour. The quantitative findings of Linek and colleagues [15] provided evidence for the importance of the information motive, as accounts with high activity and accounts of professors (that have a higher subjectively assumed expertise) had a higher number of followers. Additionally, the analysis also provided support for motives of social gratification, namely career planning (accounts of professors had a relatively high number of followers even in the case of low activity) and peer-networking of professors. However, few studies related motives for Twitter use to decisions on following and unfollowing accounts of other researchers. Such an analysis could provide a more holistic and detailed picture of academic Twitter use. Our study contributes to current research on the adoption of social media in academia by providing detailed findings on the subjective considerations driving Twitter usage among academics, focusing on motives and decisions on following and unfollowing other users' accounts. The target group of our analysis,

computer scientists, are frequent users of Web 2.0 technologies [7] and Twitter in particular [8] [9]. This will provide further insights into the shape and scope of the effect of social media usage on established practices in scholarly communication.

## 2.3 Research Questions

The overall research aim of this study is to investigate different facets of the subjective considerations of researchers, namely computer scientists, in terms of their academic usage of Twitter: First and foremost we investigate an extensive set of motives for academic Twitter use in general, based on the uses and gratifications theory. Moreover, we focus on the selection criteria for following a specific account. In addition, we also analyse reasons for unfollowing. In this context, we explore to what extent researchers are aware of their own followers. These analyses of following and unfollowing behaviour as well as the awareness of their own followers should provide insights into the resulting networking dynamics.

Taken together, our study focuses on four facets of the subjective considerations driving academic Twitter use by addressing the following research questions (RQs):

- RQ1 - Motives for the academic Twitter use in general: What are important motives for academic Twitter use?
- RQ2 - Following an account (selection criteria): What are the selection criteria for following the accounts of researchers on Twitter?
- RQ3 - Unfollowing: What are reasons for unfollowing the accounts of researchers on Twitter?
- RQ4 - Awareness of the own followers: To what extent are researchers on Twitter aware of their own followers?

## 3 METHODOLOGY

### 3.1 Description of the Online Survey

We address our research questions based on an online survey. The questionnaire was based on prior research on academic Twitter use and user motives (see theory section). It began with a short welcome including an introduction to the topic (computer scientists' academic use of Twitter), information on privacy issues and voluntary anonymous participation, as well as an announcement of the possibility to receive a short information of the survey's results and to participate in a raffle of vouchers of a popular online shop. Subsequently, socio-demographic variables (age, gender, academic status, field of research) were assessed. Furthermore, participants were asked to answer questions on their general use of Twitter including the duration and frequency of Twitter use. Also, the participants had to rate the original and current purpose of their use (private vs. academic use) based on a slide bar scale ranging from "strictly private" (corresponding to the value "0") to "strictly academic" (corresponding to the value "100"). Additionally, participants had to indicate if they use Twitter in a passive (i.e., reading) vs. active (i.e., tweeting/retweeting) manner by means of another slide bar scale ranging from "completely passive" (corresponding to the numeric value "0") to "completely active" (corresponding to the value "100"). After these general questions, participants were surveyed on their academic use of Twitter in relation to the selection criteria for following an account, the motivations for the work-related use of Twitter, and further specific questions on following and unfollowing as well as on their own followers. The questionnaire presented the measurements addressing RQ1 (motives in general) after the measurements for RQ2 (selection criteria for following) as we wanted participants to first address the more specific questions to refresh their memory and facilitate reflection of their current Twitter use.

The selection criteria for following an account (RQ2) were assessed in the form of ratings on a 5-point Likert scale ranging from 1 ("not important at all") to 5 ("very important"). First, participants were asked to rate the general importance of the content/tweets and the account owner. Second, specific aspects of the account owner (e.g., he/she is personally known to me; he/she shares my research interests) and the content/tweets (e.g., frequent tweets, entertaining/funny tweets, informative tweets) were rated. Participants also had the possibility to give additional remarks or comments.

Motives for academic Twitter use in general (RQ1) were assessed by short statements that were rated (analogous to [22]) on a 5-point Likert-scale ranging from 1 ("not at all") to 5 ("exactly"). The

statements were mainly items from established (sub)scales. The motives pass time, information seeking, and entertainment were assessed with subscale-items from Papacharissi and Rubin [22]. Content gratification in the form of information sharing (i.e., provide and share information), self-documentation (i.e., documentation of the own actions), social gratification (i.e., connecting with people), and self-expression (i.e., to show the own personality and tell other about oneself) were assessed by the corresponding subscales of Liu, Cheng, and Lee [23]. Additionally, we included three items on community development: cultivating contacts, that is, to maintain and intensify existing contacts (in accordance with [13]), to solicit advice from peers (in accordance to [16]), and community building, that is, to make new research contacts (in accordance to [16]). Based on recent findings [15], we also included seven newly constructed items on strategic career planning (see Table 1). The items were presented in random order. Table 1 provides an overview of the assessed motives (and corresponding original subscale / source of measurement in brackets) and items employed in the questionnaire.

*Table 1. Motives and related items in the questionnaire.*

<b>Motive</b>	<b>Items</b>
Pass time (sub-scale “pass time” of Papacharissi and Rubin [22])	<ul style="list-style-type: none"> <li>– Because it helps me pass the time when I’m bored</li> <li>– When I have nothing better to do</li> <li>– To occupy my time</li> </ul>
Information Seeking (sub-scale „information seeking” of Papacharissi and Rubin [22])	<ul style="list-style-type: none"> <li>– Because it is a new way to do research</li> <li>– Because it is easier (for information seeking)</li> <li>– To get information for free</li> <li>– To look for information</li> <li>– To see what is out there</li> </ul>
Entertainment (sub-scale „entertainment“ of Papacharissi and Rubin [22])	<ul style="list-style-type: none"> <li>– Because it is entertaining</li> <li>– Because I simply like to use it</li> <li>– Because it is enjoyable</li> </ul>
Content gratification: information sharing (sub-scale “information sharing” of Liu, Cheng, and Lee [23])	<ul style="list-style-type: none"> <li>– To provide information</li> <li>– To share information useful to other people</li> <li>– To present information on my interests</li> </ul>
Content gratification self-documentation (sub-scale “self-documentation” of Liu, Cheng, and Lee [23])	<ul style="list-style-type: none"> <li>– To keep a record of what I learn</li> <li>– To keep track of what I am doing</li> <li>– To document my life</li> </ul>
Social gratification / social interaction (sub-scale “social gratification” of Liu, Cheng, and Lee [23])	<ul style="list-style-type: none"> <li>– To connect with persons who share some of my values</li> <li>– To meet new people</li> <li>– To maintain a daily, personal connection with friends and family</li> </ul>
Self-expression (sub-scale “self expression” of Liu, Cheng, and Lee [23])	<ul style="list-style-type: none"> <li>– To show my personality</li> <li>– To tell others about myself</li> </ul>
Cultivating contacts (single item related to community development by Linek and Bäßler [13])	<ul style="list-style-type: none"> <li>– To maintain and intensify existing contacts / cultivating contacts</li> </ul>
Solicit advice from peers (single item related to community development by Grutz and Goertzen [16])	<ul style="list-style-type: none"> <li>– To solicit advice from peers</li> </ul>
Community building (single item related to community development by Grutz and Goertzen [16])	<ul style="list-style-type: none"> <li>– To make new research contacts / community building</li> </ul>

Special motives related to strategic career planning (single items motivated by Linek and colleagues [15])	<ul style="list-style-type: none"> <li>– For career planning / for finding (new) career opportunities</li> <li>– For making useful connections for future work</li> <li>– For finding new potential cooperation partners</li> <li>– For finding new potential employers</li> <li>– For connecting with peers</li> <li>– To show my appreciation for other academics on Twitter</li> <li>– For the sake of politeness towards other academics on Twitter</li> </ul>
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After the assessment of motives, we asked open questions to identify specific reasons for following the accounts of professors and for following the accounts of students. Subsequently, we asked with an open question if and why the participants had ever unfollowed an account (RQ3). Furthermore the participants had to rate how aware they are of their own followers (RQ4) by a 5-point Likert scale ranging from 1 (“not at all”) to 5 (“very”) and were asked to provide an estimation of the rate of academics among their followers. Finally, a rating of the overall experience of using Twitter for work-related purposes (ranging from 1 – “very dissatisfying” to 5 – “very satisfying”) was collected (question in accordance to Liu, Cheng, and Lee [22]).

### 3.2 Recruitment of Participants

We selected the sample population using snowball sampling: from a list of Twitter accounts of computer scientists [15], we selected 275 accounts from the German-speaking countries Austria, Germany, and Switzerland. We then manually identified the e-mail addresses of the account owners and asked them via e-mail to participate and forward the link to other researchers. Overall, 157 had a look at the survey, 71 started the survey and 54 completed it.

The sample comprised 42 males and 12 females. The mean age was 36 years (ranging from 27 to 53 years). The majority of the participants (91%) were computer scientist, only 9% were researchers from other fields. Most of the participants were PhD students (32%) or postdocs (35%); only 15% were professors and a minority of 6% were postgraduates (13% indicated “others”). On average, participants started to use Twitter about six years ago (ranging from 2 to 10 years) and the majority (83%) use it daily or weekly. Asked for the purpose of their Twitter use, participants indicated on a rating scale (from 0 = “strictly private” to 100 = “strictly academic”) that their original purpose ( $M = 63.30$ ;  $SD = 33.57$ ) as well as their current purpose ( $M = 69.52$ ;  $SD = 28.58$ ) was slightly more professional than private. The comparison of the original versus current purpose by t test showed only a non-significant tendency that the current purpose is slightly more academic than the original purpose ( $t = -1.755$ ;  $df = 46$ ;  $p = .085$ ). Participants indicated that they used their Twitter account slightly more passively than actively ( $M = 40.96$ ;  $SD = 26.43$ ; scale from 0 = “completely passive” to 100 = “completely active”). The overall experience of academic Twitter use was estimated (on a 5-point Likert scale from 1 = “very dissatisfying” to 5 = “very satisfying”) as relatively satisfying ( $M = 3.83$ ;  $SD = .985$ ).

### 3.3 Data Analysis

As described in the methods section, the measurements on the motives for academic Twitter usage in general (RQ1) were rated on a 5-point Likert-scale ranging from 1 (“not at all”) to 5 (“exactly”). We calculated the means and standard deviations for each of the motives and analysed the means in a descriptive way as follows:

- Means below 2.5 indicate that the motive is of minor relevance for the academic Twitter use.
- Means between 2.5 and 3.5 indicate a medium relevance of the motive.
- Means above 3.5 indicate a high relevance of the motive.

The measurements on the importance of the selection criteria for following an account (RQ2) were assessed based on a 5-point Likert-scale ranging from 1 (“not important at all”) to 5 (“very important”). Analogous to RQ1, we calculated the means and standard deviations of these ratings and analysed the means in a descriptive way as follows:

- Means below 2.5 indicate that the selection criteria is unimportant.

- Means between 2.5 and 3.5 indicate that the selection criteria is of medium importance.
- Means above 3.5 indicate that the selection criteria is highly important.

RQ3 on the reasons for unfollowing was addressed by an open question. All answers given in the open entry field were subject to a subsequent inductive qualitative content analysis aimed at aggregating replies to categories of reasons.

The data on RQ4 included two measurements: First, a rating (on a 5-point Likert Scale) on the awareness of the own followers and second, an estimation of the rate of academics among their followers. Both measurements were analysed in a descriptive way by calculating means.

## 4 RESULTS

### 4.1 Results on RQ1: Motives for the Academic Use of Twitter in General

The means (M), standard deviation (SD), and number of valid cases (n) for the motives for the academic use of Twitter are listed in table 2.

*Table 2. Motives for Twitter use – descriptive statistics.*

	<i>M</i>	<i>SD</i>	<i>n</i>
Pass time	1.94	0.84	52
Information seeking	2.88	0.97	52
Entertainment	2.75	1.08	50
<b>Information sharing</b>	<b>3.57</b>	0.93	53
Self-documentation	1.83	0.98	52
Social gratification	2.05	0.65	53
Self-expression	2.39	1.10	53
Cultivating contacts	2.74	1.38	54
Soliciting advice from peers	2.04	1.10	52
Community building	2.87	1.24	53
Career planning / for finding new career opportunities	2.25	1.45	53
Making useful connections for (future) work	3.09	1.18	53
Finding new potential cooperation partners	2.36	1.21	53
Finding new potential employers	1.75	1.14	53
Connecting with peers	3.23	1.20	53
Show appreciation	2.50	1.23	54
For the sake of politeness	1.56	0.97	54

The only motive of high relevance for the academic Twitter use was information sharing. Information seeking and entertainment were of medium relevance. Also, motives related to community development received medium ratings (i.e., cultivating contacts, community building, and solicit advice from peers). Furthermore, three of the motives related to strategic career planning (connecting with peers, making useful connections for future work, and to show appreciation) were also of medium relevance for the participants. The motives passing time, self-documentation, social gratification, self-expression as well as the motives career planning, finding potential cooperation partners, finding potential employers, and politeness were only of minor relevance for the participants.

### 4.2 Results on RQ2: Following an Account

Table 3 shows the means (M), standard deviations (SD), and number of valid cases (n) of the participants' importance ratings (from 1 = "not important at all" to 5 = "very important") of the different characteristics of the account owner and the content. Importance-ratings in table 3 are sorted by means. Highly important selection criteria are highlighted by bold letters.

Table 3. Selection criteria: Importance of the account owner and the content.

	<i>M</i>	<i>SD</i>	<i>n</i>
<b>General importance account owner</b>	<b>3.87</b>	0.99	54
<b>General importance content (tweets)</b>	<b>4.34</b>	0.73	53
<i>Importance: special aspects account owner</i>			
<b>He/she shares my research interests</b>	<b>3.98</b>	1.04	54
<b>He/she is an important researcher in my field of study</b>	<b>3.89</b>	1.27	54
<b>He/she is personally known to me</b>	<b>3.59</b>	1.14	54
<b>He/she is a person I like</b>	<b>3.52</b>	1.21	54
He/she is an academic collaborator of mine	2.83	1.41	54
He/she is someone I want to work with in the future	2.81	1.33	54
He/she works at the same institution as me	2.13	1.23	54
He/she follows my account	2.13	1.13	54
He/she has many followers	1.69	0.95	54
Her/his academic status is professor (tenured)	1.46	0.97	54
Her/his academic status is student (student, postgraduate or PhD student)	1.28	0.53	53
Her/his academic status is postdoc	1.26	0.59	53
<i>Importance: specific aspects content (tweets)</i>			
<b>Interesting tweets (inspiring / broaden my horizon)</b>	<b>4.46</b>	0.64	54
<b>Informative tweets (important scientific information)</b>	<b>4.41</b>	0.77	54
<b>Reliable tweets (high quality of information)</b>	<b>4.31</b>	0.75	54
<b>Current tweets (latest information)</b>	<b>3.57</b>	1.17	53
<b>Original tweets (self-generated tweets instead of retweets)</b>	<b>3.50</b>	1.30	54
Entertaining / funny tweets	3.02	1.09	54
Frequent tweets (high activity of the account)	2.07	0.99	54

Among the surveyed computer scientists, following decisions were shaped both by the account owner and the content provided by the account: The most important characteristics with regard to the account owners were that the owner shares the same research interests, and that the account owner is an important researcher in the field, is personally known and/or a person the participant likes. It was of medium importance if the account owner was a collaborator, or someone the participants want to work with in the future. Unimportant criteria were that the account owner works at the same institution or follows the participant's account. Also the academic status (professor, post-doc, student) or the number of other followers were estimated as unimportant. In relation to the content of an account (tweets), it was highly important that the tweets are interesting, informative, of high quality, current and original. It was only of medium importance that the tweets are funny. The frequency of the tweets was estimated as rather unimportant.

### 4.3 Results on RQ3: Unfollowing

Most of the participants (83%) indicated that they have also unfollowed accounts. Asked for their reasons for unfollowing, most participants reported (in their open answers) that they unfollowed accounts if tweets were perceived as irrelevant or uninteresting (69%). This was especially the case if accounts covered a lot of personal or private interests (i.e., we "off-topic"). The second most frequent reason for unfollowing was a too high frequency of tweets (51%). Both frequent and uninteresting tweets were repeatedly qualified as "spam" or "information noise". In some instances, the account was unfollowed because the interest of its owner changed and thereby began to deviate from the interests of the respondent. Only two respondents reported unfollowing an account because its owner tweeted too infrequently. However, 10% of those who unfollowed an account reported doing so because they wanted to limit the overall number of accounts they follow, rendering their information flow more manageable. In these instances, accounts providing too little interesting content were also deselected.

In a few instances, political reasons were given for unfollowing (e.g., racist or otherwise offensive content).

#### **4.4 Results on RQ4: Awareness of the Own Followers**

Participants reported that their awareness of their own followers (rating between 1 = “not at all” and 5 = “very”) was at a medium degree ( $M = 3.11$ ;  $SD = 1.11$ ). They estimated, on average, that their followers were an equal (50%) mixture of academics and non-academics.

### **5 CONCLUSIONS**

#### **5.1 Summary and Interpretation of Findings**

Focusing on motives for academic Twitter use, we found that it was characterized by information and also by personal interests. The main reason for using Twitter was providing and sharing information. Besides, entertainment, information seeking as well as some aspects of community building and strategic career planning were of medium importance. When following an account, however, it was not only important that the content is characterized by informative and interesting tweets of high quality and topicality (latest news), but also that the owner shared the same research interests, is an important researcher in the field, and that he/she was personally known and liked. In other words: compared to the motives for academic Twitter use in general, social considerations play a more recognizable role in following decisions. Unfollowing an account, in turn, is quite common – mainly due to the content and frequency of tweets. Participants tend to manage (i.e., limit) the amount of information received via Twitter through selective unfollowing. Despite the importance of the information dissemination motive for academic Twitter use in general, the awareness of the own followers was not very pronounced. We also found no significant correlation between information motives and awareness of followers. This indicates that the social connections on Twitter are rather weak and temporary. Academics appear to address a generalized public rather than narrowcasting to a specific audience. The relative high overall satisfaction with Twitter suggests that the flexible character of following and unfollowing other users without social restrictions may be perceived as advantageous. Twitter provides an easy way to distribute and collect information and explore new connections without too much of a social obligation.

#### **5.2 Relation to Prior Research**

Previous research has stressed the importance of the information motive for academic usage of social media, and Twitter in particular [13] [14]. Our more differentiated survey of motives for academic Twitter use does confirm that seeking information is a driver. However distributing information is even more relevant. It appears that in this respect, academics are quite similar to other users communicating in a professional capacity, such as politicians, who have been shown to be geared towards information dissemination [24]. We also confirm that community development plays a (secondary) role in academics' Twitter usage, but are able to provide a more differentiated understanding of what mainly drives academics' community development efforts on Twitter: cultivating contacts and community building. However, soliciting advice from peers was unimportant for academic Twitter use. Furthermore, some motives related to strategic career planning similarly drive Twitter usage, namely connecting with peers, making useful connections for future work, and to show appreciation.

Similar to the findings on academics' motives for Twitter usage, we find that following decisions are based on both professional and personal considerations, as the most important characteristics influencing a following decision is related to content, namely interesting, informative and reliable tweets. While academic status (professor, post-doc, student) or the number of other followers were estimated as unimportant, social considerations do affect following decisions. Academics choose to follow accounts of fellow academics that share a research interest, is personally known or an important researcher in the field. Thus, following decisions mirror the pattern of general usage motives identified in the analysis: information is a key factor, but community development and strategic politeness also affect following behaviour. Unfollowing, in turn, is largely driven by content. Based on open answers, we found that participants mostly recall unfollowing an account due to irrelevant, uninteresting or too frequent content as well as, in some instances, political disagreements.

Thereby, we extend previous research of academic Twitter usage by offering a more detailed understanding of the evolving practices of scholarly communication on Twitter: Academics are mostly drawn to Twitter because they wish to disseminate, and, to a lesser degree, collect information. As a result, they tend to follow account with tweets of high quality. When engaging with Twitter, however, personal considerations play an increasingly important role, as academics tend to follow prominent researchers and those sharing a research interest. In other words: For establishing a following network, both content and social considerations matter. Once networks are established, however, content largely shapes how they evolve: academics unfollow those accounts deemed as uninteresting, overwhelming or offensive.

To summarize, we find that academics subjective considerations in terms of their Twitter usage oscillates between content and personal aspects, with content aspects driving usage, but personal aspects also shaping following decisions, based on which content aspects again drive unfollowing decisions. This insight contributes to the current state of research on motives of academic Twitter usage finding that information and community development motives play central roles in the ensuing communication behaviour and structures [14] [15] [16]. Although previous studies have found that academic hierarchies are replicated in online social networking structures [15], our findings imply that this influence may be mediated by information considerations: wishing to collect helpful information on Twitter, academics tend to follow well-known colleagues in the field. However, the results of our survey suggest that the academic status of an account owner per se is not an important factor in following decisions

### 5.3 Outlook

As this study focused on computer scientists, it is an open question if and to what extend the findings are valid for other disciplines. Although some properties of the sample (e.g., gender distribution) are representative for the underlying population, the size of the sample is rather small, thus limiting the findings of the study. A more comprehensive analysis involving other disciplines and a larger, international sample would therefore be a crucial next step. In addition, further studies are needed that relate not only to Twitter but also to academic networks like ResearchGate and Academia. Insights into the simultaneous usage of Microblogging services, like Twitter, and academic social networks, like ResearchGate, would be especially helpful for a more comprehensive understanding of the distinct motives (gratifications sought) and practical experiences (gratifications obtained) of researchers when using social media for professional purposes.

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