Social networking for scientists: An analysis on how and why academics use ResearchGate

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Abstract

Purpose – The purpose of this paper is to examine the usage and utility of ResearchGate (RG), which is a social networking site where scientists disseminate their work and build their reputations. In a sample consisting largely of American and European academics, the authors analyzed the ways they use the site, what they thought about the site's utility, and the effects of usage on career outcomes.
Design/methodology/approach – The authors employed an online survey approach to target scientists who have an active RG account. Scientists who were not users were also recruited in order to get a better idea of the reasons for their nonuse.
Findings – Most academics who have an RG account did not use it very heavily. Users did not perceive many benefits from using the site, and RG use was not related to career satisfaction or informational benefits, but was related to productivity and stress.
Research limitations/implications – Systematic research is needed to explore positive and negative consequences of using professional social media in academia, especially productivity and stress. Findings also suggest that RG needs to increase user engagement.
Originality/value – This study is one of the first to closely examine how and why people in academia use professional social media sites and whether usage leads to perceived benefits and effects on more general career outcomes.

Keywords Academia, Social media, Social networking, Digital scholarship
Paper type Research paper

Introduction

ResearchGate (RG) is a social media platform for scientists, where academics can disseminate their work while boosting their scientific reputation (www.researchgate.net/). RG has currently over 12 million users. RG's mission is to help scientists connect with each other, share knowledge and expertise, while at the same time building up scientific reputation. This is accomplished by "following" other scientists who can also follow you back, uploading and sharing manuscripts, presentations, and project related materials, and asking and answering research related questions. Users' scientific reputation is also represented quantitatively via one's publications, questions and answers, and followers; this forms a number that is displayed publicly on the RG profile – the "RG Score". Additionally, altmetrics including number of document views and downloads are publicly displayed.

Research has not fully examined the fine-grained ways in which academics are using such tools and how they perceive them. Moreover, it is unknown whether usage benefits scholars. In the current study, we explored these questions with a largely American and European sample. We examined motives, use, and career-related outcomes. This study offers insight on how sites like RG could be improved.

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Background

There are increasingly more studies on RG and other networks for academics, but many of them take a bibliometric approach. A number of these studies demonstrate differences by discipline and country. Disciplines such as arts and humanities are underrepresented on RG, whereas biologists are overrepresented (Ortega, 2015; Thelwall and Kousha, 2014). RG is also more heavily used in Brazil and India than in China and South Korea (Thelwall and Kousha, 2015a). Several researchers have correlated the RG score, the number of citations, views, and downloads on RG with other conventional metrics and altmetrics (Hoffmann *et al.*, 2016; Thelwall and Kousha, 2015a, b 2017, Yu *et al.*, 2016). Some research has focused more on the network characteristics, i.e., network centrality on RG (Kadriu, 2013).

These studies are largely based on objective metrics, i.e., statistics that can be scraped from user profiles, but less is known about the subjective evaluation of RG and the motivations for using it. That is, what do users think about RG? Do they find it useful or not? There is much less information on how the specific features of RG are used. One study examined professional usage of multiple social networking site (SNS) of more than 3,000 scientists and engineers (Van Noorden, 2014) and found that most respondents were aware of RG, but less than half used the site. The most common reason for using it was being visible for contact. Extending on these findings, we wanted to examine the use of specific RG features, subjective interpretations and perceptions about the utility and value of RG, and the potential consequences (stress, productivity, career satisfaction, and informational benefits) – we are not aware of any research that has examined this latter question.

A majority of Facebook users (at least in the USA) are active and visit the site frequently (Greenwood *et al.*, 2016; Junco, 2011; Utz, 2016). A survey with a national sample in the USA showed that 76 percent of Facebook users visit the site daily, and 55 percent visited it multiple times a day (Greenwood *et al.*, 2016). Yet research suggests that business SNS such as LinkedIn are visited much less frequently (Greenwood *et al.*, 2016; Utz, 2016).Thus, we suspect that login frequency on RG might also be lower since it is also a professional network. With regard to feature use, it is known that SNS users engage more regularly in browsing their timeline, commenting or liking than in posting status updates (Smock *et al.*, 2011; Utz, 2015). However, due to the difference in available features, results from studies on Facebook or business networks cannot easily be generalized to RG. Our first research question is therefore:

RQ1. How often do RG users log in and which features of RG do they use?

Not much is known about the perceptions of RG. That is, what do users think about the site and its utility? On the one hand, it is a SNS because users have profiles, can connect themselves with other users, and traverse the connections of others (boyd and Ellison, 2007). On the other hand, it has less social features and might therefore, similar to business networks, be perceived more as instrumental for self-promotion and sharing and receiving work-related information (Utz and Muscanell, 2014). Because it makes publications that might otherwise be behind a paywall easily available, users might see it more as an archive for publications, and as an efficient way to access papers – though, the sharing of such publications is not always legal. People who use it in a functional way could consider it as efficient research tool, but others who get lost in browsing or annoyed by the large number of notifications, might perceive it as a distraction from their actual work. We thus pose an open research question:

RQ2. Do RG users perceive the site to be useful for academic purposes?

We were also interested in the effects of RG use. In contrast to altmetrics papers that look at objective citations such as how often a paper has been viewed or downloaded (Niyazov *et al.*, n.d.), we focus on subjective indicators from the perspective of the user: productivity, career satisfaction, and informational benefits (only sample 2). We were interested in productivity

because opposite lines of argumentations are possible. If RG exposes researchers to interesting new work in their field, makes it easy for them to access publications, and offers tools for question asking and collaboration, it should make researchers more productive. However, there is first evidence that the Q&A tool is not very efficient, leaving many questions unanswered (Alheyasat, 2015). Turning to RG might also be a waste of time, since it takes time to set up and maintain a profile, share work, and connect with other scientists, thus reducing overall productivity. There could also be effects on perceived career satisfaction. If sharing publications increases citations, this should also affect career opportunities and consequently career satisfaction:

RQ3. Do RG users (or those who more frequently use RG) have higher perceived productivity and career satisfaction?

The concept of informational benefits stems from social capital research. Social capital refers to content and network structure (Adler and Kwon, 2002). Research has shown repeatedly that weaker ties, i.e. connections with acquaintances or former colleagues, are beneficial when it comes to finding a new job/being pointed to new opportunities (Granovetter, 1973; Yakubovich, 2005). In the context of SNS, Utz (2016) found that users of LinkedIn and Twitter reported higher professional informational benefits than non-users did. We expected to replicate this finding among RG users:

H1. RG users report higher informational benefits than non-users.

We also believed that RG use could also have negative outcomes. Initial research found that some users reported RG is a source of stress due to the e-mail notifications and focus on competitors (Van Noorden, 2014). RG also triggers social comparison processes by displaying the achievements of other researchers (Utz and Muscanell, 2017), which could produce feelings of stress. Thus, we wanted to examine perceived stress in relation to a variety of academic job factors such as publishing:

RQ4. Do RG users report more job related stress?

Finally, we attempt to gather more specific insight as to why academics do or do not use RG and/or other social media sites, specifically for scholarly purposes. Additionally, we hoped to also examine other feelings/attitudes towards RG. We therefore included several open-ended items that would all us to examine:

RQ5. What reasons are provided for use or non-use of RG/social media and what other sorts of feelings do academics have about the use of social media for their work purposes?

Method

Participants

Data were collected at three time points; during the Winter of 2014, Summer of 2014 and Spring of 2015. We refer to these, respectively, as sample 1, sample 2, and sample 3. There were 1,009 total participants who completed a majority of the survey – although, 2,406 completed some of the first items, including which social media they use for academic purposes. Participants ranged in age from 18 to 86 (mean age = 39). Most participants reported that the country of their current affiliation was the USA (60.1 percent), followed by Europe (32.9 percent). Participants were at different career stages and were from several fields/disciplines. See Table I for complete demographics.

Procedure

The data were collected via an online survey. Our goal was to recruit as many academics as possible that were at varying career stages and from a variety of disciplines. There is no single

Variable	All respondents % of respondents Samples: 1-3	RG users only % of respondents Samples: 1-3
Gender	$n = 1{,}007$	$n = 417$
Male	50.3	50.2
Female	49.7	49.8
Country/region of current affiliation	$n = 1{,}005$	$n = 414$
USA	60.1	43.2
Europe	32.9	48.3
UK	3.4	4.8
Asia	1.5	1.4
Other	2.1	2.2
Field	$n = 1{,}005$	$n = 413$
Natural sciences	21.3	23.2
Social sciences	38.1	50.6
Humanities	17.6	7.7
Medicine	3.3	4.6
Business	5.9	4.4
Engineering	6.3	5.1
Math	5.2	2.9
Other	2.4	1.5
Title/stage	$n = 1{,}009$	$n = 415$
Graduate student (Master's)	8.7	5.5
Graduate student (PhD)	28.4	21.9
Post-doc	13.9	21
Assistant professor	14.3	15.7
Associate professor	8.3	10.6
Full professor	16.7	17.1
Other (i.e. industry, research institute)	9.7	8.2

Table I. Demographic variables

venue to recruit such a sample, so we relied on a convenience sample. Participants were recruited through social media sites, social science listservs and research forums, and via e-mail to contacts in the researchers' networks. See the Appendices for specific recruitment details.

The survey was similar at both time points of data collection (only a few measures varied slightly), thus we report these together. Participants first answered questions about demographics and their research background, followed by their usage of several social media sites including RG. RG users then answered questions that assessed their use of the site. These users were also asked to self-report some information provided on their RG profile. Finally, all participants completed career-related measures: perceived productivity, career satisfaction, stress, and informational benefits[1].

Measures

Demographics and research background. We assessed age, gender, country of affiliation, field/discipline, and current job title (i.e. post-doc, professor). Respondents indicated which social media platforms they used (Facebook, Twitter, professional sites like LinkedIn or Xing, and scholarly social media such as Academia.edu and RG).

RG feature usage/engagement. We assessed how frequently participants log into RG (almost never, monthly, once a week, several times a week, or daily). We also assessed to what extent individuals only log in when prompted or looking for a paper ("I only log in to RG when I receive notifications" and "I only log into RG when I am looking for a paper"; scale of 1 = strongly disagree to 5 = strongly agree). We assessed the frequency of activities

engaged in on RG (17-items). Example activities include sharing articles, requesting articles, browsing profiles of other researchers check RG stats (measured on a scale of 0 to 5, where 0 = never and 5 = a few times a day).

RG perceptions. We assessed participants' perceptions about RG, mainly relating to how much users perceived RG to be helpful for their research and productivity (11-items; adapted from Torkzadeh and Doll (1999), e.g. "RG saves my time," "RG helps me find articles more quickly"), and also whether they perceived it to be a distraction from their work (six-items). Example items for distraction are "Browsing RG distracts me from my work" and "RG wastes my time." All perception items were measured on a scale from 1 = strongly disagree to 5 = strongly agree.

Open-ended comments on RG. In all samples, RG users provided open-ended comments in response to the following question: 1. Is there anything else you would like to tell us about your use of RG, for instance why you use it, what you find useful, or what can be improved? In samples 2 and 3, the non-users were invited to tell us why they do not use RG.

Career measures

Productivity and career satisfaction. Productivity was assessed with four items generated by the researchers. Example items include, "I feel that I am productive at my job" and "I feel that I am able to manage my time effectively," items were measured on a scale from 1 = strongly disagree to 5 = strongly agree. Career satisfaction was assessed with three items (Greenhaus *et al.*, 1990). Example items were, "I am satisfied with the success I have achieved in my career" and "I am satisfied with the progress I have made towards meeting my overall career goals." Items were measured on a scale from 1 = strongly disagree to 5 = strongly agree.

Informational benefits. Informational benefits were assessed with five items (Utz, 2016). Example items were "I can get access to knowledge that is helpful in mastering job tasks from my network members" and "I receive information about innovations in my field from my network members, timely." Items were measured on a scale from 1 = strongly disagree to 5 = strongly agree.

Stress. Job related stress was measured with seven items, including how often participants feel stress stemming from tasks such as establishing/maintaining a good publication record or receiving recognition for their work. Items were measured on a scale from 1 = never to 5 = very often.

Results

The sample sizes for the main analyses slightly vary due to missing values because respondents were not required to answer each question. For early questions, i.e., social media use for academic purposes, the sample size was 2,406. For further questions that pertain to both RG users and non-users, the sample size varies from 1,002 to 1,009. For questions that pertain solely to RG use, the sample size varies between 412 and 417. We have denoted within the tables what the sample size (n) is for each analysis.

RG usage

RG was reported as being used the most for scholarly/academic purposes (40.7 percent). Other sites used for academic purposes include: LinkedIn (38.6 percent), Facebook (31.5 percent), twitter (23.5 percent), Academia.edu (22.7 percent), and 20.4 percent reported that they do not use any social media for academic purposes. In terms of the frequency of usage (*RQ1*), RG users did not appear to frequently use the site. Only 3.6 percent reported using RG on a daily basis. On average, they mainly

logged in when they receive a notification ($M = 3.65$, $SD = 1.11$; 67.4 percent "agree" or "strongly agree"), but less so when they were looking for a research paper ($M = 2.59$, $SD = 1.17$; 25.2 percent "agree" or "strongly agree". See Table II for overall use and logins.

We also examined the usage of specific features (*RQ1*). Some of these features were more self-directed forms of engagement (e.g. browsing profiles) while others were more directed by RG or other RG users (e.g. someone requests a paper from you or you receive a notification). The most common form of engagement was the notifications that RG sends its users ($M = 1.98$, $SD = 1.16$). However, even though this was the most common, the overall mean itself was low. In terms of more self-directed feature usage, the next most common was browsing profiles of other researchers ($M = 1.43$, $SD = 0.82$). Overall, participants appeared not to use many of the features on a frequent basis (all of the means were below 2.0 on a 0-5 scale, where 0 = never use and 5 = use a few times a day). See Table II for all feature usage/engagement items.

We also examined what sorts of perceptions and attitudes participants held about RG and its usefulness (*RQ2*). The strongest sentiment that participants reported was that they perceived RG to be somewhat useful for sharing their own work ($M = 3.82$, $SD = 0.99$). The next most common (yes still moderately positive) was the perception that RG helps to increase citations ($M = 3.30$, $SD = 0.88$). However, participants overall felt more neutral for most of the other perception items such as sharing expertise, increasing job market success, facilitating collaboration, etc. The means for the latter items ranged between 2.32 and 3.26. See Table III for perceptions.

Does RG usage predict career-related outcomes (*RQ3* and *RQ4*, and *H1*)? First, we tested the use of RG with a categorical variable (do you use RG, yes or no?). We conducted one-way ANOVA's to test if the categorical measure of RG use predicted career satisfaction (average of three items; $\alpha = 0.93$), productivity (average of four items; $\alpha = 0.65$), stress (average of seven items; $\alpha = 0.80$), and informational benefits (average of five items; $\alpha = 0.80$). The only significant finding was the RG use (Y/N) was that individuals who use RG reported higher levels of stress than non-users ($M = 3.2$ vs $M = 2.9$), $F(1, 699) = 18.95$, $p < 0.001$, $\eta^2 = 0.03$. (*RQ4*). In regards to the hypothesis that RG would predict higher informational benefits, this was in the expected direction (higher benefits than non-users), but was not significant, $F(1, 699) = 3.53$, $p = 0.06$, $\eta^2 = 0.005$. RG use was not related to any other career outcome variables. See Table IV for means.

Additionally, we examined whether there were any relationships between RG use (continuous measure of frequency of usage) and career/job related outcomes. Frequency of RG use was only correlated to productivity, $r = 0.11$, $p = 0.03$, albeit this was a very small effect (*RQ3*). Frequency of RG use was unrelated to career satisfaction, job related stress, and informational benefits. See Table V for correlation matrix.

Open-ended responses about why or why not people use RG? Open-ended responses were coded into a number of categories identified by the researchers (*RQ5*). For the question

	%	Samples: 1-3 *n*
ResearchGate	40.7	2,406
LinkedIn	38.6	2,406
Facebook	31.5	2,406
Twitter	23.5	2,406
Academia.edu	22.7	2,406
Do not use social media for academic purposes	20.4	2,406

Table II. Social media sites used for academic purposes

	M (SD)	Samples: 1-3 *n*
Logins and overall use		
How often do you use RG?	2.65	415
I only log in when I receive notifications	3.65	414
I only log in when looking for a paper	2.59	413
Feature use		
Receive notifications	2.12 (1.07)	415
Browse profiles	1.51 (0.79)	413
Browse papers	1.45 (0.89)	415
Receive endorsements	1.36 (0.90)	415
Receive article requests	1.28 (0.87)	414
Share articles	1.13 (0.75)	413
Endorse others	1.05 (0.75)	415
Check/compare stats	1.02 (0.95)	414
Request articles	0.71 (0.77)	414
Answer Questions	0.57 (0.70)	413
Bookmark articles	0.57 (0.76)	415
Use job feature	0.30 (0.62)	414
Ask questions	0.30 (0.52)	414
Share data	0.21 (0.46)	414
Use open review	0.16 (0.43)	414
Use projects feature	0.09 (0.33)	413

Table III.
Means for logins and ResearchGate feature use

Notes: The scale for the first item is 1-5 (1 = almost never, 2 = monthly, 3 = once a week, 4 = several times a week, 5 = daily). The scale for the second two items is 1-5 (1 = strongly disagree, 5 = strongly agree). The scale for all of the feature use items is 0-5 (0 = never use, 1 = rarely use, 2 = few times a month, 3 = few times a week, 4 = once a day, 5 = few times a day)

Perceptions	M (SD)	Samples: 1-3 *n*
RG helps me share my work	3.92 (0.92)	412
RG helps me increase my citations	3.30 (0.88)	413
RG helps me to share my advice/expertise with others	3.02 (1.08)	412
RG increases my chances on the job market	2.89 (0.84)	413
RG helps me find articles more quickly	2.87 (1.15)	414
RG makes collaboration with others easier	2.77 (0.99)	412
RG saves me time	2.64 (0.97)	414
RG wastes my time	2.55 (1.05)	412
RG helps me get answers to research related questions	2.52 (0.91)	412
RG provides too much information	2.51 (0.84)	413
RG increases my productivity	2.46 (0.94)	413
RG helps me come up with new ideas	2.46 (1.01)	414
RG allows me to accomplish more work than would otherwise be possible	2.31 (0.91)	413

Table IV.
Means for perceptions about ResearchGate

Notes: Scale is 1-5 (1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree)

pertaining to only RG users, responses fell into one of 11 categories, which were not completely exclusive. We had a total of 125 responses for this first question. The most common response was that users do not use the site very often and/or do not find it useful (35.2 percent). Some users reported that they felt RG had usability problems at the time of the study (e.g. the interface of RG was not intuitive or easy to navigate) (17.6 percent).

A quarter of the respondents felt that RG was useful (25 percent). The most helpful aspect of RG appeared to be its use for sharing papers (16.8 percent) and networking (11 percent). See Table VI for complete percentages and example responses.

For the second and third waves of data collection, we also explored reasons for not using RG and social media for scholarly purposes. For those who do not use RG, responses were coded into ten categories (not completely exclusive). There were 272 responses overall. The most frequent reason given for not using RG was that participants did not know of its existence or what it was (57 percent). The second most common reason was that participants did not perceive RG to be useful (15.4 percent). Other reasons mentioned were that RG is too similar or redundant with sites like academia.edu (10 percent), participants do not use it because it is not commonly used within their field (8.8 percent). See Table VII for complete percentages and example responses.

Discussion

The findings from this study provide a first glimpse at RG usage, perceptions, and career outcomes, particularly for academics in the USA and Europe. Findings suggest that in these countries, academics are not very active users of the site. Less than 4 percent report using RG on a daily basis, while a majority reported using it only once a week or on a monthly basis. When we examined participants' more fine-grained usage of specific features, we did not see much variability. The most frequent "activity" was receiving a notification from RG (a request for a paper), which fits in line with findings from Van Noorden (2014) – respondents main reason for use was in case someone needed to contact them. It should be noted that we use "activity" a bit loosely in this context, because the user is not specifically directing the activity. For the other features, such as browsing for articles or profiles or sharing work, most users reported doing this rarely or never. This is less surprising after considering that the item assessing frequency of use indicated low activity.

Overall, individuals from the fields of social and natural sciences reported the most users. Other disciplines had far less RG users, including business, arts and humanities, and engineering.

Perceptions	RG users *M* (SD)	Non-users *M* (SD)	Samples: 1-3
Career satisfaction	3.59* (0.86)	3.68* (0.87)	
Productivity	3.45* (0.62)	3.51* (0.70)	
Stress	3.20* (0.72)	2.95** (0.74)	
Informational benefits	3.58* (0.67)	3.69* (0.75)	

Note: Different superscripts denote significant differences , where $p < 0.05$

Table V. Means for career outcomes by RG use

	1	2	3	4	5
1. RG use	–				
2. Career satisfaction	0.03	–			
3. Productivity	0.11*	0.45**	–		
4. Stress	0.08	−0.31**	−0.36**	–	
5. Informational benefits	0.09	0.19**	0.10**	0.09*	–

Notes: *$p \leqslant 0.05$; **$p \leqslant 0.01$

Table VI. Correlations between RG use (frequency) and career outcomes

Category	Example response	% of responses Samples: 1-3 ($n = 125$)
Don't use often/is not useful	"Up to now I don´t find an additional value by this media but it consumes additional time"	35.2
RG is useful	"Overall I think it is going to really simplify my searches for other research and networking with colleagues whose work I admire but whose paths I've not yet crossed or only know from conferences"	24.8
Usability	"More instructions could be provided in easily accessible formats. For example, I'm not sure how to enter publications of mine that are not listed in the ResearchGate database"	17.6
Sharing papers	"it's a great repository for current, yet to be published work"	16.8
Negative emotions	"I hate it"	15.2
	"I have tied ResearchGate for a while, but I disliked the ranking of academics, which brings competition. Academia does about the same job without this aspect"	
Networking	"I use it since it's a cool way to interact with some experts in the fields I work. It's great to make some local connections for future projects or just being nice with your local colleagues"	11.2
Self-promotion	"increases visibility in the Research community"	4.8
Legal aspects	"as a publically-funded researcher, the conflict between journal publishers and the sharing of articles on the internet is a major hurdle. I want to share my research widely, but I don't want to infringe on copyright laws and publishers with high-paid lawyers"	3.2
New opportunities	"I find it very useful when researching people for possible job prospects or for networking"	0.8

Table VII.
Open-ended data: users' perceptions of ResearchGate

Notes: The open-ended question was: "Is there anything else you would like to tell us about your use of ResearchGate for scholarly purposes? For instance, why you use it, what you find it useful for, what can be improved?"

This is consistent with prior research demonstrating that the fields most largely represented on RG are the natural sciences and the social sciences (Ortega, 2015; Thelwall and Kousha, 2014). It should be noted that our sample is not completely representative of all disciplines. However, this could explain why we ended up with more social and natural scientists – these are the individuals who have been shown to be on RG.

In regard to career stage, the group who reported the highest percentage of RG users was postdocs and PhD students. Thus, career stage may influence RG use – PhD students and postdocs typically need to publish and network heavily. On the other hand, graduate students early in their career are also trying to establish themselves, but have less publications to share – thus, they may not be motivated (or even able) to use RG actively given their lack of publications. It should be noted that 10.6-17.1 percent of professors (assistant, associate, and full) reported being RG users. Here, it is less clear if this is directly related to different motivations or challenges with respect to career stage. One possibility is that professors use RG less than postdocs and PhD students because they have already attained a job.

The next question we explored was whether or not RG usage was related to career outcomes. Given that RG promotes itself as being a place for scientists to connect and also increase their own reputation, one could expect that RG use increases career satisfaction or informational benefits. However, our results do not suggest that this is the case. RG use (measured either categorically or continuously) was not strongly related to career satisfaction, or informational benefits. There was a small effect suggesting that RG users experience more stress. This is consistent with

Van Noorden (2014). One potential reason for this stress could be due to a focus on social comparison – comparing one's own productivity with other researchers. There was also a small correlation between RG use and productivity. Thus, increased use is related to increased perceptions of being productive. However, the lack of strong relationships with these variables overall is likely due to the fact that individuals do not seem to be actively using RG.

We also examined what users thought about RG. The results suggest that RG users are mainly ambivalent in their feelings towards the site. The strongest perception was that RG is useful for sharing work. The open-ended descriptive data that we collected from both users and non-users provides some further insight on perceptions of RG, and why individuals are not heavily using RG. Many participants (56.9 percent out of 272 respondents) reported that they did not even know what RG was. For example, a comment we saw repeatedly was, "I never heard of it." This is surprising given that Van Noorden (2014) found most respondents were aware of RG. This might reflect international differences – the latter study included participants from 95 different countries. Therefore, our findings suggest that in the US and Europe, people may be less aware of the site.

For the people who do use it, a number said (9.9 percent of 272 respondents) that they did not think it had any added value over other sites/technology that they already use, and 35.2 percent (of 125 respondents) thought it was not useful more generally. For example, some participants thought they could already sufficiently share/find work, connect with others, and promote themselves through tools such as Google Citations, Google Scholar, Academia.edu, and even basic e-mail. On top of the lack of value, participants (15 percent of 125 respondents) also reported negative feelings stemming from RG use (i.e. too much social comparison and added stress). Those who reported that RG was useful mentioned that it is helpful for sharing work and for connecting or networking with other researchers (25 percent of 125 respondents) and for sharing papers (15.2 percent of 125 respondents).

Implications

Overall, the results have practical implications, especially for American and European scholars. These findings offer suggestions on how to potentially increase active engagement and usage on RG. First, our results demonstrate that RG is not heavily used – both in terms of how frequently people login and use specific features, and also as measured by simply whether people use it. Our open-ended responses provide some insight to this – individuals do not know what RG is and/or do not see the added value of using it. Thus, RG should expand its marketing to increase academics' awareness of the site. Additionally, RG might benefit from better communicating what its' value is, especially compared directly to other social media and communication technology. The usability/interface of the platform could also be improved by reducing notifications and making sure that performing functions – such as sharing a paper or asking another researcher a question – is as easy as possible. In some sense, it probably needs to feel easier than other tools such as e-mail. Future research should also explore the role of altmetrics on the site. Some participants reported being stressed by RG because the altmetrics bring about more competition – and in some cases this is why they prefer sites like Academia.edu, which is similar but has less focus on comparing you directly to your colleagues.

To conclude, RG had little impact on perceived career outcomes. This is likely because many users are not actively making use of the various features that RG offers. Many users did acknowledge that it can be helpful in sharing papers and work. Thus, we argue that the challenge at the moment is to increase active usage and to show added value over other technology.

Limitations

One limitation is that this study relied on correlational data. Thus, we cannot make causal claims, especially in trying to understand the effect of RG use on psychological outcomes such as perceived productivity, stress, and career satisfaction. It would be difficult to truly manipulate the main variables (i.e. RG use) in order to experimentally determine these effects. Nonetheless, research could examine the long-term outcomes of using sites like RG, to determine if there are more direct outcomes over time, with particular attention to the experience of stress.

Another limitation is the nature of the sample. We relied on convenience sampling which can result in selection biases (Fricker, 2012). However, we felt that it was the most feasible means for recruiting participants for this particular study. We made concerted efforts to recruit a very large and diverse sample. There was no standard international or national database of academic names to generate a random sample from. Therefore, we had to generate our own database of e-mails, by visiting University websites one-by-one and manually pulling e-mail addresses. It was not feasible for us to do this for universities in all countries, so we limited our main efforts to the USA and Europe. Nonetheless, we felt that because of the exploratory and descriptive nature of this study, we could generate responses that would be insightful, especially because we anticipated there would be a low likelihood of response biases, i.e., social desirability, given that the topic was not very sensitive. We believe that this research is a useful starting point that can help direct researchers towards more systematic studies on social media use by academics.

Our sample therefore consisted of participants who voluntarily selected to participate. This raises the possibility that both nonresponse and selection biases affected our data. In the case of nonresponse bias, there may have been academics who simply did not participate (Sax *et al.*, 2003). Likewise, because people self-selected, our sample is likely to have an overrepresentation of certain types of people, i.e., those who use RG, or those who strongly like or dislike RG. One finding suggesting that the latter is not the case is that most of our participants seemed to report rather neutral attitudes towards the site and usage of its various features. Those who live in countries with higher internet usage and access to technology are likely to be overrepresented, while there is an underrepresentation of some academic disciplines. Indeed, most of our sample is representative of the USA and Europe, and the disciplines most heavily represented in our study were the social and natural sciences. Thus, it could be that the individuals not represented in our sample do show quite different patterns and perceptions of RG usage. Future research should systematically test similarities and differences in social media use by academics using random samples and experimental methods.

There is also a lack of systematic research on potential international differences or similarities when it comes to RG use, and more generally SNS use for professional and academic purposes. Thus, it remains an important and unanswered question that needs careful exploration with globally representative samples in the future. Our sample was biased with a high number of social and natural scientists. This is consistent with other research showing that certain disciplines are underrepresented on RG. This also could be why we found it difficult to recruit RG users from disciplines outside of the social and natural sciences, despite contacting over 47,000 academics from many disciplines. We believe that comments in the open-ended data, offer further insight. Some respondents (8.8 percent of 272) reported that RG use is not common in their field, and/or that RG would not be valuable within their field. Future work needs to target disciplines that are underrepresented on RG in order to find out why they do not use RG as a starting point. Such research should seek to better determine what factors within disciplines (e.g. differences in focus on publications) may predict usage and benefits from using the site (Table VIII).

Category	Example response	% of responses Samples: 2-3 ($n = 272$)
Not familiar	"I don't know of it" "I did not know it existed" "Not familiar with it"	56.9
RG is not useful	"It's not useful to my field of study"	15.4
No added utility	"Why would I? Google Scholar is way better at the same thing" "Not sure what advantage this site would provide over LinkedIn"	9.9
Not common in my field	"no one I know uses it" "Not popular amongst my colleagues"	8.8
Not established in career	"I would like to, I think it's a great tool. I just haven't gotten there yet I think I'm a little embarrassed because I don't have any pubs"	3.7
No time	"I just haven't had the time to learn yet another social media site"	3.3
Too many notifications	"Too many notification e-mails and I already have a lot of other online tools with my papers on them like my website and google citations"	3.3
Usability	"It's cumbersome. It took a long time to get set up and didn't offer me anything I wanted that Academia.edu – which was easy to use – didn't"	1.8
Self-promotion	"It feels more like a self-marketing platform, not a social environment"	0.7
Already established enough	"I'm old. By the time ResearchGate came along I was already established in my career and didn't need help with increasing my scholarly visibility"	0.4

Note: The open-ended question was: "Please tell us why you don't use ResearchGate for scholarly purposes?"

Table VIII.
Open-ended data: Non-users' reasons for not using ResearchGate

Note

1. Participants also completed brief personality measures including, competitiveness, contingent self-esteem, and social comparison orientation. However, these measures did not correlate with the main variables and are beyond the scope of this paper. Thus, we do not present findings on personality variables.

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Further reading

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Appendix 1. Participant recruitment index

The following document details where survey respondents were recruited from online. We have included that date of contact when possible, although for some e-mails, we do not have a record of the exact date. All data were collected between December, 2014 and June, 2015.

Researchers who contacted individuals directly

Blinded for review

Organization/Listserv	Date shared
Institute of Researchers	April 30, 2014
Leibniz Institute fur Wissensmedien	June 30, 2014
DGPS (German Psychological Society)	July 1, 2014
European Association of Social Psychology	July 2, 2014
Academic Net	December 1, 2015
Association for internet Researchers	n/a
Deutschen Gesellschaft für Publizistik- und Kommunikationswissenschaft	n/a
Deutsche Physikalische Gesellschaft	n/a

Table AI.
e-mails and Listservs

Platform	Page	Date shared
Facebook	International Communication Association	July 16, 2014
Facebook	Thesis (page for graduate students)	September 12, 2014
ResearchGate	Researcher's personal pages	September 12, 2014
Facebook	Academia.edu	December 4, 2014
Facebook	American Society for Microbiology	December 4, 2014
Facebook	Academic Transfer (Dutch job market site for academics)	December 4, 2014
Facebook	GAIN (German academics in North America)	December 9, 2014
Twitter	Author's personal page	n/a
Twitter	Co-author's personal page	n/a

Notes: We contacted academics by e-mail between April 2014 and June 2015. As a starting point, we used a Wikipedia list of state universities in the USA (https://en.wikipedia.org/wiki/List_of_state_universities_in_the_United_States) and in Europe (https://en.wikipedia.org/wiki/Category:Lists_of_universities_and_colleges_in_Europe). We visited the websites of Universities and used a Firefox extension called "Email Extractor" to scrape e-mails into a database. We focused on recruiting from universities who had e-mail addresses visible on their website. For each university, we attempted to scrape as many e-mails as we could from each department available on the website. We also asked each person we contacted to share the survey with other academics. Excel databases containing each e-mail contacted are available upon request. In total, we contacted roughly over 47,000 individuals

Table AII.
Social media

Table AIII.
US Universities Emailed

University	Country	Date(s) contacted
University of Alabama	USA	March 9, 2015
Arizona State University	USA	March 9, 2015
University of Arkansas	USA	March 10, 2015
University of California, Berkeley	USA	March 10, 2015
University of California, Davis	USA	March 10, 2015
California State University, Long Beach	USA	May 8, 2015
University of Colorado, Boulder	USA	March 31, 2015
Colorado State University	USA	March 31, 2015
University of Connecticut	USA	April 1, 2015
University of Delaware	USA	May 8, 2015
University of Florida	USA	May 8, 2015
University of Central Florida	USA	April 10, 2015
University of Georgia	USA	April 10, 2015
University of Hawaii, Manoa	USA	April 10, 2015
Boise State University	USA	May 8, 2015
Indiana University, Bloomington	USA	May 11, 2015
Purdue University	USA	March 31, 2015
University of Iowa	USA	April 22, 2015
University of Kansas	USA	May 11, 2015
University of Maryland	USA	March 13, 2015
Massachusetts Institute of Technology	USA	April 2, 2015
University of Michigan	USA	April 23, 2015
University of Minnesota, Twin Cities	USA	April 1, 2015
University of Missouri	USA	April 2, 2015
University of Nevada, Reno	USA	April 24, 2015
New York University	USA	May 28, 2015
Columbia University	USA	May 28, 2015
State University of New York, Buffalo	USA	May 28, 2015
Duke University	USA	June 2, 2015
North Carolina State University	USA	June 2, 2015
North Dakota State University	USA	June 2, 2015
The Ohio State University	USA	June 3, 2015

Table AIV.
Non-US Universities Emailed

University	Country	Date(s) contacted
Universidad Compultense	Spain	n/a
Birkbeck, University of London	UK	n/a
Royal Holloway, University of London	UK	n/a
Trinity college Dublin, University Dublin	Ireland	n/a
LMU München, University Munich	Germany	n/a

Appendix 2. Recruitment advertisements

Note: e-mails were sent to multiple scholars at one time, but were tailored based upon discipline. Below, we provide an example of the content of the e-mails.

Recruitment Flyer (distributed via listservs and social media)

Attention my fellow academics: Are you an academic who uses RG? Please take our survey and help us learn about the role of social media in academia! You can be from any field/discipline (grad students, postdocs, and professors alike can participate). Please help share the link too!

Example of e-mail recruitment

Medical scholars' use of Social Media

Calling medical scholars! Please help us out with our new online survey. We are interested in learning more about how individuals in academia use various social media for professional and work-related purposes. Importantly, we hope to have as many disciplines as possible represented, including medicine. Basic requirements: You must be in academia (any career stage, i.e. grad student, post-doc, professor). You do not have to be a social media user (we are recruiting both users and non-users). By participating you have a chance to win an Amazon voucher. Please feel free to share the survey with other academics you know!

Study link: blinded for review

Contact info: blinded for review

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