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Academic engagement: Differences between intention to adopt Social Networking Sites and other online technologies

Eleni Dermentzi [a], Savvas Papagiannidis [a, *], Carlos Osorio Toro [b], Natalia Yannopoulou [a]

[a] *Newcastle University Business School, 5 Barrack Road, Newcastle upon Tyne NE1 4SE, UK*
[b] *Liverpool Business School, Redmonds Building, Brownlow Hill, Liverpool, Merseyside L3 5UG, UK*

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ABSTRACT

This article studies firstly academic willingness to use online technologies in order to engage with their peers and secondly, whether there are any differences between academics using Social Networking Sites (SNS) and other online technologies. We synthesised the Decomposed Theory of Planned Behaviour and the Uses and Gratifications Theory, proposing a conceptual model that is evaluated twice using Structural Equation Modelling. Differences were observed between the model of SNS and the model of online technologies. Academics consider SNS more suitable for networking and presenting a professional image and the rest of online technologies for making new acquaintances in their research area and seeking academic information. Our findings have important implications as we were able to demonstrate the ecological validity of the joint model in two different cases and provide information about how academics approach online engagement. The need for providing training in utilising online technologies is evident, especially in the case of SNS, as self-efficacy is the main factor that affects perceived behavioural control, which in turn affects behavioural intention. In addition, the non-significant effect that social norms have on intention in the case of SNS indicates that universities may have to use different promotional techniques internally.

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1. Introduction

Online technologies have long been established as communication and collaboration tools in academia. In particular, when it comes to networking and information exchange Social Networking Sites (SNS) seem to prevail. SNS have been defined as "*web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system*" (Boyd & Ellison, 2007). Although many of them have not been created specifically for professional purposes, research has shown that scholars employ them as professional tools that can be used beyond instructional purposes (Veletsianos, 2012). SNS use has been found to have a positive effect on job performance and help employees balance their work-life realms (Moqbel, Nevo, & Kock, 2013). In addition, SNS can facilitate the creation of social capital in academia (Madhusudhan, 2012; Richter, 2011) and make Networked Participatory Scholarship, "*the practice of scholars' use of participatory technologies and online social networks to share, reflect upon, critique, improve, validate, and further their scholarship*", feasible (Veletsianos & Kimmons, 2012). Equally importantly, SNS can help both academics and institutions increase community outreach, their impact on society and their effectiveness in accomplishing their goals (Forkosh-Baruch & Hershkovitz, 2012; Veletsianos & Kimmons, 2013).

Due to the significant benefits that SNS can potentially offer in an academic context, scholars have begun to examine the use of SNS for academic purposes more systematically. However, so far research has focused exclusively on addressing "how" SNS can change academic practice and "what" the academics' usage patterns are (Forkosh-Baruch & Hershkovitz, 2012; Madhusudhan, 2012; Van Noorden, 2014; Veletsianos, 2012; Veletsianos & Kimmons, 2012, 2013). For example, a recent study has shown that Italian academic staff use SNS mainly for personal reasons and for connecting with other academics in their professional networks rather than for teaching (Manca & Ranieri, 2016). Our work builds

* Corresponding author.
E-mail addresses: e.dermentzi@newcastle.ac.uk (E. Dermentzi), savvas.papagiannidis@ncl.ac.uk (S. Papagiannidis), c.a.osoriotoro@ljmu.ac.uk (C. Osorio Toro), natalia.yannopoulou@newcastle.ac.uk (N. Yannopoulou).

on this emerging body of research, extending it by focusing on "why" scholars are willing to use online technologies and participate in SNS as part of their academic engagement activities. To the best of our knowledge this is the first scholarly article that attempts to understand the motivating factors that drive academics to adopt online technologies (SNS and other technologies) for networking quantitatively. Previous studies have been of an exploratory nature so far, using qualitative approaches and focusing exclusively on SNS (Gruzd, Staves, & Wilk, 2012; Lupton, 2014). Even in the cases where the researchers have used a mixed method approach, as in the study of Donelan (2015), the quantitative part is not theory-driven but follows the interpretivist paradigm, mainly analysing answers to open ended questions. Although such approaches are extremely useful when studying new phenomena, they hinder the generalisability of the results and therefore their applicability in practice. In addition, current research is based entirely upon the views of users of SNS, ignoring the vantage point of academics that do not use online technologies for professional purposes. Examples of such studies are the ones that are based largely on the analysis of data extracted from Twitter (Ferguson & Wheat, 2015; Li & Greenhow, 2015). This could limit the potential practical value of the findings as stakeholders such as SNS providers and universities are equally interested in knowing the factors that could motivate non-users to adopt such technologies, so that they can launch appropriate strategies.

Based on the above, the research objective of this article is to study the use of online technologies for academic engagement, taking into consideration both users and non-users of online technologies. More specifically, we aim to study firstly why academics are willing to use online technologies in order to engage with their peers and what the motivating factors are and secondly whether there are any differences between academics using Social Networking Sites for engagement purposes and other technologies (OT, e.g. webpages, blogs, forums, portals etc.). By separating SNS from other online technologies and studying them in parallel we also provide insights as to how social networking applications are perceived compared to other more established technologies. In order to address the above questions, we synthesise and apply the Decomposed Theory of Planned Behaviour (Decomposed TPB) and the Uses and Gratifications Theory, proposing a conceptual model that aims to determine the factors that affect academics' intention to use online technologies in order to disseminate their research and engage with their colleagues. On one hand, the Decomposed TPB has been found to provide a fuller understanding of behavioural intention in IT studies compared to other acceptance models (Taylor & Todd, 1995), while on the other Uses and Gratifications Theory is an appropriate theoretical framework for examining the uses of new media by individuals (Foregger, 2008; Papacharissi & Rubin, 2000). The joint use of the two theories will provide a robust theoretical framework that will capture the technologies under study holistically.

This paper is organised in the following way. Firstly, we review the related literature and propose a research model and associated hypotheses. Then, we present our methodology and the results of our data analysis. The discussion of the results follows and the paper concludes with the implications of our findings, the limitations of our study and potential directions for future research.

2. Literature review

2.1. Engagement and collaboration within academia and the role of online technologies

In the context of our work, engagement is defined as a two-way communication process among academics, involving interactions and listening, with the goal of generating mutual benefits for all parties involved (NCCPE, 2015). While this form of communication is usually informal and ad hoc, it can lead to a more formal type of interaction, namely a research collaboration. A research collaboration can take various forms depending on the institution, field, sector and country, and is typically measured through multi-author or multi-address papers (Katz & Martin, 1997). Its importance stems from the benefits that it provides to academics, as it is associated with high academic performance and productivity (Abbasi, Wigand, & Hossain, 2014; Ductor, 2014; Rostan & Ceravolo, 2015; Zutshi, McDonald, & Kalejs, 2012). A collaboration is usually initiated by the material, knowledge-based or social needs of academics, such as the need for infrastructure, research equipment and personnel (Melin, 2000; Rostan & Ceravolo, 2015). However, early career researchers may also be motivated to initiate interactions with their colleagues by needs for impression management and symbolic inclusion in networks (Pifer & Baker, 2013). PhD students, on the other hand, initiate professional relationships and interactions as they seek support, advice and guidance from more experienced students and academics (Baker & Pifer, 2011).

Although it has been suggested that online technologies facilitate the development of international collaborations, research results are inconclusive about the role of the Internet in the formation of academic networks (Wagner & Leydesdorff, 2005). In the past few years there has been a growing interest in the topic, resulting in a number of studies that mainly examine the use of social media in academia. This may be due to the characteristics that make them popular among academics. For example, Twitter, which enables quick and direct responses even among users that are not connected to each other, has been found to be an important source of support and professional socialisation for early career academics that use channels like #ECRchat to discuss topics relevant to the academic career and create a professional online image (Ferguson & Wheat, 2015). Twitter is also used by academics who want to share resources that contribute to academic discussions in their research field. However, contrary to what one may have expected, it is not used to a great extent for self-promotion (Stewart, 2015). Another study reported use of Twitter is being utilised as a conference backchannel that enables information sharing, building connections, and note-taking (Li & Greenhow, 2015).

Academia.edu has been studied as a case study as well, since it is one of the few purely academic SNS. Academics have reported that the main reasons for using the site are getting in touch with other researchers, disseminating their research results and getting informed about other researchers' activities. However, their actual use shows that they do not utilise the full capacity of the site to meet their goals, since most of them do not upload any documents and follow fewer than ten academics (Nández & Borrego, 2013). Another study about Mendeley has shown that the motivation to enhance one's professional profile and to share information about research articles was stronger only for users that joined many groups (Jeng, He, & Jiang, 2015). This may explain the absence of a clear relationship between altmetric (i.e. number of views, downloads and followers/followings on SNS) and bibliometric indicators at author level. According to a recent study, the correlations between them are poor and therefore altmetrics can be used only for evaluating the networking and social skills of researchers rather than being used as a proxy for research evaluation at author level (Ortega, 2015). However, another study that focuses exclusively on ResearchGate has shown that the metrics of this SNS along with other bibliometrics (e.g. impact points, number of citations and downloads etc.) can measure researchers', institutions' and countries' academic performance in a more holistic way (Yu, Wu, Alhalabi, Kao, & Wu, 2016). This is probably an indication that some academic SNS are more popular than others and therefore

they can predict academic performance better than the rest.

Blogs are also popular in academia as they give the opportunity to academics to develop their academic identity online. On some occasions, academic journals actively support the 'blogging trend' by providing an online platform to their readers where they can share their research and ideas prior to or while publishing in the journal (Matthews-Jones, 2016). Academic engagement also thrives on websites that include Web 2.0 features. More specifically, a recent study has shown that introducing gamification (i.e. "using game mechanisms or elements in non-game contexts for commercial or educational purposes") into an online platform about research can impact positively on the dissemination of academic results and promote engagement not only among academics, but also public engagement (Kuo & Chuang, 2016).

Despite the aforementioned benefits that SNS can offer to academic practice, academics face a number of barriers when they attempt to incorporate them in their daily work routine. Risks such as misinterpretation, misrepresentation, confrontation and intellectual property violation on SNS are evident according to the academics that use them (Ferguson & Wheat, 2015). In online groups that consist of many prominent researchers, the likelihood of an academic becoming active decreases, which may be an indication that academics think that the risk of losing reputation in such online groups is high (Matzat, 2009). Academics also point out the lack of institutional support as far as the use of SNS in concerned (Nández & Borrego, 2013), along with the general feeling that online engagement is illegitimate (Stewart, 2015) or superficial (Ferguson & Wheat, 2015). These different mind-sets regarding the academic use of SNS result in a type of "digital divide" that 'creates a sense of isolation from their peers in the minds of "digital scholars" that have not adopted technology for scholarly work (Costa, 2015). Finally, lack of time and online skills can also be obstacles for academics with regards to using SNS (Donelan, 2015).

2.2. Conceptual framework

The Decomposed TPB is an alternative version of the TPB model proposed by Ajzen (1991). According to the TPB model, human behaviour is affected by three factors: a) attitude towards behaviour, which can be either favourable or unfavourable and is formed by beliefs about the likely consequences or other attributes of the behaviour b) subjective or social norm, which is the perceived social pressure or in other words beliefs about the normative expectations of other people, and c) perceived behavioural control, which is "*the perceived ease or difficulty of performing the behaviour*". These three factors lead to the development of behavioural intention (Ajzen, 2002). In the Decomposed TPB, the three factors are analysed further by taking apart the various dimensions that comprise them. Consequently, the Decomposed TPB provides a more holistic understanding of behavioural intentions, since the analysis of the factors renders the relationships among them clearer and easier to understand and interpret (Taylor & Todd, 1995).

While the Decomposed TPB is a suitable model for examining Information Technology (IT) usage (Taylor & Todd, 1995), it is not contextualised on new media, such as SNS. Hence, the Uses and Gratifications Theory, which is considered more appropriate for understanding the uses of new media by individuals (Foregger, 2008), has been adopted. The theory sheds light on how individuals use communication tools among other resources in order to meet their needs and accomplish their goals. It is based on five basic assumptions: a) the audience is conceived of as active, b) the audience takes a great deal of initiative in linking "*need gratification*" and media choice, c) media compete with other sources of need satisfaction, d) as far as methodology is concerned, many of

the goals related to mass media use can be derived from data provided by the audience itself, and e) judging the cultural significance of mass communication should be avoided while audience orientations are separately explored (Katz, Blumler, & Gurevitch, 1973).

Based on the Decomposed TPB (Taylor & Todd, 1995) and Uses and Gratifications Theory (Katz et al., 1973), we propose a research model that investigates how academics' intention to use online technologies in order to engage with their peers is formed. The model is evaluated twice, once with data about academic use of SNS and once with data about other online technologies (OT). The section that follows examines the various factors that may affect attitude towards behaviour, social norms, perceived behaviour control and lastly intention. The hypotheses presented below are proposed twice, once for SNS and once for other online technologies.

2.2.1. Self-promotion and image

One of the needs related to the use of media, as proposed by the Uses and Gratifications Theory, is the need to gain insights into one's personal identity (Flanagin & Metzger, 2001). Web sites are regularly used for implementing impression management strategies (i.e. strategies that aim to control information about a person, an object, an entity or idea) (Connolly-Ahern & Broadway, 2007). Participation in online communities has also been connected with self-interest motives, like seeking to enhance one's reputation (Faraj & Johnson, 2010). SNS are often used by politicians to facilitate campaign communication and improve their image as candidates during election campaigns (Bor, 2014). In the academic context, blogs are often used as tools for sharing thoughts about academic work conditions and policies and even promoting one's expertise by providing advice (Mewburn & Thomson, 2013), activities that eventually result in the creation of a virtual academic identity. Likewise, SNS have been found to be used by academics as tools for forming digital identities and engaging in impression management (Veletsianos, 2012). Many academics use social media in order to increase the visibility of their research and discuss their ideas with their colleagues (Lupton, 2014; Menendez, Angeli, & de Menestrina, 2012). We suggest that academics' need for self-promotion, which is the manifestation of someone's abilities or accomplishments in order to be seen as competent by others (Bolino & Turnley, 1999) and enhancement of professional identity, affects their attitude towards using online technologies for engagement in a positive way.

H1. Academics' need for self-promotion positively affects their attitude towards using SNS/other online technologies for academic engagement.

H2. Academics' need to maintain a positive image positively affects their attitude towards using SNS/other online technologies for academic engagement.

2.2.2. Information seeking

Knowledge management, including information exchange is a common motive for using online services. According to Papacharissi and Rubin (2000), information seeking is the most salient use of the Internet. This is especially true for virtual communities, with online users stating that the main reason they visit them is the opportunity to exchange information (Ridings & Gefen, 2004). A more recent study has found that information seeking is a motive for using SNS too, as users regard social relationships as useful sources for information (Kim, Sohn, & Choi, 2011). This is in agreement with other studies suggesting that information seeking is one of the four gratifications derived from using SNS (Ku, Chu, &

Tseng, 2013). There is also evidence that when employees perceive SNS useful for knowledge exchange, their intention to seek information on SNS for work-related purposes is higher (Behringer & Sassenberg, 2015).

SNS are used for information dissemination in academia too (Lupton, 2014; Menendez et al., 2012). More specifically, many academics use SNS in order to keep in touch with new developments and events and provide access to new or unpublished articles in their research field (Lupton, 2014). Also, it is not uncommon for academics to use SNS like Academia.edu in order to provide personal and contact information (Menendez et al., 2012). Thus, SNS and online technologies in general can be used as sources for information within academic community.

H3. Academics' need to seek information positively affects their attitude towards using SNS/other online technologies for academic engagement.

2.2.3. Networking

Studies about the use of online communities have shown that many of the ways that people use to communicate during face-to-face interactions are replicated in online environments, with online members seeking social support or friendships by joining an online community (Maloney-Krichmar & Preece, 2005; Ridings & Gefen, 2004). Not surprisingly, one of the main uses of SNS is networking in the form of maintaining old ties and creating new ones with peers that share the same interests (Foregger, 2008; Kim et al., 2011; Ku et al., 2013). Academics also use SNS for connecting and establishing networks and sometimes they even use SNS as platforms for multi-disciplinary collaborations (Gruzd et al., 2012; Jung & Wei, 2011; Lupton, 2014). We expect that:

H4. Academics' need to maintain old contacts positively affects their attitude towards using SNS/other online technologies for academic engagement.

H5. Academics' need to create new contacts positively affects their attitude towards using SNS/other online technologies for academic engagement.

2.2.4. Peer and external influence

As the Decomposed TPB suggests, social norms are affected by peer influence, which takes the form of encouragement or opposition towards using the IT in question (Taylor & Todd, 1995). Hsu and Chiu (2004) have added an additional factor, namely "external influence", which is the influence from mass media, experts and any other non-personal information that could affect individuals' considerations about performing the behaviour. Bhattacherjee (2000) agrees that external influence is an important determinant of social norms in IT-related contexts. Academics appear to take into consideration their colleagues' opinions about SNS, even if these opinions come from academics outside their home organisation or from a different discipline (Gruzd et al., 2012). Based on the above, the following hypotheses are put forward:

H6. Peer influence positively affects the social norms of academics regarding their use of SNS/other online technologies.

H7. External influence positively affects the social norms of academics regarding their use of SNS/other online technologies.

2.2.5. Privacy control

Privacy control involves the ability of academics to control information about themselves and their research in online environments. For example, as far as SNS are concerned, privacy control could be influenced by the privacy policy of SNS, the awareness that information is being collected, the voluntary character of the information submission, and the openness of information usage by the SNS (Xu, Michael, & Chen, 2013). So far, privacy control has been associated with the alleviation of privacy concerns in SNS (Xu et al., 2013) and Internet use (Dinev & Hart, 2003). In the case of academics, these concerns are about privacy in general, inability to control the content posted on social media and copyright issues (Gruzd et al. 2012; Lupton, 2014). Ajzen (2002) has introduced the general notion of controllability as the second factor that, along with self-efficacy, comprises the perceived behavioural control in the TPB model. We hypothesise that:

H8. Privacy control in SNS/other online environments positively affects the perceived behavioural control of academics.

2.2.6. Self-efficacy

In the context of online technologies, self-efficacy refers to users' beliefs about their capabilities of using online technologies. Lack of technological proficiency can be an important barrier to knowledge sharing in online communities (Ardichvili, 2008). The Decomposed TPB suggests that self-efficacy is one of the determinants of perceived behavioural control (Taylor & Todd, 1995). This notion is also supported by research in the e-commerce field that found that self-efficacy influences perceived behavioural control significantly (Hung, Ku, & Chang, 2003). Although academics are sufficiently technologically competent since they have to use the Internet in their academic practice (e.g. getting access to academic journals, submitting manuscripts through journals' online systems etc.), they may still feel that they have difficulties in managing personal and professional information when they use online tools like SNS (Gruzd et al. 2012). We therefore expect that:

H9. Self-efficacy related to the use of SNS/other online technologies positively affects the perceived behavioural control of academics.

2.2.7. Attitude, social norms and perceived behavioural control

TPB has been applied in many instances in the IT research area, showing that intention to adopt web technologies or e-services is affected positively by attitude and perceived behavioural control (Ajjan & Hartshorne, 2008; Hartshorne & Ajjan, 2009; Lu, Zhou, & Wang, 2009; Shih, 2008). Social norms have also been positively associated with intention in cases of web applications that focus on communication and interaction among online users (Hartshorne & Ajjan, 2009; Liao, Chen, & Yen, 2007; Lu et al., 2009). In addition, research on social networking has shown that attitude toward social networking is positively associated with intention to use social networking (Peslak, Ceccucci, & Sendall, 2011). Similarly, social (or subjective) norms, which is the second factor that affects behavioural intention in TPB, is found to be positively correlated to intention in an SNS context (Peslak et al., 2011). Finally, perceived behavioural control has also been found to have a positive relationship with intention in a similar context, that of participating in virtual communities (Lin, 2006). Based on the above, the following hypotheses are formulated:

H10. Attitude of academics towards using SNS/online technologies for academic engagement positively affects intention to use SNS/other online technologies for this purpose.

H11. Social norms of academics related to using SNS/online technologies for academic engagement positively affect intention to use SNS/other online technologies for this purpose.

H12. Perceived behavioural control of academics related to using SNS/other online technologies for academic engagement positively affects intention to use SNS/other online technologies for this purpose.

3. Methodology

The main analysis of our data was conducted by using AMOS 22.0. We chose a Structural Equation Modelling (SEM) technique as this makes it possible to examine a series of relationships simultaneously, and therefore we can test complex models in a more comprehensive way than any other multivariate technique (Hair, Black, Babin, & Anderson, 2014) We followed a two-step approach like the one suggested by (Anderson & Gerbing, 1988), which includes "*the separate estimation and respecification of the measurement model prior to the simultaneous estimation of the measurement and structural submodels*".

3.1. Sampling and participants profile

For the purposes of the study a purposeful sample that covers academics from different disciplines, career stages and countries was employed. In order to achieve this we used two different sampling techniques: a) we distributed the link to the survey via social networking sites, by posting it on groups with an academic focus and using our personal profiles on Twitter, Academia.edu etc. b) we created a random sample of 3000 academics and sent the link to the survey through email invitations. Since there is no list of academics around the world, we chose universities at random. After discarding the incomplete responses and outliers, 370 valid responses remained for our analysis. We ran independent samples t-tests to check for differences between the responses from the email sample and the SNS sample and no significant differences were observed, indicating that sampling bias is not an issue in our study.

The vast majority of the participants are SNS users and most of them are based in universities in Europe. Almost half of them conduct research in areas of the Social Sciences (Table 1). While 60% of the respondents stated that they use SNS in order to engage with their academic peers, only 37% stated the same for other online technologies. However, almost 65% of the respondents reported that at least half of the time they spend on using OT is for work-related purposes. The same was not true about SNS, where the percentage of respondents that stated that they use SNS for work-related reasons at least half of the time they are on SNS is just 31%. Overall our sample had a reasonable distribution of attributes and usage patterns among the demographics captured (Table 1).

3.2. Data collection and measurements

The online questionnaire that was used in the study was constructed by following the main premises of the two theories discussed (Ajzen, 2002; Francis et al., 2004). The measurements were based on a number of previously validated scales adapted from the literature (Table 2).

In order to examine the differences in academics' intention to use SNS and to use online technologies, the participants were asked the questions twice, once in relation to engagement through SNS and once for engagement via online technologies (OT). Hypotheses designated with "*a*" refer to SNS, while those designated with "*b*" refer to other online technologies.

Data were screened for normality issues and all the values of skewness and kurtosis were found to be within the recommended range of ± 2.58 (Tabachnick & Fidell, 2012). We ran both Exploratory

Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) in order to assess the construct reliability and validity. The Kaiser−Meyer−Olkin (KMO) and maximum likelihood analysis were conducted to examine the adequacy of the study sample and the validity of the study instrument, respectively. After removing one item from New Contacts (Table 2), due to failure to load with the expected factor, we found that the value of KMO for the SNS model was 0.932 and 0.930 for the OT model. All the items loaded on each distinct factor and explained 76.16% and 81.35% of the total variance in the SNS and OT model respectively. The reliability of the scales was also tested and the Cronbach's alphas of all scales ranged between 0.787 and 0.976 (Table 3), indicating very good reliability according to Fornell and Larcker (1981).

We further tested construct reliability and validity by conducting CFA using the AMOS software package. After removing one item from Perceived Behavioural Control (PBC3) in the SNS model as it had poor loading during CFA we got the results that can be seen in Table 3. All the constructs have Composite Reliabilities (CR) above the recommended value of 0.70 and the Average Variance Extracted exceeds the threshold of 0.50 (Hair et al., 2014) and therefore reliability and convergent validity have been established. In addition, the square root of AVE is greater than inter-construct correlations for every construct; thus, there is discriminant validity among them (diagonals of Tables 4 and 5).

According to Hair et al. (2014), when the number of observations is above 250 and the model contains more than 30 observed variables, significant p-values are expected for χ^2 and a good model fit has been established when CFI is above 0.90, SRMR is 0.08 or less and RMSEA is less than 0.07. Our measurement model for SNS meets all the above thresholds ($\chi^2/df = 1.765$, CFI $= 0.954$, SRMR $= 0.0563$, RMSEA $= 0.046$), demonstrating a good model fit. Similarly, the measurement model of OT meets all the aforementioned criteria ($\chi^2/df = 1.928$, CFI $= 0.952$, SRMR $= 0.0441$, RMSEA $= 0.050$).

3.3. Common method bias

We used two different techniques in order to assess whether common method bias was a serious issue in our study. Firstly, we ran the Harman's single factor test suggested in the study of Podsakoff, MacKenzie, Lee, and Podsakoff (2003). After running an unrotated principal component factor analysis for each of the two models, we found that in both models a) more than one factor emerged and b) the first (largest) factor did not account for the majority of the variance (37.0% in the SNS model and 37.9% in the OT model). Secondly, we ran multiple regression analysis using the composites of the latent factors and found that VIF values ranged from 1.234 to 4.265 for SNS model and from 1.257 to 3.329 for OT mode. Thus, all the values were below the recommended, for covariance-based SEM, VIF threshold of 5 (Kock, 2015; Kock & Lynn, 2012). Based on the results of the two tests we conclude that common method bias is not an issue in our study.

4. Results

4.1. Examining potential differences between users and non-users

Before testing our structural models, we checked for differences in the means of the four main constructs (intention, attitude, subjective norms and perceived behavioural control) between academics that already use SNS/OT for engagement and academics that do not, by conducting a series of independent samples t-tests. We found that academics that already use SNS for engagement rated their intention to use SNS for engagement purposes higher (M $= 4.16$, SD $= 0.69$) than the rest (M $= 3.12$, SD $= 1.02$), t

Table 1
Sample demographics.

Characteristic	Frequency	%	Characteristic	Frequency	%
Gender			**Age**		
Male	202	54.6%	18—24	3	0.8%
Female	168	45.4%	25—34	106	28.6%
Total	370	100.0%	35—44	125	33.8%
Current post			45—54	72	19.5%
PhD student	65	17.5%	55—64	54	14.6%
Post-Doc/Research Associate	30	8.1%	65 or over	10	2.7%
Lecturer	81	21.9%	Total	370	100.0%
Senior Lecturer/Assistant Professor	102	27.6%	**Continent**		
Reader/Associate Prof./Professor	92	24.9%	Europe	282	76.1%
Total	370	100.0%	America	38	10.3%
Academic experience			Asia	24	6.5%
1—5	57	15.5%	Australia/Oceania	25	6.8%
6—10	113	30.5%	Africa	1	0.3%
11—20	130	35.1%	Total	370	100.0%
21—30	45	12.1%	**SNS user**		
31 and over	25	6.8%	Yes	304	82.2%
Total	370	100%	No	66	17.8%
Discipline group			Total	370	100.0%
STEM	91	24.6%	**Time per day on SNS**		
Humanities	36	9.7%	Less than 10 min	39	10.5%
Social sciences	215	58.1%	10—30 min	98	26.5%
Multidisciplinary	28	7.6%	31—60 min	65	17.6%
Total	370	100.0%	1—2 h	35	9.5%
% of time on SNS work-related			2—3 h	26	7.0%
0—25%	115	31.1%	More than 3 h	41	11.1%
26—50%	73	19.7%	No response	66	17.8%
51—75%	44	11.9%	Total	370	100.0%
76—100%	71	19.2%	**SNS use for engagement**		
No response	67	18.1%	Yes	222	60.0%
Total	370	100.0%	No	148	40.0%
% SNS contacts work-related			Total	370	100.0%
0—25%	89	24.1%	**Time per day using OT**		
26—50%	84	22.7%	Less than 10 min	14	3.8%
51—75%	57	15.4%	10—30 min	45	12.2%
76—100%	72	19.5%	31—60 min	67	18.1%
No response	68	18.3%	1—2 h	60	16.2%
Total	370	100.0%	2—3 h	54	14.6%
% time using OT work-related			More than 3 h	130	35.1%
0—25%	49	13.2%	Total	370	100.0%
26—50%	83	22.4%			
51—75%	122	33.0%	**OT use for engagement**		
76—100%	116	31.4%	Yes	137	37.0%
No response	–	–	No	233	63.0%
Total	370	100.0%	Total	370	100.0%

(234) = 10.85, p < 0.001. In addition, users rated their attitude towards SNS higher (M = 3.91, SD = 0.61) than non-users (M = 3.31, SD = 0.80), t (255) = 7.81, p < 0.001. The same was true for subjective norms (users: M = 4.48, SD = 1.39, non-users: M = 3.68, SD = 1.53, t (294) = 5.11, p < 0.001) and perceived behavioural control (users: M = 5.62, SD = 0.96, non-users: M = 4.90, SD = 1.16, t (275) = 6.27, p < 0.001). Similarly, differences were observed in OT data. Academics that already use online technologies for engagement rated their intention to use them for such purposes higher (M = 4.20, SD = 0.75) than those who do not (M = 3.33, SD = 0.89), t (324) = 9.97, p < 0.001. Differences were also observed in attitude (users: M = 4.08, SD = 0.68, non-users: M = 3.45, SD = 0.75, t (305) = 8.29, p < 0.001), subjective norms (users: M = 4.64, SD = 1.47, non-users: M = 3.74, SD = 1.53, t (368) = 5.53, p < 0.001) and perceived behavioural control (users: M = 5.46, SD = 1.17, non-users: M = 4.65, SD = 1.20, t (368) = 6.29, p < 0.001). Table 6 shows the means and standard deviations of the constructs.

We then explored potential factors that may affect the continuance intentions of academics that already use online technologies for engagement and explain the above differences between users and non-users. We conducted a linear regression analysis using the stepwise method and including potential predictors such as

satisfaction with SNS/OT, number of published papers, conference papers and books, academic experience in years, gender, age, time spent on using SNS/OT and number of contacts in SNS. In the case of SNS, the regression analysis, neither a person's outputs (which could be considered a proxy for content creation and sharing), nor individual characteristics play a significant role. The regression results showed that only satisfaction with SNS (Hsu & Chiu, 2004) (Cronbach's α: 0.865) and the number of SNS contacts had a significant relationship with intention to continue using SNS for engagement and were included in the model. More specifically, satisfaction with SNS (β = 0.480, p < 0.001) and number of SNS contacts (β = 0.176, p < 0.01) are significantly and positively related to intention to use SNS for engagement (adjusted R^2 = 0.281). As far as online technologies are concerned, the variables that were found to be significantly related to intention to use OT for engagement (Adjusted R^2 = 0.365) were satisfaction with OT (Cronbach's α: 0.910) (β = 0.608, p < 0.001) and gender (β = 0.192, p < 0.01). The Variance Inflation Factor (VIF) for the variables included in these models ranged between 1.018 and 1.028 and the tolerance between 0.973 and 0.983, values that are less than the threshold of 10 and above the threshold of 0.1 respectively (Hair et al. 2014), and hence multicollinearity was not considered an issue.

Table 2
Study's items.

Construct	Items	EFA loadings SNS	EFA loadings OT	Source
Intention	I1	0.876	0.762	(Ajzen, 2002; Lin, 2006)
	I2	1.002	0.764	
	I3	0.835	0.698	
Attitude	A1	0.789	0.897	(Peslak et al. 2011)
	A2	0.852	0.918	
	A3	0.904	0.898	
	A4	0.904	0.895	
	A5	0.924	0.897	
Subj. norms	SN1	0.850	1.004	(Lin, 2006; Taylor & Todd, 1995)
	SN2	1.001	0.907	
PBC	PBC1	0.447	0.631	(Lin, 2006; Taylor & Todd, 1995)
	PBC2	0.808	0.926	
	PBC3	0.788	0.708	
Privacy control	PC1	0.904	0.970	(Xu et al. 2013)
	PC2	0.937	0.966	
	PC3	0.912	0.951	
	PC4	0.769	0.725	
Old ties	OT1	0.820	0.970	(Foregger, 2008)
	OT2	0.508	0.750	
	OT3	0.869	0.957	
	OT4	0.692	0.756	
	OT5	0.902	0.854	
New contacts	NC1	0.804	0.921	(Kim et al. 2011)
	NC2	0.877	0.825	
	NC3	0.579	0.745	
	NC4	Removed	Removed	
Info seek	ISK1	0.814	0.754	(Kim et al. 2011)
	ISK2	0.732	0.599	
	ISK3	0.973	1.002	
	ISK4	0.904	0.938	
Image	IMG1	0.488	0.670	(Moore & Benbasat, 1991)
	IMG2	0.724	0.811	
	IMG3	0.979	1.034	
	IMG4	0.974	1.014	
	IMG5	0.896	0.771	
Peer influence	PI1	0.995	0.930	(Taylor & Todd, 1995)
	PI2	0.853	0.862	
External influence	EI1	0.706	0.784	(Hsu & Chiu, 2004)
	EI2	0.946	0.961	
	EI3	0.783	0.932	
	EI4	0.886	0.890	
Self-efficacy	SE1	0.767	0.837	(Lin, 2006)
	SE2	1.078	0.886	
	SE3	0.724	0.735	
	SE4	0.628	0.861	
	SE5	0.697	0.825	
Self-promotion	SP1	0.624	0.754	(Bolino & Turnley, 1999)
	SP2	0.880	0.917	
	SP3	0.984	0.973	
	SP4	0.955	0.970	
	SP5	0.805	0.885	

Table 3
Composite reliability, AVE and Cronbach's α of our model's constructs.

Construct	SNS			Other online technologies		
	C.R.	AVE	Cronbach α	C.R.	AVE	Cronbach α
Intention	0.967	0.908	0.965	0.972	0.921	0.972
Attitude	0.943	0.767	0.942	0.963	0.837	0.962
Subj. norms	0.944	0.893	0.943	0.976	0.953	0.976
PBC	0.774	0.641	0.787	0.841	0.638	0.843
Privacy control	0.927	0.760	0.930	0.953	0.837	0.951
Old ties	0.899	0.640	0.896	0.939	0.756	0.941
New contacts	0.913	0.777	0.911	0.901	0.752	0.899
Info seek	0.920	0.743	0.918	0.929	0.766	0.924
Image	0.932	0.735	0.937	0.943	0.767	0.947
Peer influence	0.946	0.897	0.945	0.954	0.912	0.954
External influence	0.906	0.706	0.902	0.952	0.831	0.951
Self-efficacy	0.910	0.672	0.916	0.924	0.708	0.922
Self-promotion	0.920	0.703	0.925	0.954	0.805	0.953

4.2. The structural models

After testing the full hybrid model of SNS ($\chi^2/df = 1.945$, CFI = 0.942, SRMR = 0.0767, RMSEA = 0.051) and OT ($\chi^2/df = 2.069$, CFI = 0.943, SRMR = 0.0755, RMSEA = 0.054), we obtained the results that are presented in Figs. 1 and 2.

As far as the SNS model is concerned, maintaining old contacts ($\beta = 0.212$, $p < 0.001$), creating new contacts ($\beta = 0.285$, $p < 0.001$), information seeking ($\beta = 0.165$, $p < 0.05$), and image ($\beta = 0.231$, $p < 0.001$) had a significant positive effect on attitude towards using SNS for academic engagement and therefore H4a, H5a, H3a and H2a were supported. The effect of self-promotion, on the other hand, was not significant and thus H1a was rejected. Peer influence ($\beta = 0.483$, $p < 0.001$) and external influence ($\beta = 0.145$, $p < 0.05$) had significant positive effects on social norms, and thereby H6a and H7a were supported. While self-efficacy ($\beta = 0.664$, $p < 0.001$) had a significant positive effect on perceived behavioural control,

Table 4
Construct correlation matrix for the SNS model (**AVE** on the diagonal).

	I	A	SN	PBC	OC	NC	Img	SP	PI	EI	PC	SE	IS
I	**0.953**												
A	0.764	**0.876**											
SN	0.438	0.497	**0.945**										
PBC	0.705	0.728	0.463	**0.800**									
OC	0.527	0.582	0.410	0.553	**0.800**								
NC	0.607	0.644	0.459	0.548	0.617	**0.881**							
Img	0.436	0.520	0.529	0.414	0.365	0.492	**0.857**						
SP	0.375	0.348	0.335	0.362	0.413	0.491	0.404	**0.838**					
PI	0.303	0.281	0.561	0.367	0.289	0.327	0.514	0.285	**0.947**				
EI	0.284	0.282	0.410	0.356	0.303	0.362	0.499	0.232	0.583	**0.840**			
PC	0.133	0.208	0.215	0.126	0.230	0.243	0.199	0.159	0.144	0.279	**0.872**		
SE	0.598	0.661	0.394	0.652	0.477	0.571	0.486	0.387	0.424	0.423	0.255	**0.820**	
IS	0.534	0.628	0.520	0.575	0.567	0.779	0.520	0.419	0.380	0.396	0.180	0.585	**0.862**

Table 5
Construct correlation matrix for the OT model (**AVE** on diagonal).

	I	A	SN	PBC	OC	NC	Img	SP	PI	EI	PC	SE	IS
I	**0.959**												
A	0.787	**0.915**											
SN	0.476	0.447	**0.976**										
PBC	0.597	0.616	0.569	**0.799**									
OC	0.376	0.417	0.309	0.419	**0.869**								
NC	0.508	0.557	0.439	0.481	0.654	**0.867**							
Img	0.390	0.398	0.537	0.407	0.302	0.396	**0.876**						
SP	0.414	0.316	0.369	0.374	0.346	0.396	0.399	**0.897**					
PI	0.393	0.377	0.718	0.472	0.338	0.398	0.568	0.379	**0.955**				
EI	0.242	0.322	0.499	0.374	0.307	0.416	0.469	0.270	0.613	**0.912**			
PC	0.122	0.275	0.283	0.327	0.145	0.182	0.307	0.182	0.300	0.339	**0.915**		
SE	0.468	0.519	0.307	0.616	0.378	0.469	0.392	0.349	0.329	0.380	0.281	**0.841**	
IS	0.524	0.595	0.519	0.585	0.489	0.621	0.457	0.326	0.445	0.439	0.211	0.529	**0.875**

Table 6
Means and standard deviations.

Construct	Mean -SNS	Standard deviation -SNS	Mean - OT	Standard deviation - OT
Intention	3.75	1.01	3.65	0.96
Attitude	3.67	0.84	3.68	0.84
Subj. norms	4.16	1.54	4.08	1.59
PBC	5.25	1.33	4.95	1.44
Privacy control	3.74	1.66	3.55	1.60
Old ties	3.60	0.94	3.30	1.01
New contacts	3.49	1.07	3.29	1.00
Info seek	3.46	1.13	3.56	1.03
Image	3.62	1.62	3.76	1.60
Peer influence	3.85	1.58	3.85	1.62
External influence	3.73	1.56	3.78	1.55
Self-efficacy	4.71	1.52	4.93	1.36
Self-promotion	2.67	1.08	2.64	1.08

the effect of privacy control was not significant and therefore only H9a was supported, whereas H8a was rejected. Finally, H10a and H12a were supported as attitude ($\beta = 0.524$, $p < 0.001$) and perceived behavioural control ($\beta = 0.335$, $p < 0.001$) affected intention to use SNS for academic engagement positively. H11a, however, was rejected as the effect of social norms on intention was not significant.

Taking the OT model into consideration, creating new contacts ($\beta = 0.262$, $p < 0.001$), information seeking ($\beta = 0.361$, $p < 0.001$), and image ($\beta = 0.105$, $p < 0.05$) had a positive effect on attitude towards using online technologies for academic engagement and thus H5b, H3b, and H2b were supported. H4b and H1b were rejected as maintaining old contacts and self-promotion did not have significant effects on attitude. Both peer influence ($\beta = 0.664$, $p < 0.001$) and external influence ($\beta = 0.100$, $p < 0.05$) had

significant and positive effects on social norms, supporting H6b and H7b. Similarly, privacy control ($\beta = 0.164$, $p < 0.001$) and self-efficacy ($\beta = 0.586$, $p < 0.001$) affected perceived behavioural control positively, supporting H8b and H9b. H10b, H11b and H12b were supported as well, since attitude ($\beta = 0.703$, $p < 0.001$), social norms ($\beta = 0.132$, $p < 0.001$) and perceived behavioural control ($\beta = 0.104$, $p < 0.01$) significantly and positively affected intention to use online technologies for academic engagement.

5. Discussion

The aim of this research was to study the factors that motivate academics to use online technologies in order to engage with their peers and determine whether there are any differences between using SNS and other online technologies. Based on our data
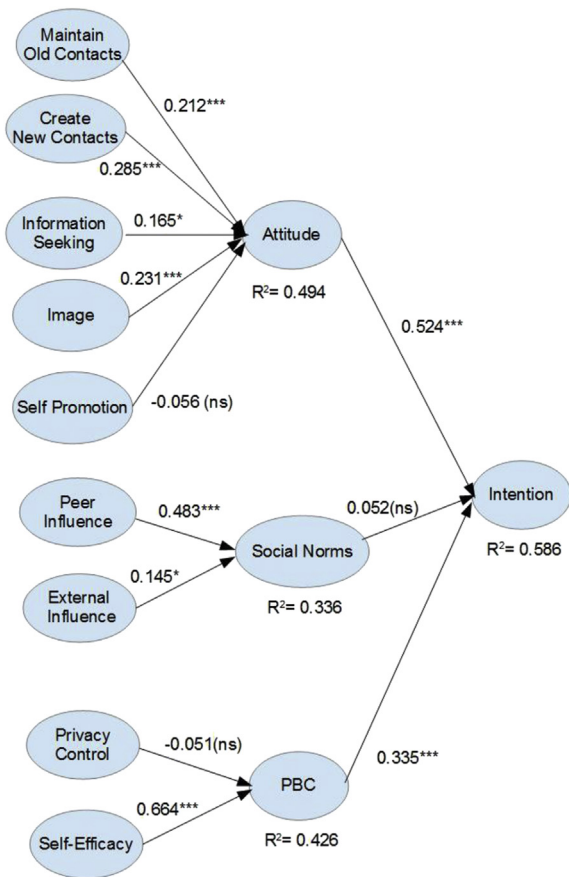
Fig. 1. Paths for SNS model (Note: ***sig. at 0.001, **sig. at 0.01, *sig. at 0.05 and ns = non-significant).
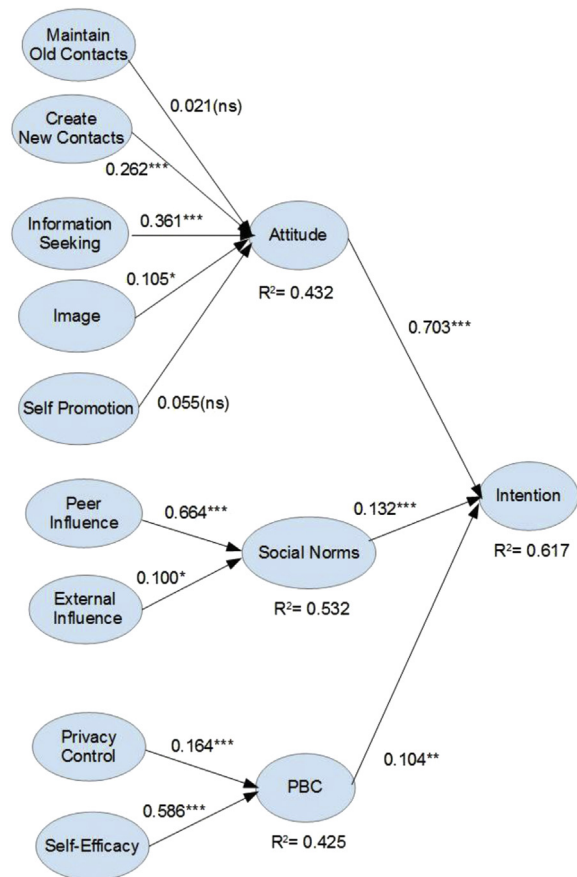

Fig. 2. Paths for OT model (Note: ***sig. at 0.001, **sig. at 0.01, *sig. 0.05, ns = non-significant).

analysis, nine out of the twelve hypotheses were supported in the SNS model and ten out of twelve in the OT model.

Starting with the Uses and Gratifications part of the model, it is interesting to note that the main difference regarding the factors that affect academics' attitude in the two models is that the need to maintain old contacts affects positively attitude only in the case of SNS. This shows that academics probably consider using SNS also as a way to maintain old contacts rather than just connecting with other academics that they do not know. For other online technologies, academics were found to use them for connecting to other academics in their research area, rather than peers that they already know.

A second interesting finding is that the effect of image was much stronger in the case of SNS than in the OT model. The perceived utility of SNS in maintaining a professional image in academia was expected, as it has also been reported in other studies (Ferguson & Wheat, 2015). This finding also conforms with the results of other studies that stress the important role that social media play as tools for building a professional image online (Fieseler, Meckel, & Ranzini, 2015; Gandini, 2016). The weaker effect in the OT model may be related to the way that such online technologies are used often focusing more on the utilitarian academic-oriented and not the aesthetic personal-oriented one. Whereas in SNS academics create profiles and their online presence is apparent and thus their image as an academic may be enhanced, the use of other online technologies may not be particularly evident, unless the academic has a personal website or blog.

A difference in the strength of the relationship with attitude has been observed in the case of information seeking. The effect of the

variable is stronger in the OT model, indicating that academics primarily consider online technologies other than SNS for seeking information related to their work. This could be attributed to the fact that online technologies, such as websites, newsletters, RSS feeds and wikis, have been long-established as reliable information channels and thus academics are more likely to accept and adopt them for seeking information for academic tasks. This finding is in line with the limited use of Twitter for practical-based issues by academics, which suggests that academics are concerned about the accountability of information through non-official channels (Knight & Kaye, 2016). This may also be the reason that privacy control affects significantly perceived behavioural control only in the OT model. As privacy control is relevant to information exchange online, it is understandable why it seems to be more important in the case of OT, which seem to be preferred by academics as sources of information. Also, previous research has shown that academics do not upload any documents on SNS (Nández & Borrego, 2013) and their willingness to share information is limited by concerns about copyright issues and the risk of their ideas being plagiarised (Lupton, 2014). It would be normal for academics to consider privacy control as a relatively unimportant factor of the overall control they believe they have over their SNS use, if they do not disclose any sensitive or significant information. In fact, it has been found that privacy concerns and information sharing on SNS are related, with privacy concerns having a negative effect on the self-disclosure of personal information (Xu et al., 2013).

Finally, the self-promotion motive has insignificant effects on attitude in both models. This finding agrees with the results of Stewart (2015), who found that Twitter was not used by academics

for self-promotion. A potential explanation is that self-promotion may be considered as something undesirable in academia as the focus should be on advancing knowledge and not one's personal interests. Indeed, it has been found that, in general, continuous posting about the user's success can have the opposite effect of being considered as undesirable posts, as well as affecting the self-esteem of people reading these posts (Osorio, 2015).

When it came to the second part of the model, attitude was found to have a strong and significant effect on academics' intentions in both the SNS and OT models. Similarly, perceived behavioural control affects intention positively in both cases, a finding that is in line with the expectations of TPB. The same is not true for social norms. While social norms affect intention positively in the case of online technologies, their effect in the case of SNS is not significant. This is not completely unexpected. For instance, Lin (2006), who looked into the intention to participate in virtual communities, found that social norms do not influence behavioural intention. An explanation for this discrepancy may be that while certain types of online technologies are used officially by universities and academics are encouraged or even required to use them in order to communicate with the organisation and their colleagues (e.g. websites, newsletters, portals etc.), this does not apply to SNS. On the other hand, as relevant studies have showed, the use of SNS for academic purposes is often considered illegitimate and superficial and academics that decide to use them after all do so even if they are not supported or encouraged by their institutions (Ferguson & Wheat, 2015; Nández & Borrego, 2013; Stewart, 2015).

The fact that differences were observed between the two models shows that even when the compared technologies are similar in nature, there may still be differences in how they are perceived by users and therefore no theoretical framework can explain the adoption of all technologies in general, but has to be adapted to fit the case under examination. This finding agrees with the conclusion that Venkatesh, Thong, Chan, Hu, and Brown (2011) reach, which highlights the importance of context and the need for consideration of context-relevant variables in studies about technology adoption and use.

6. Conclusions

The present study contributes to our understanding of academic engagement by examining the factors that affect academics' intentions to use SNS and other online technologies as a part of their academic practice. Differences were observed between the model of SNS and the model of online technologies, indicating that academics consider using SNS for different reasons and in different ways than the rest of online technologies. While academics' attitude and perceived behavioural control are the main drivers of their intentions in both cases, social norms play an important role only in the case of online technologies. Academics seem to consider SNS more suitable for networking (either for creating new contacts or connecting with the old ones) and maintaining a professional image in the academic community and the rest of online technologies for making new acquaintances in their research area and seeking academic information. As far as perceived behavioural control is concerned, self-efficacy plays an important role in both models, but privacy control is considered important only in the case of the other online technologies. In the OT model, where social norms are a significant predictor of intention, both peer and external influence are found to affect the social norms of academics.

6.1. Theoretical and practical implications

The paper's first theoretical contribution stems from the joint use the Decomposed TPB and the Uses and Gratification Theory. By

jointly using these theories, this study has made it possible to examine a number of motives users may have for using the chosen technologies for performing a given task (in our case engaging with academics). In doing so, we were able to demonstrate the ecological validity of the joint model in two different cases of technology usage. Secondly, we contributed to the growing body of literature studying why academics participate in SNS or use other technologies. By following a quantitative approach our study has filled the gap in the relevant literature in which qualitative methodology prevails. Using an established theoretical framework enabled us to determine specific factors that affect academics' behavioural intention. Our findings not only shed light in terms of how different user groups utilise online technologies but also how online technologies usage can be different when it comes to undertaking a set of tasks by the a user group.

From a practical perspective our findings provide information about how academics think about online engagement and adapt their engagement strategies accordingly. In an increasingly competitive sector, effective use of online technologies can provide tangible benefits for individual users. Similar strategies can be formed and executed at an institutional level. As academics are the ones that undertake research and create impact it is important that they feature at the foreground of their institution's engagement efforts with other researchers and the public. Providing training and support on how to use SNS and other online technologies could be helpful since self-efficacy has been found to play a crucial role in academics' perceived behavioural control. Training on how to maintain one's privacy could also be helpful in making academics feel more competent in using online technologies. In addition, associating the use of SNS for academic engagement with a professional image that is desirable in academia and recognising online engagement activities as a part of formal academic practice may result in more academics adopting social media for professional reasons. Finally, our findings can help academic online services providers, such as Academia.edu and ResearchGate, understand the needs of their members and design more effective services. For example, as academics focus on maintaining their connections and building their professional image, SNS providers can aim to offer new innovative online services that meet these needs and enhance the networking experience on their platforms. In addition, as social norms do not affect academics' intention to use SNS, marketing approaches that stress the actual benefits that an academic can gain by using SNS could prove to be more efficient in the recruitment of new members than approaches that encourage academics to join a social network because their peers are already members.

6.2. Limitations and future research

With regard to this study's limitations, due to the specific context on which our research focuses, asking questions that capture actual use reliably was not feasible. Although we were able to capture the general use of SNS/online technologies by asking respondents to self-report the time they spend on them, specific questions about the time spent on online technologies solely for engaging with other academics were considered too complicated as it is often difficult to separate personal from professional use. This is also due to the fact that most academics do not consciously separate the time they spend using online technologies for engagement purposes from the time they spend using them for other reasons. Consequently, our model accounts only for intentions and not for actual use. Also, our model does not differentiate intention from continuance intention. However, the results of the independent t-tests show that users rate intention, attitude, social norms and perceived behavioural control more highly than potential users in both the cases of SNS and OT. Also, the regression analysis shows

that satisfaction affects continuance intention. Therefore, future research could focus on continuance intention to use online technologies and how satisfaction affects the other variables of the model. Finally, the generalisability of our findings may be limited due to the demographics of our sample. Although special attention has been paid to including academics from different countries, levels of experience and disciplines, the majority of our respondents work in universities in Europe and almost half our sample comes from the social sciences. Using the results of this study to understand academics' motives from other disciplines and/or geographical areas should be done with caution.

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