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Expressive participation in Internet social movements: Testing the moderating effect of technology readiness and sex on student SNS use

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ABSTRACT

An understanding of students' use of social networking sites (SNS) for expressive participation in Internet Social Movements (ISMs) is absent in the literature on the social psychology of student social networking behavior. Using the Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical framework and survey data collected from 214 students in Spain, we empirically test the UTAUT theory in this context. Our results confirm that effort expectancy, social influence, and performance expectancy significantly affect students' intentions to use SNS for expressive participation in Internet social movements. We also test the moderating effect of students' sex and Technology Readiness (TR) on these UTAUT relationships. Our results show that the intention to use SNS is strongly influenced by effort expectancy for female students and students with self-reported low-levels of technology readiness. For male students and students with self-reportinghigh-levels of technology readiness, the relationship is strongly influenced by social influence. The implications of our findings for theory and practice are discussed.

1. Introduction

Social movements has been defined as social networks that engage in sustained collective action, have a common purpose and challenge the interests and beliefs of those with power (Tarrow, 2005). The rise in social media has facilitated the rise in mediated social movements, more commonly termed Internet Social Movements (ISMs). Social media enables individuals to find others with similar interests and social movement organizers to spread their message and generate pressure for action via the Internet (Rolfe, 2005). Social Movements in Spain and the uprising in Egypt, both of which were supported by social media, are recent examples of ISMs. Communication scholars suggest that social media serves as an important resource for social movement communication, provide opportunities that were not previously available through broadcast media (Kessler, 1984; Owens & Palmer, 2003; Steiner, 1992) and contribute to a shift in the balance of power amongst traditional actors (Castells, 2009). Communication power is the central form of power today, the Internet allows the construction of communicative autonomy and allows movements to communicate the emotions of outrage and hope that are needed for switching from collective emotions to collective action, and contemporary social movements are online and offline socially networked movements, for which social media are of crucial importance (Castells, 2012).

The specific class of social media that is playing a crucial role in this upsurge of participation in ISMs is the social networking sites (SNS) such as Facebook, MySpace, Tumblr, and Friendster. A report in 2011, published by the Center for the Digital Future, stated that the number of online community members has doubled and that 79% indicated that they participated in new social causes because of their involvement in online communities. An online community is defined in this study as a group that shares thoughts or ideas through electronic communication only. All online communities require a technological infrastructure with tools and applications to enable user interaction and communication (Wang, Chung, Park, McLaughlin, & Fulk, 2011). SNS are a combination of information and technology systems as well as human interface that allow their users to create an online community. SNS have enabled the dissemination of information regarding movement identity, views and issues to interested recipients both inside and outside the movement. They also serve as an instrument of mobilization by functioning as a relatively autonomous site of interaction and dialogue (Shangapour, Hosseini, & Hashemnejad, 2011).

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While popular research reports cite a rise in user participation in ISMs mediated by SNS, little empirical research exists that examines user beliefs about SNS and their use for the expressive socio-political participation. Previous research has focused on defining SNS and online communities while discussing their functionality (Wellman, 2001; Wenger, McDermott, & Snyder, 2002); their social affordances (Mynatt, O'Day, Adler, & Ito, 1998; Ruhleder, 2002); their design and evaluation (Kim, 2000; Preece, 2001; Shneiderman, 2002); strategies for attracting new user groups (Ren, Kraut, & Kiesler, 2007); and profiling user types by their participation (Bishop, 2007; Tedjamulia, Dean, Olsen, & Albrecht, 2005). While these studies highlight the emerging vanguard and supported uses of SNS to facilitate identity formation, mobilization, social networking and information diffusion, a gap exists in our understanding of the beliefs that influence how and why users of SNS use them specifically for expressive participation. This insight would provide further understanding of the role of SNS and social media in the emergence, development and outcomes of political and social movements.

A further gap in the literature is our understanding of the use of SNS for expressive participation by a very important and dominant segment of SNS users, that is, students or young adults. The justification for selecting this target group is based on the fact that they are heavy users of SNS (Ellison, Steinfield, & Lampe, 2007), also called hyper-SNS users. Hyper-SNS users are socially interesting and provide interesting implications for the use of social-media and civic engagement amongst younger adults. Students studying in higher education remain one of the heaviest user groups of the popular SNS Facebook, which was initially launched as a network for students to keep in touch with friends at university. Research shows that between 85% and 99% of college or university students use Facebook (Jones & Fox, 2009; Roblyer, McDaniel, Webb, Herman, & Witty, 2010) to support their social and peer interactions. Growth in student adoption of Facebook and social engagement through other SNS like YouTube and Friendster has brought the need to consider how young people use SNS for expressive participation in social and political movements and what influences this participation to the forefront of social and political discussions.

In this study we argue that young adults' beliefs about their technology readiness and their sex[1] moderates the relationship between their expectancy beliefs about SNS and their intention to use and their actual use of them for expressive participation. We use the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) as our theoretical framework and we make two key contributions to the literature. First, we employ UTAUT to understand student perceptions of SNS use expectations (performance expectancy and effort expectancy), social acceptance (social influence), and their perceptions about resource availability (facilitating conditions) in the use of SNS for expressive socio-political participation. Second, we report on the moderating effect of a student's sex and their beliefs about their Technology Readiness (TR) on the UTAUT relationships. To our knowledge, this is the first empirical study to test the moderating role of sex and technology readiness in understanding student beliefs for accepting and using SNS for ISMs.

[1] In technology acceptance and use research the dominant use of the term gender is as a synonym for sex, and thus refers to the biological condition of being male or female. However, gender studies which focuses on the socialization of technology acceptance increasingly use the term gender to refer to socio-psychological masculinity or femininity (Trauth, 2002; Wood & Dindia, 1998; Zahedi, Van Pelt, & Srite, 2006). The focus of this research is the biological condition of being male or female and, as such, the term sex or 'being male or female' is used.

1.1. Utility of Social Network Sites (SNS) for Internet Social Movements (ISMs)

SNS such as Facebook, YouTube and Tumblr have been popularly defined as "a web-based service that allows individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system" (boyd & Ellison, 2007, p. 211). Similarly, Kwon and Wen (2010) define SNS as "websites that allow building online relationships between persons by means of collecting useful information and sharing it with people". Essentially, SNS are online services or networked sites that enable individual members to construct his/her profile; to share text, images and photos; and to link with other members by applications and groups provided on the Internet (boyd & Ellison, 2007; Pfeil, Arjan, & Zaphiris, 2009; Powell, 2009; Tapscott, 2008). It is through these mediated social communication practices that users present themselves, connect to their social network, and develop and maintain social relationships with others (Ellison et al., 2007; Kane, Fichman, Gallaugher, & Glaser, 2009). Because of the rise in the number of sites and the number of users, SNS have become an important means of communication for many, but especially for young adults such as college students. They have also become an important social platform that is a critical part of these young adults' daily life (Correa, Hinsley, & de Zúñiga, 2010; Powell, 2009; Tapscott, 2008).

With the original objective of facilitating social interactions (Hoy & Milne, 2010), in recent years, popular social networking services have become important resources for the mobilization of collective action. This has lead to the subsequent creation, organization and implementation of social movements around the world. By functioning as a relatively autonomous platform for interaction and dialogue, they play a crucial role in the field of mediated social movements or cyberactivism. Prominent cyberactivism movements include anti-war (Bennett, Breunig, & Givens, 2008; Gillan, 2009; Vasi, 2006; Verhulst, 2010); anti-globalization (Kahn & Kellner, 2004); and global justice movements (Agarwal, Lim, & Wigand, 2012). Social networking services enable the dissemination of information regarding a movement's identity, views and issues to interested parties both inside and outside the movement, and by doing so, serve as platforms for the mobilization of social movement. SNS have not only increased political efficacy (Lee, 2006) and political participation in Egypt (Attia, Aziz, Friedman, & Elhusseiny, 2011; Howard & Hussain, 2011; Khamis & Vaughn, 2011; Tufekci & Wilson, 2012), they have also had a significant impact on social and political participation around the world. For example, they facilitated both the 2008 and 2012 presidential elections in the USA (Baumgartner & Morris, 2010; Conroy, Feezell, & Guerrero, 2012; Wattal, Schuff, Mandviwalla, & Williams, 2010); enabled information seeking during the political crisis in Tunisia (Lotan et al., 2011) and Iran (Morozov, 2009); mediated online political activism in China (Guobin, 2009); and spearheaded political change in Malaysia (Smeltzer & Keddy, 2010). Scholars have described SNS as an important new resource for the successful organization and implementation of social movements (Della Porta & Mosca, 2005; Langman, 2005; O'Lear, 1999; Wasserman, 2007) and for expressive participation by movement supporters (Conroy et al., 2012; Gil De Zúñiga, Puig-I-Abril, & Rojas, 2009; Howard & Hussain, 2011; Khamis & Vaughn, 2011; Puig-i-Abril & Rojas, 2007).

SNS give supporters the opportunity to express their social or political participation with and throughout their digital social networks. Discussion is thought to be integral to feelings of efficacy among citizens, and leads to higher rates of social activity (Andersen & Hansen, 2007; Cho et al., 2009; Delli Carpini, Cook, & Jacobs, 2004; Delli Carpini & Keeter, 1997; Fishkin, 1991; Gastil

& Dillard, 1999; Robinson & Levy, 1986). As mediated conversations are a core practice through SNS, discussion through a SNS page or group can encourage more thoughtful consideration of viewpoints (Eveland, 2004; Huckfeldt, 2007). The Internet has laid the foundation for a mediated context that is rich with diverse information and people. These foundations coupled with the conversational functionality of SNS have seeded fertile ground for the co-creation of groups with members who share similar values and ideas, a condition ripe for the discussion of politics with like-minded others (Bimber, 2008).

While there appears to be a general agreement among scholars that social media and specifically SNS are mediating social and political change through expressive participation, the distinctive and sustaining features for participation and users' expectancy beliefs are not well understood. A critical missing element is a theoretical framework that can lay a solid foundation for the understanding of the adoption of SNS for expressive participation, as well as provide insight on a growing and important group of citizens in society, i.e., higher education students.

2. Research model and hypotheses

The research model, proposed in this study, is based on the adaptation and integration of the unified theory of acceptance and use of technology (Venkatesh et al., 2003) and the technology readiness model (Parasuraman, 2000). In the research model in Fig. 1, SNS use represents a user's expressive social participation, that is, their beliefs about their personal expression online about matters concerning social causes. Formally, expressive social participation is defined as a form of social participation that entails the public expression of social orientations (Puig-i-Abril & Rojas, 2007).

2.1. Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT consists of four core determinants of technology behavioral intentions and usage: performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh et al., 2003). By synthesizing prior research on SNS adoption and UTAUT, the present study proposes a UTAUT-based framework to explain the process underlying the use of SNS for expressive participation (Fig. 1). To use this framework, we adapted the four core UTAUT beliefs discussed by Venkatesh et al. (2003) and Brown and Venkatesh (2005) to our context, i.e., expressive participation. *Performance expectancy* is defined as the degree to which using SNS will provide benefits to members in expressing participation on SNS. *Effort expectancy* is the degree of ease associated with the use of SNS for expressive participation. *Social influence* is the extent to which SNS members perceive that significant others, such as family and friends, believe they should use SNS for expressive participation. Finally, *facilitating conditions* refers to the SNS members' perception of the resources and support available to perform behavior akin to expressive participation. According to UTAUT, performance expectancy, effort expectancy, social influence and facilitating conditions are theorized to influence the behavioral intention to accept and use a technology, with this intention determining its use (Brown & Venkatesh, 2005; Venkatesh et al., 2003). Hence:

H1. Intention to use SNS for expressive participation will significantly predict its use.

H2. The performance expectancy of SNS will positively influence the intention to use SNS for expressive participation.

H3. The effort expectancy of SNS will positively influence the intention to use SNS for expressive participation.

H4. The social influence surrounding the use of SNS will positively influence the intention to use SNS for expressive participation.

H5. The facilitating conditions in using SNS will positively influence the intention to use SNS for expressive participation.

2.2. The moderating influence of sex

We argue that a user's sex plays a role in moderating UTAUT relationships. Many technology acceptance and usability studies include sex as a simple sample descriptor variable. Despite reports of similarity in terms of overall web adoption statistics, differences remain in how, why and what influences male and female web use. Females are reported to be less frequent and less intense users than males, as well as being less frequent online purchasers and are driven by different motives (e.g., women by social motives and men by search and enjoyment) (Garbarino & Strahilevitz, 2003; Gefen & Ridings, 2005; Simon & Peppas, 2005). However, despite the differences between male and female users in how they behave in a networked economy (Taylor, 2004; Wilson, 2004) and participate in its development (Robertson, Newell, Swan, Mathiassen, & Bjerknes, 2001), it is surprising that researchers have only recently

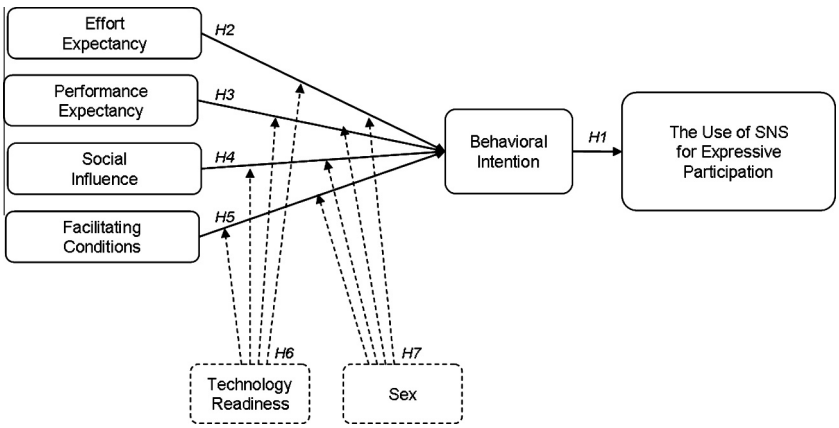

Fig. 1. Proposed research framework.

started to treat sex as a boundary condition that moderates technology belief–use–intention relationships (Venkatesh et al., 2003) and web use (Hasan, 2010; Hwang, 2010; Muscanell & Guadagno, 2012).

In this paper, sex is considered to be a boundary condition that moderates the effect between user expectancy beliefs about SNS use for expressive participation in ISM and their intention to use SNS in this context. Drawing upon previous research (Bozionelos, 1996; Venkatesh & Morris, 2000; Venkatesh et al., 2003), it is proposed that the effect of effort expectancy on behavioral intention will be more salient for women than for men. In the context of social influence, research suggests that women tend to be more sensitive to the opinions of others and therefore social influence is more salient when forming an intention to use new technology (Miller, 1976; Venkatesh, Morris, & Ackerman, 2000). Thus, effect declines with experience (Venkatesh & Morris, 2000; Venkatesh et al., 2003) and differs on the basis of the social context within which they have been socialized (Page, Robson, & Uncles, 2012). Hence:

H6. The belief–intention relationships proposed in H2, H3, H4, and H5 will be moderated by a participant's classification of being female or male.

2.3. The moderating influence of technology readiness beliefs

As the penetration rate of a new technology increases, so does customer frustration and disillusionment (Mick & Fournier, 1998). Technology users can therefore hold both positive and negative views about technology-based goods and services (Dabholkar, 1996). These paradoxical views can coexist with views ranging along a continuum from highly technology ready at the one end to highly technology resistant at the other (Mick & Fournier, 1998). Parasuraman (2000) described these resistant concerns as psychological barriers that dampen enthusiasm for embracing the technology and which adversely affectindividuals' technology readiness. He coined the term *Technology Readiness* (TR), which describes the propensity to embrace new technology for accomplishing goals in home life and at work. It is an overall state of mind resulting from a gestalt of mental contributors and inhibitors which collectively determine predisposition to use new technologies (Parasuraman, 2000). TR is composed of four components: *optimism* and *innovativeness* (contributors) and *discomfort* and *insecurity* (inhibitors). Optimism is a positive view that technology offers increased control, flexibility and efficiency. Innovativeness refers to a tendency to be a technology pioneer and thought leader. Discomfort is a perceived lack of control over technology and a feeling of being overwhelmed by it. Insecurity relates to a distrust of technology andscepticism about its ability to work properly. Feelings of insecurity inhibit some people from sharing personal information or doing business with a company that can only be reached electronically. The TR model has been applied to a variety of contexts including self-service technologies (Elliot & Meng, 2009; Lin, Shih, & Sher, 2007); the construction industry (Jaafar, Abdul Aziz, Ramayah, & Saad, 2007); wireless technology (Chang & Kannan, 2006); online services (Taylor, Celuch, & Goodwin, 2002); educational choice (Hendry, 2000); and healthcare services (Rosen et al., 2003).

Parasuraman and Colby (2001) found that the markets for technologically based products fall into five segments on the basis of their technology readiness scores (see Table 1) and that each TR segment entered the market at different times (i.e., explorers before pioneers, pioneers before sceptics, and so on). Tsikriktsis (2004) replicated Parasuraman and Colby's (2001) research in the UK and found support for the existence of all types of technology users, except for paranoids. In the context of the present study, TR stands out as a key factor as the technology ready activist segments could evolve with the evolution of the ISMs' development. The underlying belief structures of each TR segment may provide a meaningful explanation of why a particular SNS user segmentplaces more (or less) importance on a specific feature of expressive participation in ISMs with, and through, SNS.

Table 1
Definition of technology readiness segments.

Segment	Definition
Explorers	The first to adopt technology because they have no fears about it (high on optimism and innovativeness and low on discomfort and insecurity)
Pioneers	They share the optimism and innovative views of explorers, but they also feel some discomfort and insecurity (high on optimism and innovativeness but above average on discomfort and insecurity)
Sceptics	They tend to be dispassionate about technology and also have some inhibitions (low on both optimism and innovativeness)
Paranoids	May find technology interesting, but at the same time exhibit high degrees of discomfort and insecurity (high on optimism about technology but not very innovative)
Laggards	They possess few motivations toward technology and typically would be the last group to adopt a new technological service or product (low on optimism and innovativeness and high on discomfort and insecurity)

It is proposed that TR is a key moderator in the relationship between UTAUT variables and behavioral intention. We expect respondents with a high or low TR to differ in their beliefs–intention relationships. Hence:

H7. The belief–intention relationships proposed in H2, H3, H4 and H5 will be moderated by participant beliefs of their level of technology readiness.

3. Research method

3.1. Measurement

The UTAUT constructs have shown consistent reliability and validity while applied across contexts and cultures. We used the measurement instrument for the UTAUT constructs (i.e., performance expectancy, effort expectancy, social influence, facilitating conditions and behavioral intention) from Venkatesh et al. (2003). To measure the four dimensions of technology readiness (optimism, innovativeness, discomfort and insecurity), we used the 26 items abbreviated scale by Parasuraman (2000). All items were measured using a 7-point Likert scale, with the anchors being 1 = *strongly disagree* to 7 = *strongly agree*. Age was measured in years. Sex was coded using a 1 or 2 dummy variable where 1 represented woman. Respondents' expressive participation in social movements on SNS was measured by asking about the weekly frequency of the use of five activities, which were indicated on a 7-point interval scale (1 = *never*, to 7 = *frequently*). The scale items are disclosed in Table 3.

The initial questionnaire was created in English and was reviewed for content validity by a group of academic university staff. The final questionnaire was administered in Spanish, so the English questionnaire was translated into Spanish and then back into English to ensure translation equivalence (Brislin, 1970). After the first draft of the questionnaire was completed, the survey instrument was validated through a pre-test and pilot test. The pre-test involved seven respondents, each with more than 2 years' experience using SNS. Respondents were asked to comment on the length, the format and the wording of the scales. After several rounds of

Table 2
Confirmatory Factor Analysis (CFA).

Constructs and items	Factor loadings[a]
The use of SNS for expressive participation (α = 0.81; CR = 0.83, AVE = 0.502)	
How often do you engage in the following activities on a SNS?	
Use email to comment on social causes current affairs known through SNS	.62[b]
Send SNS private messages with social information	.56 (8.65)
Sharing video content, photo content or commenting SNS practices	.72 (7.21)
Post comments to social blogs linked to SNS	.60 (6.27)
Express your opinions on current issues related to social causes to your SNS	.72 (7.35)
Behavioral intentions (α = 0.89; CR = 0.84; AVE = 0.516)	
In the next 8 weeks...	
I have the intention to continue using SNS for expressive social participation	.83[b]
I will tell others about the positive aspects of using SNS for expressive social participation	.82 (13.89)
I will recommend others to use SNS for expressive social participation	.84 (14.28)
I would prefer to use SNS for expressive social participation rather than traditional methods	.70 (10.87)
I have the intention to use SNS for expressive social participation as much as possible	.80 (13.11)
Performance expectancy (α = 0.92; CR = 0.89; AVE = 0.512)	
I believe that using SNS for expressive social participation could be useful for...	
...my life	.67 (10.09)
...information acquisition and exchange	.77 (11.95)
...relationship development or maintenance	.70 (10.58)
...social and emotional support	.68 (10.43)
...diffusion of ideas	.80b
...creating and developing social movements	.79 (12.46)
...mobilizing people with respect to social causes	.77 (11.82)
...inducing offline civic participation	.79 (12.39)
Effort expectancy (α = 0.82; CR = 0.82; AVE = 0.504)	
I believe that, in the context of expressive social participation,...	
...my interaction with SNS is clear and understandable	.79 (7.74)
...participating in SNS does not require a lot of mental effort	.66 (6.98)
...it is easy for me to participate in SNS	.73 (7.51)
...It is simple for me to navigate in SNS	.50 (6.45)
...I find it easy to get SNS to do what I want it to do	.60[b]
Social influence (α = 0.89; CR = 0.83; AVE = 0.502)	
In the context of expressive social participation, ...	
...most people who are important to me think that I should use SNS	.76[b]
...most people who are important to me think that using SNS is a good idea	.78 (11.57)
...most people who are important to me think that I should try out SNS	.84 (12.60)
...most people who influence my decisions think that I should use SNS	.78 (11.61)
...most people who influence my decisions think that I should try out SNS	.78 (11.60)
Facilitating conditions (α = 0.86; CR = 0.86; AVE = 0.545)	
I believe that, in the context of expressive social participation,...	
...I would be able to use SNS	.65 (8.004)
...I have the required resources to make use of SNS	.67[b]
...I have the necessary knowledge required to make use of SNS	.57 (9.67)
...I have the required ability to make use of SNS	.62 (9.84)
...using SNS would be entirely within my control	.70 (8.51)

Note: The goodness-of-fit indices were: $\chi^2/(df) = 1.733$; CFI = 0.932;TLI = 0.922; RMSEA = 0.059; α = Cronbach's alpha; *CR* = composite reliability; *AVE* = average variance extracted.

[a] The *t*-statistic for each estimate is in parentheses.

[b] The reference category.

Table 3
Descriptive statistics, correlation matrix, and square root of AVE.

	1	2	3	4	5	6
1. Expressive participation	*0.708*					
2. Behavioral intentions	0.438*	*0.718*				
3. Performance expectancy	0.418*	0.691*	*0.716*			
4. Effort expectancy	0.468*	0.665*	0.627*	*0.710*		
5. Social influence	0.491*	0.745*	0.624*	0.691*	*0.708*	
6. Facilitating conditions	0.413*	0.676*	0.736*	0.786*	0.816*	*0.738*
Mean	3.51	3.75	3.60	3.44	3.52	3.92
Standard deviation	0.24	0.28	0.28	0.07	0.26	0.23

Diagonal values represented in italics are square root of AVE; off-diagonal values are correlations between constructs.

* Significant at $p \leqslant .01$.

discussion and revision to ensure the appropriate meanings and clarify ambiguous questions, the instrument was pilot tested with a sample of eighteen respondents selected from the "*Democracia Real Ya*" Facebook community. Based on the respondents' feedback at the pre-test and pilot test, several items were modified, and some items were revised after the initial reliability and validity check in the pilot sample.

3.2. Data Collection and Participant Profile

This study focuses on young adults studying at university in Spain. Spain is ranked third in the world ranking of active users of social networks with 77% of the population taking part in such activities (Nielsen, 2010). The Spanish market is also third in growth in penetration of social networks in Europe between 2009 and 2010 (11.3%); also, the penetration rate of social networks in Spain is above the average penetration of social networks in Europe. According to the Report of Observatory Cocktail Social Networks Analysis (2013), 93% of Spanish Internet users have active SNS accounts, and an average of 2.3 per individual networks. Facebook is also reported to be the social network of choice for Spanish users with a total Internet user penetration of 83%.

The survey was administered online to a sample of 246 Spanish undergraduate students at a public university in Huelva–Spain – all of whom use SNS – during the first week of the winter quarter of 2012. There were 214 valid respondents to our survey: 62% of the sample were female; 75% were aged 18–25 years; and 91% were single. 30% of the students surveyed were business students; 24% were majoring in Sciences and Engineering; and 47% were Social Studies and Languages students. 33% of the sample had SNS access at home and 48% accessed it through smartphones. 20% spent more than seven hours in a typical week on SNS, with under 5% spending less than one hour. The sample had high Internet-use experience, with 79% of the sample having used the Internet and 23% using SNS for more than 5 years.

The sample is not homogenous on key demographic variables and is easily comparable to the wider student university population and at similar state public universities. We do not claim that the findings are generalizable to a wider population of Internet users, but it is reasonable to assume that this sample might be representative of hyper-SNS users, in addition to being younger, more trained, and more socially interested and active than other cohorts.

4. Results

4.1. Assessment of measures

Exploratory (EFA) and confirmatory factor analyses (CFA) were conducted to assess the convergent and discriminant validity, reliability and unidimensionality of factor structures of the UTAUT

constructs. We used SPSS 19.0 for the EFA. Structural equation modeling (M-Plus 5.21 version) was employed for the CFA and for the multi-group invariance analysis by using the maximum likelihood estimation procedure.

4.1.1. Measure validation

A single measurement model was estimated to assess the validity of the measures. The chi-square statistic for the model is significant ($\chi^2/(df) = 1.733$), as might be expected due to the large sample. The other fit indices indicate a good fit (comparative fit index (CFI) = .93; tucker Lewis index (TLI) = 0.92; root mean square error of approximation (RMSEA) = .059). All items load significantly on their respective constructs with factor loadings range from 0.50 to 0.84. This meets the threshold of 0.50 set by Hair, Black, Babin, Anderson, and Tatham (2006) and demonstrates convergent validity at the item level. In addition, at the construct level, the reliability coefficients (Cronbach's alpha) and composite reliability for all constructs were well above the threshold level of 0.70 (Nunnally & Bernstein, 1994), and the average variance extracted (AVE) exceeds 0.50 (Fornell & Larcker, 1981), all of which provide evidence for convergent validity at the construct level (see Table 2). Evidence of discriminant validity is provided by the fact that the AVE for each construct is greater than the squared correlation between that construct and any other construct in the model (Fornell & Larcker, 1981). Table 3 presents the correlation matrix and summary statistics.

Finally, a test was performed to investigate the presence of common method variance. The initial EFA with oblique rotation produced seven factors with eigenvalues larger than one, which collectively accounted for 64% of the variance. The first factor accounted for 25% of the variance, which suggests that common method bias may not be a major concern (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

4.1.2. Psychometric properties of Technology Readiness (TR) scale

The psychometric properties of the TR instrument were tested by conducting the factor analysis and the reliability analysis (Cronbach's alpha). On the basis of the criteria suggested by Hair et al. (2006) (i.e., eigenvalues greater than one and the screen plot criterion), four factors were extracted which confirm the original factor structure reported by Parasuraman (2000). The results are shown in Table 4.

The overall TRI score for each respondent was calculated by averaging the scores on optimism, innovativeness, discomfort and insecurity after reverse coding the scores on discomfort and insecurity (Parasuraman, 2000, p. 318). Cluster analysis was used to identify TR-based segments (Parasuraman, 2000; Tsikriktsis, 2004). The results confirmed the existence of four segments, i.e., pioneers, explorers, sceptics and laggards, but not paranoids. The resulting segments exhibited high within-segment homogeneity (i.e., similar belief structures) and high between-segment heterogeneity in terms of the TR dimensions. Table 5 presents the profiles for four TR segments and within-subject *t*-test analysis (see superscripts Table 5). Table 5 also summarizes the results of the pairwise mean comparisons of the between-subject differences across the four segments, with the number in brackets indicating which segment pairs were significantly different. As suggested by the TR typology, explorers and pioneers tend to posses higher positive technology-related beliefs (innovativeness and optimism) than sceptics or laggards. Conversely, pioneers and paranoids possess higher negative beliefs (insecurity and discomfort) than explorers or sceptics. Finally, Table 6 characterizes the four TR segments in terms of traditional demographics (age, sex). Results indicate significant differences between the TR segments with regards to sex ($\chi^2 = 8.26$ $p = 0.04$; Cramér's $V = -0.197$ $p \leqslant 0.05$), but no significant differences in age ($\chi^2 = 6.51$ $p = 0.88$).

Table 4
Results of Factor Analysis (VARIMAX Rotation): technology readiness (TR) Scale.

TR Items	Optimism	Innovativeness	Discomfort	Insecurity
OPTIMISM1	.712			
OPTIMISM2	.714			
OPTIMISM3	.707	.423		
OPTIMISM4	.667			
OPTIMISM5	.704			
OPTIMISM6	.577			
OPTIMISM7	.392			
INNOVATIVENESS1	.516	.764		
INNOVATIVENESS2		.731		
INNOVATIVENESS3		.797		
INNOVATIVENESS4		.771		
INNOVATIVENESS5		.746		
DISCOMFORT1			.572	
DISCOMFORT2			.636	
DISCOMFORT3			.729	
DISCOMFORT4			.663	
DISCOMFORT5			.651	
DISCOMFORT6			.459	
DISCOMFORT7			.519	
DISCOMFORT8			.396	
INSECURITY1				.778
INSECURITY2				.778
INSECURITY3				.422
INSECURITY4				.456
INSECURITY5				.477
INSECURITY6				.376
Cronbach's alpha	0.82	0.87	0.74	0.68
Mean	33.12	18.71	31.09	28.82
Standard deviation	7.49	6.87	7.79	5.69

Note: 1 to 7 Scale: 1 = *strongly disagree*, 7 = *strongly agree*. Loadings below .30 are not shown.

Table 5
Segment variable profiles.

Segment (size)	Contributors		Inhibitors	
	Optimism	Innovativeness	Discomfort	Insecurity
	Segment mean scores (standard deviation)			
1. Explorers (33)	41.64^{a} (5.75)	25.69^{b} (5.48)	23.04^{x} (6.47)	26.42^{y} (6.97)
2. Pioneers (112)	35.3^{a} (4.85)	20.4^{b} (5.01)	34.2^{x} (5.76)	29.3^{y} (5.43)
3. Sceptics (44)	26.1^{a} (3.13)	14.95^{b} (4.51)	25.22^{x} (4.96)	27.3^{y} (4.93)
4. Laggards (25)	24.4^{a} (6.2)	8.5^{b} (3.25)	37.9^{x} (6.1)	32.6^{y} (3.8)
Belief	Segment pairs (significant at $p \leqslant .01$)			
Significant segment mean (between-subject) differences on technology beliefs				
Optimism	[1,2]; [1,4]; [1,3]		[2,3]; [2,4]	
Innovativeness	[1,2]; [1,3]; [1,4]		[2,3]; [2,4]	[3,4]
Discomfort	[1,2]; [1,4]		[2,3]; [2,4]	[3,4]
Insecurity	[1,2]; [1,4]		[2,4]	[3,4]

Note: The different superscripts (e.g., a and b) denote that the with-in subject differences among contributors and inhibitors are statistically significant ($p \leqslant .01$) for a given segment. For example, for Explorers the mean scores for 'optimism' and 'innovativeness' are statistically different (a and b).

4.2. Main effects

A main effects structural model was estimated. Then, to assess the moderating role of technology readiness and gender on UTAUT relationships, two sets of subgroup analyses were undertaken. The goodness-of-fit indices suggest that the main effects model fits the data reasonably well ($\chi^2/(df) = 1.745$; CFI = 0.93; TLI = 0.92; RMSEA = 0.059). Positive relationships were observed for performance expectancy → intention ($\beta = .37$, $t = 3.87$, $p < .001$), social influence → intention ($\beta = .53$, $t = 4.15$, $p < .001$), and

Table 6
TR Segment demographics and significant differences.

	Explorers (n = 33)	Pioneers (n = 113)	Sceptics (n = 43)	Laggards (n = 25)	
Sex	M: 14 (42%) F: 19 (58%)	M: 47 (42%) F: 66 (58%)	M: 18 (42%) F: 25 (58%)	M: 3 (12%) F: 22(88%)	χ^2 = 8.26 p-Value = 0.04* Cramér's V = −0.197*
Age	<18: 2 (6%) 18–24: 23 (70%) 25–34: 7 (21%) 35–44: 1 (3%) >45: 0	<18: 3 (3%) 18–24: 86 (76%) 25–34: 17 (15%) 35–44: 5 (4%) >45: 2 (2%)	<18: 3 (7%) 18–24: 31 (72%) 25–34: 5 (12%) 35–44: 3 (7%) >45: 1 (2%)	<18: 1 (4%) 18–24: 21 (84%) 25–34: 3 (12%) 35–44: 0 >45: 0	χ^2 = 6.51 p-Value = 0.88

* Significant at $p \leqslant .05$. Cramér's measure of association (V) is used to assess the usefulness of the result (strength of relationship): 0 indicates complete independence, and 1 indicates complete dependence. Note that Cramér's statistic is computed only when the chi-square test is significant; a non-significant chi-square test suggests that any v greater than 0 is due to chance.

intention → use of SNS for expressive participation (β = .47, t = 5.19, p < .001). No significant effect was found for the relationship between effort expectancy and intention and facilitating conditions and intentions.

4.3. Multigroup invariance analyses for technology readiness and sex

We performed measurement and structural invariance multigroup analyses, based on a covariance matrix using M-Plus 5.21 and the maximum likelihood estimation procedure in order to compare the findings across two distinct groups on the basis of their technology readiness (low and high) and sex (male and female). We followed the distinction stipulated by Byrne, Shavelson, and Muthén's (1989) and Vandenberg and Lance (2000) by referring to the first two tests (configural and metric invariance) as tests of aspects of measurement invariance (as they concern tests of relationships between measured variables and latent constructs) and referring to the final test as testing aspects of structural invariance (as it refer to tests concerning the latent variables themselves).

The goodness-of-fit indices reported in Table 7 for the configural model for both technology readiness and sex indicates that configural invariance is attained and provides support that the pattern of fixed and non-fixed parameters in the research model are identical across all the groups. Second, *metric invariance* was tested to ensure that different groups respond to the items in the same way so that we may compare the ratings obtained from different groups in a meaningful way (Steenkamp & Baumgartner, 1998). The factor pattern coefficients were constrained to be equal across groups and the model is fitted, yielding a χ^2 value for the constrained model. These constraints increased the χ^2 value for technology readiness from 971.73 (610 *df*) to 999.041 (632 *df*) and for sex from 869.44 (608 *df*) to 888.34 (630 *df*), gaining 22 degrees-of-freedom each. Because this metric invariance model (constrained model) is nested within the baseline model, a χ^2 difference test was performed. Given that $\Delta\chi^2(\Delta df)$ for technology [27.311 (22 *df*)] and for sex the [18.89 (22 *df*)] were not statistically significant at p = 0.05, metric invariance was supported (see Table 7). This suggests that the different scores on the item can be compared meaningfully across groups, that is, observed item differences indicate group differences in the underlying latent construct (Steenkamp & Baumgartner, 1998). These findings provide the confidence that all measures are operating in the same way for both groups belonging to technology readiness level (high and low) and sex (male and female), and we can proceed in testing for the equality of the structural parameters.

In the final step, the *structural invariance* test involves increasingly restrictive models and it is performed by imposing equality constraints on the factor loadings, measurement intercepts and structural covariance across the two groups of technology readiness (low and high) and sex (male and female). The interest focuses on the hypothesized underlying factors, as well as on their interrelational structure. The results in Table 7 from the estimation of structural invariance model yielded an increase in the χ^2 value for technology readiness from 971.73 (610 *df*) to 1060.421 (674

Table 7
Parameter estimates of structural model and test for measurement invariance.

Hypothesized path	Technology readiness			Sex		
	Low	High	z-Scores	Female	Male	z-Scores
H2: effort expectancy → intention	0.27*	−0.36*	−2.73*	0.40**	0.10	3.14*
H3: performance expectancy → intention	0.49**	0.42**	−0.55	0.51**	0.71**	1.87
H4: social influence → intention	0.26*	0.57**	3.78*	0.06	0.28*	2.01*
Configural model = unconstrained			*Configural model* χ^2 (*df*) = 971.73** (610) CFI = 0.931;TLI = 0.911; RMSEA = 0.065		*Configural model* χ^2 (*df*) = 869.44** (608) CFI = 0.92; TLI = 0.91; RMSEA = 0.045	
Metric invariance model = factor loadings constrained equal across groups Result: measurement equivalence achieved			*Metric invariance model* χ^2 (*df*) = 999.041** (632) $\Delta\chi^2$ (Δdf) = 27.311 (22); p = 0.20 CFI = 0.928; TLI = 0.9; RMSEA = 0.065		*Metric invariance model* χ^2 (*df*) = 888.34** (630) $\Delta\chi^2$ (Δdf) = 18.89 (22); p = 0.65 CFI = 0.92; TLI = 0.91; RMSEA = 0.045	
Structural invariance model = factor loading, measurement intercepts, and structural covariance constrained equal across groups Result: structural equivalence not achieved			*Structural invariance model* χ^2 (*df*) = 1060.421** (674) $\Delta\chi^2$ (Δdf) = 88.69 (64); p = 0.02* CFI = 0.89; TLI = 0.87; RMSEA = 0.065		*Structural invariance model* χ^2 (*df*) = 932.62** (645) $\Delta\chi^2$ (Δdf) = 54.19 (37); p = 0.03* CFI = 0.91; TLI = 0.90; RMSEA = 0.048	

Note: $\Delta\chi^2$ = difference in chi-square values between models; Δdf = difference in number of degrees of freedom between models. Following Parasuraman (2000, p. 318), the split of TR score into low and high is based on three-way split of the sample (with approximately equal subsample sizes) based on respondents' scores on the 7-point TRI scale.

** Significant at 0.01 level.

* Significant at 0.05 level.

df) and for sex from 888.34 (630 *df*) to 932.62 (645 *df*). Given that $\Delta\chi^2(\Delta df)$ for technology [88.69 (64 *df*)] and for sex the [54.19 (37 *df*)] were statistically significant at $p = 0.05$, structural invariance was not supported. These results suggest that the model varies across groups, and so confirms the moderating effect of technology readiness and sex on the UTAUT relationships proposed in Fig. 1.

The beta-weights reported in Table 7 provide a further insight into the role that technology readiness and sex plays as a moderator for the UTAUT's hypothesized relationships. Technology readiness moderates the effort expectancy → intention relationship such that it is positive for respondents with low TR ($\beta = 0.27$; $p < .05$) and negative for high TR respondents ($\beta = -0.36$; $p < .05$). The social influence → intention relationship was stronger and highly significant for high TR respondents ($\beta = 0.57$; $p < .01$) as compared to low TR respondents ($\beta = 0.26$; $p < .05$). Similarly, sex moderates the effort expectancy → intention relationship such that the effect was only significant for females ($\beta = 0.40$; $p < .05$). The social influence → intention relationship was only significant for males ($\beta = 0.28$; $p < .05$).

5. Discussion and conclusions

Social influence emerged as a significant predictor of behavioral intention, which suggests that users who felt more pressure from others to use SNS for expressive participation were more likely to intend to engage in its use. Contrary to prediction, however, facilitating conditions did not emerge as a significant predictor of intentions. Because the effect of facilitating conditions decreases as the level of volition increases (Walsh & White, 2007), this finding may reflect people's high volitional control over the use of SNS given their accessibility.

The findings reveal that a user's technology readiness and sex significantly moderate social and psychological factors. This supports past research, which has suggested that women and men differ in their beliefs about technology (Clegg & Trayhurn, 2000; Venkatesh et al., 2003). Given this finding, it is suggested that males and high TR respondents are driven by interpersonal communications. This group tends to concentrate on relatives' and friends' suggestions of new technologies, and they appear to be fairly "fraternal," considering the interpersonal-related factors when using SNS. However, the behavior of females and low TR respondents is driven more by effort expectancy. Although these groups may still have been receiving and thinking about advice from friends or colleagues, the effort expectancy, that is, the degree of ease associated with the use of SNS for expressive participation, was more important. Performance expectancy, that is, the degree to which using SNS will provide benefits to them in expressing socio-political participation on SNS, is shown to be of equal importance for males and females and for low and high TR groups.

Based on these findings, ISM organizers can focus on interpersonal features and the use benefits for these groups. For example, the size of a network and invitations from familiar people to use the site need to be communicated to male and high TR users, while for female and low TR users, the focus should be more on the ease of using SNS for expressive participation in ISMs.

From a pragmatic standpoint, psychographic profiles are generally more difficult to observe in a population than demographic data. Thus, it is useful to correlate psychographics with demographic information. Specifically, if there are differences between TR segments on demographics as well as beliefs, then demographic profiles may be used as surrogates (Gilbert & Warren, 1995). As results indicate, significant differences were found among the TR segments with regard to sex. For example, laggards were predominately female (88%). Interestingly, there were also more females (58%) then males (42%) in the explorer, pioneer and sceptics segments. Ultimately, demographic characterizations of TR segments may be surrogates for psychographic constructs, and they may prove useful in design and marketing strategies.

5.1. Implications for Internet social movements

This research and its findings are significant on three important levels. First, we illustrate the need to start looking more deeply into SNS usage for civic engagement. SNS are not useful in and of themselves, as much as they are a platform for various applications that have important implications for studying how people interact today. This study highlights one SNS application from one specific SNS at one point in time. While we show that SNS promote civic participation, we believe this is just a preliminary step towards understanding the potential of SNS to impact on the processes of mobilization both online and offline. Our target population was the current users of SNS, general interest-oriented services that provide a space where users can meet others interested in a specific topic, disseminate information about that topic, and have public discussions. SNS could encourage civic engagement because they can provide an opportunity for members' expressive participation. Discussion is thought to be integral to feelings of efficacy among citizens, leading to higher rates of political and social activity (Andersen & Hansen, 2007; Cho et al., 2009; Delli Carpini et al., 2004). We focus specifically on SNS, which currently are the most visited and popular websites on the Internet. We do not expect that SNS have a disproportionate political and social use, but we assert that they potentially have substantial effects on the civic engagement process. Social movements need technology to express themselves, discuss and spread their message.

Second, we have provided empirical support for the applicability of UTAUT to the expressive participation via a survey of 214 SNS users. Our results confirm that effort expectancy and performance expectancy significantly affect student intentions to use SNS for expressive participation. Although Venkatesh et al. (2003) found that social influence was not significant in voluntary contexts, it was supported in our study. This implies that the study of social influences that propel individuals toward collective action is both important and consequential (Van Zomeren, Postmes, Spears, & Bettanche, 2011). Not surprisingly, the impact of facilitating conditions on behavioral intention was not supported because SNS, such as Facebook, are sufficiently known by Spanish university students. With regard to performance expectancy, an interesting question is raised about the objectives that people have in mind when using SNS. Civic participation will occur when, besides the hope of obtaining a shared goal, there is a mechanism that will encourage the intention in the participation in the form of benefits for those who do so (Olson, 1965). In this sense, we may speak of the need for incentives for successful expressive participation. Opinions from close people are also important in using SNS for civic engagement. What matters most is the degree of personal connection with close people to encourage participation, i.e., a "strong-tie" phenomenon. This pattern shows up again and again in traditional social movements, for example, the more friends that you had who protested or had the same purpose, the more likely you were to join the social movement. One's acquaintances – not one's friends – are one's greatest source of new ideas and information. The Internet lets one exploit the power of these kinds of distant connections with marvelous efficiency. It is remarkable for the diffusion of innovation, interdisciplinary collaboration, for seamlessly matching up buyers and sellers, and for the logistical functions of the dating world. However, weak ties seldom lead to high-risk activism. SNS are effective at increasing participation by lessening the level of motivation that participation requires. This is a powerful mechanism to engage the civic population. In other words, SNS activism succeeds not by motivating people to make a real sacrifice but by

motivating them to do the things that people do when they are not motivated enough to make a real sacrifice (Gladwell, 2010).

The last point we make emphasizes the dual nature of the findings. Different types of people respond differently to the process of intention to use SNS. We confirm the moderating effect of TR and sex on the UTAUT relationships. The impact of performance expectancy on behavioral intention was not significantly different between the low and high level of technology readiness and between the two sexes. This may indicate that performance is an important factor that affects technology adoption equally across people. Although statistically insignificant, the coefficient of performance expectance was a bit larger in the male sample against some opinion on that women are more directed towards collective goals than men (e.g., Venkatesh & Morris, 2000). It is interesting that effort expectancy has a greater impact on behavioral intention in females than males and in students with self-reported low levels of technology readiness. This implies that female users' decision-making on technology adoption is affected more than male users by how easy the technology is to use. Normally for people who have good skills in ICTs, this factor is not altogether important since this experience improves their ability to learn in this area. One surprising result is that the impact of social influence on behavioral intention was not supported by female users. Some studies have showed that women tend to be more susceptible to the opinions of others (e.g., Lu, Yu, & Liu, 2009; Venkatesh & Morris, 2000). It is generally accepted in the literature that the effect of social influence on behavioral intention is stronger for females than males (Cyr, Hassanein, Head, & Ivanov, 2007; Venkatesh et al., 2003). On the other hand, for students self-reporting high-levels of technology readiness, the relationship is strongly influenced by social influence. This indicated that good skills users were more likely to use SNS if they had the intention to use it. As a result, changing or adapting the method of addressing these people according to their subgroup may be an effective ploy. This model allows online activists to assess which subgroups are important, and so makes it possible to target them on issues that encourage them to use technology for expressive participation. Our model, then, becomes a viable management tool by showing which groups need specific attention.

Finally, the research carried out here has highlighted the need for studying ISMs from a social psychological perspective, rather than just a technology use approach. That is because the social opportunities derived from ISMs originate not so much in the technical or functional characteristics of SNS, which at any rate are always present implicitly, but rather in the benefits which these mediated social systems can offer to activists and wider social movements as reflections not just of social action but also social and political discourse. Consequently, it is necessary to conduct further research grounded in the social psychological perspective and which allows us to learn more about the potentials offered by expressive participation in ISMs with and through mediated forms of social communication. This and similar work contributes to our understanding not only of ISM but also the growing and important role of SNS on social movements.

5.2. Limitations and future research

Although our work provides empirical insights, it is not without its limitations. Firstly, nearly 90% of our participants were between 18 and 35 years old, commonly described as hyper-SNS users and a key market for technology-enabled products. While this age range was suitable for our research purposes, future research should be conducted with a more diverse sample of SNS users in terms of both psychographic profile (e.g., range of technology readiness) and their demographic profile (e.g., age, culture, etc.). Secondly, our sample participants are SNS users from Spain; above average-users or hyper-users of SNS; and potentially more trained, socially interested, and socially active than might be represented in other age cohorts. Although representational of the population of young adult SNS users, we advise caution about generalization from this work to other groups where incultural and lifestyle habits may differ. Future research is recommended on SNS user groups from across diverse cultures, countries and demographics. It would be also interesting to consider using controls in future research (e.g., alternative social behaviors displayed on SNS sites, alternative forms of "offline" collective action) for comparison purposes. Thirdly, we only examined a limited set of psychographic and demographic factors as moderators of the intention to use SNS for expressive participation. Additional factors, such as perceived network externalities, system quality, trust, and perceived risk of privacy theft, may also affect users' intended SNS use. Lastly, our study of expressive participation focuses on one type of social media service, social networking sites. In order to add richness to our understanding of the use of social media for participation in ISMs, future research should consider other mediated communications practices with and through different social media applications, services and platform contexts.

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