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## Article

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European Research on Management and Business Economics (ERMBE)

## Provided in Cooperation with:

European Academy of Management and Business Economics (AEDEM), Vigo (Pontevedra)

*Suggested Citation:* Roldán, José L.; Sánchez-Franco, Manuel Jesús; Real, Juan C. (2017) : From frequency of use to social integration: The mediation of routinization and infusion in Tuenti community, European Research on Management and Business Economics (ERMBE), ISSN 2444-8834, Elsevier, Amsterdam, Vol. 23, Iss. 2, pp. 63-69, <https://doi.org/10.1016/j.iedeen.2016.07.002>

This Version is available at:

<https://hdl.handle.net/10419/205741>

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## From frequency of use to social integration: The mediation of routinization and infusion in Tuenti community



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### ARTICLE INFO

#### Article history:

Received 7 January 2016

Accepted 29 July 2016

Available online 27 October 2016

#### JEL classification:

D8

M15

M21

O33

#### Keywords:

Frequency of use

Routinization

Infusion

Social integration

Social network sites

Partial least squares

### ABSTRACT

This study examines post-adoption behaviors (i.e., frequency of use, routinization and infusion) and their effects on the sense of community in the domain of social network sites. In particular, this contribution formulates mediation hypotheses, which posit how frequency of use affects social integration via routinization and infusion. The data was collected from 278 users of Tuenti, a highly-popular social network site among the Spanish college student population during the period 2006–2012. Results from partial least squares structural equation modeling (PLS-SEM) show these sophisticated types of usage are inter-related in such a way that routinization and infusion (a) fully mediate the effect of frequency of use on social integration; and (b) exert significant influences on social integration, as an active sense of belongingness to a social network site. In order to attain social integration, it is therefore essential for managers to devise strategies to foster advanced post-adoption behaviors.

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### 1. Introduction

Social network sites (SNS) are here associated with online environments that allow individuals to connect with each other in order to seek or share content, professional advancement, friendship, and entertainment (Sánchez-Franco, Buitrago-Esquinas, & Yñiguez-Ovando, 2015). Their long-term viability will thus depend on (a) their users' enduring participation, and (b) the formation and maintenance of social capital (Blanchard & Markus, 2004). Nevertheless, there is a paucity of research about the motives which lead people to socially integrate.

In particular, given the relatively recent introduction of SNSs, there is currently limited research related to sophisticated or deeper types of usage and their influences on community successor social integration as an individual-level outcome of the use of an SNS. Initial usage is not enough to fully bring about the desired benefits from an application (Cooper & Zmud, 1990). In this vein, Saga and Zmud (1994) highlighted the importance of expanded

usages (i.e., from using more of the technology's features to use the technology to accomplish new tasks or activities) over initial acceptance.

Firstly, growing system research calls for expanding the scope of research from simple usage behavior to post hoc usage (i.e., expanded usages) evaluation (cf. Burton-Jones & Straub, 2006; Chin & Marcolin, 2001; Po-An Hsieh & Wang, 2007, among others). Schwarz and Chin (2007) particularly encouraged a broadening of the understanding of Information System (IS) usage from extent or frequency of use to interrelated usage-based types such as infusion and routinization (cf. Saga & Zmud, 1994). It is necessary (a) "to demystify the complex relationships between different types of usage" (Po-An Hsieh & Zmud, 2006, p. 8) and (b) to analyze their influences on performance outcomes (cf. Sundaram, Schwarz, Jones, & Chin, 2007), such as involvement and participation in social activities, and, consequently, the individual's feelings of identity with and attachment to SNSs. Social integration will be here considered as an essential indicator of community success (or performance outcome).

Secondly, one well-known model that has been used extensively to account for a variety of adoption-acceptance-post adoption usage is proposed by Cooper and Zmud (1990). Our research will

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concentrate on acceptance, routinization and infusion – broadening our understanding of system acceptance toward post-adoption usage. When members use an SNS in a way that goes beyond simple, or standardized usage, they achieve a higher level of usage that may allow them to exploit the fullest potential of the system, fostering more positive individual benefits (Po-An Hsieh & Wang, 2007).

To achieve the objectives proposed, this paper is organized as follows. First, we detail the literature review and hypotheses, followed by the research method. Next, we present our results, and a discussion of them based on the analysis of data collected from 278 users of Tuenti, the most popular computer-mediated SNS among the Spanish youth (college student and teenager population) during the period 2006–2012 (Apaolaza, Hartmann, Medina, Barrutia, & Echebarria, 2013). Finally, we conclude with a discussion of theoretical and practical implications and limitations.

## 2. Literature review and research hypotheses

### 2.1. Social integration

The development and testing of models that may aid in predicting a general positive feeling toward an SNS and a motivation to affectively stay with the SNS is a primary concern in our research (Sánchez-Franco et al., 2015). Nevertheless, there is still a lack of research that analyzes the effective drivers associated with social integration, omitting essential research questions of why members perceive community support provided by one SNS over a competing SNS.

Whereas social capital distinguishably relates to receiving emotional support from people who would help one feel better, social integration measures both the sense of belongingness to and the identification with the SNS and the social community's interactivity level. In particular, our research draws on two aspects of social integration: "social-psychological or emotional integration which involves introspective social experiences or perceived depth of connectedness, and structural integration which refers to concrete involvement in activities" (Gracia & Herrero, 2004, p. 7), aiming to capture the construct of social integration in its broader sense.

On the one hand, community integration is defined as "members' feelings of membership, identity, belongingness, and attachment to a group that interacts primarily through electronic communication" (Blanchard, 2007, p. 827; see also Blanchard, 2008). On the other hand, community participation deals with the extent to which members actively engage in community activities, and stresses the social community's interactivity level (Herrero & Gracia, 2007). Our research presents social integration as a superordinate second-order construct reflected in community participation and community integration, and it focuses on the intercorrelations between first-order factors which form a system of interdependence that is itself important in measuring social integration.

To sum up, the success of SNSs – as communities of relationships – should be the development of a sense of belongingness to an SNS and an active participation in an SNS. Next, we focus on issues such as what motivates users to join and regularly participate in SNSs.

### 2.2. The relationship between frequency of use and social integration

Frequency of use represents the traditional surrogate measure of the acceptance of an Information Technology (IT), being the behavioral result of attitude and intention to use (Saga & Zmud, 1994). Therefore, taking into account the complexity and flexibility of current SNSs, this represents the first stage in the progression of sophistication in the use of such technologies. We will, therefore,

conceptualize frequency of use as the number of times that an individual uses an SNS, the periods being daily, weekly, etc. (cf. Burton-Jones & Straub, 2006).

The IT literature has traditionally supported the link between usage and individual performance as a sequential process (cf. Sundaram et al., 2007). In addition, DeLone & McLean's *IS success model* (2003) propose overall that the amount of use of a system (e.g., an SNS) is a direct antecedent of the individual impact or net benefits for the user. Accordingly, first, the duration, frequency and intensity of interaction are likely to help members develop a special bonding with others in the online community and thus strengthen their ties (cf. Haron & Razzaque, 2008). Second, a higher frequency implies a high level of exposure to information and communication about issues discussed among community members (cf. de Valck, Van Bruggen, & Wierenga, 2009). This fosters the member's affective commitment; that is, the desire to maintain a valued relationship with others. This leads to the first hypothesis.

**Hypothesis 1 (H1).** Frequency of use is positively related to social integration.

### 2.3. The mediating role of routinization

Frequency has been here qualified as initial usage. However, the initial usage may not always be sufficient to fully derive the desired benefits from an SNS. According to innovation diffusion research, users still need to institutionalize (or routinize) the innovation (i.e., an SNS) as part of regular behaviors (Cooper & Zmud, 1990).

Routinization describes the state in which SNS use is no longer perceived as out-of-the-ordinary but actually becomes institutionalized (Saga & Zmud, 1994), and this is associated with habitual and standardized usage; that is, the integrating of the SNS into daily routines (Schwarz & Chin, 2007). Routinization involves an efficient use of the system (Sundaram et al., 2007). In this regard, there is an interrelationship between frequency of use and routinization. Frequent members become accustomed to an SNS and increasingly recognize its use as a normal activity (Saga & Zmud, 1994). An increased (or frequent) usage will, therefore, create an opportunity for the SNS to be routinized (Sundaram et al., 2007).

On the one hand, according to Cooper and Zmud (1990) the institutionalization of behaviors is more important than their initial manifestation (or initial use). Users initially develop a simple usage. After obtaining more experience, users progress to the routinization stage. Routinization will be a consequence of a learning process (Po-An Hsieh & Zmud, 2006) known as exploitation, which can drive individual performance outcomes. Exploitation refers to the routine execution of knowledge (cf. March, 1991). That is, the improvement of existing competencies by using what has already been learnt, namely, by adaptation; i.e., usage that implements and executes one's knowledge of one's SNS and tasks (Burton-Jones & Straub, 2006). Its results are predictable, achieved quickly and positive, leading to foreseeable and immediate benefits for social users in the short run.

On the other hand, higher routinization will provide sufficient time for members to leverage on their learning acquired from daily usage of the SNS (cf. Jaspersen, Carter, & Zmud, 2005). We therefore expect a positive relationship between routinized members and the formation and maintenance of social integration. The routinized virtual settings create a level of comfort such that members feel free to discuss and share their ideas, fostering mutual aid and empathy. Routinized members will tend to be more informal and are more willing to share personal information, thereby achieving greater social integration.

In accordance with our presentation so far, we postulate that an increase of frequency of use can intensify a routinized behavior of

an SNS, raising the likelihood of intensifying the members' social integration. Thus, this leads to H2.

**Hypothesis 2 ((H2)).** The relationship between frequency of use and social integration is mediated by routinization.

#### 2.4. The mediating role of infusion

The achievement of the routinization stage does not mean that a person uses an SNS' full potential (Sundaram et al., 2007). In this regard, we conceptualize infusion as the extent to which a person uses an SNS to its highest level to maximize its potential (Jones, Sundaram, & Chin, 2002), implying the notion of a deeper use. In particular, the infusion stage of an SNS can be operationalized in three alternative ways (Saga & Zmud, 1994): extended use, where individuals utilize more of an SNS' features to support their life activities; integrative use, reflecting the use of an SNS to enhance linkages between diverse social tasks or life activities; and emergent use, or using an SNS to perform social or life activities that were not previously acknowledged as being amenable to SNS support.

Once members have begun using an SNS, it can be expected that their attitude toward the SNS will be likely to influence the members' infusion (Jones et al., 2002). As Hall and Loucks (1977) noted, continued interaction with the technology (or frequency of use) can lead to achieving a higher level of use (or infusion) (cf., Afonso, Schwarz, Roldán, & Sánchez-Franco, 2015). Moreover, the IT implementation model can be thought of as activities, some of which may occur in parallel (Cooper & Zmud, 1990). As hypothesized before, frequency of use may lead to routinization and, likewise, could simultaneously influence infusion.

Likewise, taking into account DeLone & McLean's (2003) research, infusion may lead to individual impacts (or net benefits) for the SNS user. Infusion is achieved through the direct experience of users with the SNS and associated learning processes that enable individuals to use an SNS to its full potential. This kind of learning could be identified as exploration (March, 1991). Particularly, exploration refers to the search for novel or innovative ways of doing things with an SNS (cf. Burton-Jones & Straub, 2006), it being postulated that long-run performance depends on sustaining a reasonable level of exploration (March, 1991). Indeed, when individuals use an SNS in a way that goes beyond routinized usage, they achieve a higher level of usage that may allow them to exploit the fullest potential of an SNS, resulting in more positive individual impacts (Cooper & Zmud, 1990) (cf., Afonso et al., 2015).

Infusion can be compared with high quality contents creation by users. Users who reach the infusion stage integrate more socially with the SNS rather than merely being routinized members. As Lim and Lee (2011) comment, "members in this stage are well known by others in the community due to the contribution of good quality information as well as well-built social ties with other core members such as 'devotees' and 'insiders'".

Therefore, we theoretically expect that the more users explore an SNS, the more likely they will use the full potential that it offers, enhance their own social integration and, consequently, foster ideas or social activities related to mutual interest that were not previously acknowledged as being amenable to SNS support. Based on this logic and previous research, we hypothesize the following:

**Hypothesis 3 ((H3)).** The relationship between frequency of use and social integration is mediated by infusion.

According to the process model of IT implementation, routinization also precedes infusion. As users become familiar with an SNS, they might not be satisfied with the current use situation and may explore and find more useful functionalities to support their life activities (Saga & Zmud, 1994). Thus, through the direct experience and learning processes accumulated in prior stages, individuals

**Table 1**  
Demographic characteristics of the sample.

Demographic characteristics		Number	Percentage
Gender	Male	119	42.8
	Female	159	57.2
Age (years)	Average	21.04	
	SD	2.403	
Tuenti friends	Total	110	
	Active	63	
Frequency of Tuenti usage	Never/almost never	1	0.4
	Less than once a month	2	0.7
	A few times a month	5	1.8
	A few times a week	45	16.2
	About once a day	56	20.1
	Several times a day	169	60.8

who attain the routinization level have the potential to use an SNS in a more comprehensive and sophisticated manner, allowing them to attain the infusion stage (Po-An Hsieh & Wang, 2007) (cf., Afonso et al., 2015). At the same time, Hassandoust, Techatassnasontorn, and Tan (2016) recognize routinization as the main individual user behavioral factor to explain infusion. Accordingly, we also propose that infusion is preceded by routinization.

Given the above-mentioned theory and empirical evidence, frequency of use will be related to social integration first through routinization and then via infusion. Thus:

**Hypothesis 4 ((H4)).** The relationship between frequency of use and social integration is sequentially mediated by routinization and infusion.

### 3. Research method

#### 3.1. Participants

Participants were recruited from social studies at a public University in Southern Spain. In January 2009, undergraduate students were asked if they were Tuenti members, and, consequently, were presented with a series of items related to their Tuenti usage. A total of 278 members responded to the offline survey. Table 1 summarizes the respondents' demographic characteristics.

#### 3.2. Measures

The instrument development first consisted of reviewing contributions analyzed in the Literature Review and Research Hypotheses Section so as to identify measures for each construct which had established their reliability and validity, thereby satisfying content validity. Likewise, selected scales were modified to make them relevant to the SNS-based context.

In particular, the frequency of Tuenti usage was operationalized by two self-reported measures (see Table 2). As the community behavior we are interested in is not particularly sensitive (with respect to data about income, ethnicity, financial practices, etc.), self-reports could be accurate (Ajzen, 1988). While the routinization measure was developed by Sundaram et al. (2007), the infusion scale has been operationalized by Jones et al. (2002).

Following Herrero and Gracia (2004), our research has tried to capture the construct of social integration in its broader sense (i.e., that of belonging to an SNS and the degree of participation), being designed as a superordinate multidimensional construct (Polites, Roberts, & Thatcher, 2012) composed of its community participation and integration dimensions. Community participation and integration dimensions represent different manifestations of the underlying multidimensional construct (i.e., social integration). Ten items were used to assess community participation and

**Table 2**  
Measurement model evaluation.

Construct/dimension/indicator	Loadings	Composite reliability	Average variance extracted
<b>Frequency of use</b>		0.908	0.832
Frequency of Tuenti usage	0.892		
Frequency of Tuenti usage ( <i>very infrequently – very frequently</i> )	0.932		
<b>Routinization</b>		0.961	0.890
My use of Tuenti has been incorporated into my regular life schedule	0.944		
My use of Tuenti is pretty much integrated as part of my normal life routine	0.944		
My use of Tuenti is a normal part of my life	0.942		
<b>Infusion</b>		0.943	0.806
I am using Tuenti to its fullest potential for supporting my life	0.918		
I am using all capabilities of Tuenti in the best fashion to help me in my life	0.905		
I doubt that there are any better ways for me to use Tuenti to support my life	0.858		
My use of Tuenti in my life has been integrated and incorporated at the highest level	0.911		
<b>Social integration<sup>a</sup></b>		0.914	0.841
<b>Community participation</b>	0.907	0.920	0.659
I intend to actively participate in Tuenti community activities	0.789		
In general, I participate in order to stimulate Tuenti community	0.869		
I often provide useful information/contents for our Tuenti members	0.826		
I eagerly reply to postings by the help-seeker of Tuenti community	0.759		
I actively participate in Tuenti community activities to satisfy my social needs	0.813		
In general, I'm very motivated to participate actively in Tuenti community activities	0.811		
<b>Community integration</b>	0.927	0.923	0.750
I identify with my Tuenti community	0.895		
My opinions are valued in my Tuenti community	0.923		
Lots of people in my Tuenti community know who I am	0.821		
I feel like my Tuenti community is my own	0.822		

<sup>a</sup> Superordinate multidimensional construct.

integration – adapted from Algesheimer, Dholakia, and Herrmann (2005), Casaló, Flavián, and Guinalú (2007), Herrero and Gracia (2007), Koh and Kim (2004), and von Loewenfeld (2006).

Both indicators and dimensions have been modeled following a reflective measurement model (Mode A). All items are seven-point Likert-type, ranging from “strongly disagree” (1) to “strongly agree” (7). A pilot test was conducted with four e-business professors to assess content validity. Table 2 includes a list of the 19 items used in this study.

3.3. Data analysis

Our research model has been tested using Partial Least Squares (PLS), a variance-based structural equation modeling (Roldán & Sánchez-Franco, 2012). We have chosen PLS because (1) the research model is complex according to the type of relationships hypothesized (direct and mediation) and the levels of dimensionality (first- order and second-order constructs); (2) this study uses latent variables scores in the subsequent analysis of predictive relevance, particularly in the implementation of the two-stage approach for modeling the multidimensional construct; and (3) this research defines the nature of the main dependent theoretical construct (i.e., social integration) as defined. This implies that this study relies on a composite measurement model with a reflective design approximation (Mode A), which means that, in the case of the social integration variable, the dimensions (community integration and community participation) represent different facets, although correlations exist between them. Therefore, the use of traditional PLS is advisable (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016). This study uses SmartPLS 3.2.4 software (Ringle et al., 2015).

4. Results

4.1. Measurement model

The assessment of the measurement model for reflective indicators in PLS is based on individual item reliability, construct reliability, convergent validity, and discriminant validity (Roldán

& Sánchez-Franco, 2012). Individual item reliability is considered adequate in this study because all the indicators and dimensions have loadings above 0.759 (Table 2). All the constructs, dimensions and the multidimensional construct meet the requisite of construct reliability as their composite reliabilities (CR) are greater than 0.7 (Table 2). To assess convergent validity, we examine the average variance extracted (AVE). All latent variables achieve convergent validity given that their AVEs surpass the 0.5 level (Table 2).

Finally, Table 3 shows that all the constructs attain discriminant validity following both the Fornell-Larcker and the strictest HTMT85 criterion (Hair, Hult, Ringle, & Sarstedt, 2017). This means that all the constructs are empirically distinct

4.2. Structural model

The sign, size and significance of the structural path coefficients, the R<sup>2</sup> values, and the Q<sup>2</sup> test for predictive relevance initially allow an evaluation of the structural model. Consistent with Hair et al. (2017), bootstrapping (5000 resamples) was used to generate t-statistics and confidence intervals. This enables us to assess the statistical significance of the path coefficients. Five of the six direct effects described in Fig. 1 are significant. On the other hand, this

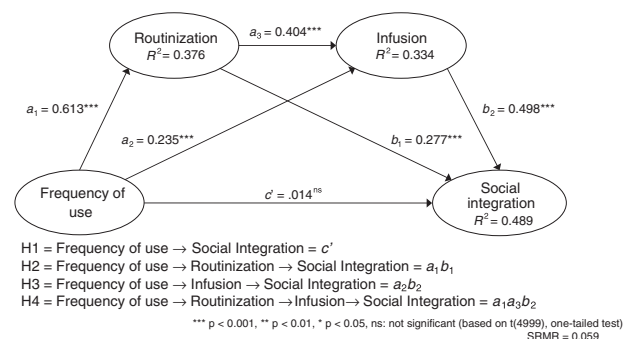


Fig. 1. Structural model results.

**Table 3**  
Measurement model. discriminant validity.

	Fornell–Larcker criterion				Heterotrait–Monotrait ratio (HTMT)				
	FU	R	I	SI	FU	R	I	SI	
FU	<b>0.912</b>				FU				
R	0.613	<b>0.944</b>			R	0.703			
I	0.482	0.548	<b>0.898</b>		I	0.548	0.577		
SI	0.425	0.559	0.657	<b>0.917</b>	SI	0.519	0.639	0.751	

Notes: FU: frequency of use; R: routinization; I: infusion; SI: social integration. Fornell–Larcker Criterion: Diagonal elements (bold) are the square root of the variance shared between the constructs and their measures (average variance extracted). Off-diagonal elements are the correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements. AVE: average variance extracted.

**Table 4**  
Effects on endogenous variables.

Effects on endogenous variables	Direct effect	t-Value	Percentile bootstrap 90% CI	Explained variance	f <sup>2</sup>
<i>Routinization</i> (R <sup>2</sup> = 0.376/Q <sup>2</sup> = 0.331)					
Frequency of use (a <sub>1</sub> )	0.613***	15.989	[0.546; 0.673] Sig.	37.55%	0.601
<i>Infusion</i> (R <sup>2</sup> = 0.334/Q <sup>2</sup> = 0.260)					
Frequency of use (a <sub>2</sub> )	0.235***	3.666	[0.129; 0.340] Sig.	11.33%	0.052
Routinization (a <sub>3</sub> )	0.404***	5.622	[0.282; 0.517] Sig.	22.11%	0.153
<i>Social integration</i> (R <sup>2</sup> = 0.489/Q <sup>2</sup> = 0.407)					
<b>H1:</b> Frequency of use (c')	0.014 <sup>ns</sup>	0.267	[−0.072; 0.104] N.Sig.	0.62%	0.000
Routinization (b <sub>1</sub> )	0.277***	4.158	[0.161; 0.386] Sig.	15.51%	0.082
Infusion (b <sub>2</sub> )	0.498***	9.32	[0.409; 0.588] Sig.	32.75%	0.323

Notes: Sig. denotes a significant direct effect at 0.05; N.Sig. denotes a non-significant direct effect at 0.05. Bootstrapping based on n = 5000 subsamples.

\*\*\* p < 0.001.

<sup>ns</sup> : not significant (based on t(4999), one-tailed test).

t(0.001, 4999) = 3.092.

analysis shows that H1 is not supported. The direct effect of frequency of use on social integration (c') is not significant. In addition, our research model seems to have an appropriate predictive power for all the dependent variables (Table 4). Hence, social integration attains the largest explained variance (0.489). Furthermore, with the exception of the frequency of use variable as an explanatory construct of social integration, the rest of the variables represent key antecedent constructs of their respective dependent variables. This is supported after analyzing the Cohen f<sup>2</sup> values, which are well above the base level of 0.02 (Roldán & Sánchez-Franco, 2012). We also evaluate the model with the cross-validated redundancy index (Q<sup>2</sup>) for the endogenous reflective constructs. A Q<sup>2</sup> greater than 0 implies that the model has predictive relevance. The results summarized in Table 4 confirm that the structural model has satisfactory predictive relevance for all the endogenous constructs. Finally, we have additionally computed the standardized root mean square residual (SRMR) of our model as the root mean square discrepancy between the correlations observed and the model-implied correlations (Henseler, Hubona, & Ray, 2016). Our research model achieves a SRMR of 0.059 (Fig. 1), which means an appropriate fit taking the usual cut-off of 0.08 into account.

To test our mediation hypotheses (H2–H4), we have applied the analytical approach described by Nitzl et al. (2016). We specify and contrast the indirect effects through the mediators (i.e., routinization and infusion) (Table 5). We also examine the total (c) and direct (H1: c') effects of the independent variable (i.e., frequency of use) on the dependent variable (i.e., social integration). We have chosen the bootstrapping procedure to test the indirect effects using both percentile and bias corrected confidence intervals. As Table 5 show, frequency of use has a significant total effect on social integration. When mediators are introduced (Fig. 1), frequency of use no longer has a significant direct effect on social integration (H1: c'). Therefore, H1 is not supported. In addition, all the indirect effects of frequency of use on social integration are significant. This means that H2 to H4 have been supported. This way, the analyses reported show that routinization mediates the relationship between frequency of use and social integration (H2: a<sub>1</sub>b<sub>1</sub>). The results also show that infusion mediates the path between frequency of use and social integration (H3: a<sub>2</sub>b<sub>2</sub>). Finally, we find that frequency of use is positively associated with higher routinization and infusion, which relates to higher levels of social integration (H4: a<sub>1</sub>a<sub>3</sub>b<sub>2</sub>). Consequently, this means that routinization and infusion fully and

**Table 5**  
Summary of mediating effect tests.

Total effect of FU on SI (c)		Direct effect of FU on SI		Indirect effects of FU on SI					
Coefficient	t Value	Coefficient	t Value	Point estimate	Bootstrap 95% CI		VAF		
					Percentile	BC			
0.425***	9.892	<b>H1:</b> c'	0.014 <sup>ns</sup>	0.267	Total	0.410	[0.343; 0.479]	[0.343; 0.478]	96.6%
					<b>H2:</b> a <sub>1</sub> b <sub>1</sub> (via R)	0.170	[0.101; 0.240]	[0.101; 0.240]	40.0%
					<b>H3:</b> a <sub>2</sub> b <sub>2</sub> (via I)	0.117	[0.063; 0.176]	[0.101; 0.240]	27.6%
					<b>H4:</b> a <sub>1</sub> a <sub>3</sub> b <sub>2</sub> (via R+I)	0.123	[0.080; 0.172]	[0.079; 0.171]	29.0%

Notes: FU: frequency of use. R: routinization. I: infusion. SI: social integration.

\*\*\* p < 0.001.

<sup>ns</sup> : not significant (based on t(4999), one-tailed test).

t(0.001, 4999) = 3.092.

BC: bias corrected. VAF: Variance accounted for.

jointly mediate the influence of frequency of use on social integration. This is also supported by applying the variance accounted for (VAF) index (Hair et al., 2017), which determines the size of the indirect effect in relation to the total effect. When the VAF has an outcome above 80%, a full mediation can be assumed. This occurs when we assess the total indirect effect of frequency of use on social integration (VAF = 96.6%).

## 5. Discussion

This study has tackled SNS usage at different levels of sophistication, considering a usage range from frequency of use to deeper usage behaviors such as routinization and infusion. Our results show these types of usage are interrelated in such a way that routinization and infusion fully mediate the effect of frequency of use on social integration. In addition, this paper demonstrates that diverse kinds of usage exert different influences on social integration as a gratification (e.g., social self-esteem).

### 5.1. Theoretical implications

Using a technological diffusion approach (Cooper & Zmud, 1990; Saga & Zmud, 1994), we have distinguished three post-adoption behaviors or successive stages of SNS usage; that is, frequency of use (acceptance), routinization and infusion. This paper is the first that tackles the study of the factors that can influence the infusion variable in the context of SNSs (cf. Hassandoust et al., 2016). In addition, our contribution sheds light on how diverse types of SNS usage exert different influences on social integration, seen as an individual performance outcome or personal net benefit. On the one hand, a routinized behavior – as a consequence of an exploitation learning process (Po-An Hsieh & Zmud, 2006) – is more important than the initial use of an SNS. On the other hand, when members, by an exploration learning process (Burton-Jones & Straub, 2006), use an SNS to its fullest extent, it allows them to capitalize the SNS' potential, prompting an enhancement of their social integration as a positive individual impact (Cooper & Zmud, 1990; Jones et al., 2002). In fact, infusion represents the best predictor of social integration in our research model (it clarifies 32.75% of its explained variance), surpassing the influence of frequency of use and routinization on the final endogenous variable.

Besides, this study has helped to demystify the complex relationships between these different stages of SNS usage. Indeed, the structural model shows that all path coefficients between frequency of use, routinization and infusion are significant. Consequently, such post-adoptive behaviors are interrelated not only in a sequential process, but also in parallel (Hall & Loucks, 1977); that is, frequency of use is significantly associated with routinization and infusion. Going deeper into this issue, we have shown that routinization and infusion sequentially mediate the relationship between frequency of use and social integration. Our results further exhibit that this mediation is complete. Accordingly, this demonstrates the relevance of extended use or higher levels of usage over initial acceptance (frequency of use) in order to exploit the fullest potential of an SNS. Certainly, in the presence of routinization and infusion, the direct impact of frequency of use on social integration is completely irrelevant.

### 5.2. Practical implications

Our empirical results provide strong support for the arguments that post-adoption behaviors lead the Tuenti member into developing a growing social integration. Routinized behaviors and infusion predispose members to a higher participation in community activities, people's feelings of attachment to them and expectations of continuity. Post-adoption behaviors affect the purpose of social

communicating in a specific SNS, and provide scholars with a growing understanding of their interaction effects on the relationships between the community drivers and the sense of attachment to their SNS. Our results seem to indicate that analyzed constructs help to foster a desire to develop a stable relationship, a willingness to make short-term sacrifices to maintain the relationship, and a confidence in the stability of the relationship.

Community managers should seek complementary ways to foster their members' continuance interaction and active participation. On the one hand, community managers need first of all to ensure that an SNS is technically sound, with good security practices put in place to minimize the risks for the users. Perceived risk is an important factor initially affecting user intention to socially integrate into SNSs. Our research also suggests the expanding of technology acceptance models by considering both the affective and the cognitive dimensions of users' attitude. Managers interested in the development of feelings of being supported by others in an SNS, an active participation in it, and, as a result, a sense of belonging to it should develop strategies and mechanisms based on relational drivers that encourage interaction in terms of quantity or quality (e.g., participating in SNSs includes updating others on their activities and whereabouts, sharing photo and archiving events, getting updates on activities by friends, displaying a large social network, sharing the same interests or passions, among others) and the strength of the relationships between members.

Furthermore, because the SNS is an important part of the member's life, highly-routinized members have strong motivations to avoid dissatisfaction and emphasize social integration. In this regard, fulfilling, gratifying, useful and easy access to community features – via technical adjustments and modifications to rules and procedures – to enhance technical and operational knowledge (e.g., self-efficacy) will indeed reinforce the spontaneous tendency to go back to a preferred SNS. Regarding the users' control level, virtual environments must also be designed to be optimally stimulating to use, with the aim of evoking compelling experiences in order to increase cumulative satisfaction. Post-adoption behaviors – with daily procedures for dealing with SNSs – could then be one type of switching costs as they will become essential if the members question the relationship.

Finally, in this context of the routinization of online social network users, a necessary strategy determines that the SNS and its members be omnipresent in the member's life through all kinds of mobile devices. These guarantee immediateness, broadened personal information and proximity location. It is thus indispensable for the community users to visualize their meetings as routine social experiences and even advance toward extended, integrating or emerging uses (cf. Saga & Zmud, 1994; Schwarz & Chin, 2007; Sundaram et al., 2007).

### 5.3. Limitations

An initial potential limitation that readers might think about this paper is about the SNS selected to test our model, that is, Tuenti. This is why its owner, Telefonica, has shut down this social network, transforming it in a mobile virtual network operator (Dans, 2016). Tuenti had been losing users since 2012. This phenomenon might be explained either by a replacement or switching process to other SNS (e.g., Facebook or Twitter) (Bhattacharjee, Limayem, & Cheung, 2012; Polites & Karahanna, 2012) or by a discontinuance process (Recker, 2016) that affects the user's intention to discontinue or switch the use of the SNS, a stage that is previous to the three post-adoption behaviors upon which our attention is focused. Consequently, both the aims and the results derived from our study would not be affected by such an SNS closure.

The second limitation of this research pertains to the sample. This might limit the external validity of our findings. For instance,

the specific cultural context may have affected our findings. Future research using a more sophisticated sampling design and different SNSs (e.g. Facebook or Twitter) would establish the external validity of our findings. The third limitation is the age of the data. These were collected in 2009. We considered that it would be advisable to replicate this study with more recent data from a more relevant SNS. The fourth limitation is that our model is a set of main-effect relationships. Potential contingency variables have not been included. Future research should assess the contingent relationship and test the moderating role of variables such as gender and age. Fifth, the design of the research employed was cross-sectional. However, the members' perceptions can change over time. Accordingly, future research should measure the constructs analyzed at several points of time, taking the dynamics in user patronage behavior into account.

## Acknowledgments

This research was supported by the Junta de Andalucía (Consejería de Economía, Innovación y Ciencia) Spain (Proyectos de investigación de excelencia P10-SEJ-6081/P10-SEJ-5801).

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