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Linking social networks to utilitarian benefits through counter-knowledge

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Abstract

Purpose – Social Networking Sites (SNS) enable users to create their own public profiles within a website. In recent years there has been an increase in the number of people spreading misleading information or rumours (i.e. counter-knowledge) about friends and other people via social media platforms. This paper aims to identify the role played by social networks in the process of creating counter-knowledge, focusing on the counter-knowledge that users develop in the context of SNS and its effect on utilitarian benefits.

Design/methodology/approach – This study analyses these effects through an empirical investigation of 236 users of social networking sites. The methodology involves the construction and analysis of a structural equation model from a review of relevant literature.

Findings – The results confirm that, although the context of social networking sites is a variable that will lead to positive effects on counter-knowledge, the relationship between counter-knowledge and utilitarian benefits becomes statistically insignificant. The results also show that the content of social networks may lead to higher levels of utilitarian benefits. This either amplifies or helps to encourage cooperation among users and providers of rumours, beliefs and assumptions about what they think is the truth.

Originality/value – From a user perspective few, if any, studies of SNS have considered the relationship between the information collected and generated by SNS and counter-knowledge. Therefore the results of this study lead us to advise managers of social networking sites to consider that most, but not all, the content on social networking sites is associated with the spread of rumours, misinformation and unverified claims.

Keywords Social networking sites, Counter-knowledge, Utilitarian benefits

Article classification Research paper

Introduction

Social networking sites (SNS) have emerged as a tool with which users can establish and maintain relationships with their relatives, friends and other agents (Hennig-Thurau *et al*., 2010). SNS are defined as applications that enable users to connect by creating personal information profiles, and also provide specific profiles of organisations where users can build and maintain relationships with each other (Zaglia, 2013). From this perspective users are able to learn from each other, generate new ideas and get important feedback from SNS (Dholakia *et al*., 2004). In this regard Walton and Hepworth's (2011) study provides evidence that an individual progresses from a novice to an expert user during their learning journey.

This means that in the context of SNS, users establish relationships over a period of time that allow information exchange but, rather than being mere recipients of information, they use SNS to recommend products and services to others (Loureiro *et al*., 2014) or express and disseminate their experiences and opinions about friends, relatives or news (De Valck *et al*., 2009), creating new knowledge in the process.

Although reviews and comments in SNS become first reference points for users (e.g. consumers) when they search for information on products (Jalilvand and Samiei, 2012), it should be noted here that all so-called "knowledge" generated from SNS is not necessarily good knowledge. Rumours, as well as gossip, unsupported explanations and justifications shared on SNS are some examples that illustrate users' ability to create inappropriate or false beliefs via SNS. Regarding this, poorly written blogs can have obvious detrimental effects on writing skills (Rector, 2008), while misinformation and the absence of relevant knowledge can hinder effective buying decisions (Lewandowsky *et al*., 2012). Counter-knowledge is created when people develop inappropriate or incorrect interpretations of certain events or sequences of facts (Thompson, 2008). Hence, as Koller and Alpar (2008) noted, wikis, blogs and web 2.0 technologies are nowhere near as reliable as printed media and users may create counter-knowledge as a consequence of these unreliable or inaccurate sources. The above examples illustrate users' capacity to create counter-knowledge by using digital social media platforms and high-tech gadgets such as tablets and smart phones (Hirose and Sonehara, 2008).

However, as acknowledged in previous literature, counter-knowledge generated via SNS is not always necessarily bad (Yerkovich, 1977; Baumeister *et al*., 2004; Cegarra *et al*., 2014a). For example Yerkovich (1977) and Baumeister *et al*. (2004) argue that gossip is useful for conveying information to others, for social influence and for entertainment. Such anecdotes may also be useful to explain how our culture and society operate (Dunbar, 1996; Fox, 2001). In fact Baumeister *et al*. (2004) suggest that knowledge, even if it is untrue, can help. For example people can learn a lot about users (e.g. colleagues) who are spreading or starting the gossip, and that in itself is good knowledge (Baumeister *et al*., 2004). Gossiping can also strengthen team work, empathy and bonds between co-workers (Baumeister *et al*., 2004) and that can lead to understanding reality by sifting through all the facts and drawing up a good plan that team members can carry out successfully to overcome erroneous or inaccurate information (Kurbanoglu, 2003; Kurbanoglu *et al*., 2006).

The considerations outlined above lead us to argue that the content on social networks is simultaneously a hindrance stressor (which has negative effects) and a challenge stressor

(which has positive effects). In other words while on some occasions, the content on social networks is an important trigger that contributes to positive performance, on other occasions, this content may have negative consequences, inducing incorrect assumptions about how to meet people's needs and how to improve social relationships. This study explores the following questions: Does the availability of information that arises from SNS necessarily mean the creation of counter-knowledge? How can users gain positive utilitarian benefits from using information that arises from SNS? These research questions are empirically examined by using a dataset consisting of undergraduate students. The rest of the paper is structured as follows. The next section describes in detail the theoretical frameworks that characterise counter-knowledge and SNS. Following that, the research model and its associated hypotheses are presented. Next, the methodology used for sample selection and data collection is discussed and data analysis and results are examined. Finally, the paper concludes with a discussion of research findings, limitations and closing remarks.

Conceptual framework

Recent years have seen explosive growth of various online communities. Social networking sites (e.g. Facebook, Twitter and Tuenti) are the latest online communication tool that allows users to connect and interact with hundreds of millions of users worldwide (Katona *et al*., 2011; Kaplan and Haenlein, 2010; Hossain and De Silva, 2009). There are various different approaches to SNS. On the one hand, authors such as Ellison *et al*. (2007) have argued that SNS can provide opportunities for new relationships as well as strengthening existing relationships, whether your relatives and friends are close to home or on the other side of the world. On the other hand, users can also use SNS to behave in a way that is cruel or hurtful (Ybarra *et al*., 2006). This includes everything from posting nasty comments and photos to spreading rumours and making threats (Ybarra *et al*., 2006; Chiou *et al*., 2013).

Unable to measure the size and content of personal networks in a direct and reliable manner, researchers have employed different types of surveys that aim to refresh users' memory in order to generate proxies of their social network content (e.g. McCallister and Fischer, 1978; Burt, 1984; Fu, 2005). This study follows the suggestion of Pempek *et al*. (2009) that communication is facilitated through information posted on the social networking site, which often includes:

- the user's personal information, including photos about their life, holidays or their children;

- posts created by the user on their wall (a public writing space where others who view a profile can see and write messages) about their views on religion, economics or politics;
- posts created by others on their wall.

The considerations above imply that SNS constitute a context to share gossip, lies, exaggeration and partial truths (Ybarra *et al.*, 2006) whereby knowledge is not only "discovered" but is also socially constructed (Burt, 2001). In this regard most SNS incorporate unedited and unverified content and promote involvement in social activities that are derived from rumour or gossip (Burt, 2001). With this in mind, counter-knowledge may be unwittingly acquired from SNS. Thompson defines counter-knowledge as "misinformation packaged to look like fact" (2008, p. 1). This author proposes that counter-knowledge is based on false statements, gossip, rumours and even lies, which may lead to the adoption of inappropriate or outdated assumptions. Thus, based on previous literature, counter-knowledge can be viewed as resulting in a natural deterioration or depreciation of knowledge shared among the networking members, usually with negative consequences for learning processes and academic goals (Thompson, 2008; Zhao and Kuh, 2004).

Counter-knowledge may also be related to false beliefs based on extremist politics and religious viewpoints (Thompson, 2008). However, extremist politics and religious viewpoints are not included in the current study because they could be considered statistical outliers. This has to do with the fact that the average age of responders in this study is 22.4 years old and up to now they have not held extreme views on politics, religion or immigration. In fact most young university students across Spain are not even interested in religious issues (Elzo, 2001), much less in extremist religious viewpoints. This is further supported by recent research showing that young people in Spain are not very religious (Diaz *et al.*, 2013; Garcia and Bernabe, 2013; Alaminos and Penalva, 2012). In addition, the focus of this study is not only the negative effects of counter-knowledge, but also its positive potential to inform (e.g. Foster, 2004; Dunbar, 1996). In line with this idea, past research has shown that gossip can deter selfishness (Beersma and van Kleef, 2011; Feinberg *et al.*, 2014; Piazza and Bering, 2008) and facilitate indirect reciprocity (Sommerfeld *et al.*, 2007).

This study suggests that counter-knowledge generally involves the provision of unverified information by one agent to another about a third. Under this framework counter-knowledge is simply the sharing of unverified news and the process through which users catch up. It is verbal communication as part of social grooming, through which people maintain relationships (e.g. Gambetta, 1994; Dunbar, 1996). In this vein Ben-Ze'ev (1994)

noted that one primary function of gossip is to allow people access to information about others' personal and intimate lives (information to which they would not otherwise be privy), with the ultimate purpose of using that information to control and understand their own lives. As noted above, counter-knowledge is also useful for conveying information to others, for social influence and for entertainment (Yerkovich, 1977; Baumeister *et al*., 2004). From this perspective counter-knowledge could reveal potentially useful information about how society in general and, more specifically, online community members operate (Ben-Ze'ev, 1994; Baumeister *et al*., 2004).

Triggers of counter-knowledge can arise for different reasons. For the purposes of this paper SNS potentially lead to a degradation of learned knowledge (Lewandowsky *et al*., 2012). For example when SNS members provide information that is derived from unsupported evidence, rumour or gossip, the learning process is undermined. As a result SNS members who tend to accept unsupported and false statements may well develop an increased propensity to believe further rumours and gossip (i.e. counter-knowledge). In addition, SNS members who engage in gossip begin to forget to a certain degree why they are members of the SNS.

As a result they lose focus and over time they and their friends may come to rely more on unedited and unverified information than on face-to-face interactions.

According to this discussion, this study proposes the following hypothesis:

H1. Content on social networking sites is positively associated with counter-knowledge.

Utilitarian benefits provide user value by offering a means to an end and come from financial advantages, such as monetary savings (Mimouni-Chaabane and Volle, 2010). Ellingsen and Johannesson (2008) have argued that consumers seek to receive economic advantages from their relationships with a business or brand. Among these benefits are pricing incentives, sales, coupons, discounts, special offers, gifts or rewards (Chiu *et al*., 2005; Wendlandt and Schrader, 2007; Leenheer *et al*., 2007; Gable *et al*., 2008; Bridson *et al*., 2008; Chen and Chiu, 2009). It is considered that this type of benefit comes from economic and financial advantages that users perceive when they develop relationships via social networks. This means that utilitarian benefits are an important reason for a consumer to develop a relationship with a social network site (Harris *et al*., 2003).

Since information on social networking sites provides benefits such as increased information and opportunities, this study posits that participants who use this information are able to produce collateral benefits and avoid collateral harm. For example social networking

sites may reveal utilitarian benefits that online community members may not want to express directly such as experiences of companies overcharging, lack of trust in institutions or other people, and other dysfunctional aspects of any organisation. It should be noted that the uses and gratification theory predicts that a proactive attitude encourages people to recognise and meet their learning needs through the internet or other media (Althaus and Tewksbury, 2000), and thus create utilitarian benefits. Therefore the hypothesis is:

H2. Content on social networking sites is positively associated with utilitarian benefits.

Although the vast majority of counter-knowledge is not all that harmful and it does not necessarily involve the malicious spread of lies or hurtful information (Foster, 2004; Cegarra *et al*., 2014a; Feinberg *et al*., 2014) it is often considered trivial or antisocial (e.g. Thompson, 2008; Zhao and Kuh, 2004). For example counter-knowledge may promote cyber-bullying by facilitating posting abusive messages on profiles, adding rude comments to a picture that has been uploaded, posting a video or photo that makes fun of someone, and setting up fake profiles to tease others or to get them into trouble. These considerations lead us to frame the following hypothesis:

H3. Counter-knowledge has a negative effect on utilitarian benefits.

Figure 1 presents the model underlying the analysis in this paper. The lower branch in the figure proposes that counter-knowledge acts as a mediator between the content on social networking sites and utilitarian benefits.

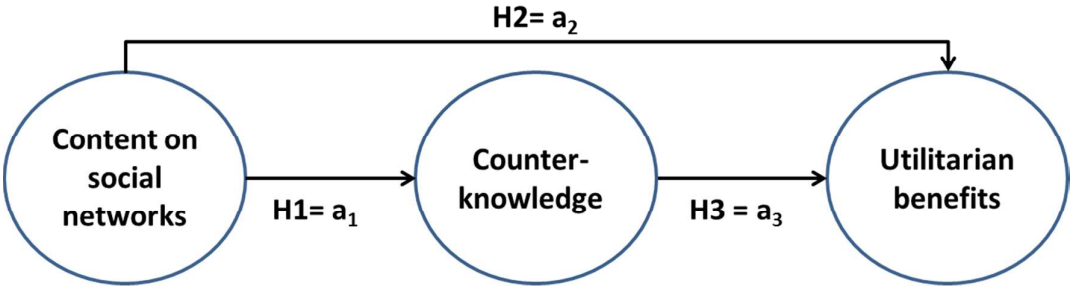

Figure 1. Theoretical model

Method

Data collection

In order to test the above hypotheses, we used students belonging to a School of Business Management at a Spanish university, which was chosen for two main reasons. First, despite academic staff introducing a number of innovations within the Bologna European Higher

Education Convergence Process, studies on how students use such innovations and what prospective students expect of these innovation as part of their university have been underdeveloped. It should be noted that the Bologna Process constitutes a constructivist context to share and co-produce counter-knowledge. For example the Process calls on its members to actively organise students in small groups as they have more opportunities to practise and respond. Under this framework counter-knowledge plays a central role in the Bologna Process, where both students and teachers form a small education community with common interests working and studying in a classroom, and on many occasions they are being driven by gossip, exaggerations and partial truths (Cegarra *et al*., 2014b). Second, the School of Business Management is an ideal platform for sharing good and bad gossip about teachers, because the school provides education and training not only to students but also to teachers, allowing the exchange of information to be inserted into the social context of the students, which may make learning and unlearning more effective for all participants.

The School of Business Management at this university was considered an appropriate setting for an investigation into counter-knowledge and its impact on utilitarian benefits. We contacted 800 students who had attended at least one year of classes at the school. These students were expected to have a broad overview of the classroom environment studied in this paper because they had attended courses during the academic year 2012-2013. From a sample of 800 a total of 236 students responded to a survey questionnaire conducted in February and March 2014, the majority of respondents being male (71.2 percent). This resulted in a response rate of 29.5 percent with a factor of error of 5.35 percent for p=q=50 percent and a reliability level of 95.5 percent.

Measures

Churchill's (1979) approach to questionnaire development was used, combining scales from several other relevant empirical studies with new items to make an initial list of 15 items. Before undertaking the survey, a pilot survey was conducted involving a series of interviews with three students in order to discover, in detail, what they understood by the term "content" relating to a social network. In doing so, before undertaking the survey, a 60-minute (consensus, revision) meeting was held with an expert panel (two potential responders, one item writer, the research team and the translator). All respondents identified the following as being provided by SNS: the user's personal information, access to posts created by the user and access to posts created by others on their wall. Since specifying translation tasks requires an exchange of information between researchers, questionnaire designers, target language implementers and translators (Acquadro *et al*., 1996) the goal of this meeting was also to

compare the independent translations of the same questionnaire and reconcile discrepancies and agree on a final version which exploits the best of the independent translations (Guillemin *et al*., 1993). Based on this pilot survey, several items were modified as a result of these interviews with the three students and three items in each of five broad categories were identified, as shown in Appendix 1.

The counter-knowledge scale was constructed from a literature review. Three items made up the scale for "counter-knowledge". Previous studies by Szvetelszky (2003) and Chapman and Ferfolja (2001) provide guidance on how to develop items to measure counter-knowledge. Among the indicators of counter-knowledge, factors relating to the lack of congruity between the intended communication and its recipient (e.g. misunderstandings) are most often used (Thompson, 2008). This study also adopted questions focusing on gossip which thrives on lies, exaggeration and partial truths (Chapman and Ferfolja, 2001).

The psychometric literature suggests that having more scale points is better but there is a diminishing return after around 11 points (Nunnally, 1978). Having seven points tends to be a good balance between having enough points of discrimination without having to maintain too many response options. In this study in order to avoid the effects of extreme symmetry (Andrews, 1984) by facilitating discrimination and reducing statistical error (Fornell, 1995) a seven-point scale was used (1= strongly disagree and 7= strongly agree).

The measures relating to "the content on social networks" consisted of nine items taken from a scale designed by Pempek *et al*. (2009) to measure the information posted on the social networking site. As described above, three dimensions relate to the content on social networks: "the user's personal information", "access to posts created by the user" and "access to posts created by others". The user's personal information consisted of three items describing how many personal links, personal photos and status updates had been posted on the user profile in an average year. In order to measure "access to posts created by the user", three items were used. During this process, respondents were asked to indicate how many wall posts on their social website pages they have in a typical year, including all those about their personal views on education, economics or finance. Finally, "the access to posts created by others" was measured using three items. These items recognise the support of other users and documents and comments that were posted on the user's profile but created by others in an average year.

Among the indicators of utilitarian benefits, factors that provide utilitarian value by convenience and saving a user time and money are most often used (Mimouni-Chaabane and Volle, 2010; Frisou and Yildiz, 2011). Utilitarian benefits were measured using a seven-point

Likert scale from Mimouni-Chaabane and Volle's (2010) work. Three items tapped into the extent to which virtual users were able to use eagerness as a means to attain utilitarian outcomes.

Data analysis

This study used SmartPLS 3.1.5. software (Ringle *et al*., 2014) to conduct an analysis of the data collected. Using PLS involves following a two-stage approach (Barclay *et al*., 1995). The first step requires the assessment of the measurement model.

This allows the relationships between the observable variables and theoretical concepts to be specified. This analysis is performed in relation to the attributes of individual item reliability, construct reliability, average variance extracted (AVE) and discriminant validity of the indicators of latent variables. In the second step the structural model is evaluated. The objective of this is to test the extent to which the causal relationships specified by the proposed model are consistent with the available data. To test the hypothesis this study used the bootstrapping procedure recommended by Chin (1998).

In order to analyse the relationships between the different constructs and their indicators, this study adopted the latent model perspective in which the latent variable is understood to be the cause of the indicators. This study therefore refers to reflective indicators for first-order constructs or dimensions. Two constructs in the model are operationalised as first-order reflective constructs (i.e. counter-knowledge and utilitarian benefits), while the content on social networks is modelled as a second-order formative construct. With regard to the measurement model this study began by assessing the individual item reliability (Table 1). The indicators exceed the accepted threshold of 0.7 for each factor loading (Carmines and Zeller, 1979).

Table 1. Factor loadings of reflective constructs

	Profile	Self-creation	Created by others	Counter-knowledge	Utilitarian
Content_1	*0.88*	0.08	0.24	0.06	0.07
Content_2	*0.94*	0.43	0.54	0.12	0.15
Content_3	*0.74*	0.15	0.23	-0.04	0.12
Content_4	0.33	*0.99*	0.24	0.06	0.07
Content_5	0.32	*0.99*	0.23	0.07	0.08
Content_6	0.27	*0.99*	0.18	0.07	0.07

Content_7	0.20	0.10	*0.74*	0.10	0.13
Content_6	0.46	0.25	*0.88*	0.05	0.15
Content_8	0.40	0.16	*0.93*	0.10	0.20
Counter_1	-0.02	0.06	0.13	*0.72*	0.34
Counter_2	0.11	0.06	0.10	*0.90*	0.43
Counter_3	0.07	0.03	0.01	*0.89*	0.44
Util_1	0.11	0.06	0.06	0.44	*0.81*
Util_2	0.14	0.05	0.21	0.33	*0.76*
Util_3	0.08	0.04	0.20	0.34	*0.77*

As can be seen in Table 2 the data support the assertion that all of the constructs are reliable. The values for both the Cronbach's alpha coefficient and composite reliability are greater than the 0.7 required in the early stages of research and the stricter value of 0.8 for basic research (Nunnally, 1978). The AVE should be greater than 0.5, meaning that 50 percent or more variance of the indicators should be accounted for (Fornell and Larcker, 1981). All the constructs exceed this condition (Table 2). A comparison of the square root of the AVE (i.e. Table 2 diagonals) with the correlations among constructs (i.e. the lower triangle of the matrix in Table 2) determines discriminant validity.

Table 2. Descriptive statistics and correlation matrix

	Mean	SD	CA	CR	AVE	1	2	3	4	5	6
1. Profile	99.44	403.93	0.82	0.89	0.73	***0.85***					
2. Self-creation	96.15	646.88	0.74	0.99	0.99	0.17	***0.99***				
3. Created by others	88.29	254.59	0.99	0.89	0.73	0.27	0.18	***0.85***			
4. Social network content	94.62	308.50	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	***n.a.***		
5. Counter-knowledge	4.12	1.52	0.78	0.87	0.71	0.03	0.07	0.11	0.09	***0.84***	
6. Utilitarian	4.47	1.24	0.68	0.80	0.61	0.11	0.07	0.19	0.15	0.48	***0.78***

Notes:

Mean = the average score for all of the items included in this measure; S.D. = Standard Deviation; CA = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted; n.a. = not applicable. They represent the dimensions of each second-order construct. The bold numbers on the diagonal are the square root of the Average Variance Extracted. Off-diagonal elements are correlations among constructs.

The evaluation of formative dimensions of the high-order construct "content on social networks", is different from that of the reflective dimensions. The appropriate procedure for formative dimensions is an examination of the weights (Mathieson *et al*., 2001), which is a canonical correlation analysis and provides information about how each indicator contributes to the respective construct (see Table 3). Weights do not need to exceed any particular benchmark because a census of indicators is required for a formative specification (Diamantopoulos and Winklhofer, 2001).

This study confirmed the validity of the formative dimensions using the procedures suggested by Fornell and Larcker (1981) and MacKenzie *et al*. (2005) (see Table 3). The concern with formative dimensions is potential multicolinearity with overlapping dimensions, which could produce unstable estimates (Mathieson *et al*., 2001). The results of a colinearity test show the variance inflation factor scores of each second-order construct for all dimensions are far below the commonly accepted cut-off of 10 (< 1.10).

Table 3. Weights of the formative construct

High order constructs and their dimensions	Weights	t-value
The content on social networks		
• The user's personal information	0.38	8.70
• Access to posts created by the user	0.59	9.90
• Access to posts created by others	0.36	5.06

Results

Chin (1998) recommends using Chin's F^2 ratio to test a more restricted model. The partially mediated model involves a direct relationship between social network content and utilitarian benefits, while the fully mediated model involves the same relationship with counter-knowledge acting as a mediator. Consistent with Hair *et al.* (2013), bootstrapping (500 resamples) was used to generate standard errors, t-statistics and confidence intervals. Table 4 summarises the structural models resulting from the PLS analysis and shows the explained variance of endogenous variables (R^2), the Q^2 test for predictive relevance and the standardised path coefficients.

Although the fully mediated model results in an acceptable fit, Chin's F^2 ratio (1998) indicates a significant improvement of the partial mediation model over the full mediation

model ($\Delta R^2 = 0.689$; $F^2 = 0.614$). Such an improvement is significant in those cases where F^2 is greater than 0.02. In addition, the explained variance (R^2) and the Q^2 test of utilitarian benefits show that the partially mediated model has more adequate fit indices than the fully mediated model has, indicating that one model represents a significant parsimony gain over another (Hair *et al*., 2013). These findings support the partially mediated model, which is technically a suppressor model. It is important to note here that suppressor models share important similarities with partial mediation models (MacKinnon *et al*., 2000). In particular and as in a partial mediation model, the independent variable influences the dependent variable directly and indirectly via a third variable in a suppressor model (MacKinnon *et al*., 2000; Shrout and Bolger, 2002).

Table 4. Effects on endogenous constructs

	Partially mediated model				Fully mediated model			
	R^2	Q^2	Direct effect	*t*-value	R^2	Q^2	Direct effect	*t*-value
Counter-knowledge	0.243	0.164			0.237	0.160		
H1: Counter-knowledge = a_1			0.49***	9.19			0.487***	8.90
Utilitarian benefits	0.925	0.556			0.236	0.135		
*H2:*Social network content=a_2			0.33***	45.54			n.a.	n.a.
*H3:*Counter-knowledge =a_3			0.007ns	0.30			0.485***	8.81
ΔR^2	(0.925-0.236)=0.689							
F^2	0.614							

Notes:

***$p < 0.01$, n.a. = not applicable, ns = not significant (based on a Student t (499) distribution with two tails); t(0.01,499)=2.585711627, t(0.05,499)=1.964726835

Figure 2 summarises structural competing links, which indicate that a positive relationship exists between social network content and utilitarian benefits (a_2=0.958; $p < 0.01$). While social network content's influence on counter-knowledge receives full verification, (a_1=0.492; $p < 0.01$), the relationship between counter-knowledge and utilitarian benefits becomes statistically insignificant in the partial mediation model (a_3= 0.007; n.s). Consequently the findings do not support *H3* and completely support *H1* and *H2*.

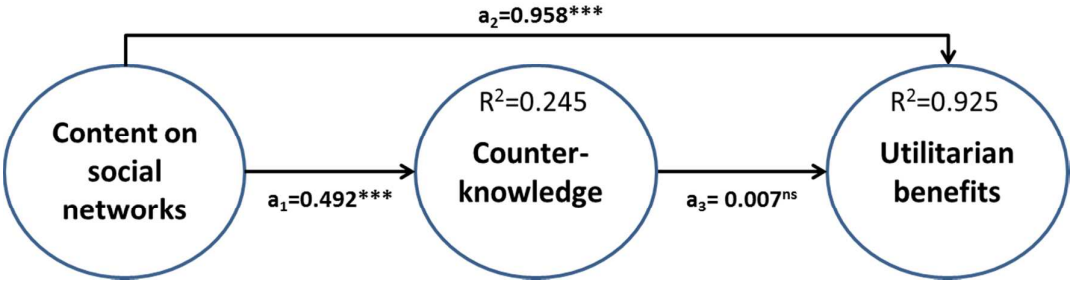

Figure 2. Structural equation model of the contents of social networks

Notes:

***p < 0.01, ns = not significant (based on a Student t (499) distribution with two tails); t(0.01,499)=2.585711627, t(0.05,499)=1.964726835

Following the recommendations of Preacher and Hayes (2008), this study has carried out a *post hoc* indirect effect analysis to test the indirect effect of independent variables on the dependent variable by way of the mediator (see Table 5). In doing so, a two-step procedure for testing mediation in PLS has been followed. First, this study uses the specific model in question with both direct and indirect paths included and performs 500 bootstrap resampling and explicitly calculates the product of the direct paths that form the indirect path being assessed. Second, this study estimates the significance using percentile bootstrap. This generated 95 percent confidence intervals for the indirect relationships under study. As Table 5 shows, counter-knowledge does not mediate the relationship between social network content and utilitarian benefits.

Table 5. Indirect effects

Indirect effects on	Point estimate	Percentile bootstrap 95% confidence interval		
		Lower	Upper	
Utilitarian benefits				
$SN \rightarrow CK \rightarrow UB = a_1 \times a_3$	0.003	-0.013	0.091	0.143^{ns}

Notes:

ns= not significant; SN=Social network content; CK= Counter-knowledge; UB= Utilitarian benefits.

Discussion

Gathering and analysing relevant data, this study demonstrates that although social network content is an important trigger for counter-knowledge as it facilitates communication and allow individuals to exert influence through an uncontrolled user-generated exchange of information and ideas, counter-knowledge (i.e. what is being said) does not lead to higher levels of utilitarian benefits, thereby neither dispersing nor helping encourage cooperation among users and providers of rumours, beliefs and assumptions about what they think is the truth. This is an important finding, as the deep understanding of counter-knowledge is crucial to get optimal outcomes from a network's potential. The theoretical and managerial implications of the relationships observed across those constructs are discussed below.

Regarding *H1* this paper provides further empirical evidence that the content on social networks is also relevant in increasing counter-knowledge because through using such content users can establish relationships (e.g. Yerkovich, 1977; Baumeister *et al*., 2004; Feinberg *et al*., 2014). This means that online social networks, such as Twitter or Facebook, have become an ideal source of counter-knowledge to spread misleading information or rumours about other people or to collect human-to-human interactions and unveil the social structures that people constitute. In this sense the social network content can be viewed as a prerequisite for simulating the counter-knowledge dissemination as this process is not organised centrally and the network is not designed in an intelligent way (Doerr *et al*., 2012). A possible explanation would be the fact that such forms of communication can be modelled only by informal contacts (Doerr *et al*., 2012). In this regard many online social networks allow different ways of communication such as posts on user's personal pages, possibly resulting in their friends being notified of the post when they next log in. They then forward the news if it is sufficiently interesting, despite it being inaccurate, or unverified.

With regard to *H2* social network content leads to either an improvement or increase of utilitarian benefits. From this perspective social network content which is formed by the user's personal information, posts created by the user and posts created by others may be considered to be positively associated with utilitarian benefits as a result of: 1) facilitating indirect reciprocity among users and providers of content (Sommerfeld *et al*., 2007); 2) helping users track successful content and build relationships with those users who have exploited that content, even when such exploitation was not directly observed (Beersma and van Kleef, 2011; Feinberg *et al*., 2014; Piazza and Bering, 2008); 3) fostering a sense of adequacy with regard to the combination of unexpected links between variables, such as people and the social network content (Doerr *et al*., 2012); and 4) increasing users' prior

knowledge of the potential interactions between the social network content and its consequences (Feinberg *et al*., 2014).

With regard to *H3* surprisingly counter-knowledge had no significant effect on utilitarian benefits and consequently the relationship between counter-knowledge and utilitarian benefits needs to be investigated further. In contrast to the conventional belief that counter-knowledge is malicious and should be avoided (e.g. Chapman and Ferfolja, 2001; Thompson, 2008) the results support the position that counter-knowledge does not play a major role in creating utilitarian benefits to users. A possible explanation is that although counter-knowledge is a source of entertainment for users, the majority of people do not use rumours, gossip, exaggerations and partial truths to construct meaning, create knowledge and make decisions (Yerkovich, 1977; Baumeister *et al*., 2004). Another possible explanation for that insignificant relationship may be that due to information overload in social media and its impact on social relations (Lewandowsky *et al*., 2012) it is harder to differentiate between counter-knowledge that is false and other counter-knowledge that is correct, which in turn could lead users to mistrust of counter-knowledge (Cegarra *et al*., 2014b).

This study has some limitations. First, although the constructs have been defined as precisely as possible by reference to relevant literature and validated by students, they can realistically only be regarded as proxies for underlying phenomena that in themselves are not fully measurable. Second, only a single research methodology was employed and further research through interviews and observational case studies could be undertaken for triangulation. Third, this research was performed in a specific university, which might prevent the generalisation of the results to other universities. This means that any extrapolation of the conclusions might not be generalisable beyond the sample frame, which could be addressed by cross-sector and cross-cultural studies. Fourth, this study is based on the assumption that counter-knowledge is similar for different actors and participants (e.g. teachers or university administrators), and therefore their assessment could be conducted in the same way for other participants. In other words the study does not include the possibility of actors and participants being able to consider alternative uses of counter-knowledge available to them.

Taking into account all of the above limitations, this study does however point to a variety of potentially fruitful directions for further research. First, some factors which are also likely to affect counter-knowledge in other frameworks have not been addressed in this study (e.g. extremist politics and religious viewpoints). Therefore future research should include counter-knowledge based on extremist politics and religious viewpoints to complement the

results of the current study. Second, only subjective information relating to the posts that users receive in a typical year was solicited, thereby objective measures should be used to supplement subjective information (e.g. visiting and collecting a sample of Facebook walls). Although this kind of subjective information is commonly used in studies (e.g. Metzger, 2007; Vermeulen and Seegers, 2009), the addition of other measures from objective sources would have added to the validity and reliability of the study. Third, it would also be interesting to extend the survey to different actors and network members (e.g. teachers and university administrators), since they might have different understandings of counter-knowledge. Finally, longitudinal research to further examine the relationships between the presence of counter-knowledge and utilitarian benefits is likely to be worthwhile.

Conclusions

A highly connected network not only provides opportunities for the development of gossip, lies or partial truths but is also essential in providing a corridor for different users to overcome misconceptions about the nature of their online relationships. This paper aimed to clarify the existing literature which tries to contribute to the discussion of utilitarian benefits, and helps social network users to obtain meaning out of the relationship between the content on social networks, counter-knowledge and utilitarian benefits. The proposed method involved the identification and test of two structural models. Although the fully mediated model resulted in an acceptable fit, the partially mediated model had more adequate fit indices. This means that the content on social networks can be directly associated with either utilitarian benefits or the creation of counter-knowledge.

The results show that although counter-knowledge may be unwittingly acquired from unreliable and inaccurate sources such as Twitter or Facebook, it has an insignificant effect on utilitarian benefits, which means that although social network users using social networks are able to share rumours, gossip, exaggerations and partial truths, they do not use this counter-knowledge in responding to a promotion or shopping convenience (i.e. utilitarian benefits). A practical implication for social network users is to carry out informal or formal actions that allow them to verify the content on social networks that looks useful. The findings in this study provide different ways and approaches to effectively spreading information on social media. Assessing accurate and complete knowledge requires social network users to continuously and appropriately verify the content on social networks, to

have the time or resources to check all that is being said and done with the content on social networks and to use this knowledge as a means to enhance the utilitarian benefits.

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Appendix 1. Questionnaire items

Content related to your profile: Regarding your social network posts, put the following in order or comment on the following topics (ONLY LAST YEAR):

1. Post(s) and details related to your profile (e.g. pages you like, change of status)
2. Post(s) oriented toward the exchange of personal information (e.g. birthday parties, hobbies)
3. Post(s) related to family members (e.g. wedding anniversary of a relative)

(Source: Adapted from Chapman and Ferfolja, 2001)

Content and documents created by yourself: Regarding your social network posts, put the following in order or comment on the following topics (ONLY LAST YEAR):

1. Posts related to arts and culture created by yourself
2. Posts related to education created by yourself
3. Posts related to economics and finance created by yourself

(Source: Adapted from Chapman and Ferfolja, 2001)

Content and documents created by other people: Regarding your social network posts, put the following in order or comment on the following topics (ONLY LAST YEAR):

1. Original content created by other people (e.g. photos or jokes)
2. Files created by other people and shared on your page (e.g. videos, photos)
3. Post(s) on your page or invitations received from other people

(Source: Adapted from Chapman and Ferfolja, 2001)

Counter-knowledge: Regarding the information on your own space:

1. There is gossip that thrives on lies, exaggerations and partial truths
2. There are malicious rumours which support mistrust
3. There is unverified information that often leads to misunderstandings

(Source: Adapted from Chapman and Ferfolja, 2001)

Utilitarian benefits: With respect to information collected on friends' or contacts' social networks:

1. It has enabled better shopping in traditional stores
2. It has allowed me to spend less
3. It has allowed me to save money

(Source: Adapted from Mimouni and Volle, 2010)