Information Uses and Gratifications Related to Crisis: Student Perceptions since the Egyptian Uprising

Steven D. Sheetz
Virginia Tech
sheetz@vt.edu

Andrea Kavanaugh
Virginia Tech
kavan@vt.edu

Edward A. Fox
Virginia Tech
fox@vt.edu

Riham Hassan
Arab Academy of Science and Technology e-
riham@aucegypt.edu

Seungwon Yang
Louisiana State University
seungwonyang@lsu.edu

Mohamed M. G. Farag
Arab Academy of Science and Technology e-
mmagdy@aast.edu

Donald Shoemaker
Virginia Tech
shoemake@vt.edu

ABSTRACT

People use diverse sources of information, e.g., newspapers, TV, Internet news, social media, and face-to-face conversations, to make sense of crises. We apply uses and gratifications theory (UGT) and structural equation modeling to illustrate how using internet-based information sources since the political uprisings in Egypt influence perceptions of information satisfaction. Consistent with expectations we find that content and process gratifications constructs combine to explain information satisfaction, while social gratifications do not significantly influence satisfaction in the context of a crisis. This suggests that UGT is useful for evaluating the use of information technology in a context where information is limited in quantity and reliability.

Keywords

Uses and gratifications theory; information sources; Internet; social media; structural equation modeling

INTRODUCTION

The popular uprisings that brought down governments in Tunisia, Egypt, and Libya, along with protests in other countries, became known as the 'Arab spring'. Political uprisings such as these are crises both for citizens and governments. Uses and gratifications theory (UGT) describes how information consumers use media to meet their information needs. UGT has been widely applied over time and more recently to assess the Internet (Stafford, Stafford et al., 2004), social media (Ku, Chu et al., 2013), and political information (Kaye and Johnson, 2002; Kaye and Johnson, 2004). UGT describes both how (through use of the different communication media and information

technology) and why (to achieve some purpose or need, i.e., gratification) a consumer pays attention to an information source.

Jamal and Melkote (2008) suggest that social gratifications are likely less relevant in crises than in normal non-crisis situations. They propose that process gratifications and content gratifications will dominate perceptions in the crisis context. Using partial least squares based structural equation modeling (PLS-SEM) we show that the expectations for traditional UGT constructs of content and process gratifications hold in our context of political uprisings, explaining a substantial amount of variance in our information satisfaction construct ($R^2 = .30$) and having significant positive influences on information satisfaction. Social gratifications has an inverse effect on satisfaction, rather than the expected positive effect hypothesized from prior Internet and social media research.

In the following section we provide background on the situation and expand on how the theory is relevant in the contexts of political uprisings. This is followed by sections for our hypotheses and research model, research methodology, presentation of measurement model, and results for our two structural models, discussion of the implications and limitations of our study, and summary conclusions.

BACKGROUND AND THEORY

Massive protests occurred in Egypt between January 25 and February 11, 2011 leading to the end of the Presidency of Hosni Mubarak. The government restricted cell phone access in Cairo and Alexandria during demonstrations, and cut off Internet access completely for several days (Singel, 2011), clearly attempting to limit the peoples' abilities to obtain and share information by restricting access to information sources. This is similar to the network disruptions that happen when communications infrastructure is destroyed in natural disasters, however in political uprisings technical disruptions are often a tool that governments use to suppress and control information. The resulting lack of information increases peoples' concerns about the accuracy and reliability of information they receive, ultimately driving their perceptions of information satisfaction.

Information sources in Egypt

There were many television stations, newspapers, and other information sources throughout Egypt at the time of the uprising. Internet adoption in Egypt was 43% in 2012 based on 2013 data from the International Telecommunications Union World Internet statistics (http://www.Internetworldstats.com/stats5.htm). Cell phones were a primary form of communication with an 87% adoption rate. The Internet also had diffused throughout Egypt's 86.9 million population, with Facebook reaching 14.5% of the population in 2012.

Young people (15-29 years old) were a large portion of the Egyptian population (about 33%) in 2012. These young people also were the largest group of Internet users, and users of social media in Egypt at the time (Mourtada and Salem, 2011). Muhtaseb and Frey (2008) apply UGT to Arab Americans' use of the Internet, finding that information-seeking was the most important motive for using the Internet followed by convenience, entertainment, to pass-time, and interpersonal motives including social enhancement. This suggests that our sample is likely primed to using the Internet prior to the emergence of a crisis, implying that they will turn to this resource when in need of information.

While the uprising impacted all of society, it is likely that the dissemination of information through the Internet and social media likely occurred disproportionately through this group (Kavanaugh et al., 2013). They pass along this information through face-to-face and cell phone interactions with older family members and friends. Thus, it is important to understand their perceptions of the information they receive to inform how information sources can be used effectively in the context of crisis situations.

Uses and Gratifications Theory

Uses and gratifications theory has a long history in the study of mass communication (Katz and Lazarsfeld, 1955, Katz et al., 1973). UGT argues that people use media and technology to fulfill specific needs, such as seeking information. Gratifications have been associated with specific media selection and use including: information-seeking, social interaction, relaxation, entertainment, passing time, and companionship (Katz, 1987). Our study draws on research applying UGT to Internet use, social media, and political information.

Stafford et al. (2004) identify a SEM model consisting of three constructs including content gratifications, process

gratifications, and social gratifications of the Internet. Content and process gratifications are defined as: "Content gratifications concern the messages carried by the medium, and process gratifications concern actual use of the medium itself," (Stafford et al., 2004, pg. 267). They include social gratifications due to the nature of communication over the Internet. They then test the measurement model, finding a good fit of their indicators with these constructs in the context of Internet use and confirming the relevance of the social gratifications construct.

We adopt the content, process, and social gratifications construct naming of Stafford et al. (2004) because they find a good fit for these constructs for modeling uses of the Internet. Perceptions of information accuracy and reliability are consistent with their content gratifications construct, while web browsing and surfing are part of their process gratifications construct. Finally, their social gratifications construct includes interactions with friends and other people using technology. These three constructs are consistent with our interest in how information is obtained related to crisis contexts, in this case a political uprising.

UGT applied to the Internet, Social Media, Political information

Permalee and Perkins (2012) applied a qualitative methodology to show that participants used their social network to trigger information-seeking activities on the Internet. Searchers focused on obtaining additional details on topics seen in traditional broadcast media and perceptions of media credibility triggered searches representing ideological diversity and politically diverse opinion.

Ji and Fu (2013) investigate how UGT influences affinity for the Internet and types of Internet content. They find that the affinities for the types of content are correlated and relate positively to social gratifications. Lin (2002) studies gratifications of online services and traditional broadcast media using regression analysis to find that information seeking and the interaction experiences are significant, predicting 39% of the likelihood of media use.

In a content analysis Pentina and Tarafdar (2014) find that social media contribute to and reduce information overload. Social media reduce information overload by providing a filtering of information socially curated by the network based on what others think is relevant. Yet, social media contributes to information overload by increasing the number of messages that must be processed, which implies an association between social and process gratifications. Whiting and Williams (2013) also use UGT to perform a qualitative study of social media. They find an emphasis on entertainment rather than information sharing and information seeking gratifications. Smock et al. (2011) describe a uses and gratifications approach to understanding SNS features using Facebook. They find information sharing and keeping in touch with friends and family motivations drive use of different features and use of Facebook overall. Cheung et al. (2011) include UGT constructs along with social influence and social presence in a SEM model to predict intention to use social media (R^2=0.28). Finding process and social gratifications significant, as well as social presence. However, they do not find content gratifications to be significant.

In a study of the adoption of social media, Pai & Arnott (2013) describe browsing, receiving instant responses, uploading pictures, and customizing as the primary uses of social media. They find that the highest gratifications for users is a sense of belonging, followed by hedonism, self-esteem, and reciprocity. Lee and Ma (2012) study news sharing in social media using UGT. Finding several hypotheses relating information seeking, socializing, and status seeking, along with prior sharing experience, significant for the intention to share news.

UGT has been applied to political information and understanding political activities in many studies. Findings from these studies indicate all UGT constructs contribute to motivations for using (Kaye & Johnson, 2002) and trust (Kaye & Johnson, 2004) in political information. Neubaum et al. (2014) examine sharing of emotions to find that active participation is associated with positive experiences such as feeling better, while passive usage was perceived as less beneficial. Macafee (2013) investigates the use of traditional and social media for political engagement. They find that only frequency of Facebook use is significant for explaining engagement; while TV, Print, and Internet news were not significant. Chung, et al. (2012) compare traditional and technological factors for determining online news credibility. They find that traditional factors of trustworthiness and expertise are the only significant factors driving use of online news sites of established news sources, e.g., New York Times and USA Today. While technology factors, e.g., hypertextuality, are significant for search sites including Google and Yahoo.

In summary, many studies that apply UGT to the Internet, social media, and political news use constructs consistent with the content, process, and social gratifications constructs. Our study applies these constructs in a model to assess their influence on information satisfaction in a crisis context.

RESEARCH MODEL AND HYPOTHESES

We use the construct names identified by Stafford et al. (2004) because they also make sense in our crisis context. Most importantly the process gratifications construct is measured by similar indicators as constructs named information-seeking or entertainment in other studies. Information-seeking is consistent with what we believe occurs related to crises, entertainment is not. Conceptually, browsing the Internet as an entertaining activity, is replaced by browsing the Internet to understand what is happening related to the crisis.

We extend their model by adding the information satisfaction construct used in prior research (Bailey and Pearson 1983, McKinney, Yoon et al. 2002, Wixom and Todd 2005) and hypotheses that relate each type of gratifications to this dependent variable. We define information satisfaction as a 2nd order formative construct consisting of dimensions of information availability and information influence dimensions. Table 1 presents our construct definitions (items for constructs are available upon request).

Information is always constrained in crisis. Sometimes these constraints are due to widespread damage to infrastructure, while in political situations governments may deliberately restrict or disable the Internet and other communications networks. Information availability refers to being able to access the information wanted and needed; higher perceptions of availability are indications of higher satisfaction with the information received. Information influence is our second dimension of information satisfaction. We expect that when people believe that their information was important for influencing their thinking about the crisis, they will also be more satisfied with that information.

Table 1: Construct Definitions: Content, Process, and Social Gratifications, and Information Satisfaction

Panel A: Uses and Gratifications Constructs	
Content	The degree to which the information/messages the participant obtained since the crises was accurate and reliable.
Process Gratifications deriving from the use of the Internet	
Internet Frequency	The frequency with which participants use the Internet for getting information about the crisis. Including how many hours per day, frequency of using video, social media, and Internet news sites.
Information Activities	The number of activities used to get information on the crises. Including the number of actions performed with cell phones, the social media features used, and types of Internet sites visited.
Social Gratifications deriving from the Internet as a social environment	
Sharing Internet	The degree to which the participant shares (receives) information obtained from the Internet with (from) their family and friends.
Sharing Frequency	The frequency with which the participant shares information obtained from all sources with their family and friends.
Panel B: Information Satisfaction Constructs	
Information Influence	The degree the information they obtained was important for influencing their thinking about political events.
Information Availability	The degree to which the participant was able to obtain all the information they needed and wanted.

Content Gratifications

Our first UGT hypothesis is that higher levels of information content gratifications lead to higher levels of information satisfaction. Information related to a crisis is hard to find and interpreting the information appropriately is difficult. Content gratifications in a non-crisis/normal situation is related to the areas identified by Stafford et al. (2004) including, education, learning, research, and knowledge. In crises, the focus is on information related to the issues in the situation, be it natural or man-made, and the other dimensions become less relevant. For example, using

the Internet for education and learning not related to the crisis is less important for those in such situations than information related to crisis response and management. A primary characteristic of the actual message is the perception that the information contained within it is accurate and reliable. When the content of the information is felt to be more accurate and reliable, information satisfaction should be higher, as should perceptions of information availability and the influence of the information. Thus, we propose Hypothesis H1:

H1: Content gratifications has a positive influence on information satisfaction.

Process Gratifications

We define Process Gratifications as a 2nd order formative construct consisting of dimensions of information seeking activities and the frequency of engaging in these activities. Process Gratifications in non-crisis situations are related to activities of using the Internet including searching, surfing, and using web sites (Stafford et al., 2004). In crises the process of obtaining information related to the issues in the situation is often complicated by compromises in network capabilities and other disruptions. Gratifications derived from the process are related to pursuing various activities frequently enough to feel the process is sufficient for obtaining the available information. That is, participants will engage in additional processes or perform more effective processes more frequently in crises, not solely for the experience of the process, but to have the feeling that the process provided the information that can be obtained. When people in the situation feel better about their processes for obtaining information and having the information that is available, their information satisfaction should be higher.

We also expect that more frequent exposure to information, even the same or erroneous information, will influence perception that the information is important and that it should influence thinking about the crisis. In addition, when the information obtained from frequent repetitive access of the Internet related to a crisis doesn't change or changes immaterially, perceptions that participants have the information available should emerge.

So, both the information activities and Internet frequency dimensions of process gratifications should influence the dimensions of information satisfaction. Thus, we propose Hypothesis H2:

H2: Process gratifications has a positive influence on information satisfaction.

Social Gratifications

Our third UGT hypothesis is that higher levels of social gratifications will lead to higher levels of information satisfaction. Social gratifications is defined as using the Internet to share information with others consisting of two dimensions. Sharing information from the Internet is an important aspect of our research due to the demographics of Egypt, with the younger people more likely having access to the Internet. We also expect that receiving and sending information from the Internet to and from family and friends increases connectedness and perceptions of information satisfaction. Higher levels of sharing should increase perceptions of having the information wanted, as sharing informs discussions of the information which should lead to assessment of information that is missing or needed. Further, we expect sharing to initiate interactions vetting the shared information, which should increase perceptions of the influence of that information.

Similarly, sharing information more frequently increases perceptions of the influence of that information and perceptions that you have the information that is available. More frequent interactions that include evaluations of the shared information should increase perceptions the information is important. Despite suggestions that social gratifications may not be as relevant in the context of crises, we follow the preponderance of UGT research on the Internet and social media use that indicates social gratifications likely influence information satisfaction in a positive manner. Thus, we propose Hypothesis H3:

H3: Social Gratifications has a positive influence on information satisfaction.

Social Gratifications influence on Process Gratification

Further we expect that obtaining Social Gratifications likely impacts Process Gratification. This is due to the need to have more and different processes for socially oriented information sharing activities beyond the normal process for information seeking. One result of the Arab spring was the perception that social media was influential in the process of the uprisings and their aftermath. The shut-down of the Internet during the uprising implies authorities were attempting to control information and limit sharing. This leads to an exploratory hypotheses relevant to UGT.

The hypothesis is that higher levels of social gratifications will lead to higher levels of process gratification. Sharing frequency involves social media, video sharing, and other activities that involve the Internet, clearly implying a relationship with Internet frequency. That is, more sharing activities will mean more online activity that could lead to other Internet sites. Similarly, more frequent sharing likely increases the number of Internet activities engaged.

Sharing information from the Internet also likely influences Internet frequency, since, to be shared, information must first be obtained from the Internet. A desire to share information from the Internet also may lead to more Internet activities. Thus, we propose Hypothesis H4:

H4: Social Gratifications has a positive influence on process gratification.

These four hypotheses are derived from the results of UGT studies of the Internet, social media, and political information discussed above. Figure 1 presents our research model.

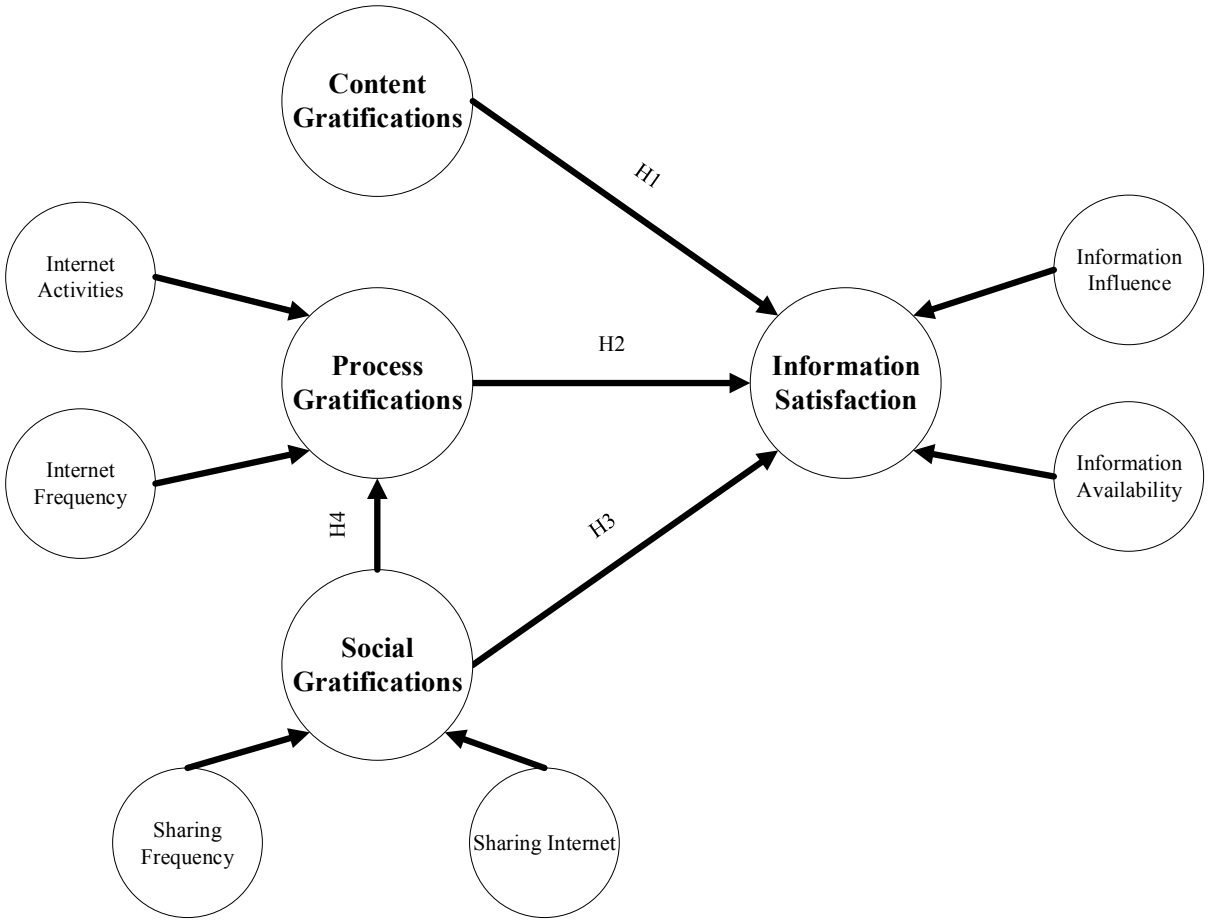

Figure 1: Information Uses and Gratifications in Crisis Research model.

METHOD

We adapted the survey from items used on previous studies applying UGT to investigate the use of the Internet and social media in particular (Kraut et al., 2002). Then we sent via email an invitation to participate in the survey for extra course credit or equivalent assignments to 500 students at a large university in Egypt. Students completed our online survey, which was transcribed into Arabic.

Our procedures for the web-based survey were consistent with the guidelines recommended by Punter, et al. (Punter, Ciolkowski, Freimut, & John, 2003) and (Singer & Vinson, 2002) for online software engineering surveys. Web-based surveys are less costly, more convenient, and provide more control than postal surveys (Couper, 2000). Moreover, web-based surveys have been shown to be similar to postal surveys in terms of the quality of data gathered (Bachmann, Elfrink, & Vanazza, 1996; Coderre, Mathieu, & St-Laurent, 2005), and the number of items answered (Bachmann et al., 1996; Coderre et al., 2005); also they are useful for reducing social desirability bias (Whitley, 2002).

Consistent with the recommendations of Bryant et al. (2004), we included controls to account for internal validity threats such as increased dropout rates and multiple submissions from the same participant. We encouraged participation in the study by describing the intent of the survey to the participants (Lazar & Preece, 1999). To control for the internal validity threat of multiple submissions from the same participant, participants were asked to provide their e-mail addresses; there were no duplicates received. To reduce item non-response, participants had to answer all questions in one section of the survey before proceeding to the next section.

RESULTS

The elections for the unicameral legislature held from November 2011-January 2012 were intended to resolve the crisis. However, the results of these elections were ruled to be illegitimate on June 14th 2012 by the Egyptian Supreme Court. We collected data in April and May 2012, between the election and the contentious ruling by the court. Thus, the resolution of the uprising had not yet occurred during the time our data was collected, even though it was 14 months after the initial uprising.

The survey was sent to 500 potential participants; a total of 204 participants attempted the survey and 170 students completed it, for a 34% response rate. There were more female (56%) than male respondents; most (89%) were single and lived in the city near the university or in nearby towns. Most (73%) had been using the Internet for 7 or more years, with 19% using the Internet for more than 10 years. Most (85%) were 19-21 years old and eligible to vote in Egypt.

We use partial least squares structural equation modeling (PLS-SEM) to test our research model. PLS-SEM is appropriate for our context because it is recommended for exploratory research, such as our unique application of UGT in crisis situations (Gopal, Bostrom, & Chin, 1992). The PLS-SEM measurement and structural models were assessed using smart PLS version 2.0 beta (Ringle, Wende, & Will, 2005).

Measurement Properties of Constructs

We first evaluated the measurement reliability and validity of the 1st order reflective constructs in our model. We assessed the scale reliabilities, along with convergent and discriminant validity of these constructs. Table 3 lists the descriptive statistics and scale measurement properties for these constructs. Scale reliability was assessed via composite reliability and Cronbach's alpha (Fornell & Larcker, 1981). As shown in Table 2, composite reliabilities are all well above the recommended 0.70 level, and Cronbach's alphas for the process and social gratifications constructs exceed the traditional 0.70 cutoff, while content and information influence exceed recommendations of .60 for exploratory research (Agarwal & Karahanna, 2000; Nunnally & Bernstein, 1994; Staples & Seddon, 2004). Although Information Availability at .58 is below the desired level, we maintain it due to high composite reliability (Hair et al., 2013).

Table 2: Construct means, standard deviations, and measures of internal consistency

Construct	# Items	Mean	Std. Dev.	AVE	Composite Reliability	Cron.'s Alpha[a]
Content Gratifications	3	2.88	0.58	0.58	0.85	0.76
Internet Frequency	4	6.00	2.96	0.65	0.88	0.81
Information Activities	3	4.19	1.45	0.62	0.83	0.70
Sharing Internet	2	2.88	1.58	0.95	0.97	0.94
Sharing Frequency	6	4.74	1.88	0.53	0.87	0.82
Information Influence	3	2.16	0.59	0.61	0.82	0.68
Information Availability	2	2.38	0.52	0.70	0.82	0.58

[a] Hair et al. (2014) and Ringle et al. (2005) indicate that Cronbach's alpha is not necessary for component based SEM implemented in PLS.

To determine convergent validity, all item loadings (outer loadings) should be greater than 0.70 (Agarwal & Karahanna, 2000) (Bassellier & Benbasat, 2004). We evaluated the cross loadings factor matrix from smart PLS (Ringle et al., 2005). Most of the items have loadings above the recommended 0.70 (Agarwal & Karahanna, 2000) (Bassellier & Benbasat, 2004). Seven items are below 0.70, yet above 0.60. Only one item, "the number of hours on the Internet per day (0.467), had a loading below 0.60 (text for indicators available from authors upon request). We retained this item due to the high scale reliability for the frequency of Internet use construct and content validity of the item. All items loaded more highly on their hypothesized construct when compared to any other construct. The t-statistics for all other item loadings are greater than 2.58, $p < .01$ (Gefen et al., 2000).

A further test of convergent validity is to determine if constructs have an average variance extracted (AVE) greater than or equal to 0.50, indicating at least 50% of the indicator variables' variance is determined by the latent variable (Chin, 1998). Our 1st order reflective constructs meet this requirement, as shown in Table 2.

We also used an AVE test to establish both discriminant and convergent validity of these constructs (Fornell & Larcker, 1981; Netemeyer, Johnston, & Burton, 1990). The diagonal elements of the matrix in Table 3 contain the square root of the AVE estimates for each construct; the off-diagonal elements are the correlations between constructs. Validity is achieved if the AVE estimates for both constructs are greater than the correlation of the two constructs. The diagonal elements are all larger than their corresponding correlation coefficients, indicating that these constructs all demonstrate convergent validity and discriminant validity (D. Gefen, D. Straub, & M. Boudreau, 2000).

Table 3: Construct correlations and square-root of AVE values on diagonal.

	Info Activities	Content	Internet Frequency	Info Influence	Sharing Internet	Info. Availability	Sharing Freq.
Info Activities	**0.790**						
Content	0.134	**0.837**					
Internet Freq.	0.723	0.119	**0.809**				
Info Influence	0.302	0.217	0.245	**0.779**			
Sharing Internet	0.313	0.075	0.455	-0.124	**0.973**		
Info Availability	0.314	0.418	0.281	0.199	0.196	**0.838**	
Sharing Freq	0.449	0.179	0.368	0.368	0.013	0.059	**0.727**

We conducted a power analysis to ensure our ability to find the hypothesized effects if present. Hair et al. (2013) recommend Cohen's (Cohen, 1988) 80% likelihood for detecting effects approach for determining the sample size needed when using PLS-SEM, while others recommend at least 10 times the largest number of paths affecting a dependent construct in the model (Chin, 1998). Our sample, comprised of 170 observations, is consistent with detecting R^2 values of 0.10 at a 0.05 level of significance for a model with a maximum of 3 paths influencing any one dependent construct (Hair et al., 2013, p. 21), thereby ensuring an adequate level of power.

Results for Structural Models

The second step in PLS-SEM analysis determines which of the hypothesized relationships in the model are significant, and the relative strengths of the significant influences. We first evaluate the highly parsimonious UGT model developed above, then decompose the formative endogenous satisfaction construct as recommended by Cadogan and Lee (Cadogan & Lee, 2013).

We evaluated the structural models for effects on information satisfaction using coefficient of determination (R^2) values and in terms of the significance and relative values of the path coefficients (Kishore & McLean, 2007) (D. Gefen, D. Straub, & M.-C. Boudreau, 2000). The following subsections present the results for the initial and decomposed structural models.

Initial Structural Model

Figure 2 shows the R^2 values, path coefficients, and their significance levels calculated by SmartPLS 2.0 beta (Ringle et al., 2005) for the initial structural model that tests the fundamental propositions of UGT. The model explains 30% of the variance in information satisfaction, indicating a weak yet significant level of explanation (Hair et al., 2013). In addition, the social gratifications construct significantly influences the process gratifications construct, explaining 33% of its variance.

The path coefficient for the relationship showing the effect of the content construct on information satisfaction is significant (0.392, $t = 6.056$, $p < 0.01$), as shown in Figure 2, supporting H1. Hypothesis H2 relating influence of process gratifications on information satisfaction also is supported (0.404, $t = 4.806$, $p < 0.01$). The influence of social gratifications on information satisfaction was marginally significant (-0.109, $t = 1.296$, $p < 0.10$), however the sign of the coefficient is negative rather than positive as hypothesized, thus H3 is not supported.

We investigated whether process gratifications is mediating the influence of social gratifications as described by Hair et al. (2013), pg. 224. After removing process gratifications from the model the path coefficient from social gratifications to information satisfaction is not significant, thus process gratifications is not mediating social gratification. Thus, hypothesis H4 is supported as social gratifications does have a substantive influence on process gratifications (0.578, $t = 12.309$, $p < 0.01$).

Support for three of four hypotheses and explaining 30% of the variance in information satisfaction indicates that UGT is applicable for understanding information use in crises, such as the uprisings and subsequent events in Egypt. In addition, the social gratifications influence on information satisfaction hypothesis that is not supported, was previously suggested to not be relevant in the crisis context (Jamal & Melkote, 2008).

This result suggests one way the use of information in a crisis context is different than in non-crisis contexts where UGT was developed.

In the past our analyses may have ended with this highly parsimonious and UGT congruent result. However, recent measurement research (Cadogan & Lee, 2013; Rigdon, 2014) suggests that dependent variables consisting of higher order endogenous formative constructs can provide potentially misleading results. Since our primary dependent endogenous variable information satisfaction is formative, we decided to evaluate a second model where it is replaced with its 1st order dimensions of information availability and information influence.

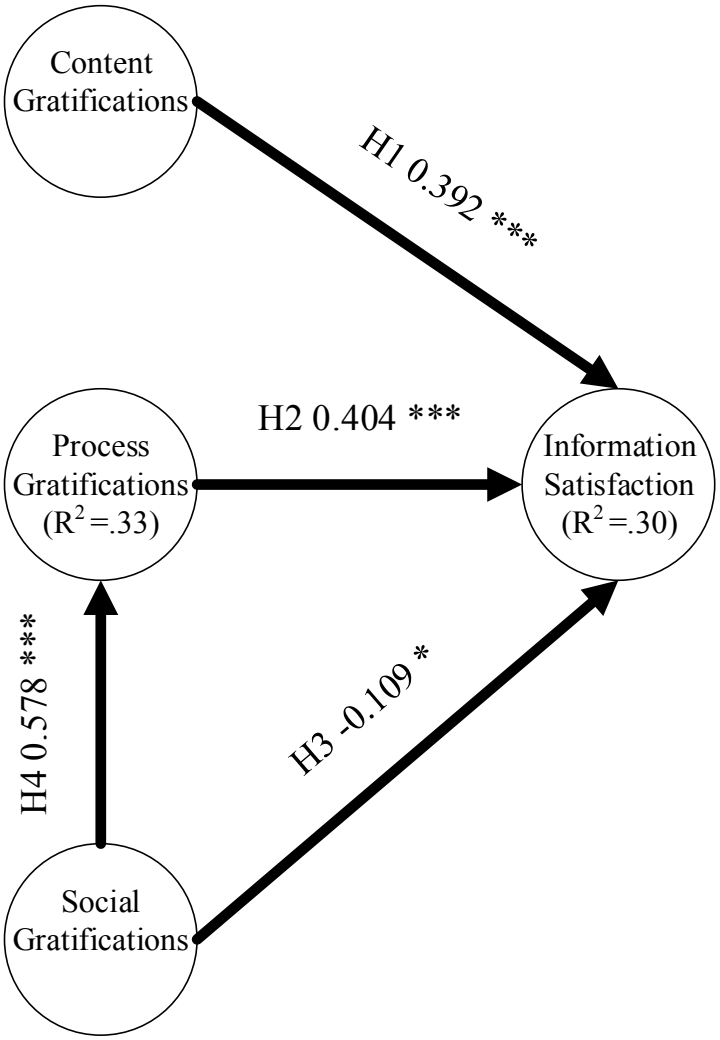

Figure 2: Information Uses and Gratifications in Crisis structural model

Dimensions of Information Satisfaction Structural Model

Evaluating the dimensions of Information Satisfaction means replacing one formative construct with two reflective constructs of information availability and information influence. Each of these constructs has the same paths predicting them as did the higher order information satisfaction construct. The individual dimensions are not as well explained in this model, with information availability having $R^2 = 0.24$ and influence of information having $R^2 = 0.12$; recall that information satisfaction in the initial model has $R^2 = 0.30$. The social gratifications construct also significantly influences the process gratifications construct in this model, explaining 32% of its variance. Figure 3 shows the revised model.

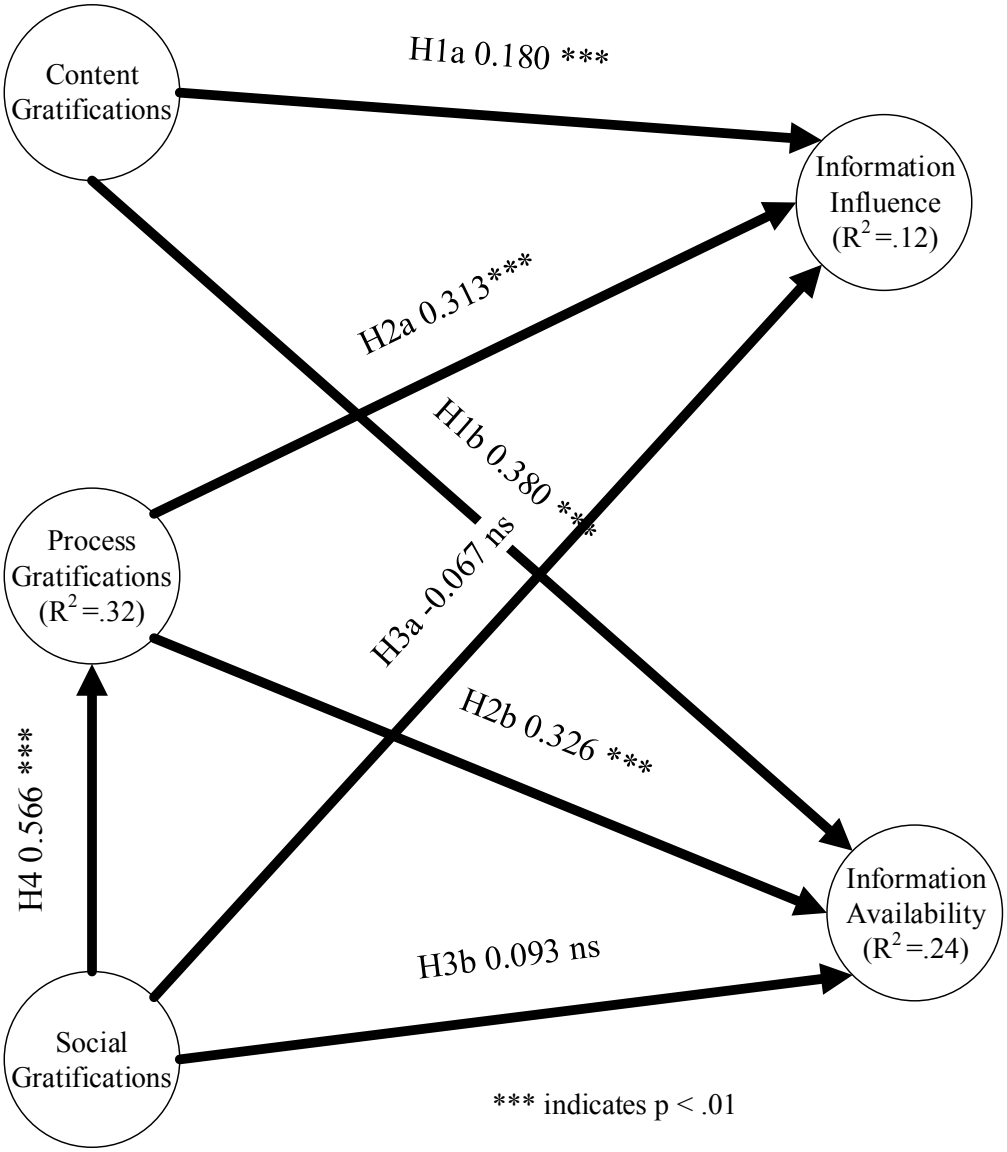

Figure 3: Structural model of dimensions of information satisfaction.

The path coefficients in the decomposed model are consistent with those in the initial model. Content gratifications is a significant contributor to both dimensions of information satisfaction, impacting information influence, i.e., H1a, (0.180, t = 2.673, p < 0.01) and information availability, i.e., H1b, (0.380, t = 5.421, p < 0.01). Process gratifications significantly impacts information influence, i.e., H2a (0.313, t = 4.112, p < .01) and information availability, i.e., H2b, (0.326, t = 4.167, p < 0.01), with nearly equivalent coefficients. Hypothesis H4, that social gratifications influence process gratifications is the same as in the prior model and significant (0.566, t = 10.574, p < 0.01). Thus, hypotheses H1, H2, and H4 are again supported.

Social Gratifications do not significantly impact information influence, i.e., H3a, (-0.067, t=0.416, p ns) or information availability, i.e., H3b (-0.093, t=1.062, p ns), thus not supporting these sub-hypotheses. This suggests again that the crisis context somehow limits the potential for Social Gratifications to lead to Information Satisfaction. These results confirm that the UGT model of information satisfaction in crisis situations is supported overall at two levels of abstraction.

DISCUSSION

In summary, our results suggest several observations. First, higher perceptions of the accuracy and reliability of the information, i.e., content gratifications, are associated with perceptions of higher information satisfaction. Further, content gratifications significantly effect the information availability and the influence of the information dimensions of information satisfaction. Content gratifications has the largest effect of any construct on information availability, and a stronger influence on information availability than on the influence of the information. Indicating perceptions of information availability will increase if the accuracy and reliability of the information obtained can be increased. Specifically recognizing the variability in the accuracy and reliability of information and explicitly considering how to evaluate it may facilitate users' perceptions of knowing when sufficient information is available. Accuracy and reliability also affect the influence of the information, such that more accurate and reliable information will be more important for influencing thinking. We expect the source, e.g., government or independent TV stations, of the information will be one aspect of the information that will be used to judge accuracy and reliability.

Second, process gratifications is predictive of information satisfaction, positively impacting information availability and how influential the information is perceived and the largest impact of any construct on the influence of information. Process gratifications consists two dimensions including the number of information activities engaged and the frequency of those activities. We examined another model (figure not included) where the process gratifications construct was decomposed into its dimensions, finding similar R^2 values for information availability (R^2=0.24) and the influence of information(R^2=0.13). The dimension of internet activities has path coefficients of (0.212, t = 2.473, p < .01) for information availability and (0.281, t = 2.925, p < .01) for the influence of information, while the frequency of internet activities has path coefficients of (0.145, t = 1.686, p < .10), for information availability and (0.061, t = 0.510, p ns), for the influence of information. This suggests that users pay relatively more attention to the number of varying search activities they pursue, rather than the frequency of searching. By increasing the variety of search activities people cast a wider net and should increase perceptions of both information availability and the influence of the information. Participating in different activities has the potential for confirming or contradicting information originating from multiple sources. Finding the same or similar information from multiple activities, i.e., confirming, may indicate that the information available has been obtained, while finding differing information, i.e., contradicting, may imply that more information is available or needed. Similar effects may apply to the influence of the information, with contradicting information suggesting lower influence and confirming information suggesting higher influence. The frequency of activities does not significantly affect the influence of information, perhaps this is due to finding the same information from the same activities, i.e., confirming, is not as satisfying as confirming across activities. In addition, the more frequently the same information is found reduces the amount of different information obtained, i.e., the potential for finding contradicting information is lower. Overall it seems doing the same things more frequently may not provide much marginal satisfaction.

Third, social gratifications were speculated to not be influential in a crisis context (Jamal and Melkote, 2008); our results support this previous speculation. Our finding a negative path coefficient for hypothesis H3 implies that more frequent sharing and more sharing with friends and family of information obtained through the Internet reduces satisfaction with that information. This seems a fundamental disconnect with the widespread use of the Internet for social purposes and is inconsistent with prior UGT research on why people use the Internet and the social gratifications they receive. To understand this in more detail, we examined another model (figure not included) where the social gratifications construct was decomposed into its dimensions, finding a similar R^2 value for information availability (R^2=0.24) and a higher value for influence of information (R^2=0.21). The dimension of sharing activities has path coefficients of (0.028, t = 0.404, p ns) for information availability and (-0.272, t = 4.279, p < .01) for the influence of information, while the frequency of sharing has path coefficients of (-0.160, t = 2.420, p < .01), for information availability and (0.148, t = 1.660, p < .10), for the influence of information. Thus, the subdimensions of social gratifications have inverse effects on different subdimensions of information satisfaction that in the higher order model combine for an overall inverse impact on satisfaction. Higher sharing activity information with friends and family drives lower the influence of information, while the more frequent activities reduces perceptions of information availability.

Our results are consistent with many prior UGT studies related to using the Internet (Ku et al., 2013; Lee & Ma, 2012; Parmelee & Perkins, 2012; Stafford et al., 2004), social media (Ku et al., 2013; Lee & Ma, 2012; Lenhart & Madden, 2007; Macafee, 2013), and political information (Barbara K Kaye & Johnson, 2002; Barbara K. Kaye &

Johnson, 2004; Lariscy et al., 2011; Parmelee & Perkins, 2012). Specifically, we support the theory by finding the constructs valid and reliable in data from another context. Further, we confirm primary hypotheses relating gratifications to information satisfaction, while uncovering a situation where social gratifications are not as influential as expected.

The limitations of our study involve our opportunity sample and our web-based survey methodology. We have attempted to control for the vulnerabilities of the web-based survey as described in the methods section and believe that many of those concerns have been controlled. Our sample makes generalizing beyond young people and college students difficult, however they experienced the uprising and are likely representative of the users of the Internet and social media in Egypt. Further, we feel it is important to understand the perceptions of the young adults given their large proportion of the population in Egypt and many of the other countries involved in the Arab Spring. Our data were collected well after the original uprising, yet it was during the time when the 1st cameral election was invalidated by the supreme court. Which we believe is part of the extended crisis that resulted from the uprising.

CONCLUSION

Uses and gratifications theory can be applied to the use of information sources related to crises. Individuals searching for information related to crisis should 1) identify the information they want and how they'll know it is accurate; and 2) maximize the number of different activities for information-seeking rather than focusing on frequency of a few activities; and 3) beware of potential for information sharing activities to reduce their information satisfaction. Why the impact of social gratifications on information satisfaction hypothesized by UGT seems to be suppressed in the context of this crisis is a topic for future research.

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Appendix 1: Indicators of model constructs.

Code	Content Gratifications Items
CON1[a]	Overall, information I was able to get was accurate since the uprising (March 2011 - March 2012). (six point scale strongly disagree to strongly agree)
CON2[a]	The news and information about events I received was reliable since the uprising (March 2011 - March 2012).
CON3[a]	The information I was able to get was not reliable since the uprising (March 2011 - March 2012). (reversed)
	Process Gratification: Internet Activities
PGIA1	What Internet sites did you visit? (check all that apply, ***number checked***) (Facebook pages on the uprising (e.g., we are all Khaled Saed), Twitter - a person you follow, Twitter - an organization you follow, Newspaper websites (e.g., Al Masry Alyoum, Al Youm Al Sabea, etc.), Television News channel websites, News websites (e.g., Masarawy), Other)
PGIA2	Since the uprising (March 2011 - March 2012), which of the following features did you use on Social Networking Sites? (check all that apply, ***number checked***) (Post comments, Post pictures or videos, Physically show others your site, Join groups, Read others' posts, Look at the site information of others, Update my status, Other)
PGIA3	Since the uprising (March 2011 - March 2012), which of the following activities did you do on a cell phone? (check all that apply, ***number checked***) (Make or receive phone calls, Send or receive a text message, Take a picture, Take a video, Send a picture or video to another person, Send a picture or video to an organization, Look at a picture or video from another person, Browse the Internet, Other)
	Process Gratification: Internet Frequency
PGIF1	On a typical day since the uprising (Mar.2011 - Mar. 2012), about how many hours a day were you using the Internet? Include time spent on instant messaging, email, browsing the Internet, and on social networking sites, for work and personal reasons. (***number of hours***)
PGIF2[b]	How often since the uprising (March 2011 - March 2012) were you looking at video or photo sharing websites, e.g., YouTube or Flickr?
PGIF3[b]	How often since the uprising (March 2011 - March 2012) were you using Social Networking sites, e.g., Facebook?
PGIF4[b]	How often since the uprising (March 2011 - March 2012) were you using the Internet?

[a] Measured on: strongly disagree to strongly agree.

[b] Measured on a scale of: almost never, < once per month, about once per month, several times per month, about once per week, serveral times per week, about once per day, several times per day.

Social Gratification	
Code	**Social Gratification: Sharing Activities**
SGSA1[a]	I shared information that I obtained from the Internet (including Facebook, Youtube, Twitter, etc.) with other family members and friends?
SGSA2[a]	Other family members and friends shared information with me that they obtained from the Internet (including Facebook, YouTube or Twitter)?
	Social Gratification: Sharing Frequency
SGSF1[b]	How often did you use email to communicate (share information) with any of your friends and family?
SGSF2[b]	How often did you use a cell phone text message to communicate (share information) with any of your friends and family?
SGSF3[b]	How often did you use a cell phone voice calls to communicate (share information) with any of your friends and family?
SGSF4[b]	How often did you use instant messaging to communicate (share information) with any of your friends and family?
SGSF5[b]	How often did you use a social networking site to communicate (share information) with any of your friends and family?
SGSF6[b]	How often did you use an Internet communication service, e.g., Skype, to communicate (share information) with any of your friends and family?
Information Satisfaction	
	Information Satisfaction: Influence
ISII1[c]	How important has been the information you received from social networking sites, e.g., Facebook, as an influence on your thinking about these events.
ISII2[c]	How important has been the information you received from Internet video sharing sites, e.g., Youtube, as an influence on your thinking about these events.
ISII3[c]	How important has been the information you received from Internet news sites, e.g., Newspaper websites, TV channel websites, Facebook news pages, or News websites (Masarwy), as an influence on your thinking about these events.
	Information Satisfaction: Information Availability
ISIA1[a]	I was not able to get the information I needed since the uprising (March 2011 - March 2012). (reversed)
ISIA2[a]	I was able to get the information I wanted since the uprising (March 2011 - March 2012).

[c] Measured on a four point scale: not at all important, not too important, somewhat important, very important.