DETERMINANTS AND MODERATORS OF ONLINE BEHAVIORS

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Received: March 21, 2018; Revised: November 7, 2018;
Accepted: January 29, 2019

Abstract

Constructs related to an individual's behavior in online environments were identified from previous studies and categorized as personal motivations (the need to belong, the need for individuation, altruism, personal growth, and curiosity), personal factors (gender, age, level of education, time online, work position, and online experience), or online behaviors (pushing or pulling online content). A theoretical model was proposed with personal motivations directly affecting online behaviors and personal factors moderating those effects. The model was analyzed using data collected by questionnaire from a sample of 1,133 individuals. Only curiosity and the need for individuation were found to have important effects on online behaviors while only gender, online experience, time online, and work position had significant moderating effects. Compared with previous studies new findings included the relative unimportance of the effects of the need to belong, altruism, and personal growth on online behaviors. Also, the results for the moderating effects of the personal factors have not been examined or reported commonly in previous studies. From a practical perspective the findings indentified groups of individuals where personal motivations have significant effects on pushing or pulling behaviors and, more importantly, groups where the effects are not significant but may be increased by practical actions.

Keywords: Altruism; curiosity; individuation; need to belong; personal growth; push/pull online content

Introduction

Although the study of human communication networks predates the internet, the development of social networks and online communities has motivated researchers from different fields of study to investigate online communication networks from the perspectives of: identity; privacy; social capital; youth culture; and education (Dissamarn, 2011). Online communication systems are human-centered information systems used for developing human relationships and they are quite different from task-oriented information systems which provide users with information or automated processes in order to improve their work performance (Sombutpibool, 2011).

Because of the relationship with human factors an individual's behavior to forward (push) or seek (pull) content in an online environment cannot be explained by system performance alone (Rau et al., 2008; Steinfield et al., 2008). Reasons why individuals push/pull online content have been theorized using social capital and cognitive theories (Huang et al., 2008), human emotions (Phelps et al., 2004; Dobele et al., 2007; Li et al., 2009), financial factors (Goldsmith, 2002; Knowledge@Wharton, 2009), and psychological motivations (Ho and Dempsey, 2009; Dissamarn, 2011). Also, some studies have examined personal factors such as: gender; age; level of education; work position; and the individual's experience with online systems (Sun et al., 2006; Ho and Dempsey, 2009; Dissamarn, 2011). The practical applications of theoretical findings are relevant to viral marketing, electronic word of mouth, buzz marketing, knowledge sharing, and social networks.

Social capital theory examines pushing/pulling behaviors in terms of personal relationships within the online community based on trust, cooperation, and collective actions. These behaviors are explained in a social network in terms of an individual's cognitive functions. The human emotions provoked by different content have been studied in order to identify the type of content that is likely to be pushed or pulled. The online environment is fast growing, innovative, and profitable. In the online marketplace the return on investment is related closely to increased brand awareness and an effective method to increase the return on investment is to use customers to pull and push information through their online social networks. Financial factors/benefits in conjunction

with the emotional impact of the content are among the key issues that have been examined in the study of viral marketing (Nutley, 2007; Dalsgaard, 2008).

It has been suggested by Ho and Dempsey (2009) that there are five personal motivations which have important influences on pushing/pulling behaviors: the need to belong to a group; the need for an individual to be different from others; the need for altruism or affection; the need for personal growth; and an individual's curiosity or desire to know and learn. However, only a few studies have examined these motivations and the current findings require further validation (Chen and Shen, 2015; Osatuyi 2015; Shanmugam et al., 2016; Ho and Dempsey, 2009).

In addition to personal motivations with direct influences on pushing /pulling behaviors there are suggestions among previous studies that these direct effects may be moderated by personal factors: gender (Venkatesh et al., 2012; Zhou et al., 2014); age (Venkatesh et al., 2012; Ho and Dempsey, 2009); level of education (Dissamarn, 2011); work position (Dissamarn, 2011); time online (Dissamarn, 2011; Ho and Dempsey, 2009); and online experience (Venkatesh et al., 2012; Shi and Chow, 2015). However, studies of these moderating effects have received little attention in previous studies.

The purpose of this study is to address three related questions: *Which personal motivations directly affect an individual's pushing/pulling online content behavior? Are these effects moderated by personal factors? What are the practical implications of the findings?* The findings are expected to contribute to a theoretical understanding of online communication with practical relevance for those responsible for online applications such as viral marketing, knowledge sharing, and the development of social networks and online communities. In particular, no studies of this type were found that were conducted in the context of Thailand even though the importance of online communication is emphasized in Thailand's National ICT Policy Framework 2011-2020.

A review of related literature and the development of a theoretical model are presented next followed by discussion of the research design and methodology. The results of data preparation and analyses are followed by a discussion of the findings of the study and concluding remarks are presented last.

Related Literature and Theoretical Model

The review of related literature included a variety of studies concerned with human behavior in online environments (e.g. viral marketing, electronic word of mouth, buzz marketing, knowledge sharing, online applications, and social networks). The focus of each study, the unit of analysis, and the method used for data collection are summarized in Table 1. The studies have been classified according to the research approach adopted: qualitative studies with a focus on the development of concepts; and quantitative studies with explanations based on the analysis of theoretical models. Both types of studies were used to identify the important constructs included in the theoretical model for this study.

Table 1: Overview of Previous Studies

Focus of Study	Unit of Analysis	Data Collection Method	Reference
Research Approach: Qualitative and Descriptive Concept Development			
Emotional connection through viral messages	Individuals	Survey	Dobele et al. (2007)
How to win friends and influence people the social networking way	Individuals	Survey	Nutley (2007)
Evaluating viral marketing: isolating the key criteria	Individuals	Survey	Cruz and Fill (2008)
Facework on Facebook	Individuals	Case study	Dalsgaard (2008)
Networks of friends	Networks	Survey	Naone (2008)
Blogging	Blogs	Survey	Singh et al. (2008)
A culture based approach to understanding the diffusion of new products	Individuals	Survey	Yalcinkaya (2008)
A conceptual model of viral marketing	Individuals	Survey	Lam and Wu (2009)
Social media	Social media	Survey	Mangold and Faulds (2009)
Millennials a portrait of generation next	Individuals	Survey	Pew Research Center (2010)
Knowledge sharing: a review and directions for future research	Studies	Literature review	Wang and Noe (2010)
Trust, distrust, and website characteristics	Individuals	Survey	Seckler et al. (2015)
The role of social network ties during socialization	Individuals	Survey	Morrison (2002)

Table 1: Continued

Focus of Study	Unit of Analysis	Data Collection Method	Reference
Research Approach: Quantitative and Explanatory			
Motives to communicate on the internet	Individuals	Survey	Hennig-Thurau et al. (2004)
Viral marketing examining motivations to pass along email	Individuals	Interview	Phelps et al. (2004)
Causes and effects of online word of mouth (mouse)	Students	Survey	Sun et al. (2006)
Word of mouth communication within online communities	Individuals	Survey	Norman and Russell (2006)
Electronic word of mouth and its effect in communities	Individuals	Case study	Dwyer (2007)
Emotions, satisfaction, and word of mouth communication	Individuals	Survey	Ladhari (2007)
Word of mouth communication in online communities	Individuals	Case study	Brown et al. (2007)
The impact of electronic word of mouth	Individuals	Survey	Cheung et al. (2008)
Email spreading behavior across gender	Students	Survey	Chiu et al. (2008)
Culture influences on responses to online store atmospheric cues	Students	Survey	Davis et al. (2008)
A multi-stage model of word of mouth influence through viral marketing	Students	Survey	De Bruyn and Lilien (2008)
Blogging acceptance, social influence, and knowledge sharing	Individuals	Survey	Hsu and Lin (2008)
Factors affecting pass-along email intentions	Email users	Survey	Huang et al. (2008)
Determinants of mobile based word of mouth	Individuals	Survey	Okazaki (2008)
An agent-based model of viral marketing	Agents	Experimentation	Wang (2008)
Motivations to forward online content	Students	Survey	Ho and Dempsey (2009)
Discovering influential nodes for viral marketing	Individuals	Survey	Li et al. (2009)
Factors that influence knowledge sharing behavior via weblogs	Individuals	Survey	Yu et al. (2010)
Factors that determine forwarding online content behavior	Individuals	Survey	Dissamarn (2011)
Sense of presense and perceived autonomy in social virtual worlds	Individuals	Survey	Jung (2011)

Table 1: Continued

Focus of Study	Unit of Analysis	Data Collection Method	Reference
Research Approach: Quantitative and Explanatory			
Factors that determine the use of social network systems	Individuals	Survey	Sombutpibool (2011)
Relationship quality, social support, and social commerce intention	Individuals	Survey	Hajli (2014)
Virtual community behavior and mediating and moderating effects	Individuals	Survey	Tsai and Pai (2014)
Social virtual world continuance, perceived benefits, satisfaction, **moderating effect of gender**	Individuals	Survey	Zhou et al. (2014)
Social commerce, social support, community commitment, and trust	Individuals	Survey	Chen and Shen (2015)
Social media dependence, rational behavior, rational use, and a cognitive-affective-behavioral model	Individuals	Survey	Wang et al. (2015)
Social commerce constructs, social support, and trust	Individuals	Survey	Shanmugam et al. (2016)
Trust, personality framework, and e-commerce	Individuals	Survey	Azam et al. (2013)
Social commerce, trust, and trustworthiness	Individuals	Survey	Shin (2013)
Social commerce, **experience as a moderator** and trust transfer theory	Individuals	Survey	Shi and Chow (2015)
Social commerce, trust, social presence theory, and purchase intention	Individuals	Survey	Lu et al. (2016)
Personality traits, computer anxiety, information privacy, and social media platforms	Individuals	Survey	Osatuyi (2015)

Based on previous studies two groups of important constructs were identified (personal motivations and personal factors) that influence online behaviors (pulling and pushing online content). Table 2 shows operational definitions for each of the constructs as well as references to previous studies which highlighted the important role of these constructs in the study of online behaviors.

Table 2: Operational Definitions

Construct	Definition	Reference
	Personal Motivations	
Need to Belong	The extent of an individual's need to be a member of a group.	Morrison, 2002; Phelps et al., 2004; Ho and Dempsey, 2009; Dissamarn, 2011; Azam et al., 2013; Shin, 2013; Hajli, 2014; Tsai and Pai, 2014; Chen and Shen, 2015;Osatuyi 2015; Seckler et al., 2015; Wang et al., 2015; Shanmugam et al., 2016; Lu et al., 2016.
Need for Individuation	The extent of an individual's need to be different from others.	Yalcinkaya, 2008; Ho and Dempsey, 2009; Dissamarn, 201; Jung, 2011; Azam et al., 2013; Tsai and Pai, 2014; Osatuyi 2015; Lu et al., 2016.
Altruism	The extent of an individual's desire to have close and personal relationships with others.	Morrison, 2002; Phelps et al., 2004; Hennig-Thurau et al., 2004; Ho and Dempsey, 2009; Dissamarn, 2011; Azam et al., 2013; Shin, 2013; Hajli, 2014; Chen and Shen, 2015; Osatuyi, 2015; Lu et al., 2016.
Personal Growth	The extent of an individual's need to take control and experience new opportunities, roles, and relationships.	Phelps et al., 2004; Ho and Dempsey, 2009; Dissamarn, 2011; Jung, 2011; Tsai and Pai, 2014; Seckler et al., 2015; Osatuyi 2015; Wang et al., 2015; Shanmugam et al., 2016.
Curiosity	The extent of an individual's desire to know and learn.	Ho and Dempsey, 2009; Dissamarn, 2011; Azam et al., 2013; Chen and Shen, 2015; Osatuyi 2015; Shanmugam et al., 2016.
	Personal Factors	
Gender	Male or female.	Venkatesh et al., 2000; Venkatesh et al., 2003; Venkatesh et al., 2012; Wang and Wang, 2008; Chiu et al., 2008; Dissamarn, 2011; Zhou et al., 2014.
Age	The individual's age in years	Venkatesh et al., 2003; Venkatesh et al., 2012; Dissamarn, 2011; Ho and Dempsey, 2009.
Level of Education	An individual's highest level of education completed or being undertaken at present.	Dissamarn, 2011.

Table 2: (Continued)

Construct	Definition	Reference
	Personal Factors	
Work Position	The individual's current work position (student, officer, supervisor/manager, consultant, senior executive).	Dissamarn, 2011.
Time Online	The number of hours an individual spends each week using online information services for any purpose.	Dissamarn, 2011; Ho and Dempsey, 2009; Phelps et al., 2004; Sun et al., 2006.
Online Experience	The number of months an individual has been using online information services.	Venkatesh et al., 2003; Venkatesh et al., 2012; Dissamarn, 2011; Shi and Chow, 2015.
	Online Behavior	
Pull Online Content	The number of hours each week an individual uses online information services to deliberately search for (seek or find or pull) information content or messages from other online sources.	Sun et al., 2006; Ho and Dempsey, 2009; Dissamarn, 2011.
Push Online Content	The number of times each week an individual deliberately passes **(**forwards or pushes) selected information content or messages to other people or places using online information services.	Ho and Dempsey, 2009; Dissamarn, 2011.

In relation to the personal motivations in Table 2 it is noted that:

Need to Belong is fundamental to the creation of societies and the maintenance of interpersonal relationships. An individual's desire to share information with others is affected by their desire to belong to and be accepted by a group (Phelps et al., 2004; Norman and Russell, 2006; Dwyer, 2007; De Bruyn and Lilien, 2008; Ho and Dempsey, 2009; Dissamarn, 2011);

Need for Individuation refers to the need to be different or stand out in a community and individuals who have a high need for public individuation are usually involved in public affairs, express their opinions, and stand out in the

crowd (Yalcinkaya, 2008). Word of mouth communication can enhance an individual's status in a group by attracting attention from other members and satisfying the need for individuation (Ho and Dempsey, 2009; Dissamarn, 2011);

Altruism is the need to demonstrate generosity toward others and it is significantly positively correlated with the desire for close and personal relationship (Hsu and Lin, 2008; Ho and Dempsey, 2009). Individuals often express altruism by sharing information in an online environment (Hennig-Thurau et al., 2004; Phelps et al., 2004; Ho and Dempsey, 2009; Dissamarn, 2011);

The need for ***Personal Growth*** causes individuals to push or pull information via electronic channels as a means of gaining experience and developing new relationships, opportunities, and roles (Phelps et al., 2004; Ho and Dempsey, 2009);

Curiosity has a positive association with pushing/pulling online content behaviors (Ho and Dempsey, 2009; Dissamarn, 2011).

The online behaviors (***Push*** and ***Pull Online Content***) were included as the dependent variables in the study directly affected by the personal motivations. They represent basic human behaviors which underpin the reasons why individuals use online information services including internet based services such as: forums; chat rooms; bulletin boards; weblogs; email; messaging services; search engines; and internet telephony that are available to individuals through networks and at web sites and social networks/media sites using smart and mobile phones and computers of all types. Understanding what influences these online behaviors provides insights into important topics such as: viral marketing; electronic word of mouth; buzz marketing; knowledge sharing; online applications; social networks; e-commerce; and social commerce.

As stated in the introduction this study is concerned with factors that influence online behaviors that concern: **(a)** motivations that affect an individual at a person al level (personal motivations); and **(b)** the extent to which these influences are moderated by personal characteristics (personal factors). Other studies have addressed other influences such as those related to the technology, the system, and social and cultural factors. Based on findings in previous studies

referenced in Table 2 it is expected that each of the five personal motivations (need to belong, need for individuation, altruism, personal growth, and curiosity) is positively associated with the others and that each has a significant positive causal effect on both of the online behaviors. Previous studies have suggested that each of the six personal factors (age, gender, level of education, online experience, work position, and time online) has a significant moderating effect on each of the causal relationship between the five personal motivations and the online behaviors. These causal and moderating effects are illustrated in the theoretical model in Figure 1. The figure has been notated to identify the research hypotheses which are stated explicitly in Table 3 where references to previous studies which motivated the formulation of the hypothesis are included.

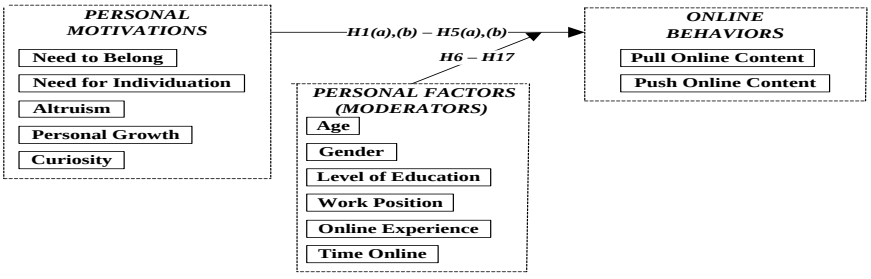

Figure 1: Theoretical Model.

Table 3: Research Hypotheses Associated with the Theoretical Model

Research Hypothesis	Reference
Direct Effects	
H1: Need to Belong has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**(a)** Dissamarn (2011) **(b)** Phelps et al. (2004); Ho and Dempsey (2009)
H2: Need for Individuation has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**(a)** Dissamarn (2011) **(b)** Ho and Dempsey (2009); Dissamarn (2011)

Table 3: (Continued)

Research Hypothesis	Reference
Direct Effects	
H3: Altruism has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**(a)** Dissamarn (2011) **(b)** Phelps et al. (2004); Ho and Dempsey (2009); Dissamarn (2011)
H4: Personal Growth has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**(a)** Ho and Dempsey (2009) **(b)** Ho and Dempsey (2009); Dissamarn (2011)
H5: Curiosity has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**(a)** Ho and Dempsey (2009) **(b)** Dissamarn (2011)
Moderator Effects	
H6- H17: Each of the six variables representing Personal factors (Age, Gender, Level of Education, Work Position, Online Experience, and Time Online) has a significant moderating effect on each of the 10 direct causal effects specified in the 10 Hypotheses H1(a),(b) – H5(a),(b)	Previous studies which motivated the 12 hypotheses related to moderating effects are displayed as part of Table 2.

Note: Significant refers to statistical significance at a level of 0.05 or less.

Research Design and Methodology

The study was designed as a cross-sectional quantitative field study. Data was collected using a questionnaire based on a modification of the instrument used successfully by Dissamarn (2011). The unit of analysis was an individual who uses online information services and there were no restrictions on the information services or the technologies used. In order to ensure the validity and reliability of responses to questionnaire participants were required to be at least 12 years of age.

The questionnaire was prepared in the English and Thai languages and was reviewed by a focus group of five experienced users of online information

services. Modifications related mainly to language translation were incorporated and the Thai language version was then used in a pilot study with 15 participants. No further changes were suggested and the Thai language version was used in the full study. A notated English language version is included in Appendix A1.

Table 4 describes the measurement of the two online behaviors, the six personal factors, and the five personal motivations including references to existing measuring instruments used in the preparation of the questionnaire.

Table 4: Measurement of Model Variables

Online Behaviors: Pull and Push Online Content were treated as interval scale measures (see Appendix A1).		
Personal Factors (Moderators): Gender was measured as a nominal scale variable. Age, Online Experience, Level of Education, Time Online, and Work Position were treated as interval scale measures (see Appendix A1).		
Personal Motivations: Each construct was measured as a latent variable with indicators measured on 7-point Likert scales treated as interval scale measures.		
Construct	**Indicators**	**Existing Measuring Instruments**
Need to Belong	NB1 - 7	Phelps et al., 2004; Dissamarn, 2011.
Need for Individuation	NI1 - 7	Yalcinkaya, 2008; Dissamarn, 2011.
Altruism	AL1 - 5	Phelps et al., 2004; Hennig-Thurau et al. (2004); Dissamarn, 2011.
Personal Growth	PG1 - 8	Phelps et al., 2004; Dissamarn; 2011.
Curiosity	CU1 - 5	Ho and Dempsey, 2009; Dissamarn, 2011.

The study assumes that the content that is pushed or pulled may originate from any source (e.g. email, instant messaging, chat rooms, and blogs). There is no emphasis on the use of any particular technologies because the means of pushing/pulling content are integrated within existing technologies such as smart phones and social network systems. The unit of measurement for Push Online Content was the number of times per week this occurred. For Pull Online Content the unit of measurement was the number of hours per week spent on this activity. These units of measurement were used because they are closely

aligned with nature of these different activities and were considered to be easy for participants to recall and estimate their level of engagement in these activities.

The population size was unknown but exceeded 100,000. Based on 5 percent precision and a 95 percent confidence level a minimum sample size of 400 was determined (Israel, 2013). An adequate sampling frame was not available so following Dissamarn (2011) a purposive sampling method was used to select participants who were contacted online. The contact was made through a large e-commerce site in Thailand where access was made available to the researcher in order to post the questionnaire and request respondents to ask their contacts to participate in the study. Data collection lasted one month and resulted in 1,231 responses.

Data and Model Analyses

This section focuses on the presentation of the results of analyses. These results form the basis for the interpretation of the results and discussion of the findings presented in the next section.

Data Preparation

There were no missing values among the responses in the initial sample of 1,231 questionnaires and no data entry errors in an SPSS worksheet were detected when a random selection of 10 percent (123) were examined. One hundred and eighteen questionnaires (118) were removed because they included an outlier value for at least one of the model variables leaving a final sample of 1,113 questionnaires.

Principle Component factor analysis and Cronbach alpha coefficients were used to determine the construct validity and the equivalence reliability of the measures of the latent variables, respectively. The results in Appendix Table A1 show a set of indicators for each latent variable with satisfactory construct validity and equivalence reliability.

Descriptive Analyses

Profile of the Respondents: From responses to section 1 of the questionnaire it was found that most respondents were males (62 percent). The average age of respondents was 24 years. Almost all respondents were 12-32

years old (92 percent) with 46 percent aged 19-25 years. Most of the respondents (80 percent) either held or were completing a bachelor degree (74 percent) or a master degree (6 percent). Another 20 percent were either attending or had completed secondary/high school as their highest level of education. Forty seven percent (47 percent) were full time students, 32 percent worked as officers, 16 percent were senior executives, and 5 percent were supervisors/managers or consultants.

Ninety eight percent (98 percent) accessed online services using mobile technologies at their homes. Eighty nine percent (89 percent) had more than 15 months experience using online services and the average online experience was 21 months. The average number of hours per week spent online was 21 hours but 48 percent spent more than 25 hours per week online. On average individuals deliberately pushed information content to other people online 15 times per week but 50 percent of the respondents pushed online content more than 15 times per week and 46 percent exceed 21 times per week. On average online services were used to pull online content for 16 hours per week but 50 percent of the respondents pulled online content from 16 hours per week up to a maximum of 25 hours per week.

Model Variables: Appendix Table A2 shows descriptive statistics for the variables in the theoretical model (Figure 1). The magnitudes of skewness and kurtosis were less than 3 and 7, respectively, which ensured the validity of the descriptive analyses of variables and the use of maximum likelihood estimation in the structural equation modeling (SEM) analyses of the theoretical model (Kline, 2016). For the descriptive analyses using t-tests, Chi-square, and correlation coefficients a single interval scale measure of each latent variable was computed for each participant as a weighted sum of the values of its indicators where the weights were based on the standard deviations of the indicators. For example, using the standard deviations from Appendix Table A2 a single scale measure for Altruism was computed for each participant as: (0.841*AL1 + 0.774*AL2 + 0.837*AL3 + 0.772*AL4 + 0.822*AL5)/ (0.841 + 0.774 + 0.837 + 0.772 + 0.822).

T-tests were used to examine the differences between the mean values of the five personal motivation variables (Need to Belong, Need for Individuation, Personal Growth, Curiosity, and Altruism) and the *neutr*al value of 4 on their 7-

point Likert measurement scales which represented "*no opinion*". For each of the five variables the mean value was significantly greater than 4 ($p < 0.001$). T-tests were used to examine differences between the means of the distributions of these five variables for males and females. The only significant difference ($p < 0.01$) was associated with Pull Online Content where on average males pulled online content for 17 hours per week compared to 15 hours per week for females.

Table 5 shows the results of analyzing: associations between Gender and the other 12 variables in the theoretical model using Chi-square (χ^2); and correlations among these other 12 model variables.

Table 5: Associations and Correlations Among Model Variables

		Moderator						**Exogenous**					**Dependent**
Model Variable		Gender	Age	Level of Education	Work Position	Online Experience	Time Online	Need to Belong	Need for Individuation	Personal Growth	Curiosity	Altruism	Push Online Content
		χ^2 (df)	Correlation Coefficients										
Moderator	Age	6.0(4)	1										
	Level of Education	2.3(2)	**.562**	1									
	Work Position	5.6(4)	**.348**	**.157**	1								
	Online Experience	3.7(4)	**.185**	**.130**	**.136**	1							
	Time Online	11.2(7)	.052	**.066**	**.116**	**.717**	1						
Exogenous	Need to Belong	1.2(3)	**-.172**	**-.135**	**-.087**	.049	**.074**	1					
	Need for Individuation	3.2(4)	.003	.006	.016	**.101**	**.094**	**.304**	1				
	Personal Growth	3.6(3)	-.039	-.017	.031	**.112**	**.123**	**.312**	**.377**	1			
	Curiosity	4.0(3)	-.029	.055	-.007	**.098**	**.125**	**.307**	**.371**	**.544**	1		
	Altruism	2.9(3)	**-.082**	-.056	-.013	**.079**	**.098**	**.393**	**.315**	**.487**	**.489**	1	
Dependent	Push Online Content	10.5(8)	**.110**	**.115**	**.165**	**.471**	**.505**	**.073**	**.146**	**.148**	**.189**	**.130**	1
	Pull Online Content	**19.1**(7)	.027	.052	**.129**	**.740**	**.897**	**.094**	**.106**	**.130**	**.134**	**.093**	**.534**

Note: (a) Correlation coefficients or Chi-square values in bold type are statistically significant at a level of 0.05 or less; **(b)** Shaded cells identify correlations among the five variables representing personal motivations and two variables representing online behaviors.

Model Analyses

The direct effects in the theoretical model in Figure 1 were analyzed using Amos computer software. Because there was theoretical support for the theoretical model a latent structured regression measurement model was used with maximum likelihood estimation (Schumaker and Lomax, 2016). The effects of the personal motivations on each of the online behaviors are shown in Figure 2. The direct unstandardized effect is shown first followed by *, **, or *** if the effect is statistically significant at a level of 0.05, 0.01, or 0.001, respectively, or NS if the effect in not statistically significant at a level of 0.05 or less. In parentheses the standardized effect is shown with S, M, or L to indicate that the magnitude of the effect is 0 ≤ small < 0.1, 0.1 ≤ medium < 0.5, or large ≥ 0.5, respectively.

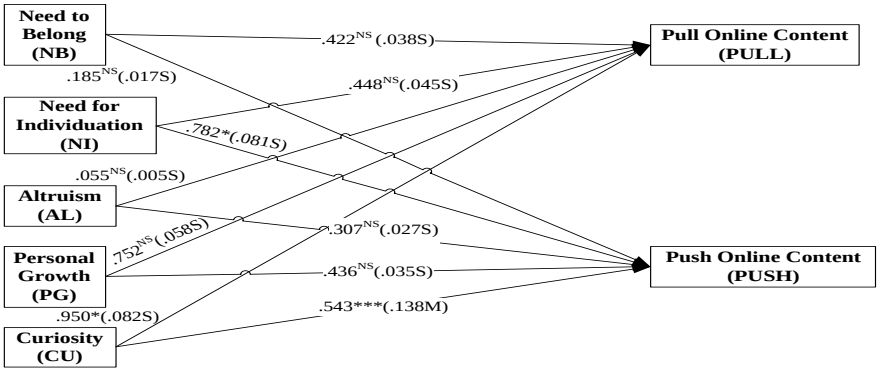

Figure 2: Analysis of Direct Effects in the Theoretical Model.

A range of fit statistics for the model recommended by Kline (2016) is shown in Table 6.

Table 6: Fit Statistics for the Theoretical Model

Model	Sample Size	Normed Chi-square (NC) = Chi-square/Degrees of freedom (χ^2/df)	GFI	AGFI	NFI	IFI	CFI	RMSEA
Theoretical Model	1113	1403.793/509 = 2.758	0.931	0.919	0.954	0.970	0.970	0.040
		R^2: Push Online Content (0.48); Pull Online Content (0.38)						

Note: R^2 is the proportion of the variance of the variable explained by those that directly affect it.

From Table 6 it is seen that the values of the fit statistics are satisfactory and that reasonable proportions of the variance of Push Online Content and Pull Online Content are explained by the effects of the personal motivations.

Moderator Effects

Table 7 describes the basis for the formation of groups among the personal factors in Figure 1 which were hypothesized to have moderating effects. In each case the groups were decided after examining the distributions of the moderators.

Table 7: Groups Used for the Measurement of Moderators

Moderator	Groups			Number of Subjects			Basis for Group Formation
	Group 1	Group 2		Group 1	Group 2		
Gender	Females	Males		422	691		Males and females
Age	25 years or younger	26 years or older		722	391		Mean age of all subjects (24 years)
Online Experience	20 months or less	21 months or more		471	642		Mean online experience of all subjects (21 months)
Level of Education	Secondary/ High school	Bachelor or Master degree		226	887		Secondary versus a tertiary level of education
Time Online	22 hours/week or less	23 hours/week or more		518	595		Mean time online of all subjects (≈ 21 hours/week)
Work Position	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Those in fulltime education and those in junior or senior work positions
	Students	Junior Positions	Senior Positions	512	351	241	

The group analysis function in Amos was used to analyze the theoretical model in Figure 1 for each of the groups associated with the moderators. The results are displayed in Table 8 where labels for the variables and the notations *, **, ***, NS, S, M, and L are as used in Figure 2. In Table 8 direct effects and critical ratios for differences in direct effects between groups associated with the moderators which are statistically significant at a level of 0.05 or less are highlighted in shaded cells.

Table 8: Results of Analyses of Groups Associated with Moderators

Moderator	Measure and Statistical Significance of Direct Effect								Critical Ratios	Statistical Significance
	Unstandardized	Significance	Standardized	Magnitude	Unstandardized	Significance	Standardized	Magnitude		
Gender	**Females**				**Males**					
NB→PULL	.834	NS	.074	S	.255	NS	.023	S	.701	NS
NB→PUSH	.341	NS	.031	S	.026	NS	.002	S	.392	NS
NI→PULL	.112	NS	.012	S	.672	NS	.067	S	.781	NS
NI→PUSH	.570	NS	.060	S	**.947**	*	.097	S	.542	NS
PG→PULL	1.647	NS	.130	M	.283	NS	.022	S	1.198	NS
PG→PUSH	1.274	NS	.103	M	.027	NS	.002	S	1.177	NS
CU→PULL	.582	NS	.048	S	1.046	NS	.094	S	.453	NS
AL→PULL	.392	NS	.035	S	.180	NS	.015	S	.556	NS
CU→PUSH	.407	NS	.035	**S**	**2.067**	***	.190	M	**1.668**	*
AL→PUSH	.190	NS	.017	S	.691	NS	.058	S	.881	NS
Age	**25 Years or Less**				**26 Years or More**					
NB→PULL	.474	NS	.040	S	.634	NS	.059	S	.194	NS
NB→PUSH	.000	NS	.000	S	.071	NS	.007	S	.092	NS
NI→PULL	.625	NS	.064	S	.093	NS	.009	S	.952	NS
NI→PUSH	.721	NS	.075	S	.626	NS	.067	S	.135	NS
PG→PULL	.499	NS	.038	S	1.250	NS	.099	S	.649	NS
PG→PUSH	.161	NS	.012	S	.976	NS	.085	S	.758	NS
CU→PULL	.861	NS	.073	S	1.088	NS	.099	S	.223	NS
AL→PULL	.172	NS	.014	S	.400	NS	.035	S	.562	NS
CU→PUSH	**1.526**	*	.130	M	**1.453**	*	.146	M	.076	NS
AL→PUSH	.689	NS	.056	S	.193	NS	.019	S	.929	NS
Online Experience	**20 Months or Less**				**21 Months or More**					
NB→PULL	.360	NS	.058	S	.244	NS	.040	S	.262	NS
NB→PUSH	.158	NS	.015	S	.443	NS	.050	S	.874	NS
NI→PULL	.273	NS	.048	S	.345	NS	.066	S	1.589	NS
NI→PUSH	.404	NS	.043	S	**.775**	*	.102	M	.618	NS
PG→PULL	.139	NS	.018	S	.228	NS	.033	S	.583	NS
PG→PUSH	1.173	NS	.095	S	.453	NS	.045	S	1.601	NS
CU→PULL	.039	NS	.006	S	**.988**	**	.159	M	**1.711**	*
AL→PULL	.305	NS	.046	S	.396	NS	.061	S	1.273	NS
CU→PUSH	**2.708**	***	.251	M	.563	NS	.062	S	**2.490**	**
AL→PUSH	.383	NS	.035	S	.205	NS	.022	S	.209	NS

Table 8: (Continued)

Moderator	Measure and Statistical Significance of Direct Effect								Critical Ratios	Statistical Significance
	Unstandardized	Significance	Standardized	Magnitude	Unstandardized	Significance	Standardized	Magnitude		
Level of Education	**Secondary/High school**				**Bachelor or Master Degree**					
NB→PULL	.312	NS	.026	S	.660	NS	.059	S	.342	NS
NB→PUSH	.458	NS	.038	S	.187	NS	.017	S	.653	NS
NI→PULL	**1.323**	*	.148	M	.122	NS	.012	S	1.517	NS
NI→PUSH	**1.339**	*	.150	M	.475	NS	.049	S	1.126	NS
PG→PULL	1.062	NS	.085	S	.562	NS	.043	S	.399	NS
PG→PUSH	.541	NS	.044	S	.325	NS	.026	S	.178	NS
CU→PULL	.258	NS	.022	S	**1.162**	*	.101	M	.774	NS
AL→PULL	.269	NS	.023	S	.080	NS	.007	S	.285	NS
CU→PUSH	**2.436**	*	.208	M	**1.359**	**	.123	M	.945	NS
AL→PUSH	.130	.903	.011	S	.494	NS	.043	S	.525	NS
Time Online	**22 Hours/Week or Less**				**23 Hours/Week or More**					
NB→PULL	.114	NS	.019	S	.362	NS	.061	**S**	.592	NS
NB→PUSH	.145	NS	.014	S	.303	NS	.033	**S**	.232	NS
NI→PULL	.145	NS	.026	S	.189	NS	.038	**S**	.903	NS
NI→PUSH	.518	NS	.054	S	**.704**	*	.092	S	.309	NS
PG→PULL	.561	NS	.080	S	.027	NS	.004	**S**	.908	NS
PG→PUSH	.214	NS	.018	S	.383	NS	.037	**S**	.625	NS
CU→PULL	.644	NS	.105	M	**.721**	*	.118	M	**2.603**	**
AL→PULL	.227	NS	.035	S	.447	NS	.073	S	1.279	NS
CU→PUSH	**1.701**	**	.160	M	.532	NS	.057	**S**	1.378	NS
AL→PUSH	.070	NS	.006	S	.454	NS	.049	S	.448	NS

Work Position	Group			Work Groups Compared		
	Students	**Junior Positions**	**Senior Positions**	**Students and Juniors**	**Students and Seniors**	**Juniors and Seniors**
	Measure and Statistical Significance of Direct Effect			**Critical Ratio and Statistical Significance**		
NB→PULL	.857 NS .070 S	.302 NS .077 S	.042 NS .004 S	.008 NS	.851 NS	.785 NS
NB→PUSH	.568 NS .046 S	.730 NS .030 S	.898 NS .103 M	.299 NS	1.619 NS	1.209 NS
NI→PULL	.400 NS .042 S	.940 NS .070 S	.299 NS .031 S	.395 NS	.805 NS	1.019 NS
NI→PUSH	.639 NS .066 S	1.208 NS .100 S	.201 NS .023 S	.388 NS	.548 NS	.825 NS
PG→PULL	.059 NS .004 S	.995 NS .094 S	1.300 NS .104 M	1.028 NS	.947 NS	.061 NS
PG→PUSH	**.**888 NS **.**066 S	.998 NS .086 S	1.768 NS .157 M	1.618 NS	**2.001** *	.574 NS

Table 8: (Continued)

Work Position	Group						Work Groups Compared		
	Students	Junior Positions	Senior Positions	Students and Juniors	Students and Seniors	Juniors and Seniors
	Measure and Statistical Significance of Direct Effect			Critical Ratio and Statistical Significance		
CU→PULL	**1.607** * .139 M	2.127 NS .087 S	.226 NS .020 S	.536 NS	1.463 NS	.886 NS
AL→PULL	.881 NS .073 S	**1.580** * .171 M	.983 NS .092 S	**2.554** **	.086 NS	**2.352** **
CU→PUSH	**2.423** *** .206 M	**1.604** * .153 M	.019 NS -.002 S	.790 NS	**2.112** *	1.304 NS
AL→PUSH	1.039 NS .084 S	.302 NS .143 M	**1.848** * .190 M	**2.394** **	**2.937** **	.735 NS

Note: A critical ratio is a standard normal value for the magnitude of the difference between the standardized effects for the groups.

Table 9 displays a range of fit statistics recommended by Kline (2016) associated with the theoretical model for each group.

Table 9: Fit Statistics for Groups

Moderator	Group	R^2		Fit Statistics						
		Push	Pull	NC (χ^2/df)	GFI	AGFI	NFI	IFI	CFI	RMSEA
Gender	Males	0.66	0.48	1013.865/509 = 1.992	0.921	0.908	0.947	0.973	0.973	0.038
	Females	0.32	0.35	938.527/509 = 1.844	0.914	0.909	0.922	0.963	0.963	0.045
Age	25 Years or Less	0.46	0.38	1076.190/509 = 2.114	0.920	0.907	0.944	0.970	0.970	0.039
	26 Years or More	0.58	0.34	890.406/509 = 1.749	0.913	0.904	1.201	0.883	0.864	0.044
Online Experience	20 Months or Less	0.59	0.49	771.829/509 = 1.516	0.913	0.908	0.939	0.978	0.978	0.033
	21 Months or More	0.38	0.39	899.867/509 = 1.768	0.923	0.910	0.951	0.978	0.978	0.035
Level of Education	Secondary/High school	0.49	0.52	740.520/509 = 1.455	0.914	0.904	0.882	0.960	0.960	0.045
	Bachelor or Master Degree	0.42	0.48	1231.164/509 = 2.419	0.924	0.911	0.951	0.970	0.970	0.040

Table 9: (Continued)

Moderator	Group	R^2		Fit Statistics						
		Push	Pull	NC (χ^2/df)	GFI	AGFI	NFI	IFI	CFI	RMSEA
Time Online	22 Hours/Week or Less	0.30	0.39	844.314/509 = 1.659	0.914	0.900	0.940	0.975	0.975	0.036
	23 Hours/Week or More	0.39	0.40	888.360/509 = 1.745	0.918	0.904	0.947	0.976	0.976	0.035
Work Position	Students	0.51	0.56	922.240/509 = 1.812	0.917	0.902	0.935	0.970	0.970	0.040
	Junior Positions	0.55	0.48	777.444/509 =1.527	0.912	0.901	0.925	0.973	0.973	0.039
	Senior Positions	0.46	0.53	825.575/509 = 1.622	0.915	0.902	0.886	0.953	0.953	0.051

Note: R^2 is the proportion of the variance of the variable explained by those that directly affect it.

From Table 9 it is seen that the fit statistics for each group are satisfactory and in each case satisfactory proportions of the variances of the variables Push Online Content (Push) and the Pull Online Content (Pull) are explained.

Discussion of the Findings

The profile of the 1,113 respondents in the final sample showed appropriate distributions of: males and females; age groups; levels of education; work positions; and past experience and weekly usage rates with online information services. These individuals were well qualified to participate in the study. In particular, they regarded the five personal motivations (need to belong, need for individuation, personal growth, curiosity, and altruism) as very relevant aspects of their behavior.

The only significant association between gender and the other model variables involved Pull Online Content (Table 5) with: more (less) males (females) than expected pulling information for 17 hours per week or more and more (less) females (males) than expected pulling information for 16 hours per week or less. This was supported by the result that on average males pull information for 17 hours per week which is significantly more than 15 hours per

week for females. In Table 5 significant correlations among model variables showed that:

Among the measures for the five personal motivations and the two online behaviors high (low) measures on any one was associated with high (low) measures on all of the others;
Measures for each of the five personal factors (moderators) (age, level of education, work position, time online, and online experience) were associated with high (low) measures for pushing online content and, apart from age and level of education, the same was true for associations with the measures for pulling online content;

Among the four personal factors (moderators) (age, level of education, work position, and online experience) high (low) measures on any one were associated with high (low) measures for the others. With the exception of age the same result applied to the associations with the measures for time online.
Older (younger) individuals were less (more) altruistic toward others and like those with either high (low) levels of education or more (less) senior work positions they had a weak (strong) need to belong. The need to belong was strong (weak) among individuals who spent more (less) time online;

The need for individuation and personal growth, the level of curiosity, and altruistic behavior were strong (weak) among individuals who spent more (less) time online and had accumulated more (less) online experience.

Decisions for Research Hypotheses

Direct Causal Effects: Table 10 summarizes the decisions for the research hypotheses concerning direct effects in the theoretical model presented in Table 3. The decisions are based on the results in Figure 2 and Table 8. In Table 10 decisions refer to the whole sample of participants as well as any of the groups associated with the moderating variables where there was support for the hypothesis.

Table 10: Decisions for Hypotheses Concerning Direct Effects

Hypothesis about Direct Effects	Decision	Reference
H1: Need to Belong has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**H1(a)** and **H1(b)** are not supported for the whole sample or any of the groups among the personal factors (***N***).	**(a)** Dissamarn (2011) **(b)** Phelps et al. (2004); Ho and Dempsey (2009)
H2: Need for Individuation has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**H2(a)** is only supported for those with secondary/high school as their highest level of education (***N***). **H2(b)** is supported for the whole sample and separately for: males; those with at least 21 months online experience; those with secondary/high school as their highest level of education; those with at least 23 hours per week of time online.	**(a)** Dissamarn (2011) **(b)** Ho and Dempsey (2009); Dissamarn (2011)
H3: Altruism has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**H3(a)** is supported only for those in junior work positions (***N***). **H3(b)** is supported only for those in senior work positions (***N***).	**(a)** Dissamarn (2011) **(b)** Phelps et al. (2004); Ho and Dempsey (2009); Dissamarn (2011)
H4: Personal Growth has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**H4(a)** and **H4(b)** are not supported for the whole sample or any of the groups among the personal factors (***N***).	**(a)** Ho and Dempsey (2009) **(b)** Ho and Dempsey (2009); Dissamarn (2011)
H5: Curiosity has a significant positive direct effect on: **(a)** Pull Online Content **(b)** Push Online Content	**H5(a)** is supported for the whole sample and separately for: those with either at least 21 months online experience or at least 23 hours per week time online; full time students; those with a bachelor or master degree as their highest level of education. **H5(b**) is supported for the whole sample and separately for: males; both age groups and both groups for level of education; those with either 20 months or less of online experience or 22 hours per week or less of time online; and either full time students or working in junior positions.	**(a)** Ho and Dempsey (2009) **(b)** Dissamarn (2011)

Note: The notation (***N***) indicates that this finding is not reported in previous studies.

From Table 10 it is seen that the need to belong to a group and the need for personal growth had negligible direct influence on either pushing or pulling behavior. It appears that while an individual's need to be a member of a group and to experience new opportunities, roles, and relationships may be part of the explanation as to why they use online social media to interact with others these needs have little to do with the extent to which they push or pulling content online. The need for individuation and the desire to be altruistic had an important influence on pulling behavior but only among individuals who had either no university level education or were employed in junior level work positions. However, unlike individuals in other work positions those in senior positions did push information for altruistic reasons.

Not surprisingly, pulling information behavior was an important consequence of an individual's desire to know and learn (curiosity). This was true across the whole sample of respondents but especially among full time students and those who had completed or were engaged in tertiary level education as well as those with above average levels of either online experience or time spent online. The influence of curiosity on pushing online behavior was important across the whole sample regardless of the individual's age or level of education but especially among males, those in full time education or junior work positions, as well as individuals with less than average levels of either online experience or time spent online. For the whole sample, compared to the influence of curiosity on pushing behavior the influence of the need for individuation was less but still important. In particular, the need for individuation had an important influence on pushing behavior among males, those without tertiary level education, and those with more than average levels of either online experience or time spent online. Apparently, among individuals with either above average time online or above average online experience an increasing need to be seen as different from other people was satisfied by an increase in pushing behavior, which presumably gives an impression to others that the individual is better informed and more knowledgeable compared to others. However, among individuals with either below average time online or below average online experience an increase in pushing behavior was a consequence of increased curiosity rather than an increased need for individuation.

Overall there was reasonable support for the hypotheses suggested by the previous studies referenced in Table 10 except for H1(a), H1(b), H4(a), and H4(b) where the need to belong and the need for personal growth were not important personal motivations for pushing or pulling behaviors. In Table 10, decisions that corresponded with new findings not found in previous studies are notated (***N***) and it is noted that these new findings need to be validated in further studies. However, regardless of whether or not the hypotheses related to direct causal effects were supported there were significant positive correlations among the variables in each of the hypotheses (Table 5). Individuals with strong (weak) personal motivations spent a lot of (little) time and effort pushing or pulling online content.

Moderating Effects: Table 11 summarizes and describes the decisions for the research hypotheses where moderating effects due to personal factors were significant. The decisions are based on the results in Table 8.

Table 11: Decisions for Hypotheses Concerning Significant Moderating Effects

Significant Moderator Effects	Description of the Effect
Gender has a significant moderation effect on: Curiosity → Push	The positive direct effect Curiosity → Push is significantly greater for males than for females.
Online Experience has a significant moderation effect on: Curiosity → Pull Curiosity → Push	The positive direct effect Curiosity → Pull is significantly greater for those with at least 21 months online experience. The positive direct effect Curiosity → Push is significantly greater for those with at most 20 months online experience.
Time Online has a significant moderation effect on: Curiosity → Pull	The positive direct effect Curiosity → Pull is significantly greater for those who spend at least 23 hours per week online.
Work Position has a significant moderation effect on: Curiosity → Push Personal Growth → Push Altruism → Push Altruism → Pull	The positive direct effect of: Curiosity → Push is significantly greater for full time students compared to those in senior positions. Personal Growth → Push is significantly greater for those in senior work positions compared to full time students. Altruism → Push is significantly greater for those in senior or junior work positions compared to full time students. Altruism → Pull is significantly greater for those in junior work positions compared to either full time students or those in senior positions.

From Table 11 it is seen that the only personal factors which are involved in significant moderating effects were: gender; online experience; time online; and work position, while age and level of education did not have any significant moderating effects. The direct effects on pushing or pulling behavior that were influenced by at least one of these four moderators were due to three personal motivations (curiosity, personal growth, and altruism).

As described in separate parts of Table 11 the positive effect of curiosity on pushing behavior was moderated by gender, online experience, and work position while the positive effect of curiosity on pulling behavior was moderated by online experience and time online. The effects of personal growth and altruism on pushing behavior were modified by only work position which was the only moderator that influenced the effect of altruism on pulling behavior. The moderation effects of gender, online experience, and time online have not been reported often in previous studies (Table 2). In this study work position had intuitively correct moderating effects on four of the causal effects on pushing and pulling behaviors. This important moderator role for work position was not evident in most previous studies and does require validation in future studies.

Implications for Practice

There are practical insights among the findings related to moderating effects and the direct causal effects on pulling and pushing content online.

Considering the whole sample of respondents it is evident that if the objective is to increase the likelihood that information is pulled by an individual then the content, its presentation, and access to it must pay primary attention to the extent to which it appeals to the individual's curiosity. Other personal motivations are much less important than curiosity and arranged in decreasing order of their effect are: personal growth; the need for individuation; the need to belong; and altruism. In order to increase the likelihood that information is pushed by an individual, primary attention should be given to the individual's curiosity as well as their need for individuation. Other personal motivations are much less important and arranged in decreasing order of their effect are: personal growth; altruism; and the need to belong. From a practical perspective it is important to note that individuals who are most (least) likely to pull information are those who are most (least) likely to push information and on average each of the personal motivations was very evident among participants.

Because this study also investigated the moderating effects of six personal factors it is possible to identify groups of participants where the effects of the personal motivations on pushing or pulling online content are or are not significant. For the groups where effects are significant practitioners need to maintain current approaches and for the groups where effects are not significant there needs to be a focus on practical actions designed to increase the positive effects of these motivations on pushing or pulling behaviors. The findings are presented in Table 12 where the personal motivations are presented in decreasing order of their overall effects on pulling and pushing behaviors.

Table 12: Strengthening the Effects of Personal Motivation Among Groups

Practical Objective	Personal Motivation	Groups where the Effects of Motivations Need to Be Strengthened
1. Increase the likelihood that information is pulled by an individual	Curiosity	Those in junior work positions Those in senior work positions; Separately: males; and females; Separately: those in both age groups; Those with secondary/high school as their highest level of education; Those with either at most 20 months online experience; Those who spend 22 hours per week or less online
	Personal Growth	All groups
	Need for Individuation	Those with university degrees as their highest level of education
	Need to Belong	All groups
	Altruism	Those in full time education; Those in senior work positions
2. Increase the likelihood that information is pushed by an individual	Curiosity	Females; Those in senior work positions; Those with at least 21 months online experience; Those who spend 23 hours per week or more online
	Need for Individuation	Females; Those with either at most 20 months online experience; Those who spend 22 hours per week or less online
	Personal Growth	All groups
	Altruism	Those in full time education; Those in junior work positions
	Need for Individuation	All groups

From Table 12 it is seen that strengthening influences on pulling behavior involves all groups almost equally except that those with below average online experience and below average time spent online each week do not require special attention. Strengthening influences on pushing behavior involves mainly: males; all work groups; and those with above average online experience and above average time spent online each week. The information in Table 12 enables practitioners to consider various means by which the effects of motivations on pulling/pushing behaviors may be increased among the groups identified by paying attention to: the informative value of the content; content storage and display; online site design and user friendliness; access methods; and the security and privacy of access and information.

For example, from Table 12 it is seen that the influence of curiosity on pushing behavior needs to be increased among females. If it is assumed that in practice the current high level of curiosity among females (mean value of 6 out of 7) remains unaltered then the objective would be to try and increase the current level of use that females make of online information services for forwarding information to others. For this purpose, online content needs to be designed so that it is especially appealing to females compared to content which is available offline (e.g. magazines and other media). In fact, offline media should encourage females to consult online sources for additional information about interesting topics stressing the ease with which the online information can be forwarded to others. The universally recognized caring nature of females should be taken into account so that in addition to appealing to a female's curiosity the online content should appeal to the notion that sharing the content with others is very helpful to them. The strengthening of other group effects in relation to the other influences of personal motives on pushing or pulling behavior detailed in Table 12 may be examined in a similar manner.

Conclusion

In response to the questions addressed by the study as presented in the introduction it was found that based on previous studies there were five personal motivations (need to belong, need for individuation, altruism, personal growth, and curiosity) which potentially had significant direct effects on pushing and

pulling behaviors and that these direct effects were possibly moderated by six personal factors (gender, age, online experience, level of education, time online, and work position). Based on responses from the whole sample of 1,113 individuals the only significant direct effects were due to curiosity affecting pushing and pulling behaviors and the need for individuation affecting only pushing behavior (Figure 2). Only gender, online experience, time online, and work position had significant moderation effects (Table 11). The direct effect of curiosity on pushing behavior was moderated by gender, online experience, and work position while online experience and time online moderated the effect of curiosity on pulling behavior. Work position moderated the direct effects of personal growth on pushing behavior and altruism on both pushing and pulling behaviors. In addition, from a practical perspective the findings indentified groups of individuals where personal motivations were having significant effects on pushing or pulling behaviors (Table 10) and, more importantly for practitioners, groups where the effects were not significant but there is a potential to take practical steps to increase the effects of personal motivations on pushing or pulling behaviors (Table 12).

There are new findings. These involve the unimportant direct effects due to the need for individuation, the need to belong, altruism, and personal growth all of which have been proposed in many previous studies to have important effects on online behaviors. In addition, the results related to moderating effects of gender, online experience, time online, and especially work position have not been reported commonly in previous studies.

There are limitations on the findings especially related to the moderators (personal factors). There was little guidance in previous studies as to possible moderators and how to form groups for analyzing moderator effects. Consequently, the groups among the moderators were based on the distributions of the moderators for all of the 1,113 respondents (Table 7). It is recognized that different moderators may be proposed and different groupings may be formed and further study is strongly recommended. Although the sample of respondents represented adequately the target population the external validity of the findings needs to be tested in further studies, especially the direct effects involving the need for individuation, the need to belong, altruism, and personal growth. In addition, further studies may examine pushing and pulling behaviors in relation to different types and sources of content and different cultural settings.

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Appendix

A1 Questionnaire

The questionnaire has been notated to show the labels for variables and indicators and their measurement scales.

Section I: Personal Information

1. Age in Years: (**A**) ○ 12 - 18 (**15**) ○ 19 - 25 (**22**) ○ 26 – 32 (**29**) ○ 33 – 39 (**36**) ○ 40 – 46 (**43**) ○ 47 – 53 (**50**) ○ 54 - 60 (**57**) ○ More than 60 (**67**)

2. Gender: (**G**) ○ Female (**1**) ○ Male (**2**)

3. Highest level of education completed or currently completing: (**E**) ○ Secondary/High School (**12**) ○ Bachelor Degree (**16**) ○ Master Degree (**18**) ○ Doctoral Degree (**22**)

4. Work Position: (**W**) ○ Student (**1**) ○ Officer (**2**) ○ Supervisor/Manager (**3**) ○ Consultant (**4**) ○ Senior Executive (**5**)

*Questions 5 to 9 refer to **online information services** which include all of the online internet based services such as forums, chat rooms, bulletin boards, weblogs, email, messaging services, search engines and internet telephony that are available to you through networks and at web sites and social networks/media sites using smart and mobile phones and computers of all types.*

5. How long have you been using online information services? (**EX**) ○ Less than 1 month (**1**) ○ 1 - 5 months (**3**) ○ 6 - 10 months (**8**) ○ 11 – 15 (**13**) ○ 16 -20 (**18**) ○ 21 – 25 (**23**) ○ More than 25 months (**28**)

6. On average how many hours each week do you spend using online information services for any purpose? (**T**)

○ Less than 2 (**1**) ○ 2 – 4 (**3**) ○ 5 – 7 (**6**) ○ 8 – 10 (**9**) ○ 11 – 13 (**12**) ○ 14 – 16 (**15**) ○ 17 – 19 (**18**) ○ 20 – 22 (**21**) ○ 23 – 25 (**24**) ○ More than 25 (**27**)

7. The place where you mainly use online information services: (**P**) ○ Home (**1**) ○ School or University Campus (**2**) ○ Net Café (**3**) ○ Mobile technologies (e.g. laptop, mobile phone) (**4**)

8. On average how many times each week do you deliberately pass forward (pass on or push) selected information content or messages to other people or places using online information services? (**PUSH**)

○ Never (**0**) ○ 1 – 3 (**2**) ○ 4 – 6 (**5**) ○ 7 – 9 (**8**) ○ 10 – 12 (**11**) ○ 13 – 15 (**14**) ○ 16 – 18 (**17**) ○ 19 – 21 (**20**) ○ More than 21 (**22**)

9. On average how many hours each week do you spend using online information services to deliberately search for (seek or find or pull) information content or messages from other online sources? (**PULL**)

○ Less than 2 (**1**) ○ 2 – 4 (**3**) ○ 5 – 7 (**6**) ○ 8 – 10 (**9**) ○ 11 – 13 (**12**) ○ 14 – 16 (**15**) ○ 17 – 19 (**18**) ○ 20 – 22 (**21**) ○ 23 – 25 (**24**) ○ More than 25 (**27**)

Section II: Personal Characteristics

Responses were scored on a scale ranging from *not at all like me* (**1**) to *extremely like me* (**7**) with the *neutral* point (**4**).

Variable (Label)	Indicator	Characteristic	Variable (Label)	Indicator	Characteristic
Need to Belong (NB)	NB1	I want others to accept me.	Personal Growth (PG)	PG3	I like challenges.
	NB2	I am easily hurt when I feel that others do not accept me.		PG4	I welcome new ideas.
	NB3	I believe chatting with like-minded people is nice.		PG5	I like to be in control of my life.
	NB4	I value my relationships with other people in my group.		PG6	I have a good sense of where I am headed in my life.
	NB5	I like being part of a group.		PG7	I like to determine the role/position that I have in a group.
	NB6	Being a member of a group is very important to me.		PG8	I like to play a leadership role.
	NB7	I care very much about socializing with my friends.	Curiosity (CU)	CU1	I like to ask questions.
Need for Individuation (NI)	NI1	I do not like to be exactly like other people.		CU2	I am curious about many things.
	NI2	My friends think that I am a good source of advice and information.		CU3	I want to learn more and gain more knowledge.
	NI3	My friends think I have special characteristics.		CU4	My friends think I am inquisitive.
	NI4	I like to be treated as an individual.		CU5	I spend a lot of time seeking information about many things.

Variable (Label)	Indicator	Characteristic	Variable (Label)	Indicator	Characteristic
Need for Individuation (NI)	NI5	My talents are different from those of my friends.	Altruism (AL)	AL1	I like to help other people.
	NI6	My contributions to my group are different from those of other members.		AL2	I like to share my experiences with my friends.
	ni7	I often have different opinions to other people in my group.		AL3	I like to share my feelings with my friends.
Personal Growth (PG)	pg1	I like new experiences.		AL4	I like to share my knowledge with others who I like.
	pg2	I like to create new opportunities for myself.		AL5	I enjoy having close personal relationships with others.

Table A1: Factor Analysis and Cronbach Alpha

Indicator	Latent Variable					Cronbach Alpha
	NI	NB	PG	CU	AL	
NI1	**.863**	.084	.140	.112	.043	0.955 Excellent
NI5	**.863**	.094	.144	.158	.107	
NI4	**.858**	.154	.098	.116	.137	
NI7	**.851**	.090	.153	.115	.093	
NI3	**.851**	.127	.131	.160	.136	
NI6	**.849**	.126	.132	.141	.123	
NI2	**.830**	.136	.129	.160	.138	
NB5	.120	**.865**	.077	.099	.128	0.943 Excellent
NB4	.074	**.848**	.097	.087	.147	
NB6	.135	**.842**	.046	.098	.143	
NB1	.149	**.833**	.092	.115	.137	
NB2	.119	**.824**	.105	.117	.118	
NB7	.082	**.806**	.117	.077	.213	
NB3	.097	**.804**	.142	.120	.142	
PG1	.110	.107	**.791**	.259	.192	0.935 Excellent
PG3	.121	.102	**.774**	.237	.216	
PG2	.139	.114	**.774**	.236	.223	
PG6	.117	.093	**.766**	.170	.179	
PG7	.177	.103	**.749**	.170	.158	
PG8	.156	.129	**.749**	.201	.132	
PG4	.103	.085	**.739**	.247	.254	
PG5	.168	.098	**.734**	.185	.137	
CU1	.171	.126	.191	**.832**	.162	0.927 Excellent
CU2	.128	.110	.230	**.828**	.166	
CU4	.144	.080	.158	**.821**	.195	
CU3	.096	.102	.266	**.798**	.229	

Table A1: (Continued)

Indicator	Latent Variable					Cronbach Alpha
	NI	NB	PG	CU	AL	
CU5	.153	.101	.195	**.791**	.213	0.927 Excellent
AL3	.115	.150	.160	.189	**.835**	0.918 Excellent
AL4	.100	.152	.177	.174	**.813**	
AL1	.084	.150	.164	.161	**.807**	
AL2	.116	.145	.196	.235	**.806**	
AL5	.109	.179	.166	.182	**.783**	

Total Variance Explained

Latent Variable	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Percentage of Variance	Cumulative Percentage	Total	Percentage of Variance	Cumulative Percentage	Total	Percentage of Variance	Cumulative Percentage
NI	12.225	38.203	38.203	12.225	38.203	38.203	5.484	17.136	17.136
NB	3.884	12.139	50.342	3.884	12.139	50.342	5.206	16.270	33.406
PG	3.754	11.730	62.072	3.754	11.730	62.072	5.184	16.201	49.606
CU	2.211	6.909	68.981	2.211	6.909	68.981	4.077	12.740	62.347
AL	1.879	5.871	74.852	1.879	5.871	74.852	4.002	12.505	74.852

Notes: (a) Extraction Method: Principal Component Analysis; **(b)** Rotation Method: Equamax with Kaiser Normalization. Rotation converged in 6iterations; **(c)** Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .960; **(d)** Bartlett's Test of Sphericity Approx: Chi-Square = 29904.800, df = 496, p = 0.000; **(e)** Significant loading factors are highlighted; **(f)** Loading factors associated with latent variables have magnitude ≥ 0.4 and corresponding eigenvalues ≥ 1 (Straub et al., 2004); Only factors with eigenvalues ≥ 1 are shown; **(g)** All Cronbach alpha values are greater than 0.7 with the interpretation suggested by George and Mallery (2003).

Table A2: Descriptive Statistics

Variable	Mean	Standard Deviation	Skewness	Kurtosis	**Variable**	Mean	Standard Deviation	Skewness	Kurtosis
Age	23.78	6.245	.499	.030	Personal Growth	6.23	.639	-.985	.091
Level of Education	15.30	1.731	-1.148	.063	PG1	6.38	.801	-1.043	.153
Online Experience	21.41	5.496	**-.**620	**-.**061	PG2	6.35	.762	-.894	.003
Time Online	21.05	6.891	-.679	-1.008	PG3	6.20	.824	-.705	-.332
Push Content	15.05	7.581	-.470	-1.395	PG4	6.36	.700	-.635	-.775
Pull Content	16.05	7.809	-.253	-1.565	PG5	6.30	.755	-.845	.138
Need to Belong	6.01	.739	-.621	-.631	PG6	6.12	.764	-.517	-.244
NB1	5.91	.893	-.284	-.880	PG7	6.06	.767	-.449	-.276
NB2	5.80	.827	-.312	-.413	PG8	6.11	.778	-.519	-.288
NB3	6.06	.826	-.456	-.606	Curiosity	6.02	.744	-.566	-.666
NB4	6.21	.820	-.711	-.338	CU1	5.91	.875	-.306	-.762
NB5	6.10	.868	-.592	-.548	CU2	6.15	.868	-.608	-.654
NB6	5.98	.892	-.487	-.602	CU3	6.25	.815	-.777	-.258
NB7	6.03	.852	-.527	-.445	CU4	5.85	.842	-.314	-.526
Individuation	5.31	.861	.010	-.780	CU5	5.93	.825	-.376	-.466
NI1	5.28	1.060	.100	-.771	Altruism	6.15	.704	-.605	-.582
NI2	5.51	.885	-.050	-.506	AL1	6.05	.841	-.455	-.641

Table A2: (Continued)

Variable	Mean	Standard Deviation	Skewness	Kurtosis	**Variable**	Mean	Standard Deviation	Skewness	Kurtosis
NI3	5.29	.954	-.003	-.521	AL2	6.20	.774	-.531	-.652
NI4	5.27	1.018	.006	-.656	AL3	6.11	.837	-.547	-.551
NI5	5.24	.994	.077	-.608	AL4	6.25	.772	-.640	-.499
NI6	5.34	.927	-.003	-.565	AL5	6.14	.822	-.645	-.262
NI7	5.25	.921	-.076	-.525					