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Abstract

Nowadays, the booming of Mobile Healthcare Applications (MHAs) provides several new kinds of health services and methods of information transmission. However, it is a salient challenge for MHA vendors to attract users to adopt software continuously. Though users' perceived e-health literacy is recognized as a critical factor in some recent studies, its influence was still not clear. This paper has investigated how the users' perceived e-health literacy (PEHL) affects their continuance intention when adopting mobile healthcare applications based on elaboration likelihood model (ELM). We distributed questionnaires by Wechat (similar to Whatsapp) in China, where hundreds of MHAs can be downloaded, and 273 valid samples were collected. Result shows that ELM works well in this model with 6 of the 8 hypotheses are supported. The moderate effect of PEHL is largely significant on peripheral route but not significant on central route. The most interesting finding is that the relationship between PEHL and users' satisfaction in continuance adoption is positive. Possible reasons are discussed such as, there could exist a moderator on this relationship. Limitations, future researches and implications for theory and practice are also given. The paper should include an abstract. The abstract should be understandable by the general reader outside the context of the study. The abstract should be formatted like this paragraph, and may be up to 200 words in length.

Keywords: Mobile Healthcare Applications (MHAs), Perceived e-Health Literacy, Continuance Intention, Elaboration Likelihood Model (ELM), Trust.

1   INTRODUCTION

According to an Internet Statistics Report in China, the number of mobile internet users has reached 594 million as of 2015 (CNNIC 2015). Meanwhile, the massive use of mobile applications has generated new forms of technology in many aspects of life (Mart ñez-P érez et al 2013). One of these aspects is healthcare, where Mobile Healthcare Applications (MHAs) provide us with several new kinds of health services and methods of information transmission (Free et al 2013). Thanks to these MHAs, our healthcare environment has become more and more "mobile", where patients can carry out health-related work (e.g., online registration and online consulting) without being limited by time or space compared to traditional communication technologies (Kafeza et al 2004). Though MHAs have a great deal of potential for improving individuals' health state, these applications are worthless if users do not use them continuously (Norman & Skinner 2006b). In this paper, continuance use refers to users' behaviour if they reuse the MHAs after their first use (Bhattacherjee 2001). For exploring the problem why users continuance use MHAs or not, researchers especially in Information Systems have took a lot efforts over the years (Touray et al 2015). More specifically, continuance adoption behaviours are divided into health searchers' adoption and physicians' adoption (Agarwal et al 2010). In this research, we focus on the former, exploring why these health searchers continuously use MHAs or not.

Trust has been proven to play an important role in individuals' continuance behaviours when they use information technologies (Gefen et al 2003; Hsu et al 2015; Zahedi & Song 2008; Zhou 2012). Especially in some special environments, trust appears to have a more important influence on continuous adoption, such as mobile banking and healthcare. According to the definition of trust, it can be regarded as an attitude to MHAs or MHA providers (Gefen et al 2003). In the psychology literature, the Elaboration Likelihood Model (ELM) provides a theoretical perspective on how attitudes change over time (R. E. Petty et al 1981). ELM suggests that users' attitude to a certain technology can change through two ways: central route and peripheral route. The central route processes are related to information and this entails effort and time spent on scrutinizing information. In contrast, the peripheral route processes information cues and it requires less investment of effort (R. Petty & Cacioppo 1986). As stated above, users' attitude building process can be explained by ELM. That is to say, trust, as one kind of attitude, can also be explained by ELM. Therefore, in this research, we employ ELM as our theoretical background to explore how trust is developed and change when users use MHAs continuously.

It is also noted that electronic health tools provide little value if the intended users lack the skills to effectively engage with them (Norman & Skinner 2006a). Thus, the concept of e-health literacy is proposed to assist us to measure these special skills such as information literacy, which can be further defined as Perceived e-Health Literacy (PEHL) dues to its measure method of self-reported (Norman & Skinner 2006b). What's more, PEHL is recognized as a critical factor in recent studies (Chan et al 2009; Collins et al 2012; Werts & Hutton-Rogers 2013), however, its influence was still not clear. In social cognition theory, self-efficacy seems to give the best explanation of what PEHL is and how it works (Bandura 1997). Based on this, we define PEHL in this paper as "user's perceived ability to use a health technology to improve health status" and explore its role in users continuous behaviours when they use MHAs.

2   LITERATURE REVIEW & THEORY DEVELOPMENT

2.1   Elaboration Likelihood Model in MHAs

ELM suggests that users' attitude to a certain technology can change through two ways: central route and peripheral route. According to Petty and Cacioppo (1986), central route views attitude change as

resulting from a diligent consideration of issue-relevant arguments. Its processes are related to information and this entails effort and time spent on scrutinizing information, such as, the behaviors of comprehension, learning and retention of message arguments (R. E. Petty et al 1981). In contrast, peripheral route views attitude change because the attitude object has been associated with either positive or negative cues. It processes information cues and it requires less investment of effort, such as, credible, attractive and powerful (Zhou 2012).

To better distinguish the two ways that influence attitude in IS research, Bhattacherjee and Sanford (2006) summarized the differences between them. Firstly, the two routes process different types of information, which need different levels of efforts. When users use MHAs, they will search health information through these platforms and receive feedback information such as the answers to the questions they asked. Then the users scrutinize this information, which takes effort, and judge whether it is correct and useful for them, which means central route works. In contrast, MHAs' interface or navigation will affect users' attitude a great deal. For users, whether they feel comfortable or not after the use of MHAs depends directly on the extent of ease of use they perceived intuitively. Thus, MHAs' interface or navigation can be regarded as a kind of information that users can obtain and analyze without too much effort (e.g., take efforts scrutinizing them), which means peripheral work. Secondly, the stability of the two ways is different. Changes induced via the central route are generally more stable and predictive due to the deliberate and thoughtful consideration of relevant arguments (Ho & Bodoff 2014), whereas changes induced via the peripheral route are less enduring and predictive.

2.2   Trust and Satisfaction

Trust reflects a willingness to be in a position of vulnerability based on the positive expectation toward another party's future behavior (Gefen et al 2003). Scholars propose that trust often includes three beliefs: ability, integrity and benevolence. However, trust building contains two processes: the formation of cognitive trust and emotional trust (Zahedi & Song 2008). The three beliefs we mention above can be regarded as cognitive trust, which is defined as a rational expectation that a trustee will have the necessary ability, benevolence, and integrity to be relied upon. Cognitive trust influences emotional trust indicating that trust attitude can be formed through trust beliefs. In general, trust has been widely accepted as antecedent variable of continuance intention.

Satisfaction is also a core factor in this research. In IS, satisfaction is widely used in exploring the determinants of technology acceptance behavior, especially for the study of continence use. The Expectation-Confirmation Model (ECM) is regarded as the most popular and fundamental model in these researches (Brown et al 2014). ECM originates from Expectation-Confirmation Theory, whose predictive ability has been demonstrated over a wide range of product repurchase and service continuance contexts (Oliver 1993). ECM suggests that users' continuance intention to a certain technology depends on users' satisfaction directly. After the appearance of ECM, more and more studies have verified the positive relationship between satisfaction and continuance intention, which provides the foundation for our research.

2.3   Perceived e-Health Literacy

Individuals need essential skills to complete healthcare-related activities (Norman & Skinner 2006b). Scholars have stated that this applies for e-Health Literacy, the definition of which is "the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem" (Norman & Skinner 2006a). E-health Literacy is an objective evaluation index that determines how much outcome users will get during the whole e-Health activity. In order to measure the level of e-Health Literacy for individuals, Norman and Skinner (2006a) developed the e-Health Literacy Scale. The scale is a self-report tool based on an individual's perception of her or his skills and knowledge within each measured domain. Actually, it

measures consumers' perceived skills and comfort with e-Health instead of the skills directly, which is also regarded as a limitation in their research (Norman & Skinner 2006a). Thus, in this paper, we have called it Perceived e-Health Literacy (PEHL) and define it as the user's perceived ability to use health technology to improve their health status.

To solve this research gap and clarify the relationship between e-Health Literacy and PEHL, especially in the mobile environment, we employ the concept of self-efficacy in social cognitive theory. Self-efficacy reflects the individuals' perceived ability to perform an activity to acquire the expected outcome (Bandura 1997). In the mobile healthcare environment, the activity should be using MHAs to improve users' health state and the perceived ability should be users' perceived e-Health Literacy. Thus, we consider PEHL as a kind of self-efficacy, which helps us better understand what it can do. Self-efficacy contributes to understanding how PEHL affects individuals' behavior in the mobile healthcare environment. Meanwhile, ELM says that attitude will change through two routes, indicating that PEHL can influence users' choices when they use MHAs. Thus, we deem that PEHL plays the role of elaboration likelihood in the ELM when users use MHAs. PEHL is an important factor that influences trust and then affects individuals' continuance intention.

3 RESEARCH MODEL AND HYPOTHESES

3.1 Elaboration Likelihood Model and Trust

According to ELM, the central route processes arguments are related to information such as information quality (Bhattacherjee & Sanford 2006). When consumers use MHAs, the most visible investment in the software is its depth, breadth and quality of its information. To reduce the information asymmetry and inform consumers of high-quality services, the providers should support rich enough information. Thus, if the information is precise, timely, understandable and useful, the users will think the MHA has the ability, integrity and benevolence to provide high-quality services meaning trust generated. Zhou (2012) has found that central cues including information quality and service quality positively affect initial trust. However trust is built up gradually over time, the effect of information quality on trust will continue during the use and experience of this technology. Hence,

> **H1.** *Central cues such as information quality positively affect trust.*

In comparison, the peripheral route processes information cues which require less effort (Bhattacherjee & Sanford 2006; R. E. Petty et al 1981). In ELM, peripheral cues are suggested to have effects on attitude in some circumstances. For instance, Zhou (2012) proposed that peripheral cues, such as system quality can influence initial trust in the environment of online banking. In MHAs, system quality refers to if the application has high access speed, simple navigation and visual appeal or not and if the application is ease-of-use. If the MHA has a good user interface and clear navigation, users can easily understand that the application can provide a good user experience without scrutinizing it. Trust is dynamic and built up over a long period, so in this paper, we suggest that,

> **H2.** *Peripheral cues such as system quality positively affect trust.*

Elaboration is regarded as an important factor that will moderate the effect of central cues and peripheral cues on attitude in ELM. R. E. Petty et al. (1981) suggested that an elaboration refers to every variable that will change the likelihood when people choose between the two ways. According to self-efficacy, PEHL will affect users' behaviours, which reflects users' perceived ability to improve their health state with the help of MHAs. That is to say, if the users have high PEHL level, they will firstly set a high goal and make more effort to achieve it. Thus, users with a high level of PEHL will prefer to choose central route, such as scrutinizing information, to decide if the MHAs and their providers are trustworthy. Analogously, users with a low level of PEHL would prefer to choose the peripheral route and decide whether or not to trust MHAs and their providers by experiencing their system quality, which needs less effort. Meanwhile, since Zhou (2013) has proved that self-efficacy

has the moderate effect on the relationship between central central/peripheral cues and initial trust, we propose that PEHL has the moderate effect under the environment of MHAs. Hence, we suggest that,

H3. *Perceived e-Health Literacy positively moderates the effect of the central cues such as information quality on trust.*

H4. *Perceived e-Health Literacy negatively moderates the effect of the peripheral cues such as system quality on trust.*

3.2   Perceived e-Health Literacy and Satisfaction

Satisfaction refers to the extent those ones' confirmation to expectation (Bhattacherjee 2001), which depends on the expectation and confirmation of a user's experience. Contrast Model based on disconfirmation of expectation theory suggests that ultimate outcome evaluations are based on the direction and size of the gap between expectations and experiences and are ultimately biased in the direction of experiences (Patterson et al 1997). According to self-efficacy in social cognitive theory, users with a high level of PEHL will set a relatively high goal when they use MHAs. They think the applications will improve their health state as what they have expected. Therefore, the higher the user's goal is, the higher user's expectation will be formatted, and more difficult it will be for MHAs to satisfy them. Thus, we suppose,

H5. *Perceived e-Health Literacy negatively affects satisfaction.*

3.3   Trust and Satisfaction and Continuance Intention

Trust reflects the positive expectation to an object and concludes three beliefs, ability, integrity and benevolence (Gefen et al 2003). According to trust-building process, the formation of the three beliefs referred above means trust builds (Dirks & Ferrin 2002). Under this condition, satisfaction, referring to users' emotional reaction to the transactions experienced with MHAs, seems to give a better explanation of why the change occurs. For example, if a user satisfied with a MHA, he/she may consider that the provider or application is able to meet his/her expectations (Bandura 1997). Then the user will generate cognitive trust (e.g., ability, integrity and benevolence) if their expectation are fulfilled and emotional trust arise, which we call trust attitude. Thus, we assume,

H6. *Satisfaction positively affects trust.*

Studies about the relationship between trust and continuance intention are numerous. Hsu et al. (2015) suggested that trust affects repurchase behaviour by moderating effects of habit in online group buying. In the e-health environment, trust represents the attitude of users to both the MHA they are using and its provider. What is more, higher concern for privacy makes the effect of trust on continuance intention more important; thus, we propose,

H7. *Trust positively affects continuance intention.*

Satisfaction is also a key factor in studies of continuance adoption (Bhattacherjee 2001; Brown et al 2014). The classical model, named the Expectation-Confirmation Model, suggests that satisfaction positively affects continuance intention in the field of IS. The ECM has been greatly developed, but the role of satisfaction is stable. In the e-health environment, user's satisfaction reflects the level of their expectation, which matches experience; hence, we suggest,

H8. *Satisfaction positively affects continuance intention.*

4   METHOD

We choose college students as our ideal group in this research, dues to their popularity with mobile applications. An online questionnaire was adopted to collect data（http://www.sojump.com/?s=1）.

We forwarded the questionnaire by WeChat (mobile social application). In general, we sent 532 questionnaires and 317 participants replied with a 59.6% response rate. After the questionnaires were returned, we first deleted invalid data – that which was finished in less than 60 seconds – from the dataset. Finally, the size of the sample is 273. Then the analysis of the SEM followed.

The measurement scales were modified from prior research studies. Each item was measured using a 7-point Likert-type scale (i.e. 1=strongly disagree, 7=strongly agree). In general, six measurements are tested in this research; they are perceived e-health literacy, information quality, system quality, trust, satisfaction, and continuance intention. These items were first translated into Chinese by a researcher. Then, another researcher translated them back into English to ensure consistency. Both researchers have knowledge in information technology and expertise in English-Chinese translation. Specifically, we used MHAs as our research topic and replaced all measures based on it. When the instrument was developed, it was tested by 10 users who have mobile healthcare applications' experience. Then, we revised some items to improve clarity and understandability.

Partial least squares (PLS) analysis is used for data analysis in this research. PLS is a component-based structural equation modeling method, which is suitable for predictive models and theory building (Chin, 2003). PLS is chosen in this paper because it works well with small-to-medium-sized samples (Chin, 2010). What's more, two stages including measurement model and structural model are conducted to analyse research model.

5 RESULTS

The number of medical individuals is 122 (44.7%) and the number of non-medical individuals is 151 (55.3%). An F-test was conducted with data from the first and last 25% respondents and showed that there was nonresponse bias (F=1,121). There were 105 male and 168 female participants. And 258 participants were aged from 20 to 29, which covers 94.5% of the sample. Type of MHA that participants used was also collected. Results show that software for running, weight controlling, bodybuilding, and other MHAs are all included in the sample (for the limitation of paper length, demographic information is limited).

5.1 Measurement Model

First, we tested the measurement model using SmartPLS version 3.0. Quality Criteria measured convergent validity, as Table 1 shows. All average variance extracted (AVE) exceeds 0.5 and Composite Reliability (CR) exceeds 0.7; thus, the scale has a good convergent validity. In addition, Cronbach's Alpha (Cα) exceeds 0.7, suggesting a good reliability (Nunnally et al 1967).

Indicators	Abb.	AVE	CR	$C\alpha$
Central Route	CR	0.857	0.947	0.917
Peripheral Route	PR	0.884	0.958	0.935
Perceived e-Health Literacy	PEHL	0.633	0.923	0.902
Trust	TR	0.757	0.940	0.919
Satisfaction	SA	0.851	0.958	0.941
Continuance Intention	CI	0.810	0.928	0.882

Table 1.   Quality criteria

Discriminant validity was measured by Fornell-Larcker Criterion (FLC) and Cross Loadings (CL). In the outer model, the two criteria selected can reflect differences in interpretation ability and the ability of other significant variables to construct latent variables for their corresponding significant variables. The results in Table 2 show the discriminant validity of our model (for the limitation of paper length,

table of Cross Loading is limited). For each factor, the square root of AVE (figures in bold) is larger than its correlation coefficients with other factors. This suggests good discriminant validity (Fornell & Larcker 1981).

Items	CR	CI	PEHL	PR	SA	TR
CR	*0.926*					
CI	0.663	*0.900*				
PEHL	0.433	0.457	*0.795*			
PR	0.568	0.687	0.460	*0.940*		
SA	0.683	0.681	0.420	0.658	*0.922*	
TR	0.686	0.664	0.484	0.638	0.700	*0.870*

Table 2.   Fornell-Larcker criterion

5.2   Structural Model

Analysis of the Structural Model is the second stage in the SEM. The significance of each path coefficient was calculated by bootstrapping with 5000 samples using the replacement method. R^2 for Continuance Intention was 0.705. The results showed that six of the eight hypotheses were supported. P-values showed that H2, H6, H7, H8 were very significantly supported, whilst H1 and H4 were significant. H3 and H5 were unexpectedly not significant. Results are shown in Table 3.

No.	Path coefficient	P-value	Result
H1+	+0.119	0.043*	Support
H2+	+0.270	0.000***	Support
H3+	+0.044	0.105	Not Support
H4-	-0.132	0.020*	Support
H5-	+0.420	0.000***	Reverse Support
H6+	+0.435	0.000***	Support
H7+	+0.303	0.000***	Support
H8+	+0.579	0.000***	Support

*=p<.05;**=p<.01;***=p<.001

Table 3.   Path coefficient and significance

6   DISCUSSION

The results also confirmed most of the hypotheses in this research model. Firstly, ELM is integrated as the foundational theory to study the users' continuous behaviours in MHAs environment. Both information quality and system quality have positive effects on trust. PEHL has significant impact on moderating the relationship between system quality and trust, but non-significant impact on the relationship between information quality and trust. According to ELM, elaboration likelihood is not a personality trait or an individual difference, but rather a temporal state that may fluctuate with situational contexts and time, even for the same individual (R. E. Petty & Cacioppo 1996; R. E. Petty et al 1981). Thus, we consider the reason why H3 is not supported is that, although users have a high level of PEHL, they may still choose the peripheral route because of limited time or inadequate effort. The verification of H5 gives a reverse result. However, as distinct from traditional healthcare technology, the iterative updating of mobile applications is more frequent. Thus, the confirmation of

mobile healthcare applications' use will better match users' expectations. Thus, we suppose there exists unknown factors (e.g. user-designer interaction) that moderate the relationship between PEHL and satisfaction. In general, the higher perceived e-health literacy users have, the more satisfaction they will achieve.

6.1 Implications for Theory and Practice

This research has some theory implications. Firstly, the research examined users' continuance behaviours when using MHAs from the perspective of ELM instead of initial behaviours, which have been widely studied. To our knowledge, this paper is one of the first researches aiming to explore users' continuance behaviours in MHAs environment. On one hand, the model enriches extant research on ELM and these results can help us understand MHAs users' continuance behaviours. On the other hand, we think the environment (refers to MHAs environment in this paper) where ELM is used may have some effect on the appropriateness of the model. Secondly, a new method to comprehend the data we collect when we want to measure users' ability by questionnaire is proposed. Thirdly, PEHL is innovatively integrated in our model, which has been confirmed to play an important role in users' continuance behaviours.

This research has also some practice implications. From the perspective of MHAs providers, we suggest that system quality and other peripheral cues shoul be improved primarily, such as improve their interface and navigation to show a better system quality and enhance their reputation. Information quality and other central cues are also suggested to improve such as make their information more and more professional. From the perspective of MHAs users, users need training and practice to enhance thier PEHL, which will help them to find useful MHAs and keep them using these appliactions continously. What's more, a high level of PEHL will help users get more benefits no matter they have high or low e-health literacy actually. Users will improve health state if they have real e-health literacy. Users with low level of real e-health literacy will also improve their ability as they will enhance their knowledge or skills.

6.2 Limitations and Future Research

Some limitations exist in this paper. The sample we chose was from college students due to their familiarity with mobile applications. However, MHAs should be an important way to improve the health of the aged or people who has diseases such as chronicle diseases. Thus, a future study that takes the aged population or patients as the sample is suggested.

7 DISCUSSION

Today's users are facing diverse MHA choices. While technology acceptance has been extensively explored, few studies have examined the role of PEHL on continuance intention of MHAs. This empirical research integrates the ELM as its theory foundation in the mobile healthcare context. The result shows that both information quality and system quality have positive relation with trust. And the positive moderate effect of PEHL on peripheral route is significant with a comparison to the non-significant moderate effect of PEHL on central route. We explain this phenomenon by discussing the nature of elaboration likelihood in ELM. Another interesting finding is that empirical result shows a significantly diverse effect of PEHL on satisfaction. We also discuss this result by understanding self-efficacy in social cognitive theory. This paper has many implications. For theory, we suggest that ELM should be used taken research environment into consideration, and PEHL is an important factor in users' continuance behaviours. What's more, we also think we support a new method of analysing data collected by questionnaires. For practice, suggestions both for MHAs providers and users are given. Specially, we give policy implications for government such as improving system quality and information quality. Limitations are discussed and future researches are also given.

References

Agarwal, R., Gao, G., DesRoches, C. and Jha, A.K. (2010). Research commentary-The digital transformation of healthcare: current status and the road ahead. Information Systems Research, 21(4), 796-809.

Bandura, A. (1997). Self-efficacy: The exercise of control: Macmillan.

Bhattacherjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. MIS quarterly, 351-370.

Bhattacherjee, A. and Sanford, C. (2006). Influence processes for information technology acceptance: An elaboration likelihood model. MIS quarterly, 805-825.

Brown, S.A., Venkatesh, V. and Goyal, S. (2014). Expectation confirmation in information systems research: a test of six competing models. MIS quarterly, 38(3), 729-756.

Chan, J., Leung, A., Chiang, V., Li, H., Wong, E., Liu, A. and Chan, S. (2009). A Pilot project to build e-health literacy among university students in Hong Kong. Paper presented at the Positioning the Profession: the Tenth International Congress on Medical Librarianship.

Chin, W. W. (2003). Issues and opinions on structural equation modeling.

Chin, W. W. (2010). How to write up and report PLS analyses Handbook of partial least squares (pp. 655-690): Springer.

CNNIC. (2015). Internet Statistics Report (Report No.35). Retrieved from https://www.cnnic.cn/hlwfzyj/hlwxzbg/201502/P020150203551802054676.pdp

Collins, S.A., Currie, L.M., Bakken, S., Vawdrey, D.K. and Stone, P.W. (2012). Health literacy screening instruments for eHealth applications: a systematic review. Journal of biomedical informatics, 45(3), 598-607.

Dirks, K.T. and Ferrin, D.L. (2002). Trust in leadership: meta-analytic findings and implications for research and practice. Journal of applied psychology, 87(4), 611.

Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 39-50.

Free, C., Phillips, G., Galli, L., Watson, L. and Felix, L. (2013). The Effectiveness of Mobile-Health Technology-Based Health Behaviour Change or Disease.

Gefen, D., Karahanna, E. and Straub, D.W. (2003). Trust and TAM in online shopping: an integrated model. MIS quarterly, 27(1), 51-90.

Ho, S.Y. and Bodoff, D. (2014). The effects of Web personalization on user attitude and behavior: An integration of the elaboration likelihood model and consumer search theory. MIS quarterly, 38(2), 497-520.

Hsu, M.H., Chang, C.M. and Chuang, L.W. (2015). Understanding the determinants of online repeat purchase intention and moderating role of habit: The case of online group-buying in Taiwan. International Journal of Information Management, 35(1), 45-56.

Kafeza, E., Chiu, D.K., Cheung, S.C. and Kafeza, M. (2004). Alerts in mobile healthcare applications: requirements and pilot study. Information Technology in Biomedicine, IEEE Transactions on, 8(2), 173-181.

Martínez-Pérez, B., de la Torre-Díez, I. and López-Coronado, M. (2013). Mobile health applications for the most prevalent conditions by the World Health Organization: review and analysis. Journal of medical Internet research, 15(6).

Norman, C.D. and Skinner, H.A. (2006a). eHEALS: the eHealth literacy scale. Journal of medical Internet research, 8(4).

Norman, C.D. and Skinner, H.A. (2006b). eHealth literacy: essential skills for consumer health in a networked world. Journal of medical Internet research, 8(2).

Nunnally, J.C., Bernstein, I.H. and Berge, J.M. (1967). Psychometric theory (Vol. 226): McGraw-Hill New York.

Oliver, R.L. (1993). Cognitive, affective, and attribute bases of the satisfaction response. Journal of consumer research, 418-430.

Patterson, P.G., Cicic, M. and Shoham, A. (1997). A temporal sequence model of satisfaction and export intentions of service firms. Journal of Global Marketing, 10(4), 23-43.

Petty, R. and Cacioppo, J.T. (1986). Communication and persuasion: Central and peripheral routes to attitude change: Springer Science & Business Media.

Petty, R.E. and Cacioppo, J.T. (1996). Attitudes and persuasion: Classic and contemporary approaches: Westview Press.

Petty, R.E., Cacioppo, J.T. and Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. Journal of personality and social psychology, 41(5), 847.

Touray, A., Salminen, A. and Mursu, A. (2015). Internet adoption at the user level: empirical evidence from the Gambia. Information Technology for Development, 21(2), 281-296.

Werts, N. and Hutton-Rogers, L. (2013). Barriers to achieving E-Health literacy. American Journal of Health Sciences (AJHS), 4(3), 115-120.

Zahedi, F.M. and Song, J. (2008). Dynamics of trust revision: using health infomediaries. Journal of Management Information Systems, 24(4), 225-248.

Zhou, T. (2012). Understanding users' initial trust in mobile banking: An elaboration likelihood perspective. Computers in Human Behavior, 28(4), 1518-1525.