Gender differences in satisfaction with Facebook users

Abstract

Purpose - There are two main objectives of this study: (1) to examine the factors associated with user satisfaction in the social network sites (SNSs), and (2) to explore the moderating effects of gender on user satisfaction.

Design/methodology/approach - A research model was built upon the expectation disconfirmation model (EDM) with a focus on SNSs specific motivations (i.e., relationship maintenance and entertainment). The model was tested empirically with 221 experienced Facebook users using an online survey.

Findings - The research model explained 40.5% of the variance in user satisfaction. In addition, the results showed that entertainment plays a more important role in determining user satisfaction with SNSs for male users, while relationship maintenance is more important in determining user satisfaction with SNSs for female users.

Research limitations/implications - The current study enriched the theoretical understanding of user satisfaction in the context of SNSs. Particularly, perceptions and disconfirmations about the use of SNSs were identified and empirically tested. Furthermore, gender differences in terms of SNSs usage were empirically demonstrated.

Originality/value - The present study is one of the first few studies that attempts to explain user satisfaction with SNSs as well as examine the role of gender with a theoretical foundation. It complements the empirical research in the IS literature that addresses new social communication technologies.

Keywords Social network sites (SNSs), Facebook, Expectation disconfirmation model (EDM), User satisfaction, Gender

Paper Type Research paper

1. Introduction

With the advent of information technologies, social network sites (SNSs) have undoubtedly transformed the way of how people communicate and interact in the 22th century. SNSs have evolved as an ideal platform of pursing online social interaction among Internet users. Recent usage data reported that 67% of the Internet population uses SNSs (PewInternet, 2013). Most SNSs provide online spaces for users to build and publish their profiles, create links with other users, and establish a personal network. Within the established network, users can perform a wide range of activities. For example, they can keep in touch with their offline friends, and meet new friends with shared interests. They can acquire information about new trends, events, and other social activities through friends' updates or company pages. They can also play games and listen to music with the embedded recreational features and applications.

The significance of SNSs has not gone unnoticed by practitioners and researchers. To site developers, maintaining a sound user base in the SNSs is crucial because it ensures a stable stream of income (e.g., advertising and subscription) for sustaining the sites. To researchers, the proliferation of SNSs has raised different issues that warrant further investigations, such as usage and attitude (Gangadharbatla, 2008; Sledgianowski & Kulviwat, 2009), motivation of using SNSs (Joinson, 2008; Raacke & Bonds-Raacke, 2008), and profile information (Kluemper & Rosen, 2009; Miller et al., 2010; Thelwall, 2009). While there are increasing scholarly attentions toward different usage behaviors in the SNSs, little has been done to investigate the unique factors associated with user satisfaction and the gender preferences within the platform. Satisfaction and gender differences have been recognized as a critical factors influencing information technology use (Bhattacherjee, 2001; Debrand & Johnson, 2008). Satisfaction determines the continuance intention to use an information system (Bhattacherjee, 2001), whereas gender differences influence the attitudes, beliefs and usage patterns toward an information system (Debrand & Johnson, 2008; Fallows, 2005).

The objectives of this study are twofold: (1) to examine the factors associated with user satisfaction in the SNSs, and (2) to explore the moderating effects of gender on user satisfaction. We build upon the expectation disconfirmation model (EDM) (Bhattacherjee, 2001) and develop our research model to understand user satisfaction and gender differences in the context of SNSs.

We believe that this study will provide both research and practical contributions. On the theoretical side, this study advances the theoretical understanding of the user satisfaction in the context of SNSs through the theoretical lens of the EDM. On the practical side, understanding the formation of user satisfaction with SNSs allows practitioners to develop a critical mass that allows self-sustaining of the site (Van Slyke et al., 2007). It also provides insights into the customization gender-specific user interface or functions that addresses the

needs of different user groups, enhancing the site competitiveness in the highly competitive social media industry.

We structure our paper as follows. In the next section, we provide a review of prior literature on the relevant concepts that we used to build our research model. Then, we draw upon the EDM, and propose a research model explaining user satisfaction with SNSs, and the corresponding gender effects. Subsequently, we outline the research methodology for validating the research model and hypotheses. Based on the empirical evidence, we summarize the key findings and conclude the paper with a discussion of the implications for research and practice, limitations, and directions for future research.

2. Theoretical background

2.1. The expectation disconfirmation model

The expectation disconfirmation model (EDM) is proposed by Bhattacherjee (2001) to investigate the post-adoption behaviors of information technologies. The EDM posits that perceived usefulness and disconfirmation are the two factors that influence satisfaction, while satisfaction and perceived usefulness jointly predict the continuance intention to use an information system (Bhattacherjee, 2001).

The explanatory power of EDM has been demonstrated across different contexts in the IS research, such as web-based information systems (Chou et al., 2010; McKinney et al., 2002; Susarla et al., 2003), mobile Internet (Hong et al., 2006), e-learning (Chou et al., 2012), question-and-answer site (Ruth, 2012), and online auction site (Yen & Lu, 2008). These studies have provided solid evidence in demonstrating the interplays among perceived usefulness, disconfirmation, user satisfaction and continuance use intention. With the widely use of EDM to study use satisfaction with different information technologies in the IS literature, we also believed that it is an appropriate theoretical framework for studying user satisfaction with SNSs.

2.2. User satisfaction

User satisfaction refers to the user's psychological or affective state resulting from a cognitive appraisal of disconfirmation (Bhattacherjee, 2001). Researchers have investigated user satisfaction from different theoretical perspectives. A stream of literature explained user satisfaction as an outcome of emotional responses to system attributes (Bailey & Pearson, 1983; Doll & Torkzadeh, 1988). Another stream of literature investigated user satisfaction through the theoretical lens of expectation disconfirmation model (Bhattacherjee, 2001; McKinney et al., 2002), and suggested that the formation of satisfaction includes three processes: perceptual, evaluative, and psychological.

User satisfaction has been extensively studied in different contexts, such as online shopping (Lin & Lekhawipat, 2014; Shih, 2004), mobile services (Koivumäki et al., 2008; San-Martin & López-Catalán, 2013), mobile sites (Zhou, 2013), online games (Huang & Hsieh, 2011), and internet banking (Liébana-Cabanillas et al., 2013). It is recognized as a core factor that determines the continuance use of an information system. For instance, Sung and Hah (2007) found that user satisfaction contributes to the success of a network service. Assensoh-Kodua & Lekhanya (2014) showed that satisfaction is one of the salient determinants of continuance intention in the SNSs context. Shiau & Chau (2012) also reported that satisfaction influences bloggers' continuance intention to use the blog.

2.3. The use of social networking sites

Media users are often goal-oriented and motivated to seek out particular media to satisfy their specific needs (Palmgreen et al., 1985). Contrary to the utilitarian value derived from using organizational information technologies, SNSs users primarily aim at deriving hedonic value and experience from using these new forms of online social technologies (Debrand & Johnson, 2008; Li, 2011). Remarkable effort has been devoted to investigate different types of SNS uses from different theoretical lens, which has enriched our scientific understanding on why people are motivated to use SNSs. For example, Ellison et al. (2006) found that SNS users use SNSs for four reasons: maintaining offline contacts, meeting new people, seeking information, and having fun in the site. Similarly, Nyland and Near (2007) reported that people use SNSs for meeting new people, maintaining existing relationships, pursuing social events, and obtaining enjoyment. Table 1 summarizes the different types of uses of SNSs.

Recent consultancy reports also provided insights into the predominant factors that influence the use of SNSs. It is found that approximately ninety percent of the users use SNSs mainly for relationship maintenance. The respondents indicated that using SNSs is an ideal platform to stay in touch with family members and current friends, and connect with old friends that have lost touch with (PewInternet, 2011). Apart from maintaining relationships, users also use different kinds of applications embedded in the platform for fun. For instance, Candy Crush Saga, a mini-game in Facebook, have attracted 127 millions of active users per months (SocialBakers, 2013a); Spotify, a music sharing application, also recorded 37 millions of active use per month (SocialBakers, 2013b). To sum, relationship maintenance and entertainment are the two salient drivers that motivate people to use SNSs. Therefore, in this study, we also anchor our focus to investigate impacts of the perceptions and disconfirmations of relationship maintenance and entertainment, and the gender effects upon them on user satisfaction.

[Insert Table 1 here]

2.4. Gender differences in online social interaction

In the sociology literature, researchers have indicated that male and female behave differently in communication and relationship management. In particular, sociologists believed that female are relational oriented, while male are agendic (Deaux & Major, 1987; Eagle & Steffen, 1984); female show preferences for maintaining family ties (Di Leonardo, 1987; Rosenthal, 1985), connecting with friends (WeIlman, 1992), and engaging in social activities, whereas male focus more on task-oriented activities.

In recent years, the research on gender differences in information technologies has attracted much attention in the IS community. It is suggested that male and female possess different attitudes and preferences in using different information systems (Debrand & Johnson, 2008; Venkatesh & Morris, 2000). For instance, Wolin and Korgaonkar (2003) indicated that male exhibited more positive beliefs and attitudes toward web advertising than female. Yeh et al. (2012) found that perceived uncertainty is more influential in predicting intention to purchase in an online auction site for male than female. Table 2 summarizes the moderating effects of gender on various information technology uses. Till now, little has been done to examine the gender difference in the context of SNSs. Understanding the gender effect in SNSs is of both theoretical and practical relevance. Results from this study may help researchers to explain inconsistencies as indicated in prior SNS research, while practitioners may also benefit from having a better understanding of the gender preference on SNSs.

[Insert Table 2 here]

3. Research model and hypotheses development

The expectation disconfirmation model (EDM) posits that perceived usefulness and disconfirmation are the two salient predictors that influence user satisfaction, and user satisfaction in turns influences the continuance intention with an information system. In this study, we consider relationship maintenance and entertainment as the predominant proxies of perceived usefulness. We posit that relationship maintenance and entertainment and their disconfirmations (i.e., disconfirmation of relationship maintenance and disconfirmation of entertainment) predict user satisfaction with SNSs. We also test the moderating effects of gender on these relationships[1]. Figure 1 depicts the proposed research model.

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[1] The relationship between satisfaction and continuance intention has been well established in different information systems (See Jin et al. (2013); Shiau & Chau (2012); Wen et al. (2011)) and in SNSs (See Assensoh-Kodua & Lekhanya (2014); Lin et al. (2014)). Thus, this study used only a snippet of the expectation confirmation model (i.e., perception, disconfirmation and satisfaction) to keep the research model parsimonious and focused.

[Insert Figure 1 here]

3.1. The perception of SNS uses and user satisfaction

Human are born with different needs, and are often motivated by unsatisfied needs (Maslow, 1943). With the advance of the functions and features of SNSs, individuals are now able to use SNSs to gratify a wide range of needs within the platform. As discussed in the previous section, there are two predominant types of SNS motivations, namely relationship maintenance and entertainment.

Relationship maintenance refers to the use of SNS to connect with users' old friends, classmates, colleagues, and other people they know in person (Ellison et al., 2006). With the use of SNSs, individuals' needs for socialization are likely to be fulfilled and satisfied (Lenhart, 2009). Empirical evidence supported the relationship between relationship maintenance and user satisfaction. Lampe et al. (2006) found that users use SNSs to learn more about the people they met. Lin et al. (2014) also showed that the feeling of connectedness promotes satisfaction.

Entertainment refers to the use of SNS for filling up free time, taking break and having fun (Ellison et al., 2006). Through the use of the interactive features embedded in the SNSs (e.g., poking) and social games (e.g., Candy Crush), SNSs users could have fun with their connected friends. As such, it derives positive experiences and satisfaction from using the sites. Empirical evidence supported the relationship between entertainment and user satisfaction. Lin et al. (2014) found that the pleasure obtained from using the SNSs is highly associated with satisfaction. Similarly, Xiao et al. (2014) also reported that playfulness is positively related to user satisfaction. Therefore, we hypothesize that:

H1: Relationship maintenance is positively related to user satisfaction with SNSs.

H2: Entertainment is positively related to user satisfaction with SNSs.

3.2 Disconfirmations and user satisfaction

According to the expectation disconfirmation model, disconfirmation is assessed by the users' evaluation between the initial expectation and the actual usage (Bhattacherjee, 2001). In this study, disconfirmation of relationship maintenance (entertainment) refers to the discrepancy between a user's perception of the performance of SNS on relationship maintenance (entertainment) and the initial expectation.

Positive disconfirmation with the SNSs promotes user satisfaction because it is an indicator of realizing the expected benefits of SNS use, whereas the negative disconfirmation implies the failure of achieving the expectation (Bhattacherjee, 2001). Empirical evidence supported the relationship between disconfirmation and user satisfaction. Shiau & Chau (2012) reported that positive disconfirmation is positively related to satisfaction in a sample

of blog users. Jin et al. (2013) also showed that positive disconfirmation is a significant and positive predictor of satisfaction in online question answering communities. Therefore, we hypothesize that:

H3: Positive disconfirmation of relationship maintenance is positively related user satisfaction with SNSs.

H4: Positive disconfirmation of entertainment is positively related user satisfaction with SNSs

3.3. Relationship maintenance, entertainment, and disconfirmations

The association between perception and disconfirmation is described in cognitive dissonance theory (Festinger, 1957). In the expectation disconfirmation model, Bhattacherjee (2001) argued that rationale users adjust their initial perception (e.g., usefulness) to eliminate their disconfirmations. Similarly, in the context of SNSs, users may also experience cognitive dissonance or psychological tension if the perceptions of uses (i.e., relationship maintenance and entertainment) differ from their actual usage experience. Disconfirmations arise, and users may try to adjust their initial perceptions of uses (i.e., relationship maintenance and entertainment) to make the perceptions more realistic. Put simply, positive disconfirmation inflates users' perception of uses (Bhattacherjee, 2001), whereas negative disconfirmation deters users' perception of uses.

The relationship between disconfirmation and perception is upheld by empirical evidence. Bhattacherjee (2001) and Lin et al. (2005) suggested that positive disconfirmation showed a significant impact on user satisfaction and perceived usefulness. Similarly, it is believed that if users' expectation level regarding relationship maintenance and entertainment is positively disconfirmed, they will perceive a high level of relationship maintenance and entertainment. Therefore, we hypothesize:

H5: Disconfirmation of relationship maintenance is positively related to relationship maintenance.

H6: Disconfirmation of entertainment is positively related to entertainment.

3.4. The moderating role of gender

Male and female generally show different attitudes and preferences toward the use of communication technologies. Prior research also indicated that female prefer using computer technologies to expand their social networks and keep in touch with others (Debrand & Johnson, 2008). In a ten-year follow-up study by Joiner et al. (2012), findings indicated that female use the Internet and SNSs for communication much more than male. In addition, female are more satisfied with the features embedded in the SNSs that help them to maintain relationships (Hargittai & Hsieh, 2010; Special & Li-Barber, 2012). Male, however, are found

to spend more time on the Internet for entertainment and leisure (Weiser, 2000). Joiner et al. (2012) reported that male have greater breath of Internet use and are more likely to use it for gaming and entertainment.

Similarly, we believed that the effect of relationship maintenance on satisfaction will be stronger for female, whereas the effect of entertainment on satisfaction will be stronger for male. Additionally, disconfirmation of relationship maintenance will influence satisfaction more for female while disconfirmation of entertainment will influence satisfaction more for male. Therefore, we hypothesize:

H7a: Influences of relationship maintenance on user satisfaction with SNSs are stronger for female than male.

H7b: Influences of disconfirmation of relationship maintenance on user satisfaction with SNSs are stronger for female than male.

H8a: Influences of entertainment on user satisfaction with SNSs are stronger for male than female.

H8b: Influences of disconfirmation of entertainment on user satisfaction with SNSs are stronger for male than female.

4. Research methodology

4.1 Measures

We derived the validated and established measures from prior studies with minor modifications to fit into the SNSs context. We adapted the measurement items of user satisfaction from Bhattacherjee (2001), and derived measurement items of relationship maintenance and entertainment from Ellison et al. (2006). We measured user satisfaction on a seven-point semantic differential scale, whereas measured relationship maintenance and entertainment on a seven-point Likert scales anchored with "Strongly disagree (1)" to "Strongly agree (7)". We derived measurement items for disconfirmations of relationship maintenance and entertainment from Bhattacherjee (2001) and Ellison et al. (2006). For these two constructs, we used a seven-point scale with anchors ranging from "Much lower than your expectation (-3)" to "Much higher than your expectation (3)". Table 3 presents the details of the measurement items.

[Insert Table 3 here]

4.2. Pre-test and pilot test

We conducted a pretest with two professional researchers in IS field to assess the questionnaire quality. After gathering comments and suggestions, we refined the structure, logic and wording of the questionnaire for better presentation and readability.

We then conducted a pilot study with 30 experienced Facebook users for gathering additional feedback to fine-tune the questionnaire. In particular, we verified (1) clarity of the wordings, (2) relevance of the items, (3) formatting of the questionnaire, (4) absence of biased words and phrases, (5) clarity of the instructions, and (6) use of standard English (Fowler, 2009). Other than minor formatting modifications, no major problems were surfaced. After the questionnaire was finalized, we launched the main study.

4.3. Data collection

We collected the data through an online survey. In particular, we posted the survey link to popular Facebook pages. Users who were interested in the study could click on the link, and they were directed to the online questionnaire. We described the research purposes and details in the first page of the questionnaire, users started the survey upon their consent of participation. The use of survey study is believed to be vital and qualified in the current study, as all of constructs in the research model are the evaluation of users' perception, rather than behavior (Fowler, 2009; Zhou et al., 2012).

Facebook is currently the most popular SNSs worldwide (PewInternet, 2013), and Hong Kong has an astonishing Facebook penetration rate of 60.1%, ranking top among the American, Australia and other European countries (InternetWorldStats, 2013; PewInternet, 2013). The gender distribution of Hong Kong Facebook users is balanced, consisting of 46.2% male and 53.8% female (Pageviral, 2013). With respect to the high penetration rate and balanced gender distribution, we believed Facebook users in Hong Kong is an appropriate sample in the current study.

4.4. Respondent profile

We collected a total of 243 responses in June 2013. Twenty-two responses were deleted due to perfunctory answering (i.e. choosing answers down the same column on a page), yielding 221 valid responses from subsequent analysis[2]. Among the respondents, 42.5% were male and 57.5% were female. All the respondents had experience of using Facebook and 76.9% of them had more than 6 months use experience. A total of 64.7% of the respondents visited Facebook every day and 43.5% of them spent more than 30 minutes a day on

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[2] According to Hair et al. (2014), 137 observations is needed to achieve a statistical power of 80% for detecting R^2 values of at least 0.1 (with a 5% probability of error) in PLS. Therefore, the current sample is adequate for the subsequent analysis.

Facebook. Table 4 provides a summary of the respondent profile. Our sample complies with general Facebook user that the dominant group of Facebook users (77.4%) are young adults aged 18-29. The current sample shared similar demographic characteristics as of the dominant Facebook group user (PewInternet, 2013). Thus, it is an appropriate sample for the current investigation.

[Insert Table 4 here]

5. Data analysis

5.1. Preliminary analysis

We conducted preliminary tests to detect potential common method bias, multicollinearity problem, and non response bias. We conducted the one factor test (Harman, 1967) to identify potential common method bias. Result of the principal component factor analysis found that there is no single factor accounts for a majority of variance. We then examined the correlation matrix to determine whether any constructs have extremely high correlation with each other (i.e., r > 0.9) (Pavlou et al., 2007). The correlation matrix shows that the highest inter-construct correlation in each subsample is 0.69 (See Table 6). Finally, we conducted a t-test to examine the non response bias, statistical result showed that there is no significant difference between early and late respondents (t = 1.23, p > 0.05). To sum, the tests suggested that common method bias, multicollinearity, and non response bias are not likely the threats influencing the results of our study.

5.2. Data analysis

We used Partial Least Squares (PLS) approach to analyze the research model because of several advantages (Hair et al., 2014). First, PLS is robust with fewer statistical identification issues while comparing with covariance-based SEM. Second, it is also capable in handling sample size. Third, PLS possesses the ability in analyzing data with non-normality, which is the case of our study (*Shaprio-Wilk$_{stat}$* = 0.95, *p* < 0.05). Taken together, PLS is preferred in this study. The software package used for analysis is SmartPLS 2.0 M3.

We first conducted a psychometric assessment of the measurement scales, and then evaluated the structural model. Using a two-step analytical approach (Hair et al., 2006), we are confident that the structural relationships are drawn from a set of measurement instruments with desirable psychometric properties.

5.3. Test of measurement model

We evaluated the reliability and validity of the measurement model. Reliability is examined using the composite reliability. As shown in Table 5, all are above 0.70, exceeding the recommended thresholds (Fornell & Larcker, 1981).

Convergent validity indicates the extent to which the items of a scale that are theoretically related to each other should be related in reality. Convergent validity can be verified by use of the composite reliability (CR) and the average variance extracted (AVE). The thresholds for CR and AVE are 0.70 and 0.50 respectively (Hair et al., 2014). As shown in Table 5, CR for each construct is greater than 0.70, and average variance extracted for each construct is greater than 0.50. In addition, most item loadings are higher than 0.70. Two exceptions are found in the female subgroup, where the second item of relationship maintenance and disconfirmation of relationship maintenance were slightly below 0.70. These two items were retained because they contribute to the content validity of the measures (Hair et al., 2014). To sum, the results suggest a satisfactory convergent validity of all the measurements.

Discriminant validity is the extent to which the measurement is not a reflection of some other variables. It is indicated by low correlations between the measure of interest and the measure of other constructs (Fornell & Larcker, 1981). Discriminant validity can be verified when the square root of AVE for each construct is greater than all the correlations between this construct and other constructs (Fornell & Larcker, 1981). As shown in Table 6, the square root of AVE for each construct is greater than the correlations between them and all other constructs. The results suggest a satisfactory discriminant validity of all the measurements.

[Insert Table 5 here]

[Insert Table 6 here]

5.4. Test of structural model

We performed the bootstrapping technique to 5000 samples to examine the explanatory power and path significance of the structural model (Hair et al., 2014). Particularly, we tested the proposed research model with three separate samples, the full sample, the male subsample, and the female subsample.

For the full model, the proposed relationships are upheld by empirical evidence. All the hypotheses (i.e., H1-6) are significant at $p < 0.01$. Relationship maintenance ($\beta = 0.17$, $p < 0.01$), disconfirmation of relationship maintenance ($\beta = 0.21$, $p < 0.01$), entertainment ($\beta = 0.15$, $p < 0.01$) and disconfirmation of entertainment ($\beta = 0.28$, $p < 0.001$) exert positive and significant effects on user satisfaction. Disconfirmation of relationship maintenance is

significantly related to relationship maintenance (β = 0.50, p < 0.001), whereas disconfirmation of entertainment is significantly related to entertainment (β = 0.60, p < 0.001). The model explains 41% of the variance in user satisfaction. The predictive relevance Q^2 of user satisfaction is 0.34, which implies that the model has predictive relevance for the user satisfaction (Hair et al., 2014). Figure 2 depicts the PLS results of the full model.

[Insert Figure 2 here]

To investigate the moderating effects of gender, we further tested the male subsample, and the female subsample model using the method recommended by Keil et al. (2000). We first conducted the Levene's test of equality of variance to examine the equivalence of variance between the two subsamples. No significant difference is found (F = 0.49, p > 0.05).Interesting results are found when the research model is tested separately with the subsamples (i.e., male group and female group). Within male subgroup, the paths for relationship maintenance and disconfirmation of relationship maintenance to user satisfaction are not significant (See Figure 3). On the contrary, the paths for entertainment and disconfirmation of entertainment to user satisfaction are not significant within the female subgroup (See Figure 4). Figure 3 and 4 depict the PLS results of the two subgroup models.

[Insert Figure 3 here]

[Insert Figure 4 here]

In addition, we conducted t-tests to compare the results between the two subgroups. As shown in Table 7, the structural model of the male subgroup explains 18% more of the variance in user satisfaction than the female subgroup. The R^2 change in the male subgroup is 0.12 (f^2 = 0.26), indicating a medium size effect, while the R^2 change in the female subgroup is 0.09 (f^2 = 0.14), indicating a small size effect (Cohen, 1988)[3].

In terms of relationship strengths, relationship maintenance, entertainment, disconfirmation of relationship maintenance, and disconfirmation of entertainment have different impacts on user satisfaction in each subgroup. Path coefficients of relationship maintenance, entertainment, and the two disconfirmations to user satisfaction for male are significantly different from the corresponding coefficients of female. In particular, the results suggested that relationships between entertainment, disconfirmation of entertainment and satisfaction are significant only in the male subgroup, whereas between relationship

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[3] f^2 effect sizes of 0.02, 0.15, and 0.35 are termed small, medium, and large, respectively

maintenance, disconfirmation of relationship maintenance and satisfaction are significant only in the female subgroup. These results provide strong evidence for the moderating effects of gender on the proposed relationships.

[Insert Table 7 here]

6. Discussion

The purpose of this study is to examine user satisfaction and the gender differences in SNSs through the theoretical lens of the expectation disconfirmation model. The proposed research model explains 40.5% of the variance in user satisfaction with SNSs in the full model, 52.7% of the variance in user satisfaction with SNSs in the male subgroup and 35% of the variance in the female subgroup.

Our study confirms the findings in prior SNS studies (e.g., Lin et al., 2014), and indicates the relationship maintenance and entertainment are the two salient factors that influence user satisfaction with SNSs. In addition, our study further teases out the distinct differences in using SNSs between male and female users, which is novel to the IS literature. The moderating results suggest that male users are more likely to be attracted by the entertainment features, while female users are more likely to be attracted by the relationship building and maintenance features embedded in SNSs, confirming gender differences exist also in the SNSs context.

6.1. Theoretical implications

The present study is one of the first few studies that attempt to explain how perceptions and disconfirmations about the use of SNSs influence user satisfaction with SNSs, as well as examine the role of gender in the formation of user satisfaction with a theory-guided approach. This study is expected to shed lights on the research of user satisfaction with new and complex social technologies.

The research model includes both the perception and disconfirmation variables that are specific to SNSs (i.e., relationship maintenance and entertainment) as the antecedents of user satisfaction. As most prior studies examining the antecedents of user satisfaction either focus on perception or disconfirmation, the current investigation further enriches this line of research by demonstrating the relative importance of perceptions and disconfirmations in explaining user satisfaction with SNSs.

Second, current study also advances the literature by introducing the distinctive gender specific factors in understanding user satisfaction, in which it may offer possible explanations for the inconsistencies reported in past literature towards the motivations to use SNSs (Baek

et al., 2011; Baker et al., 2007; Sledgianowski & Kulviwat, 2009; Special & Li-Barber, 2012). Specifically, for female users, relationship maintenance and its positive disconfirmation exhibit significant and positive impacts on user satisfaction with SNSs. On the contrary, for male users, entertainment and its positive disconfirmation exhibit significant and positive effects on user satisfaction with SNSs. Relationship maintenance is more valuable for female to use SNSs, while entertainment is more attractive for male to use SNSs. It is believed that the current findings will provide a deeper understanding of user satisfaction in the context of SNSs.

Finally, the simple yet explanatory research model of the current study attempts to address the call from Benbasat & Zmud (2003) and Hong et al. (2014) to incorporate IS specific features into the investigation of IS related research questions. The satisfactory explanatory power of our extended EDM illustrated the importance of including context specific factors in understanding the phenomenon. Future research aims at studying these new and complex social technologies should also consider incorporating the content specific components into their research models.

6.2. Practical implications

Besides the theoretical implications for researchers, this study provides pertinent implications for managers, designers, and educators. Understanding user satisfaction in the online environment is particularly important to site managers because the level of satisfaction is associated with critical business outcomes. A higher level of satisfaction will improve loyalty, enhance positive word-of-mouth, and lead to continuance intention (de Matos et al., 2008; Norizan Mohd & Ismail, 2009). To increase user satisfaction, SNSs managers should not only focus on improving the performance of the platform, but also take into account user expectation towards the sites, as the disconfirmation between a user's perceived performance and his/her expectation can influence both perceived performance and satisfaction level.

Further, this study also offers important implications to designers. Our study showed that developers could enhance user satisfaction with SNSs by paying more attention to their specific needs and demographic characteristics. For instance, female users are more likely to satisfy their SNSs use when they are able to use SNSs to maintain relationships with their friends, whereas male users are looking for entertainment elements within the sites. As such, developers could provide more specific user experience by customizing the user interface. For example, developers may offer female users customized interface with better notification of social information and interaction, while integrate more social games into the sites for male users.

Last, our study provides educators insights into the specific usage pattern of male and female SNS users, which may potentially unfold the myth why certain individuals spend

remarking amount of time on the site. Our study suggests that male users are attracted by entertainment features whereas female users are looking for social interactions within the site. As such, our study may offer some ideas to educators in developing measures to address the concern of potential excessive use of SNSs.

6.3. Limitations and future research

The current research is subjected to some potential limitations that warrant future research. This study is based on cross-sectional data to explain the formation of user satisfaction with SNSs. Since individuals' satisfaction level is an ongoing attitude in a dynamic world of technological change, longitudinal research may better explain user satisfaction in the context of SNSs. Although the current study has captured the major factors related to the use of SNSs, cautions need to be taken in generalizing our results to other social network platforms. Different SNSs may have somewhat unique objectives and technological features, and it is important for future studies to look into more specific features of the target SNSs. Third, this research targets users of SNSs in Hong Kong. Future studies could build upon the current study and validate the result across different regions or countries. Finally, as the proposed research model only explained 40% of the variance in user satisfaction, more effort could be devoted to identify more potential and relevant factors to explain user satisfaction with SNSs.

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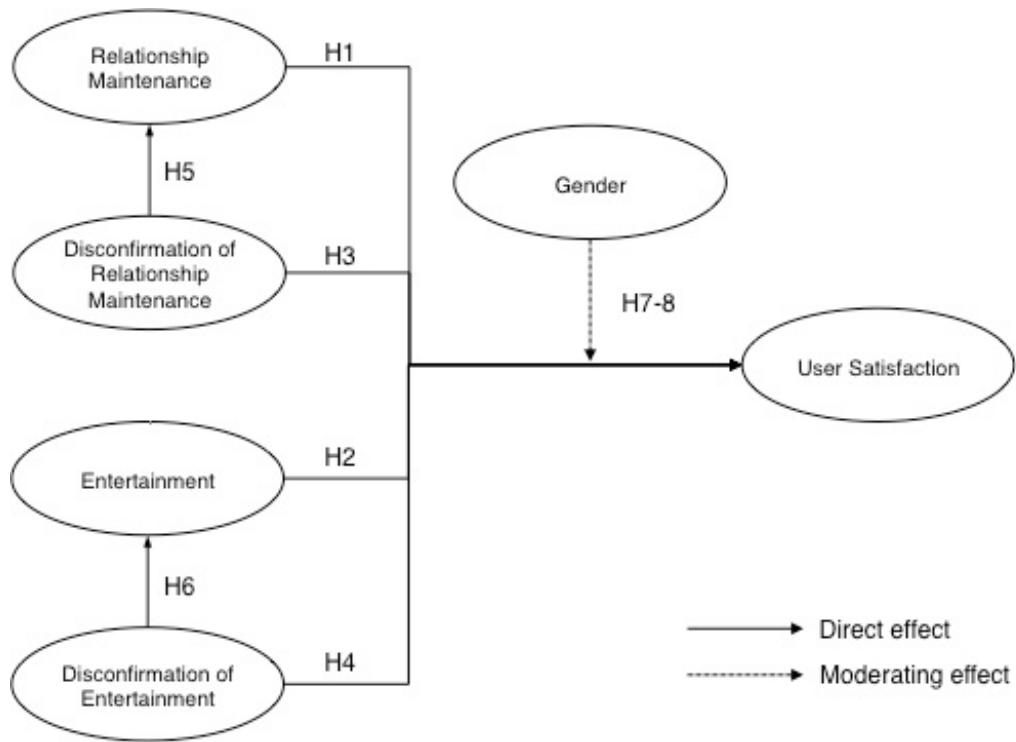
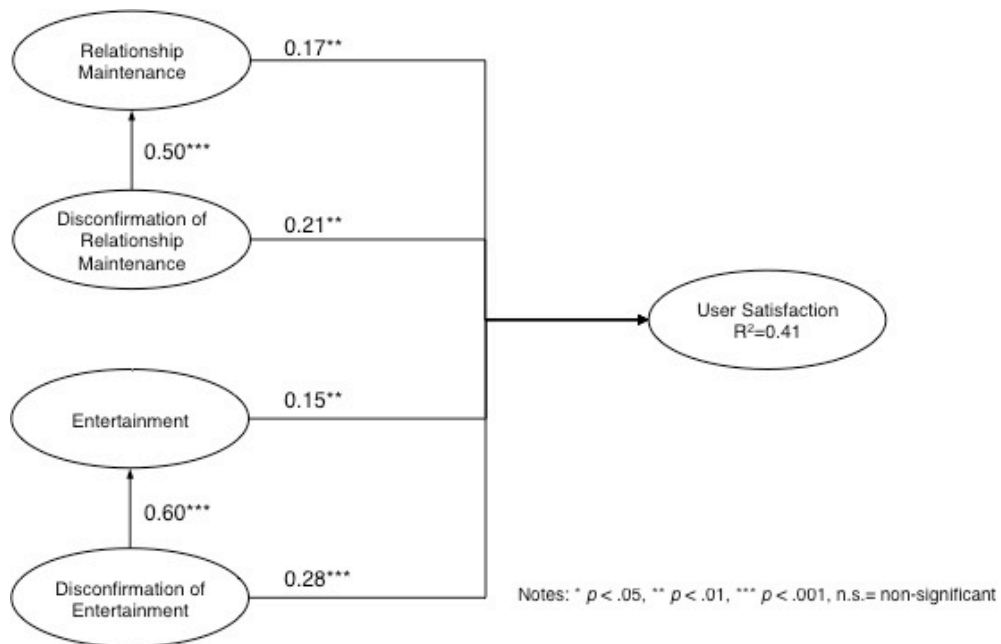*Figure 1. Proposed research model*
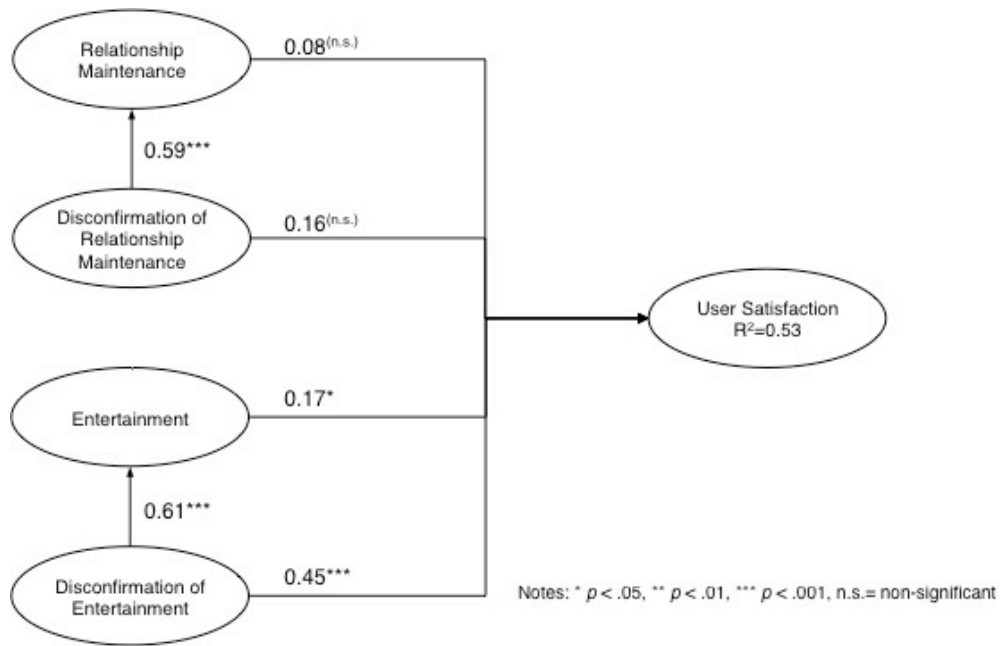

Figure 2. PLS results of the full model

Figure 3. PLS results of the male subsample model

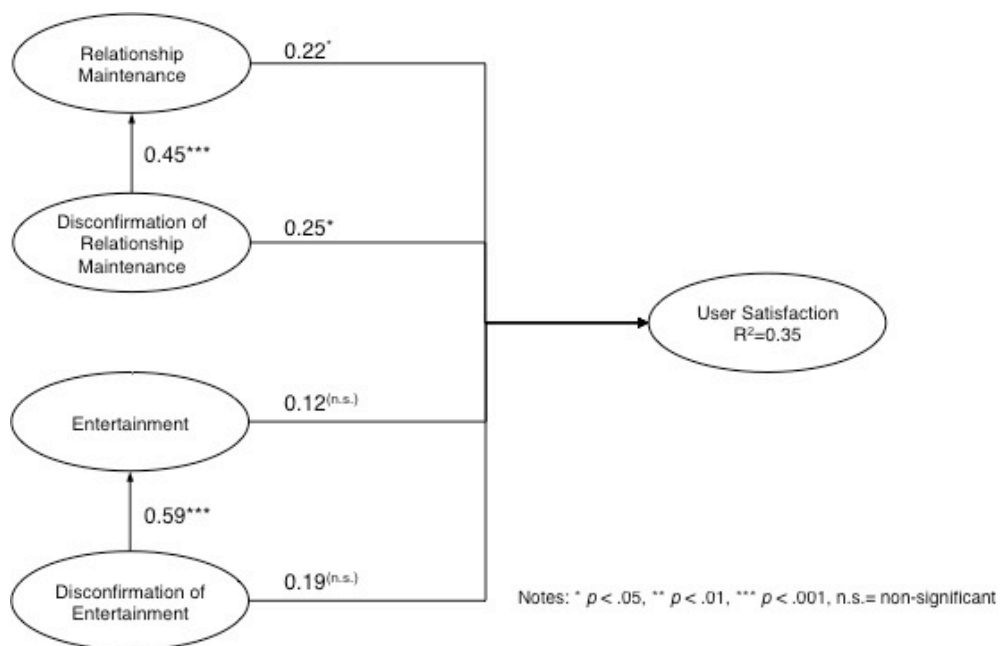*Figure 4. PLS results of the female subsample model*

Study	Motivation	Description
Ellison et al. (2006)	Information seeking	Find out about events, trends, music, or get information
	Entertainment-oriented uses	Filling up free time, taking breaks, fun
	Look up offline connections	Connect with offline contacts
	Make new friends	Meet new people
Nyland & Near (2007)	Meet new people	Meeting and communicating with people that users didn't know in real life
	Entertain	Passing time and entertaining oneself
	Maintain relationships	Maintaining already existing relationships outside of social network sites
	Social events	Learning about social activities and music
	Media creation	Generating media capabilities of social networking sites such as uploading music and videos
Raacke & Bonds-Raacke (2008)	Meet "friend" need	Keep in touch with old/current friends, and make new friends
	Meet information need	Learn about events, post social functions, and feel connected
Joinson (2008)	Social connection	Re-connecting with lost contacts and maintaining contact with existing friends
	Shared identities	Joining of groups, organization of events and meeting of 'like-minded people'
	Photographs	Posting and viewing of photographs
	Content	Content within social network sites, e.g., applications and quizzes
	Social investigation	Meet or view new people and find out more about people who are met offline
	Social network surfing	Move from one person to another via friend links
	Status updates	Viewing the newsfeed and status updates
Sledgianowski & Kulviwat (2009)	Playfulness	The degree to witch a current or potential user believes that the social network site will bring him/her a sense of enjoyment and pleasure
	Critical mass	The point where enough users have adopted an innovation so that there is an acceleration of adoption of the innovation whereupon it becomes self-sustaining
	Trust	The belief that there are safety mechanisms built into the site
	Normative pressure	An individual's perception of what significant others think about the individual performing a specific behavior
	Perceived ease of use	The extent to which a person believes that using a technology will be free of effort
	Perceived usefulness	The extent to which a person believes that using a technology will enhance his/her productivity or job performance
Baek et al. (2011)	Information sharing	To share practical knowledge or skills with others
	Convenience and entertainment	To communicate with friends and family
	Pass time	I'm bored
	Interpersonal utility	To meet people with same interests as mine
	Control	I want someone to do something for me To tell others what to do
	Promoting work	To promote the organization I work for
Mansumitrc hai et al. (2012)	Involvement	Consider SNSs a part of their lives and they had time to use it
	Usefulness	Use Facebook as a form to interact with the society, community and events.

	Usage	Share photos and videos on SNSs
	Trust	SNSs is trustful as a safe place
	Convenience	SNSs is friendly use
	Openness of information	Concern for privacy issue
	Audience	Consider whether other users are using Facebook
	Making new contracts	Contact with friends or making new friends
	Acceptability	Whether the use of Facebook is accepted in the religion
Lin et al. (2014)	System quality	The overall technical adequacy of the website
	Awareness	The degree to which a user stays informed and current with others' activities through the use of SNS
	Connectedness	The degree to which a SNS helps users stay connected and maintain social relationships and ties
	Pleasure	The perceived value of SNS, the fun and enjoyment gained from usage

Table 1. The use of social networking sites

Study	Context	Theory	Hypotheses (Gender as moderator)
Venkatesh & Morris (2000)	A system for data and information retrieval	Technology acceptance model	Perceived Usefulness → Behavioral Intention* Perceived Ease of Use → Behavioral Intention* Perceived Ease of Use → Perceived Usefulness^ Subjective Norm → Behavioral Intention*
Venkatesh et al. (2003)	Organization-wide information systems	UTAUT	Performance Expectancy → Behavioral Intention* Effort Expectancy → Behavioral Intention* Social Influence → Behavioral Intention*
Venkatesh et al. (2004)	Organization-wide information systems	Theory of planned behavior	Attitude → Behavioral Intention* Subjective Norm → Behavioral Intention* Perceived Behavioral Control → Behavioral Intention*
Ilie et al. (2005)	Instant messaging	Innovation diffusion theory	Perceived Relative Advantage → Behavioral Intention* Perceived Ease of Use → Behavioral Intention* Perceived Visibility → Behavioral Intention* Perceived Result Demonstrability → Behavioral Intention* Perceived Critical Mass → Behavioral Intention*
Morris et al. (2005)	Enterprise-wide systems	Theory of planned behavior	Attitude x Age → Behavioral Intention* Subjective Norm x Age → Behavioral Intention Perceived Behavioral Control x Age → Behavioral Intention
Ong & Lai (2006)	E-Learning	Technology acceptance model	Computer Self-efficacy → Perceived Usefulness * Computer Self-efficacy → Perceived Ease of Use* Perceived Usefulness → Behavioral Intention* Perceived Ease of Use → Perceived Usefulness* Perceived Ease of Use → Behavioral Intention^
Djamasbi & Loiacono (2008)	Decision support systems	Social feedback theory	Negative Outcome Feedback → Overall Mood* Feedback Treatment → Decision Accuracy*

Zhang et al. (2009)	Blog	Social role theory	Satisfaction → Switching Intention* Attractive Alternative → Switching Intention*
Shen et al. (2010)	Social network-facilitated team collaboration	Social influence theory	Attitude → We-Intention* Positive Anticipated Emotions → We-Intention* Negative Anticipated Emotions → We-Intention* Subjective Norms → We-Intention^ Group Norms → We-Intention* Social Identify → We-Intention*
Riquelme & Rios (2010)	Mobile banking	Technology acceptance model Innovation diffusion theory	Perception of Risk → Intention to Adopt^ Perceived Ease of Use → Intention to Adopt* Perceived Usefulness → Intention to Adopt^ Social Norms → Intention to Adopt* Relative competitive advantage → Intention to Adopt*
Heriyati & Siek (2011)	Smartphone	N/A	Word of mouth communication → Consumer Decision Making* Perceived Quality → Consumer Decision Making*

Note: *significant
^non-significant

Table 2. A summary of the moderating effect of gender on information technologies

Constructs	Items
	Indicate your actual perception of using Facebook in performing the following functions:
Relationship Maintenance (RM)	RM1. To check out someone you met socially. RM2. To learn more about other people in your classes/workplace. RM3. To keep in touch with your old friends.
Entertainment (EN)	EN1. To fill up free time. EN2. For fun. EN3. To take a break from your homework/work.
	Compared with your pre-expectation, indicate your perception of the experience of using Facebook in performing the following functions:
Disconfirmation of Relationship Maintenance (DRM)	DRM1. To check out someone you met socially. DRM2. To learn more about other people in your classes/workplace. DRM3. To keep in touch with your old friends.
Disconfirmation of Entertainment (DEN)	DEN1. To fill up free time. DEN2. For fun. DEN3. To take a break from your homework/work.
User Satisfaction (SAT)	My overall experience of using Facebook is: SAT1. Very dissatisfied/ Very satisfied. SAT2. Very displeased/ Very pleased. SAT3. Very frustrated/ Very contented. SAT4. Absolutely terrible/ Absolutely delighted.

Table 3. Measurement items

Characteristics		Frequency	Percentage
Gender	Male	94	42.5
	Female	127	57.5
Age	18 or below	15	6.8%
	19-28	171	77.4%
	29-35	28	12.7%

			36 or above		7		3.1%		
Experience with social			1 month or less		8		3.6		
network sites			2-6 months		43		19.5		
			7-11 months		64		28.9		
			1 year or more		106		48.0		
Number of contacts on			50 or less		45		20.4		
social network sites			51-100		45		20.4		
			101-200		67		30.3		
			More than 200		64		28.9		
Frequency of visiting			Once or more per day		143		64.7		
social network sites			Once or more per week		64		29.0		
			Twice or less per month		14		6.3		
The average time of using			Less than 15 minutes		42		19.0		
social network sites			15-30 minutes		83		37.5		
(minutes per day)			30-60 minutes		43		19.5		
			More than 60 minutes		53		24.0		

Table 4. Respondent profile

Items	Full sample n=221			Male subgroup n=94			Female subgroup n=127		
	CR	AVE	Loading	CR	AVE	Loading	CR	AVE	Loading
RM1	0.78	0.50	0.82	0.82	0.60	0.78	0.81	0.60	0.86
RM2			0.72			0.82			0.65
RM3			0.75			0.72			0.80
DRM1	0.80	0.50	0.87	0.85	0.65	0.82	0.78	0.54	0.81
DRM2			0.90			0.87			0.67
DRM3			0.90			0.72			0.71
DEN1	0.92	0.79	0.82	0.90	0.75	0.83	0.93	0.80	0.90
DEN2			0.76			0.92			0.87
DEN3			0.70			0.85			0.92
EN1	0.88	0.71	0.85	0.87	0.70	0.82	0.87	0.70	0.86
EN2			0.82			0.83			0.80
EN3			0.87			0.86			0.85
SAT1	0.92	0.74	0.84	0.92	0.74	0.84	0.90	0.70	0.83
SAT2			0.89			0.89			0.85
SAT3			0.84			0.84			0.82
SAT4			0.88			0.88			0.84

Table 5. Psychometric properties of measures

Sample	Correlation of constructs				
Full sample	1	2	3	4	5
Relationship maintenance (1)	*0.71*				
Disconfirmation of relationship maintenance (2)	0.55	*0.71*			
Disconfirmation of entertainment (3)	0.40	0.59	*0.89*		
Entertainment (4)	0.48	0.39	0.62	*0.84*	
Satisfaction (5)	0.51	0.54	0.59	0.51	*0.86*
Male	1	2	3	4	5
Relationship maintenance (1)	*0.77*				
Disconfirmation of relationship maintenance (2)	0.59	*0.80*			
Disconfirmation of entertainment (3)	0.47	0.57	*0.87*		
Entertainment (4)	0.43	0.45	0.61	*0.84*	
Satisfaction (5)	0.46	0.54	0.69	0.56	*0.86*
Female	1	2	3	4	5

Relationship maintenance (1)	**0.77**			
Disconfirmation of relationship maintenance (2)	0.45	**0.73**		
Disconfirmation of entertainment (3)	0.31	0.52	**0.90**	
Entertainment (4)	0.54	0.30	0.59	**0.84**
Satisfaction (5)	0.45	0.48	0.45	0.42	**0.84**

Notes: (1) bolded diagonal elements are the square root of AVE for each construct. Off-diagonal elements are the correlations between constructs; (2) all the correlations are significant at $p < 0.001$

Table 6. Correlation matrix

Path	Full (Sample=221)	Male (Sample=94)	Female (Sample=127)	Comparison of paths – Male vs. Female (t-value)
DRM→RM	0.50***	0.59***	0.45***	N/A
DEN→EN	0.60***	0.61***	0.59***	N/A
DRM→SAT	0.21**	0.16	0.25*	-8.18***
DEN→SAT	0.28***	0.45***	0.19	17.45***
RM→SAT	0.17**	0.08	0.22*	-11.67***
EN→SAT	0.15**	0.17*	0.12	3.45***
R^2 (SAT)	0.41	0.53	0.35	N/A
Effect size	N/A	Medium	Small	N/A

Notes: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

T-value calculation
t = (PC1 - PC2) / [Spooled * sqrt (1/N1 + 1/N2)] where
Spooled = sqrt {[(N1 -1) / (N1 + N2 - 2)] * SE1 square + [(N2 - 1) / (N1 + N2 - 2)] * SE2 square}
Where t = t-value with N1 + N2 - 2 degrees of freedom
    Spooled = pooled estimator for the variance
    Ni = sample size of dataset for culture i
    SEi = standard error of path in structural model of culture i
    PCi = path coefficient in structural model of culture i

Table 7. Model summary