

Modeling Consumer Switching Behavior in Social Network Games by Exploring Consumer Cognitive Dissonance and Change Experience

1. Introduction

The rapid proliferation of e-service innovations has resulted in a rich availability of similar e-services from different developers or brands. This rich availability of alternative e-service providers as well as the rapid technological development has prompted users to switch from one e-service provider to an alternative more frequently (c.f. [Bhattacharjee et al., 2012](#)). Users can freely switch between different e-service products, and “switching to a competing e-service is almost as easy as downloading and installing it, or completing an online registration form to sign up for a different service” (Bhattacharjee et al., 2012, pp. 327). Therefore, [Yang and Peterson \(2004\)](#) warned that competition in the Internet environment is just a click away because customers appear to face only minimal barriers to switch to alternative products or services.

In contrast to the rich availability of e-service adoption and continuance literature, limited research has been conducted on switching behavior in e-services, leading to a dearth of knowledge on the key drivers of e-service switching ([Bhattacharjee et al., 2012](#)). In this study, we apply cognitive dissonance theory ([Festinger, 1957, 1964](#)) to explain how the dynamics of abundance of choices alter consumers’ perceptions of their present e-service choice. We also quantify the effect of alternative attractiveness and change experience in switching intention and behavior. Rather than holding the view that consumer perceptions of a SNG are relatively static, derived solely from an evaluation of the SNG itself, our study argues that consumer satisfaction with a SNG will be affected by the attractiveness of alternative SNGs. The research framework is evaluated through the responses collected from 541 users of a leading online service provider in China.

The study focuses on user switching behavior in social network games. The success of games, such as Farmville or Cityville, has made social network games one of the most popular entertainment services, attracting tens of millions of gamers ([Shin & Shin, 2011](#)). Due to the thriving market, the competition in the SNG market is fierce and users switch frequently (Xu, Li, Heikkilä, & Liu, 2013), providing researchers with a fertile and data-rich setting to investigate e-service switching behavior.

The paper is structured as follows. The next section discusses literature related to consumer switching behavior. Section 3 introduces the cognitive dissonance theory. Section 4 presents the research framework and hypotheses. The research methodology is presented in section 5, followed by a conclusion and discussion section. The limitations of the research and future research avenues are discussed in section 7.

2. Related work

Switching behavior can be defined as an act that a consumer replaces or exchanges current service provider with another service provider (c.f. [Bansal & Taylor, 1999](#)). Regarding e-services, switching behavior may represent a process whereby consumers decrease their use of the ‘old’ service by increasing their use of the ‘new’ service, which may take days or weeks (c.f. [Bhattacharjee et al. 2012](#)).

In some prior studies, switching behavior has been widely regarded as an outcome of deteriorated consumer loyalty, based on the assumption that loyal consumers will not switch (c.f. Valvi & Fragkos, 2012; Wang, Wu, Lin, & Wang, 2011; Yang & Peterson, 2004). Such studies on e-service loyalty (e-loyalty) suggest that an improvement in various service characteristics will enhance consumer satisfaction, which in turn brings about consumer loyalty and prevent consumers from switching. This conceptualization of service characteristics (particularly, service quality dimensions) has been broadly adopted in prior studies (c.f. Cristobal, Flavián, & Guinalú, 2007; Floh & Treiblmaier, 2006; Gummerus, Liljander, Pura, & Riel, 2004; Ribbink, Riel, Liljander, & Streukens, 2004; Semeijn, Riel, Birgelen, & Streukens, 2005; Yen & Lu, 2008). By summarizing the research results of 217 relevant academic papers, Valvi and Fragkos (2012) noted that e-loyalty has been a main outcome of e-satisfaction and e-trust, which are affected by web service quality or e-service quality. In this regard, SERVQUAL (Parasuraman, Zeithaml, & Berry, 1988; Parasuraman, Zeithaml, & Berry, 1991), a multiple-item scale for measuring service quality, have been frequently utilized in the contexts of both offline and online services with the including of some new and unique e-service quality dimensions (c.f. Semeijn et al., 2005; Valvi & Fragkos, 2012). This stream of studies offers insights into enhancing consumer loyalty and preventing consumers switching from their current service provider, by identifying the most important service characteristics affecting consumer satisfaction.

This perspective, however, seems inefficient in explaining how the dynamics of market competition stimulates a change of interest to a different brand among individual consumers (Jones & Sasser, 1995). For instance, if a company provides constant but dull quality, consumers may lose their original interest and switch when more attractive products are offered by competitors (Jones & Sasser, 1995). This phenomenon may become more conspicuous when a breakthrough technological innovation emerges. Therefore, it is possible that a consumer's perception of the current e-service brand will deteriorate simply because the presence of new and more attractive alternatives make the brand 'outdated'.

Furthermore, there is a need to understand how consumers become more demanding as new e-service capabilities advance. For instance, many years ago, games were installed with specific installation files, but, nowadays, a SNG can be browser-based, providing an abundance of alternatives and easy switching. Thus, it comes naturally that the advent of new and more attractive products prompts consumers to dynamically shift from one brand to another, resulting in the fast-paced evolution of the market reflecting consumers' tastes. Taking smartphones for instance, today's most sophisticated smartphones are likely to lose their appeal within a few years.

A number of prior studies have investigated consumers' switching behavior directly. Bansal et al. (2005) incorporated 12 predictors in a push-pull-mooring framework to explore the determinants of switching behavior in the context of a tangible service. The studies employing the push-pull-mooring framework typically consider consumers' evaluations of their current product/service limitations as the push factors, customers' evaluations of the attractiveness of an alternative as pull factors, while different types of switching costs (e.g., emotional, cognitive, or monetary costs) are regarded as mooring factors (c.f. Bansal et al., 2005; Lai, Debbarma, & Ulhas, 2012; Zhang et al., 2008). There are a number of variables that have been examined in prior studies on consumer switching behavior with push-pull-mooring model, such as switching costs, trust, commitment,

brand reputation and the strength of an alternative brand, and consumers' switching intention was found to be determined by the push, pull and mooring factors together (e.g. [Bansal et al. 2005](#)).

The push-pull-mooring paradigm was later applied in the context of IS research on users' e-service switching by [Hou et al. \(2011\)](#), [Hsieh et al. \(2012\)](#), [Zhang et al. \(2012\)](#) and [Xu et al. \(2013\)](#). Investigating massively multiplayer online role playing games, [Hou et al. \(2011\)](#) found that mooring and pull factors have significant influences on switching intention, while push factors do not. [Hsieh et al. \(2012\)](#) studied user switching from blogs to Facebook. They found that pull, push and mooring factors all have significant influences on switching intention, and switching intention explains 28% of the variance of switching behavior. Based on a longitudinal survey, [Bhattacharjee et al. \(2012\)](#) explored web browser switching among student subjects and found that relative advantage and satisfaction with prior IT are significant determinants of IT switching intention. In addition, IT switching intention, together with habit, explains 15% of the variance of IT switching behavior. The above prior switching research explains rather a limited percentage of the variance in IT switching behavior, implying that there are determinants of IT switching behavior other than intention to switch only. Furthermore, in this stream of research the push and pull factors are typically treated as in-parallel factors affecting switching intention. In other words, the possible impacts of pull factors on push factors in switching research are neither considered nor supported.

For this purpose, cognitive dissonance theory has unique advantages of facilitating the understanding of how the emergence of alternative products/services affects consumer perceptions of their current brand by potentially creating switching intentions from the present to an alternative product/service especially in the '*free-choice paradigm*' ([Risen & Chen, 2010](#)). In addition, it is possible that the presence of attractive alternatives alters consumer evaluations of their current products/services, i.e. so-called dissonance resolution (see Section 3). While push-pull-mooring framework offers weak support to bridge and to explain the possible interdependence between the pull and push factors, this study presents an additional explanatory mechanism based on cognitive dissonance, in a situation where there is an increased availability of alternative products/services and lowered mooring SNGs. We think this provides a good starting point for evaluating consumers' switching behavior from a novel perspective.

3. Cognitive dissonance theory

Cognitive dissonance theory is a frequently applied social psychology theory that has generated over 1,000 experiments ([Nail & Boniecki, 2011](#); see [Tanford & Montgomery, 2014](#)). It describes how one's perceptions of different alternatives interact to ultimately reduce the possible dissonance in one's beliefs. The theory suggests that consumers have cognitive elements or knowledge about their past behavior, their beliefs, attitudes and their environment, such as previous purchase experience of a specific product or service ([Anderson, 1973](#); [Oshikawa, 1968](#)). Consumers continually receive various kinds of product information from their own experience, associates, advertisements and salesmen, and these stimuli bring about potential cognitive inconsistencies ([Anderson, 1973](#); [Holloway, 1967](#)), *dissonance*. When consumers have two ideas which are psychologically dissonant, they strive to reduce this mental discomfort by changing, or distorting the cognitions to make them more *consonant* ([Anderson, 1973](#)). The stronger the cognitive

dissonance, the more motivated consumers are to reduce it by shifting the cognitive element to be more consistent with the choice (Brehm & Cohen, 1962).

The cognitive dissonance theory is now enjoying a second wave of popularity after its first wave in 1970s in consumer behavior research in the free-choice paradigm (for a summary, see Bawa & Kansal, 2009; Soutar & Sweeney, 2003). For instance, the theory has been recently applied to the study of consumer behavior in the context of relationship marketing (Sharifi & Esfidani, 2014), hospitality purchases (Kim, 2011), travel purchases (Nail & Boniecki, 2011), grocery products purchases (Gbadamosi, 2009) as well as online user behavior like movie and music downloads (Redondo & Charron, 2013).

Consumer behavior literature suggests that, when consumers have to compare different alternatives to make a purchase decision, cognitive dissonance emerges since they have to make one choice out of the alternatives (Kaish, 1967; Sharifi & Esfidani, 2014). “In this situation, consumers feel as if they are involved in annoying comparisons of buying another choice or making the purchase from another brand” (Sharifi & Esfidani, 2014, p. 554). To reduce dissonance, consumers will adjust their evaluation and perceptions to justify their decision by valuing the selected item more and the non-selected item less (Tanford & Montgomery, 2014). For instance, in an experiment conducted by Brehm (1956), 225 participants were requested to rate a series of common appliances, such as automatic coffee-maker. Participants were then allowed to get one of the two appliances as a gift. A second round of ratings suggested that participants evaluated chosen alternative more favorable and the unselected alternative less favorable (Brehm, 1956).

Therefore, for consumers who perceived the attractiveness of alternatives, cognitive dissonance emerges when they are motivated to give up their original product/service choice (c.f. Yi & La, 2004). Consumers would “suffer from cognitive dissonance when they face experiences or information disconfirming their strong beliefs” (Yi & La, 2004, p. 357). For instance, consumers may perceive their current choice to be the best one. However, after obtaining a perception that alternative brand outperforms the current brand, cognitive dissonance will occur. In this regard, Yim, Chan, and Hung (2007) have given an excellent illustrative example:

“A regular customer of Restaurant A might have been satisfied with his experience at the restaurant because its performance exceeds his expectations (i.e., a positive disconfirmation). If he were invited by a friend to try Restaurant B (which he has considered before) and had a much better experience, he might feel a sense of regret for overlooking Restaurant B on previous dining occasions. As a result, *“the better performance of Restaurant B (positive alternative attractiveness) has a negative effect on the customer’s evaluation of Restaurant A”* (Yim, Chan, & Hung, 2007, p. 149).

Consistent with prior studies, we believe that the cognitive dissonance theory can also be applied to the context of e-service user switching behavior. For example, when e-service users face a new e-service choice that connotatively advertises new features outperforming their prior choice, the choice of switching to an alternative will conflict with their established good feeling and positive experience regarding their current e-services, leading to cognitive dissonance. Giving up a satisfactory relationship with an existing e-service provider may not be an easy decision due to

habit, high switching costs or possible feelings of betrayal etc. Our enhanced explanation is that this is a matter of *dissonance reduction* by either

- (i) *Altering their perception that the alternative has been over-exaggerated or is unreliable, and their existent choice is still the best one, or*
- (ii) *Changing their positive perceptions of the old brand, i.e. the old product/service becomes outdated and no longer good enough to combat the perceptions that the new product/service has advantages. Hence, increasing the switching intention and eventually changing to the new brand.*

It is important to note that the first approach mentioned has been criticized in the context of consumer behavior research ([Anderson, 1973](#); [Cohen & Goldberg, 1970](#)). This approach assumes that a consumer, rather than learning from his/her purchasing mistakes, increases the possibilities of making the mistakes again through his/her efforts to reduce post-purchase dissonance by the justification and rationalization of purchasing decisions ([Anderson, 1973](#); [Cohen & Goldberg, 1970](#)). In addition, there is also recent criticism on the research setting ([Risen & Chen, 2010](#)), which encourages us to adopt the second approach for this study instead. There is an apparent *overall tendency* that consumers most often switch to new and more innovative products/services that are factually better than the preceding products. Therefore, the second approach would better describe the mainstream pattern of consumer's switching behavior in dealing with cognitive dissonance in the world of innovations creating abundance of choices of SNGs.

4. Research framework

Based on the cognitive dissonance theory, we synthesized a research framework by incorporating variables from earlier switching behavior studies, and grouped them according to the ideas of cognitive dissonance theory by including alternative attractiveness, perceived service quality and satisfaction to predict e-service switching intention and behavior. In the framework, ten hypotheses are proposed and visualized as in Figure 1.

4.1. Service quality, satisfaction and switching behavior

Building up e-loyalty has been widely proposed as an effective approach for resisting consumer switching in prior studies, in which the service quality-satisfaction-e-loyalty relationship has been widely adopted (c.f. [Valvi & Fragkos, 2012](#)). In other words, when an e-service brand has good quality, consumers will feel satisfied when using it, which enhances their loyalty to it and prevents them from switching. In recent switching behavior research, satisfaction has been found to exert a significant negative influence on switching intention ([Bansal et al., 2005](#); [Bhattacharjee et al., 2012](#)). Therefore, it is reasonable to propose that a positive perception of an SNG's service quality may bring about a higher level of consumer satisfaction, preventing the intention to switch, and the following hypotheses are proposed:

H1a: Perceived service quality positively relates to satisfaction with a current SNG.

H1b: Satisfaction with a current SNG negatively relates to switching intention.

H1c: Switching intention positively relates to switching behavior.

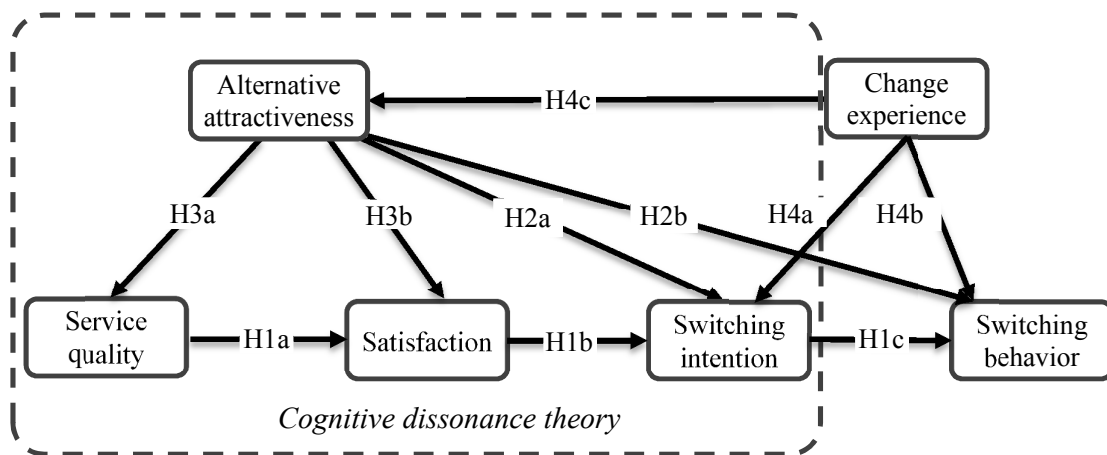


Figure 1. A cognitive dissonance e-service switch framework

4.2. Alternative attractiveness

The availability of alternatives is an important precursor for consumers to be able to switch. Consumers will be ‘loyal’ to a service provider when/if no alternative service provider is available. Jones and Sasser (1995) studied how different industry environments affect consumer loyalty. They found that in a market with a regulated monopoly or few alternatives, consumers will be stuck like ‘hostages’. Despite their dissatisfaction with their current service provider, consumers will behave with high loyalty. In contrast, in a highly competitive market with many similar alternatives, consumers become ‘mercenary’. In other words, in addition to satisfaction, the availability of attractive alternatives contributes to the important conditions for initiating the switching intention.

Furthermore, Rusbult and Farrell (1983) implied that the intention to continue/switch is a function of the attractiveness of the existing service versus that of alternatives. Users are more likely to migrate to a substitute service if they perceive the new one to be better, different, more fairly priced and more enjoyable (Hou et al., 2011). Therefore, alternative attractiveness may be an important predictor of a SNG player’s switching intention. Accordingly, we hypothesized:

H2a: Alternative attractiveness positively relates to switching intention.

As above noted, switching intention was found to explain a limited amount of the variance of *e-service* switching behavior, indicating the possible existence of other direct predictors of *e-service* switching behavior. Companies seek to obtain customers from their competitors by offering more attractive service terms or by developing more attractive products. Through these efforts, companies increase the attractiveness of their products/services to all customers—including those of their competitors, therefore motivating their competitors’ customers to switch to their companies. This should also be applicable to the SNG industry. In this context, social network gamers may be used to switching to more attractive games without much deliberation, implying a possible direct effect of alternative attractiveness on switching behavior. It is important to note that behavioral intention is defined as a kind of *conscious plan* for enacting a particular behavior in the future (Warshaw & Davis, 1985). It is possible that the availability of attractive alternative games may simply motivate a gamer to spend more time on a new game without deliberating or making a conscious plan to

switch. A game player may be a customer of multiple SNGs. Therefore, switching to a new game does not necessarily mean the discarding of a particular 'old' game, even though this behavior will reduce the time spent on playing the 'old' game, thus becoming a slow switching process. In this regard, we propose that alternative attractiveness in its variety exerts a direct influence on SNG switching behavior.

H2b: Alternative attractiveness positively relates to switching behavior.

4.3 Alternative attractiveness: from a cognitive dissonance perspective

As discussed in section 3, cognitive dissonance emerges when consumers have to make one choice out of the alternatives ([Milliman & Decker, 1990](#); [Sharifi & Esfidani, 2014](#)). The dissonance experienced will be stronger when the alternatives are similar, which makes the decision-making difficult ([Tanford & Montgomery, 2014](#)). When alternative options are apparently less desirable or attractive, decision-making is easy and cognitive dissonance is unlikely to emerge, since consumers are not motivated to modify their evaluations (c.f. [Tanford & Montgomery, 2014](#)). Vice versa, the availability of *desirable alternatives* affects the emergence of cognitive dissonance.

Based on the cognitive dissonance theory, to reduce dissonance in decision-making, consumers tend to “*value the chosen item more and the nonchosen item less*” ([Tanford & Montgomery, 2014](#), p. 4). To this end, consumers may collect favorable information that is congruent with their choice and dismiss those that is conflict ([O’Neill & Palmer, 2004](#)). For instance, a recent study shows that low-income women tend to *devalue* more expensive brand in comparison to the ones they bought, and reduce dissonance by enhancing the perceived quality of the products they purchased ([Gbadamosi, 2009](#)). O’Neill and Palmer (2004) sought to extend the cognitive dissonance theory to service industry by investigating the cognitive dissonance in colleague students’ decisions of enrolling into a university. They found that the higher the level of cognitive dissonance, the lower the perception of the service quality of the university. Therefore, it is possible that the cognitive dissonance raised by the presence of attractive alternatives will reduce the perceived service quality of the old SNG, and the following hypothesis is suggested:

H3a: Alternative attractiveness negatively relates to perceived service quality of a current SNG.

Constant exposure to the advertisement of new products will increase the chance of feeling positive towards new products and allow consumers to reevaluate the appropriateness of buying the old product. Therefore, it is possible that consumers will regret that they have made the prior purchase of a specific brand (satisfaction), or consider the present brand unattractive (service quality) after becoming aware of the attractiveness of other brands (c.f. [Holloway, 1967](#)). Consumer perceptions of the good performance of an alternative will result in a decrease of their post-purchase evaluation, such as satisfaction towards the chosen brand ([Herrmann et al., 1999](#); [Inman et al., 1997](#)). [Ping \(2003\)](#) studied the determinants of satisfaction with a marketing channel and found that alternative attractiveness is one of the most important factors exerting a negative influence on consumer satisfaction with the current marketing channel. In addition, cognitive dissonance literature broadly suggested that the presence of attractive alternatives will cause cognitive dissonance ([Sharifi & Esfidani, 2014](#); [Tanford & Montgomery, 2014](#)), which further reduces perceived satisfaction (Park,

Cho, & Rao, 2012; [Sharifi & Esfidani, 2014](#)). Thus, we assume that an enhanced perception of the attractiveness of alternative SNGs would have a negative effect on consumer satisfaction with the current SNG.

H3b: Alternative attractiveness negatively relates to consumer satisfaction with a current SNG.

4.4. Change experience

Change experience is a measurement of consumer past switching behavior. Prior studies indicate that the inherent human tendency to seek variety is a driver for seeking newness, usually leading to the adoption of unknown or untried products ([Hoyer & Ridgway, 1984](#)). [Steenkamp and Baumgartner \(1992\)](#) suggest that switching behavior may occur among satisfied customers due to their wish to try something novel or different for fun or thrill. Therefore, it is common that some consumers may wish to change and have a richer change experience than those who are more reluctant to change. Accordingly, particularly for these consumers, sole satisfaction may not well explain their switching intention and behavior.

Furthermore, prior studies suggest past behavior affects consumers' future activity because people recall their past experience as a reference for their future decisions ([Bansal et al., 2005](#); [Ganesh, Arnold, & Reynolds, 2000](#); [Hsieh et al., 2012](#)). Therefore, "people with successful previous switching experiences are more likely to move again than are those without such experience" ([Hsieh et al., 2012](#), p. 1915). Meanwhile, a failed switching attempt may impede future switching decisions ([Hsieh et al., 2012](#)). From the perspective of migration theory, individuals with a successful migratory experience are more likely to move again while unsuccessful migratory experiences may have the opposite effect ([Hou et al., 2011](#); [Kuznets & Thomas, 1984](#)). A number of studies suggest the positive impact of prior switching or change experience on the switching intention. For instance, [Hou et al. \(2011\)](#) regarded prior change experience to be a set of mooring effects and found that users with a rich change experience are associated with a stronger intention to switch. Thus, we proposed the following hypothesis:

H4a: Change experience positively relates to switching intention.

Prior change experience somewhat represents a propensity to switch in the future (c.f. [Bansal et al., 2005](#); [Hou et al., 2011](#); [Hsieh et al., 2012](#)). Prior studies suggest that *frequently performed* behavior becomes habitual. Therefore, it is possible that, for those consumers with rich change experience, they may easily trial alternative products once they have the opportunities. Considering the unique features of computer games, it is not necessary that a user must decide to give up his/her current game brand in order to switch to another game. In contrast, the user may just try a new game and spend part of his/her gaming time with it without considering discarding their current game due to their habitual tendency. As mentioned above, in the SNG industry, switching to a new game happens frequently for some gamers, who may keep hunting for new game experiences. Gamers with a rich change experience are likely to switch again as a result of their habitual tendency, rather than a deliberately formulated plan or conscious intention. Therefore, it is hypothesized:

H4b: Change experience positively relates to switching behavior.

Individuals used to switching may be more active in seeking opportunities and ready to make a switch (c.f. [Hoyer & Ridgway, 1984](#); [Hsieh et al., 2012](#)). Experienced switchers also can be expected to know ways for reducing change efforts. From the perspective of cognitive dissonance theory, it is possible that a consumer who perceives switching to other brands as being difficult may regard the alternative brands as less attractive, similar to the story of *the Fox and the sour grapes*. In contrast, compared to those who are reluctant to change, consumers used to switching may be more willing to receive/seek for information on alternative products/services and to try them.

Moreover, specific to the SNG industry, competition is heavy and new games constantly emerge. Gamers used to switching are likely to possess richer information about different games, broader access to different game platforms, and more knowledge on new launches. They may have various contacts with other companies and, for instance, receive more advertisements on new games via e.g. email. Hence, their knowledge and contacts facilitate an effective access to new games that are probably more attractive. Thus, gamers who frequently switch to a new game may be more likely to find 'better' games and perceive other games as more attractive. Therefore, it is hypothesized:

H4c: Change experience positively relates to alternative attractiveness.

5. Method

5.1. Measurement Development

A survey questionnaire was developed to collect empirical data to assess the mentioned hypotheses. All the constructs of the research framework were measured via the use of multiple-item perceptual scales, which are adapted from existing literatures. The items were modified slightly from previous studies to fit our research context. All items were measured using a 5-point Likert scale ranging from 1 (disagree) to 5 (agree). The instrument is presented in appendix A.

The questionnaire survey was administrated to collect responses from users of a social network game in China. The questionnaire was initially developed in English and then subsequently translated into Chinese by one of the manuscript's authors, a native Chinese speaker. A pilot test was conducted among 7 respondents; including 3 researchers, the manager of the service provider and 3 current service users. The purpose of this pilot test was to evaluate the validity of the questionnaire. Based on their feedback, updates were made to improve the quality of the questionnaire.

5.2 Data Collection

To maintain anonymity we refer to the social network game we investigate as "The SNG". The SNG is designed for Chinese players and run by one of the biggest social network companies with over 570 million users in mainland China. The SNG had been running for over 6 months before the data collection. It is mainly marketed and distributed via the social network site of the company.

With the aid of the company, an online survey was deployed to collect data for studying a) continuous use and b) switching behavior in SNG. The two segments were identified via self-selected questions in the questionnaire. As the SNG manager suggested, those experienced players who have not played the SNG in the past one month can be identified as potential switching players. Accordingly, responses from those potential switching users were collected to investigate the driving factors of their switching behaviors.

The company sent out 220,000 electronic questionnaires to a random selected sample from registered players of the SNG. All responses were provided voluntarily without reward. In the survey, no personal information about the respondents was collected. The electronic questionnaire was implemented with a pop-up that was added to the SNG homepage and the selected 220,000 players were invited to answer the questionnaire. If the players clicked the pop-up, they were lead to the questionnaire webpage to answer the questionnaire.

Note that switching users tend to be a very small proportion of the whole user population, particularly so in this newly introduced SNG with growing player base. Therefore, the result might be skewed due to early adopters being different from later adopters in respect with their switching behavior. Therefore, we borrowed a sample-adjusting method from the data-mining field by manipulating the experiment to enlarge the proportion of potential switching users in the sample. For instance, to study bank default, data mining researchers will manipulate the data analysis to enlarge the proportion of actual defaulters, so as to study their differences with non-defaulters. In our study, we restricted the model by testing respondents who did not play The SNG in the previous four weeks before filling in the questionnaire; an attempt to raise the proportion of *potential* switching users in the sample. This approach facilitated the obtaining of a good proportion of both switching and non-switching users.

Finally, 7769 responses were received from 220,000 players, including: (i) registered users, who claimed they had never played The SNG before (N = 2128); (ii) discontinuous players who claimed that they quit (N = 1181) playing online games and were therefore not our target group; and (iii) continuous players (N = 4123) of The SNG; (iv) and potential switching users (N = 542) of the SNG who had not played it for four weeks. The sub-sample of potential switching users was utilized to test the research framework because the inclusion of over-represented continuance users may bias the result, as above mentioned. This group of users had experience of The SNG and visited its homepage again (the link of questionnaire was installed on the homepage), but has not played it in the past 4 weeks, thus implying a high risk of switching. The description of the data is presented in Table 1.

According to a report by iResearch (2012), 32.2% of Chinese online game players are female, in compassion to 67.8% of Chinese males. The respondents of the survey, including continuous and switching users, consist of 59.1% males and 40.9% females. In the sample of iResearch (2012), 61.4% of online game players are found to be below 24 years old, and 20.1% are 25 to 35 years old. In a similar way, 64.8% of respondents of the survey are below 24 years old, while 30% of them are 25 to 35 years old. The demographic information of the potential switching user sample is available in Table 2. Note that because of the diffusion of the online gaming to the younger generation, many studies have been based on using a sample with a high proportion of young users ([Woodruff et al., 2007](#)).

Type	Total cases	Invalid cases	Valid cases	Included in this study
Non-players	2128	0	2128	NO
Discontinuous players	1181	0	1181	NO
Continuous players	4123	204(missing data)	3919	NO
Potential switching players	542	1(missing data)	541	YES
Total	7974	205	7769	

Table 1: Responses Distribution

Measure	Items	Frequency	%
Gender	Male	277	51.2
	Female	264	48.8
Age	Under 15	236	43.6
	16-18	178	32.9
	19-24	92	17
	25-30	17	3.1
	31-35	16	3
	Over 36	2	0.4

Table 2: Demographic Information

5.3. Measurement validity and reliability

Confirmatory factor analysis was utilized to test the adequacy of the measurement model using Amos 21. The results demonstrate a satisfactory fit (CMIN/DF = 2.352; GFI = 0.955; AGFI = 0.931; NFI = 0.971; IFI = 0.983; TLI = 0.977; CFI = 0.983; RMSEA = 0.050). The values of Cronbach's Alpha (α), composite reliability (CR) and average variance extracted (AVE) of the constructs are all over the thresholds of 0.7, 0.7 and 0.5, respectively, as shown in Table 3. The squared roots of AVE are higher than their correlations with other constructs, as shown in Table 4. In addition, principle component analysis was conducted to further test measurement validity as shown in Appendix B. The results show that all items fit their respective factors quite well. The results suggest the measures have unidimensionality, convergent and discriminant validity. A single factor model test was conducted to test common method bias. The single-factor model shows a poor fit (CMIN/DF = 30.819; GFI = 0.562; AGFI = 0.428; NFI = 0.587; IFI = 0.595; TLI = 0.531; CFI = 0.594; RMSEA = 0.235), against the existence of common method bias. Based on the recommendations from Podsakoff et al. (2003) and Malhotra et al. (2006), we introduced a common factor to test common method bias, and the improvement was found to be close to 0%, indicating the common method bias was not a pervasive problem in this study.

Construct (number of items)	Minimal factor loading	α	CR	AVE
Service quality (3)	0.763	0.863	0.870	0.692
Change experience (3)	0.823	0.908	0.911	0.773
Alternative attractiveness (3)	0.855	0.914	0.915	0.783
Satisfaction (3)	0.865	0.935	0.936	0.831
Switch intention (2)	0.942	0.949	0.949	0.904
Switch behavior (2)	0.884	0.902	0.904	0.824

Table 3. Reliability and validity of measurement

	SQ	CE	AA	SAT	SI	SB
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Service quality (SQ)	0.832					
Change experience (CE)	-0.386	0.879				
Alternative attractiveness (AA)	-0.539	0.654	0.885			
Satisfaction (SAT)	0.540	-0.389	-0.601	0.911		
Switch intention (SI)	-0.458	0.616	0.721	-0.569	0.951	
Switch behavior (SB)	-0.406	0.536	0.705	-0.524	0.757	0.908

Table 4. Inter-construct Correlations (diagonal values are squared roots of AVE)

5.4. Evaluation of the research framework

The structural model test indicates a good fit between the model and data (CMIN/DF = 2.386; GFI = 0.952; AGFI = 0.931; NFI = 0.971; IFI = 0.983; TLI = 0.978; CFI = 0.983; RMSEA = 0.051). Except for hypothesis H4b, all the hypotheses are supported, as shown in Figure 2. Alternative attractiveness significantly affects service quality ($\beta = -0.542$, $P < 0.001$), satisfaction ($\beta = -0.438$, $P < 0.001$) and switching intention ($\beta = 0.427$, $P < 0.001$). Service quality is a significant predictor of satisfaction ($\beta = 0.303$, $P < 0.001$), which is a precursor of switching intention ($\beta = -0.215$, $P < 0.001$). Switching behavior is a product of both switching intention ($\beta = 0.517$, $P < 0.001$) and alternative attractiveness ($\beta = 0.335$, $P < 0.001$). Change experience positively influences both alternative attractiveness ($\beta = 0.655$, $P < 0.001$) and switching intention ($\beta = 0.253$, $P < 0.001$). However, no significant influence is found from change experience to switching behavior. Overall, the model explained 42.9% of the variance of alternative attractiveness, 29.4% of service quality, 42.8% of satisfaction, 58.7% of switching intention and 62.7% of switching behavior. The total effects of the different determinants were calculated via the use of AMOS 21, as shown in table 5.

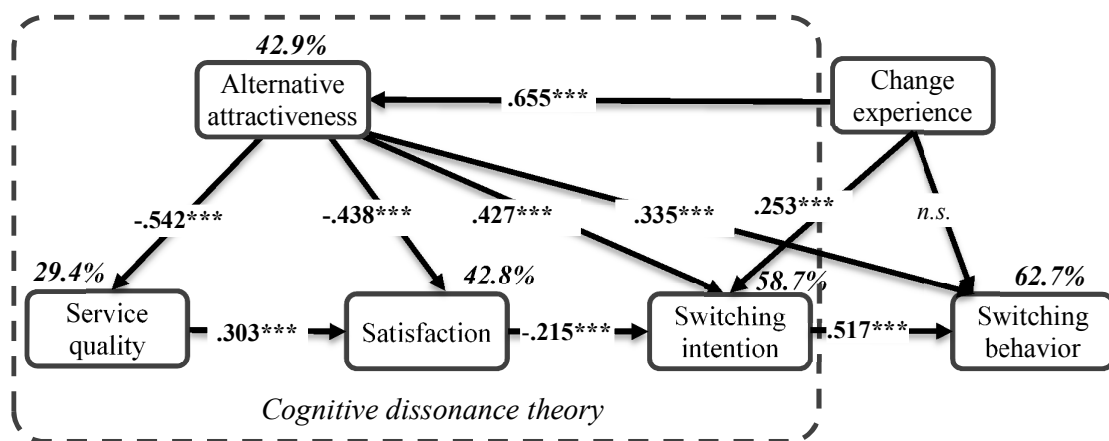


Figure 2. Results (***: $P < 0.001$; *n. s.* = not significant)

	CE	AA	SQ	SAT	SI
Alternative attractiveness (AA)	.655*				
Service quality (SQ)	-.355**	-.542**			
Satisfaction (SAT)	-.395**	-.603**	.303*		
Switch intention (SI)	.617**	.556*	-.065*	-.215*	
Switch behavior (SB)	.536*	.623*	-.034**	-.111**	.517**

Table 5. Total effects (*: $P < 0.05$; **: $P < 0.01$; CE: change experience)

An ad hoc test was used to further examine the validity of building cognitive dissonance relationships in the framework by removing the connections from alternative attractiveness to

service quality and to satisfaction. The structural model test showed an apparent deterioration in the model fit (CMIN/DF = 4.125; GFI = 0.923; AGFI = 0.890; NFI = 0.949; IFI = 0.961; TLI = 0.951; CFI = 0.961; RMSEA = 0.076) in comparison to the original model. On the other hand, this result suggests the necessity to include alternative attractiveness as a precursor of service quality and satisfaction.

6. Discussions and Conclusions

According to a report of Newzoo (2015), global games market will increase from \$83.6 billion in 2014 to \$91.5 billion in 2015 (Newzoo, 2015). Especially in China, the market revenue is expected to grow by 23% to reach \$22.2 billion in 2015 in comparison to 2014 (Newzoo, 2015). The rapid growing market highlights the importance to understand switching behavior in online gaming market. In this study we developed an e-service switching research framework for the context of SNGs in order to model the influence of alternative attractiveness in switching. In addition, change experience is incorporated into the framework to investigate whether it alters user perceptions toward a SNG and affects their switching intentions and behaviors. Because e-service switching behavior is obviously different from switching in conventional tangible services (Bhattacharjee et al., 2012), our study suggest an alternative approach for investigating switching behavior in e-services.

The study makes several contributions to SNG literature. First, the study introduced the cognitive dissonance theory into the field of SNG research. Consistent with our expectations, the results of the study indicate positive feelings of alternative attractiveness will substantially deteriorate consumers' positive perceptions of their current SNG. As a result, two new and strong relationships based on the effect of alternative attractiveness on service quality and user satisfaction were introduced.

Second, the results suggest that deterioration in the consumer perceptions of a SNG may not necessarily derive from an actual deterioration in the service quality of the brand itself. Instead, it may be essentially caused by the enhanced attractiveness of the competitors' products. Our study shows that alternative attractiveness exerts a rather strong negative influence on both perceived service quality and satisfaction with the current SNG. In particular, regarding the total negative influence, alternative attractiveness is the most influential determinant of satisfaction ($\beta = -0.542$, $P < 0.01$), which is much stronger than service quality ($\beta = 0.303$, $P < 0.01$) (see Table 5).

Note that prior studies based on the push-pull-mooring paradigm have regarded user satisfaction (push factor) and alternative attractiveness (pull factor) as *in-parallel* predictors of the switching intention (e.g. Zhang et al., 2012). Thus, the possible influence of the pull factor on the push factor seems not to be supported by the push-pull-mooring framework. Based on the cognitive dissonance theory, this study attempts to provide a theoretical basis to explain the possible effect of the pull factor on the push factor. Consistent with expectations, the pull factor of alternative attractiveness was found to exert significant negative effects on the two push factors of both service quality and satisfaction. Thus, the study is among the first to propose and test this interdependence of the push and pull factors in the context of e-service switching research.

In addition, based on the results, we argue that it might be necessary to incorporate the influence of pull factor on push factor, as a possible extension of the push-pull-mooring paradigm, into future consumer switching behavior. Based on the results, it is very likely the effect of pull effects on

consumer switching behavior may have been largely underestimated in prior studies, since the interdependence between the pull and push effects were generally not considered.

Third, the study provides a new perspective on understanding the most influential predictor of SNG or e-service switching behavior. While prior studies frequently argued that consumer satisfaction is one of the dominant factors to make consumers loyal (c.f. Valvi & Fragkos, 2012), therefore preventing them from switching, other scholars found that the industry environment (i.e. abundance of readily available alternatives on the Internet), or the relative advantages of alternatives may exert a dominant influence on both consumer satisfaction as well as their switching behavior (c.f. [Jones & Sasser, 1995](#); [Bhattacharjee et al., 2012](#)). In the present study, when considering the total effects, *both alternative attractiveness and change experience are much stronger determinants of switching intention and behavior than satisfaction* (see Table 5). The finding is partly consistent with the results of [Bhattacharjee et al. \(2012\)](#) that satisfaction exerts a much lower influence on the switching intention and behavior in comparison to the perceived relative advantage of a new IT.

Fourth, the study, to the best of our knowledge, is the first to introduce alternative attractiveness as a direct precursor of SNG, or e-service switching behavior in addition to the switching intention. A significant direct relationship was found between alternative attractiveness and switching behavior. As [Bhattacharjee et al. \(2012\)](#) indicated, IT users may utilize two different IT brands concurrently, users may switch to using a new IT without deliberating whether to give up the prior IT. Thus, when gamers find an attractive new game, they may just play the new game without deliberately deciding whether to abandon the old game. Fifth, the results show that user with change experience will be more likely to switch. It may imply that experienced switchers are likely to switch to new SNGs in the future as well.

The research contains a number of managerial insights for SNG practitioners. First, the results emphasize the strong influence of introducing attractive products in motivating consumers to switch between different SNGs. SNG providers should keep on improving their service quality to keep customers from switching. Rapidly implementing new attractive features is crucial for SNG providers wishing to retain current customers. It is also important for SNG providers to pay essential attention to the competing products on the market. However, focusing on push factors, such as raising service quality and striving for high customer satisfaction, might not be effective solutions for keeping customers. This is because alternative attractiveness, as pull factor, has stronger direct effect on push factors and on switching intention and behavior, and it is also associated strongly and indirectly via the push factors on switching intention and behavior. Therefore, SNGs must constantly invest in improving the attractiveness by innovating features and services beyond competition in order to retain the current users and to attract new users to switch from other SNGs to their SNGs. This result also highlights another possibility that when customers begin to switch, it does not necessarily mean that the service quality of the SNG has been reduced. It may be a sign of the emergence of new attractive alternatives, which makes consumers feel the current SNG is outdated.

Second, as a counter-measure SNG providers should focus more on users who have limited change experience (i.e., the loyal players) with business strategies differentiated for users based on their switching record. For instance, when a SNG company markets its new products, the company

should focus its resources (advertising campaign) more on users with a rich change experience as those SNG users with rich change experience intend to perceive alternative SNGs to be more attractive and with a higher intention to switch to alternatives. Furthermore, for those consumers with limited change experience and with high loyalty, the SNG companies should keep sustained attention and offer them more favorable service terms. Their switching to competitors will be a serious test for survival.

7. Limitations and future work

Our framework is tested in the context of SNG. Therefore it would be interesting to examine how the framework performs in the context of other different e-services. In addition, other factors (see [Bansal et al., 2005](#)), like switching costs, trust, commitment, brand reputation and the strength of alternative brands (e.g. on price) are also important factors that may affect consumer switching behavior, which are not investigated in the study. New insights may be obtained by incorporating those factors into the framework.

Another limitation of the study is that we sought to manipulate the experiment to enlarge the proportion of potential switching users in order to avoid possible skewed results that are caused by the over-presented continuance users, because of the early stage after the launch of the specific SNG. Thus, the study focused on the users who did not play the SNG for one month. More perfect data manipulation methods are needed to avoid over-presented subsamples. In addition, more reliable results would be obtained by observing actual switchers in future research.

Furthermore, consumers may naturally switch from one brand to another by following particular statistical distributions, such as negative binomial distribution (c.f. [Ehrenberg, 1968](#); [Uncles & Hammond, 1995](#)). This perspective could be used to instruct future research on e-service switching behavior. In the questionnaire, common method problems, such as order effect bias, may partly affect the result.

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Appendix A. Questionnaire

Construct	Item	Measurement	Reference
Satisfaction	SAT1	Very dissatisfied ... Very satisfied.	Oliver & Swan (1989)
	SAT2	Very displeased ... Very pleased.	
	SAT3	Very frustrated ... Very contented.	
Service Quality	SQ1	Overall I consider the service of SNG to be excellent.	Taylor & Baker (1994)
	SQ2	The quality of the SNG service is generally good.	
	SQ3	I believe the general quality of the SNG is high.	
Change Experience	CE1	I have switched SNGs often in the past.	Bansal et al. (2005)
	CE2	I have a lot of experience in switching among SNGs.	
	CE3	I have often switched to alternative SNGs after playing SNG for some time (such as 1 month)	
Alternative Attractiveness	AA1	I believe that alternative SNGs offer much better entertainment than this game.	Bansal et al. (2005)
	AA2	I believe that alternative SNGs offer much better customer service than this game.	
	AA3	I believe that alternative SNGs have better reputation than this game.	
Switching Intention	SI1	I'm considering switching from this game and play other SNGs instead.	Hsieh et al. (2012)
	SI2	The likelihood of me switching from this game to other SNGs is high.	
Switching Behavior	SB1	In terms of frequency of playing, I play other SNGs more than this SNG.	Hsieh et al. (2012)
	SB2	Regarding the time I spend, I spend more time on playing other SNGs than this SNG.	

Appendix B. Result of the principal component analysis

Rotated Component Matrix

	Component					
	1	2	3	4	5	6
SQ1	-,157	,181	,799	-,146	-,111	-,078
SQ2	-,135	,182	,871	-,153	-,105	-,109
SQ3	-,081	,225	,828	-,145	-,044	-,091
AA1	,271	-,213	-,200	,772	,286	,111
AA2	,302	-,252	-,207	,770	,201	,236
AA3	,266	-,247	-,220	,755	,190	,237
CE1	,863	-,058	-,134	,228	,152	,133
CE2	,875	-,132	-,101	,191	,140	,192
CE3	,814	-,176	-,166	,208	,147	,130
SI1	,280	-,259	-,173	,272	,302	,780
SI2	,295	-,236	-,174	,272	,332	,770
SB1	,203	-,184	-,164	,308	,800	,259
SB2	,224	-,208	-,094	,222	,846	,232
SAT1	-,112	,856	,218	-,215	-,160	-,145
SAT2	-,121	,870	,235	-,171	-,190	-,148
SAT3	-,145	,857	,221	-,182	-,084	-,131