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Research article

Can customer satisfaction and dissatisfaction coexist? An issue of telecommunication service in China

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Abstract

Although the telecommunication industry in China is growing at a fast pace, and firms are making strong efforts to provide customers with various services, customer switching continues to be high. Satisfaction has been considered as one of the most important antecedent of customer loyalty. However, little attention has been paid to dissatisfaction, a qualitatively different construct from satisfaction, which also influences loyalty. Relying on the two-factor and three-factor theory, this research proposes a theoretical framework to demonstrate the coexistence of customer satisfaction and dissatisfaction, and investigates the different antecedents and influences of satisfaction and dissatisfaction on customer loyalty. Through an exploratory study, we derived 11 telecom service attributes and further classified them into three categories, namely, hygiene factors, bivalent factors, and motivating factors. Each of these categories has a distinct effect on shaping customers' satisfaction and dissatisfaction. The PLS analysis of the survey data collected from 679 respondents provides insights into the complex interrelationships between 11 telecom service attributes, functional perception, motivating perception, customer satisfaction, customer dissatisfaction, and customer loyalty constructs. This study has a few interesting implications for researchers and telecom industry managers.
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Introduction

Although the number of mobile phone users in China is increasing and the mobile telecom service providers are making consistent efforts to retain customers, still the customer switching continues to be high. The retention rate of users after 6 months of their registration at the China Mobile Communication Corporation (CMCC), which has the largest number of mobile phone subscribers in the world, remains to be 60%. It has also been found that for customers who use the mobile service for a period longer than 6 months the rate of switching reduces greatly.

One of the reasons for such switching could be that while companies attempt to improve customer satisfaction, they do not consider its counterpart, that is, customer dissatisfaction. It is difficult to predict customer loyalty, as customer behaviour is very complex. Even loyal customers easily switch from one service provider to another. Customer satisfaction is one of the most important antecedents of customer loyalty. A number of studies have investigated customer satisfaction (Kuo *et al.*, 2009; Edward *et al.*, 2010; Kunkim *et al.*, 2011). However, little attention has been devoted to studying customer dissatisfaction. One of the reasons for such little attention is the common misconception that customer satisfaction and dissatisfaction are two sides of the same coin. Consequently, evidence of high customer satisfaction has been considered equivalent to low customer dissatisfaction. Similarly, the antecedents and outcomes of customer satisfaction have been treated as the converse of those of dissatisfaction. The unidimensional construct assumes that a single factor can generate both satisfaction (in case everything goes well or works properly) and dissatisfaction (when things do not go well or do not work properly).

However, this assumption is challenged by another perspective. According to Ou and Sia (2010), it is necessary to include both positive and negative manifestations such as satisfaction/dissatisfaction, technology adoption/rejection, system implementation success/failure, and so forth. Herzberg and Mausner (1959) proposed the two-factor theory according to which satisfaction and dissatisfaction are different constructs and are caused by different facets of interaction between a product/service and the consumer. According to the theory of negativity bias (Baumeister *et al.*, 2001), customer dissatisfaction may have a more negative impact on customer loyalty than that because of reduced customer satisfaction. If customer dissatisfaction is distinct and has a significant effect, then the results of research that ignores its importance will be biased. Since customer satisfaction and dissatisfaction are two independent constructs, enterprises need to pursue two different goals simultaneously, namely, maximizing customer satisfaction and minimizing customer dissatisfaction. Different strategies would have to be developed and executed for these two goals. Consequently, there is a need for understanding the underlying construct structure as well as to investigate the relationship between satisfaction, dissatisfaction, customers' evaluation about telecom services, and customer loyalty.

The main objective of this study is therefore to verify the construct structure of satisfaction and dissatisfaction in the telecommunication service, that is, to test whether customer satisfaction and dissatisfaction coexist or whether they are two sides of the same construct. This research also investigates the different influences of customer satisfaction and customer dissatisfaction on customer loyalty. Customer satisfaction is regarded as positive-valent affection after experience with a product or service, and customer dissatisfaction is regarded as negative-valent affection. These affections are formed by customers' functional perception and motivating perception with the product or service attributes during their encounter with the service. To retain customers, providers need to nurture satisfaction and minimize dissatisfaction by manipulating customers' perception (Oliver, 1997). If this perspective is true, practitioners can make different strategies for each attribute for achieving competitive advantage. Finally, this study investigates the different antecedents of customer satisfaction and customer dissatisfaction, and classifies 11 service attributes into different categories according to customers' perceptions.

The rest of the paper is organized as follows. The next section describes the relevant theoretical framework in order to understand the relationship between customer satisfaction and dissatisfaction. Then we discuss the exploratory study conducted to identify 11 service attributes as antecedents of customer satisfaction and dissatisfaction, and develop the theoretical model for this study. This is followed by a discussion of research methodology and presentation of the results. In the last section, we discuss the results as well as the contribution of this paper. The paper concludes with a presentation of limitation of this study and future research.

Literature and theoretical framework

Cognition–affect–behaviour framework

The primary relationship structure discussed in this study is based on the cognition–affect–behaviour framework (Fishbein and Ajzen, 1980). During the consumption of a product or service, an individual must evaluate the product or service attributes from both the functional and the motivational aspect. Such evaluation will result in affect towards the product or service. Finally, this attitude or affect will influence an individual's behaviour (Fishbein and Ajzen, 1980). Attributional theory of motivation (Weiner, 1986) offers a link between thoughts, feelings, and actions, and explores the relationships within the tripartite division of psychology into cognition, affect, and behaviour. The framework is depicted as follows:

Cognition→Affect→Behavioural intent or behaviour

This fundamental framework has been used in a number of contexts in the previous studies. For example, Poulou and Norwich's (2002) work describes the influence of teachers' causal attributions on their emotional and cognitive responses, which in turn predict their behaviour intention towards students. Similarly, Ou and Sia's (2010) study examines the relationships between attributes of website, users' cognitive perceptions, users' affective responses and their behaviours. In this study, we explore the influence of customers' evaluation about the attribute of telecom service on customers' cognition, and then the affect followed by behaviour. On the basis of this framework and by applying the two-factor and three-factor theory, we also examine the coexistence of satisfaction and dissatisfaction.

Two-factor theory

Normatively, customer satisfaction is considered to be a positive affect towards 'happy' or 'great' experiences, while dissatisfaction refers to the negative affect towards 'unhappy' or 'terrible' experiences (Zhang and Von Dran, 2000). These may be two different constructs.

The difference between satisfaction and dissatisfaction was first proposed by Herzberg's two-factor theory. He indicated that factors stimulating people to work could be divided into two categories: the hygiene factors and the motivation factors. These are consistently related to job dissatisfaction and job satisfaction, respectively. The hygiene factors (such as company policies, working conditions, and salary supervision) meet the basic safety, physiological, and social needs of the workplace. The other category called motivation factors tend to be more intrinsic to the individual and appeal to their need for growth and advancement, achievement, recognition, and responsibility (Zhang and Von Dran, 2000). Herzberg argued that motivation factors relate to feelings of satisfaction among employees, whereas hygiene factors relate to feelings of dissatisfaction among employees (Herzberg *et al.*, 1993; Kunkim *et al.*, 2011). Thus, according to the two-factor theory, factors causing satisfaction are different from those causing dissatisfaction. Therefore, satisfaction and dissatisfaction cannot simply be treated as opposite of each other. In other words, the opposite of satisfaction is not dissatisfaction, but no satisfaction. Similarly, the opposite of dissatisfaction is no dissatisfaction. Since two constructs (i.e., satisfaction and dissatisfaction) are unrelated, one's level of satisfaction can be independent of the level of dissatisfaction. An individual can simultaneously be both satisfied and dissatisfied with a product or service (Herzberg *et al.*, 1993).

Such coexistence of customer satisfaction and dissatisfaction has been studied and supported in several previous studies on customer satisfaction. A number of studies (Chan and Baum, 2007; Chow and Zhang, 2008; Füller and Matzler, 2008;

Alegre and Garau, 2010) provide evidence that the presence of certain factors generate satisfaction, yet their absence does not necessarily generate dissatisfaction. On the contrary, certain factors or situations can only generate dissatisfaction, whereas their absence does not necessarily lead to satisfaction.

This study is different from previous studies in various aspects. First, the coexistence of customer satisfaction and dissatisfaction has not been empirically tested in the telecom service in previous studies. The two-factor theory was also not always supported. For example, Swan and Combs's (1976) findings supported their modified two-factor model in consumers' experience with clothing, whereas Hunt's (1977) finding did not support this model. Maddox's (1981) results showed only mixed support for the two-factor notion. This research fills this gap by empirically examining the coexistence of customer satisfaction and dissatisfaction in the specific telecommunication service of China. Second, contrary to previous studies in marketing field and organization behaviour, the factors that can generate satisfaction and dissatisfaction are specific to telecommunication industry. Third, this study not only explored the different antecedents of satisfaction and dissatisfaction, but also examined their different outcomes.

Three-factor theory

The two-factor theory was later extended into three-factor theory by various scholars (Johnston, 1997; Oliver, 1997; Agustin and Singh, 2005). Drawing upon Herzberg *et al.*'s (1993) studies on work motivation, Oliver (1997) classified the product attributes into three dimensions: essential attributes, psychological-extra attributes, and bivalent attributes. Essential attributes are fundamental but unprocessed attributes, which only cause ill feelings when flawed. Psychological-extra attributes are an approach towards fulfilling customer needs beyond those at the functional level and can lead to enthusiasm. And bivalent attributes are upward and downward translatable attributes that can cause both ill feelings and good feelings. The three different attributes categories have different impacts on customers' evaluation of a product. Ou and Sia (2010) demonstrated their relationship as shown in Figure 1.

In the context of telecom service, a number of attributes (e.g., network quality, price, and bill system, etc.) influence customers' perception about the service (Lim *et al.*, 2006). Some attributes provide customers with better evaluation of the basic functionality or essential features of the service, whereas others motivate them. The following example further illustrates customers' perception about the attributes in the telecom service context. Network quality is one of the most important factors that influence customers' value perception (Wang *et al.*, 2004), since it is one of the most basic functional attributes. If the telecom service's network quality is poor (such as long time to connect to the dialled number, frequent call drops, poor voice quality, narrow network coverage), then the telecom service would be meaningless for customer. On the other hand, corporate image (another functional attribute of the service provider that signifies the company's performance) can act as a motivating attribute for the customer.

In this study, 11 telecom service attributes, which are considered as most important by customers, were identified through an exploratory study. We classified these attributes into three categories, namely, hygiene factors, bivalent factors, and motivating factors. Hygiene factors are those factors that play a positive and significant role in shaping functional perception and have no significant effect on motivating perception. Motivating factors are those factors that play a positive and significant role in developing motivating perception and have no significant influence on functional perception. The category called bivalent factors lies between these two categories. These factors have effects on both functional perception and motivating perception that express translatable effects (Ou and Sia, 2010).

Research model

On the basis of the cognition–affect–behaviour framework, the classic two-factor theory and the generic three-factor framework serve as important anchors in this research to investigate the determinants of customer satisfaction and dissatisfaction. Furthermore, the negative bias theory and prospect theory provide a foundation to explore the distinct influences of customer satisfaction and dissatisfaction on customer behaviour in the telecom service industry. The hypothesized model is presented in Figure 2.

Customer loyalty

A number of definitions of loyalty have been proposed in the literature, which contains both process definitions and psychological definitions. From the process perspective, the definition of customer loyalty accounts for the behaviour of loyal customers. Loyalty has been defined in some circles as repeat purchase frequency or relative volume of same-brand purchasing (Tellis, 1988). Newman and Werbel (1973) defined loyal customers as those who repurchased a brand, considered only that brand, and did no brand-related information seeking. From the psychology perspective, loyalty has been defined as a *deeply held commitment to re-buy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour* (Oliver, 1997).

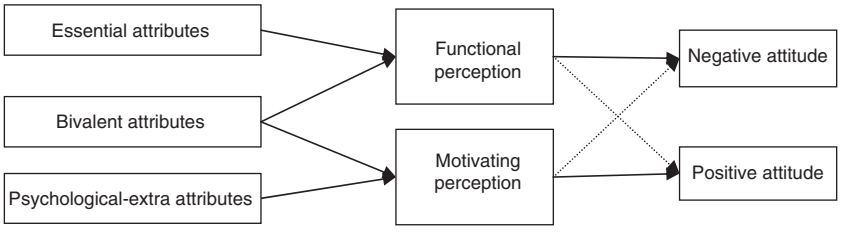

Figure 1 Relationship between service attributes and customer perception and consequential outcomes (Ou and Sia, 2010).

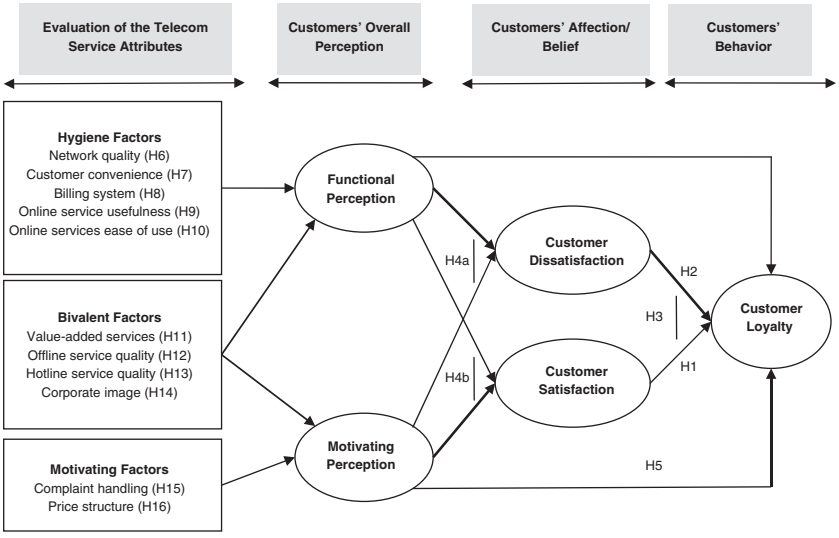

Figure 2 Research model.

A few other scholars propose that the most common behaviour of loyal customers include recommending a service provider to other customers and repeatedly patronizing the service provider (Dwyer *et al.*, 1987; Fornell, 1992). A number of studies have treated these two behaviours as indicators of customer loyalty (Zeithaml, 2000; Sirdeshmukh *et al.*, 2002). In the telecommunication industry, it is common for loyal customers to continue with the current service provider, prefer the current service provider if they wish to have one more connection, or recommend this service provider to their friends/relatives. Therefore, in this study, we consider customer loyalty as the extent to which customers recommend a service provider to other customers and repeatedly patronize the service provider.

Customer satisfaction

From the process perspective, customer satisfaction can be defined as an *evaluation of the perceived discrepancy between prior expectations and the actual performance of the product* (Oliver, 1980; Tse and Wilton, 1988). It indicates how customer satisfaction is formed. But it does not tap into the psychological meaning of customer satisfaction. Oliver (1997) proposed that customer satisfaction generally means customer reaction to the state of fulfilment and customer judgement of the fulfilled state, and that the fulfilment is pleasurable. This study adopts the psychological meaning of customer satisfaction. In other words, if a customer is satisfied with the service provider, he would be happy to use its service and be pleased with the consumption experience.

Customer satisfaction is an excellent predictor of customer loyalty. According to previous studies, customer satisfaction increases customer loyalty and reduces the costs of failed marketing, prevents customer churn, lowers customers' price sensitivity, improves the effectiveness of advertising, and enhances business reputation (Fornell, 1992; Chadha and Kapoor, 2009). Customer satisfaction is the most important variable that explains the variation in the recommended dimension (Lam *et al.*, 2004). Frederick and Sasser (1990) concluded that customer satisfaction is an important means for improving profitability by preventing customer defection. Moreover, customer satisfaction has a positive effect on customer retention (Bei and Chiao, 2001), implying that customer satisfaction has a positive effect on customer loyalty. Hence, we hypothesize:

Hypothesis 1: Customer satisfaction has a positive influence on customer loyalty.

Customer dissatisfaction

From the emotional perspective, Buskirk and Rothe (1970) defined dissatisfaction as the sense of frustration and bitterness on part of customers who have been promised more but have received less. Moreover, dissatisfaction experience would generate a high level of causal attribution activity, such as considering the cause, responsible party, alternatives that one could switch to, and avoiding the recurrence of the situation (Peeters and Czapinski, 1990). Furthermore, the intense negatively emotional experience would influence the way the service experience is absorbed and retrieved in customers' memory (Wilson *et al.*, 2008; Lee, 2010). Therefore, the dissatisfactory service would lead to customer-switching behaviour. In the telecom service context, dissatisfaction with one service provider may make customers switch to another service provider. Hence, we hypothesize:

Hypothesis 2: Customer dissatisfaction has a negative influence on customer loyalty.

As mentioned above, customer satisfaction is the positive affect, which can be portrayed as happiness or pleasure, whereas customer dissatisfaction is a negative affect, which can be portrayed as frustration and bitterness. According to the negative bias theory and prospect theory, people pay more attention (and thus more weight/importance) to negative experiences than positive ones, in processing positive and negative information (Baumeister *et al.*, 2001). Dissatisfactory service encounters act as negative stimuli and produce more cognitive activity and more cognitive representation than positive stimuli (Taylor, 1991). In other words, customer dissatisfaction appears more critical in determining switching

behaviour and word of mouth in the context of telecom service. Hence, we hypothesize:

Hypothesis 3: The influences of customer satisfaction and dissatisfaction on customer loyalty are asymmetric (i.e., customer dissatisfaction weighs more heavily in terms of lowering customer loyalty than customer satisfaction does in terms of enhancing customer loyalty).

The antecedents of customer satisfaction and dissatisfaction

According to the cognition–affect–behaviour framework (Fishbein and Ajzen, 1980), customers' cognition of the telecom service will influence their satisfaction and dissatisfaction. Factors stimulating customers' affect or attitude can be categorized into functional aspect and motivating aspect, which are consistently related to dissatisfaction and satisfaction, respectively (Herzberg *et al.*, 1993). The functional aspect represents a customer's perception about the functionality of the service and fulfil customers' basic functional needs. It is labelled as functional perception (hereafter FP) by Ou and Sia (2010). This study defines FP as a telecom service customer's overall evaluation of basic essential and functionality features of services provided by a particular telecom service provider, considering his/her interactive experience with the provider.

Motivating aspect represents customers' perception about the psychological-extra benefits of the service and fulfils customer needs beyond those at the functional level. It is labelled as motivating perception (hereafter MP) by Ou and Sia (2010). This study defines MP as a customer's overall evaluation of psychological-extra benefits provided by a particular telecom service provider and fulfilling customer needs beyond those at the functional level. During consumption of a product or service, an individual must evaluate the product or service cognitively, from both functional and motivational perspectives. Therefore, we examine FP and MP as antecedents of satisfaction and dissatisfaction.

According to the two-factor theory, the factors contributing to employees' positive and negative job attitudes are distinct (Herzberg *et al.*, 1993). Herzberg argues that when the hygiene perception falls below an acceptable level, bad feelings ensue. Motivation perception is another source of attitudes towards work, and those 'job factors reward the needs of the individual to reach his aspirations', and thus formulate an employee's positive feelings towards work (Herzberg *et al.*, 1993). In the website design context, FP plays a more significant role than MP in determining customers' negative attitude and MP plays a more important role than FP in determining customers' positive attitude (Ou and Sia, 2010). Thus, in the telecom service context, a customer's perception about the functionality of the service, which fulfils customers' basic functional needs, would play a more important role in determining satisfaction. And a customer's evaluation of psychological-extra benefits, which fulfils customer needs beyond those at the functional level, would play a more important role than FP in determining customer satisfaction. That is, MP plays more of the maintenance role, whereas FP plays more of the growth role. Hence, we hypothesize:

Hypothesis 4a: A customer's FP and MP have different positive effects on customer satisfaction (i.e., MP is more than FP).

Hypothesis 4b: A customer's FP and MP have different negative effects on customer dissatisfaction (i.e., FP is more than MP).

In the field of information systems, it has been demonstrated that users' perception and beliefs about the attributes of technology significantly influence the usage behaviour of IT. This perspective is supported by a number of cognitive-based model, such as social cognitive theory (Compeau *et al.*, 1999), the technology acceptance model (Davis, 1989), the innovation-diffusion theory (Rogers, 1995), the unified theory of acceptance and use of technology (Venkatesh *et al.*, 2003), and the theory of planned behaviour (Ajzen, 1991). Therefore, we can conclude that, as cognitive perceptions about the telecom service attributes, MP and FP may significantly influence customers' loyalty behaviour.

However, the strength of the relationship between MP, FP, and customers' behaviour should be different (Ou and Sia, 2010). In the telecom service context, customers' FP provides the underlying reason for using the service. The basic functionality of the service meets certain demands of customers, such as telecommunication, surfing online, and seeking information. However, the magnitude of the influence of these basic functional features on customer loyalty should be small, because of indiscrimination with alternatives. And customers' MP fulfils customers' needs beyond the functional level, which motivate customers to use the same service continuously (Oliver, 1997). Therefore, the magnitude of the influence of MPs on customer loyalty should be larger than that of FPs. Considering the different effects of FP and MP on customer loyalty, we hypothesize:

Hypothesis 5: A customer's FP and MP have asymmetric effects on customer loyalty (i.e., MP acts more than FP).

Specific telecommunication service attributes

As suggested by the framework integrating the two-factor theory (Herzberg *et al.*, 1993) and three-factor theory (Oliver, 1997) (see Figure 1), customers' evaluation about product/service attributes influences customers' overall cognitive perception, including FP and MP. One single attribute may contribute to fulfil customers' functional needs, psychological-extra needs or both.

We conducted an exploratory study to discover the possible determinants of FP and MP in the telecommunications industry in China. Interviews of 228 telecommunication service users were carried out by two Ph.D. candidates. Each interview lasted about half an hour. The interviewees were from varied occupational background, such as managers, teachers, students, sales persons, and accountants. The average age of interviewees was 27.5 years. Of the 228 respondents, 112 (49%) were female and 116 (51%) were male.

Unstructured interviews were designed with open-ended questions, such as 'which service features influence your perception about the service itself?' Keywords or short sentences, which describe the factors related to their perceptions, were recorded during the interviews. Through the interviews, we developed an inventory of factors that influence customers' FP or MP.

Following this step, the content analysis was carried out by two Ph.D. candidates. First, the number of items was reduced based on frequency. Items having low frequency (only one or

two times) were omitted. Thus, we were left with only 42 items after this step. The telecommunication service in China felt that customers are most concerned with these 42 situations. Then we sorted these items into several categories (which could be investigated as constructs following the card-sorting procedure) (Moore and Benbasat, 1991) to verify the construct, face, and discriminant validity of these constructs (Khalifa and Liu, 2002). Each item was printed on one card, and the cards were then shuffled randomly for presentation to the two judges (Ph.D. candidates). Each judge independently sorted the cards into categories and labelled (Moore and Benbasat, 1991). Differences in the opinion of these judges were resolved through discussion.

Finally, these 42 items were sorted into 11 categories, which can be conceptualized as 11 attributes of telecommunication services. These 11 attributes (i.e., network quality, value-added service, customer complaint handling, customer convenience, billing system, price structure, offline service quality, hotline service quality, online service usefulness, online service ease of use, corporate image) have been investigated as constructs in previous studies. Table 1 summarizes these specific factors along with their definitions and sources.

In summary, various telecom service attributes that shape telecom service customers' experiences need to be considered. In Ou and Sia's (2010) study of website design context, the essential attributes refer to those fundamental, functional, but unprocessed website design attributes that are capable only of causing ill feelings when flawed. These attributes have significant influence only on users' FP and are termed as *hygiene factors* (Ou and Sia, 2010). The psychological-extra attributes refer to those website design attributes that fulfil online consumer needs beyond the functional level, and that evoke positive feelings towards the online store. These attributes have a significant influence only on users' MP and are termed as *motivating factors* (Ou and Sia, 2010). Bivalent factors refer to those website design attributes and upward and downward translatable attributes, which are capable of influencing both positive and negative attitudes towards the vendor. These factors have significant influence on both FP and MP (Ou and Sia, 2010). In this study, we define *hygiene factors* as those attributes of telecom service that provide fundamental functional support; *motivating factors* as those telecom service attributes that fulfil customers' needs beyond those at the functional level; and *bivalent factors* as those telecom service attributes (both upward and downward translatable) that influence both the functional and motivating perception of customers. Considering the lack of a commonly agreed classification of hygiene, motivation, and bivalent factors, we classified these 11 attributes based on their definition (Table 1) and interviewees' explanation of these attributes. The attributes of network quality, customer convenience, billing system, online service usefulness, and online service ease of use

Table 1 A summary of telecom service attributes

No.	*Telecom service features*	*Definitions*	*Source*
1	Network quality	Customers' assessment of telecom service performance in regard to the time taken to connect to a dialled number, the frequency of dropping calls, the quality of voice, and the coverage of network	(Wang *et al.*, 2004; Chadha and Kapoor, 2009; Negi, 2009)
2	Value-added service	Customers' assessment of the type and convenience of digital services added to mobile phone networks other than voice services	(Kim *et al.*, 2004; Chadha and Kapoor, 2009; Kuo *et al.*, 2009)
3	Customer complaints handling	Customers' subjective feeling about the complaint processing and results	(Kim *et al.*, 2004; Negi, 2009)
4	Customer convenience	Customers' perceived convenience of the subscription and change procedures	(Kim *et al.*, 2004; Chadha and Kapoor, 2009; Negi, 2009)
5	Billing system	Customers' perceived accuracy and easiness of understood, and efficiency of resolving issues	(Lim *et al.*, 2006)
6	Price structure	Customers' perceived reasonable of the price and the type of price schedule	(Kim *et al.*, 2004; Chadha and Kapoor, 2009)
7	Offline service quality	Customers' perceived quality of the service conveyed through entity business hall	(Lim *et al.*, 2006)
8	Hotline service quality	Customers' perceived quality of the service conveyed through the hotline	(Lim *et al.*, 2006)
9	Online service usefulness	The degree to which a customer believes that using a particular online service website would enhance his/her efficiency or reduce his/her cost	(Davis, 1989; Ou and Sia, 2010)
10	Online service ease of use	The degree to which a customer believes that using a particular online service website would be free of effort	(Davis, 1989; Ou and Sia, 2010)
11	Corporate image	Customers perceive the company with a good corporate image to be innovative and forward-looking, or have a certain social contribution, or a leading firm in the industry	(Athanassopoulos and Iliakopoulos, 2003; Aydin and Özer, 2005; Lai *et al.*, 2009)

constitute basic functions of telecom service towards customers. If these attributes perform poorly, the service itself would be meaningless for customers. And the attributes of complaint handling and price structure provide the psychological-extra perception for customers. Most of the interviewees felt that it was exciting to enjoy the same functionality at a low/reasonable price. And if the service provider could address their complaint, they would be very happy. The attributes of value-added services, offline service quality, hotline service quality, and corporate image provide both basic function and psychological-extra perception for customers. For example, value-added services, such as mobile phone games, messages, ring tones, and SMS (short message service) coupons, are functional aspects of customers' need for mobile phone service. At the same time, the value-added service supports the internet-based activity, such as Web browsing and electronic transaction, thus meeting high level of customers' needs. Hence, we hypothesize:

Hypotheses 6–10: A customer's evaluations of network quality, customer convenience, billing system, online service usefulness, and online service ease of use have a positive influence on FP.

Hypotheses 11–14: A customer's evaluations of value-added services, offline service quality, hotline service quality, and corporate image have a positive influence on both FP and MP.

Hypotheses 15–16: A customer's evaluation of complaint handling and price structure has a positive influence on MP.

Methodology

The survey method was used to collect the data. The measures and the data collection procedures are detailed below.

Data collection and sampling design

Our sampling frame consisted of the customers of CMCC as it has the largest group of subscribers in the world. CMCC was established on April 20, 2004 with a registered capital of CNY 51.8 billion. It now has assets over thousands of billion yuan, and also has the largest mobile network in China. It ranks 87th in the Fortune Global 500. The brand value of CMCC is spearheaded in the world telecommunication industry, and it has become the one of the 50 most innovative corporations in the world.

We intercepted customers outside the China Mobile Service Hall, in a walking street of Wuhan, China. There were plenty of China Mobile customers of varied backgrounds on this street. They had plenty of time to respond to the questionnaires, as they were in a queue waiting for their turn, or were sitting down for a brief rest after becoming tired from window-shopping. Therefore, we could obtain responses reflecting their true opinions. It took around 20 mins on an average to fill the structured questionnaire. To motivate more participations and serious responses, we offered each participant a gift valued ¥5. It was a pleasure for the respondents to get a small gift during their free and leisure time.

A total of 783 customers of CMCC participated voluntarily in the survey. Those questionnaires that were completed in less than 10 min were abandoned since the participants might not have read the questions carefully. After deleting questionnaires with missing values or similar values for all questions, we were left with 679 valid questionnaires. Demographic information is summarized in Table 2.

The data shows that the respondents' demographic characteristics match the characteristics of internet users in China. We refer to the most recent available survey, that is, the 29th statistical report on internet development in China conducted by the China Internet Network Information Centre (CNNIC, 2012). We observed a reasonable consistency between our sample and the results of the 29th CNNIC's survey of mobile phone users in terms of gender, age, and monthly income. However, we noted that our survey participants had more formal education than individuals who responded to the CNNIC's survey (see Table 2). As there was no information about participants' work experience in the 29th CNNIC's survey, we did not make any comparison in this demographic category. Thus, the sample surveyed in this study is a reasonable representative of the telecommunication service users in China.

Questionnaire design

The measurement items used in this study were adapted from previously validated scales to suit the context of this study. All the survey items were measured on a 7-point scale with anchors ranging from 'strongly disagree' (1) to 'strongly agree' (7). The dependent variable, customer loyalty, is a widely studied variable in the marketing field. We adapted its measurement items from Zeithaml *et al.* (1996). Items for customer satisfaction were adapted from Edward *et al.* (2010). And the items for customer dissatisfaction were adapted from Chan and Wan (2009). Measurement of FP and MP incorporates the corresponding conceptualization from Herzberg *et al.* (1993) and Oliver (1997). Their items were adapted from Ou and Sia (2010).

Regarding the evaluation of specific telecom service attributes, we relied on previous studies and adapted according to the items as identified in the exploratory study. The measures of network quality were adapted from Wang *et al.* (2004) and Negi (2009). The measures for value-added services and pricing structure were adapted from Chadha and Kapoor (2009). The measures for customer complaint handling and customer convenience were adopted from Kim *et al.* (2004) and Negi (2009). The measures of billing system, offline service quality, and hotline service quality were adapted from Lim *et al.* (2006). Measures for online service usefulness and online service ease of use were adapted from Ou and Sia (2010) and Davis (1989). The measures for corporate image were adapted from Aydin and Özer (2005).

The survey instrument consisting of the above-mentioned measures was first developed in English and then translated into Chinese for administration to the subjects. To examine whether the translation altered the semantic content of the measurement, the translated Chinese instrument was translated back into English by a different translator. The two English versions were then compared. The high degree of correspondence between the original and translated English versions confirmed that the translation process did not introduce any language bias into the survey design. The applicability of the instrument items was judged by a pilot study of 30 respondents. Following the pilot test, several items were dropped and minor changes were made to the wordings of the questionnaire items.

Data analysis and results

For testing the hypotheses, we adopted the two-step approach as proposed by Anderson and Gerbing (1988). The two-step

Table 2 Demographic data of survey participants

Data set in this study (n = 679 survey participants)			*29th CNNIC's survey (n = 60,000 mobile phone users and fixed line phone customers in China)*		
Category	*Items*	*Percentage (%)*	*Category*	*Items*	*Percentage (%)*
Gender	Male	49.8	Gender	Male	58.1
	Female	50.2		Female	41.9
Age (in years)	<18	1.9	Age (in years)	<10	0.9
	18–24	64.8		10–19	29.8
	25–30	24.3		20–29	36.0
	31–40	6.3		30–39	23.7
	>40	2.7		>40	9.6
Education	Undergraduate below	35	Education	Primary school or below	6.9
	Undergraduate	47		Middle school	35.0
	Postgraduate or above	18		High school	34.3
				Junior college education	10.9
				Undergraduate or above	13.0
Monthly income (RMB)	None	40	Monthly income (RMB)	None	7.2
	<1000	12		<1000	30.2
	1000–2999	34		1000–2999	39.0
	3000–5000	10		3000–5000	14.3
	>5000	4		>5000	9.3
Work experience	⩽1 year	59	Work experience	There is no data about participants' work experience in the 29th CNNIC's survey	
	1–3 years	19			
	> 3 years	22			

approach consisted of developing a valid and reliable measurement, and subsequently testing the structural model.

Measurement model

The measurement model was subjected to several assessment steps. First, we tested the construct reliability. All constructs used in this study had Cronbach's alphas higher than 0.8, indicating adequate construct reliability, as shown in Table 3. The composite reliabilities of all constructs were above 0.9, indicating that the constructs used in this study had acceptable levels of individual item reliability. Second, the square root of the average variance extracted (AVE) figures were all above 0.86 and were larger than the squared correlations of other constructs, thus indicating sufficient discriminant validity of the constructs. Third, constructs convergent and discriminant validity were further verified with factor analysis. The principal component factor analysis (PCA) was performed on the entire set of items. The results indicated that each item is loaded on only one factor, with an explained variance of 85.64%.

Common methods variance (CMV) can be a major source of measurement error for survey studies, especially when variables are latent and measured using the same survey at a single point of time (Luo *et al.*, 2010). To check the extent of CMV, we first examined the correlation matrix among latent variables. We found that only low-to-moderate correlations existed among the latent variables, indicating the minimal influence of CMV. Furthermore, the results of factor analysis (PCA) revealed that no single general factor accounted for the majority of the variance. Each factor accounted for less than 8% of the total variance, and all 16 factors accounted for 85.64% of the total variance. All these tests confirm that CMV is not a major concern in this study.

Coexistence of customer satisfaction and dissatisfaction

The customer satisfaction and customer dissatisfaction show strong within-construct convergence and between-construct discriminant validities, suggesting that customer satisfaction and customer dissatisfaction are two distinct and separate constructs. In addition, we contrast combinations of high and low customer satisfaction with dissatisfaction. Their coexistence can serve as further evidence of the distinctiveness of customer satisfaction and customer dissatisfaction.

On the basis of the mid-point of the measurement scale (i.e., score of 4), we split the entire sample into four parts, defined as high CS (customer satisfaction) and high CDS (customer dissatisfaction) (CS>4, CDS>4), high CS and low CDS (CS>4, CDS<4), low CS and high CDS (CS<4, CDS>4), and low CS and low CDS (CS<4, CDS<4). The detailed distribution of our survey sample is presented in Table 4.

As shown in Table 4, 64% (434) of total cases fit into quadrants 2 and 3, and 36% (245) of total cases fit into quadrants 1 and 4, thus suggesting the coexistence of high customer satisfaction and high customer dissatisfaction, as well as low customer satisfaction and low customer dissatisfaction. In order to confirm whether the numbers in quadrants 1 and 4 are significant, a difference test was conducted. The *P*-value of the difference test was $P<0.001$ for 33 cases lying in the first quadrant and 212 cases lying in the fourth quadrant. These results confirm that a significant number of cases fall in quadrants 1 and 4, indicating that high customer satisfaction and high customer dissatisfaction as well as low customer satisfaction and low customer dissatisfaction coexist for a significant proportion of customers. Thus, the underlying proposition in this study that customer satisfaction and customer dissatisfaction exist simultaneously among individuals is empirically supported in our study.

Structural model

The structural model in this study was examined using the partial least square (PLS) technique. There are two reasons to use the PLS technique. First, PLS has less stricter requirements on sample size and residual distributions than covariance-based Structural Equation Modeling (SEM) techniques such as AMOS and LISREL (Chin *et al.*, 2003). Second, PLS is especially capable of testing large, complex models, including a large number of variables (Chin *et al.*, 2003).

The results of hypotheses testing using PLS are summarized in Figure 3. Overall, the results show that customer satisfaction and dissatisfaction have different antecedents and have differential influence on their consequents. The data explained 59% variance in customer loyalty, 60.7% in customer satisfaction, 63.7% in FP, and 62.7% in MP.

Interestingly, the results show that customer satisfaction contributes significantly to customer loyalty ($b=0.437$, $P<0.001$), whereas customer dissatisfaction has a negative influence on customer loyalty ($b=-0.079$, $P<0.01$), thus supporting Hypotheses 1 and 2. The comparison between the absolute magnitude of significant index of customer satisfaction and customer dissatisfaction on customer loyalty clarifies the differential roles that customer satisfaction and dissatisfaction play in relational outcomes. However, the comparison clearly signifies that the significant level of CS is much more than that of CDS, which is converse to Hypothesis 3. The implication is that the effect of CS on enhancing customer loyalty is greater than the diminishing influence of CDS on customer loyalty. The negative bias theory is thus not supported in this study. Perhaps there are some other reasons that restrain the negative influence of CDS on customer loyalty, such as switching cost, habit, and customer-perceived power imbalance. We will discuss this phenomenon in detail in the next section.

Regarding the antecedents of CS and CDS, the results show that CDS is significantly influenced by both FP ($b=-0.172$, $P<0.001$) and MP ($b=-0.116$, $P<0.05$), and CS is also significantly influenced by both FP ($b=0.359$, $P<0.001$) and MP ($b=0.485$, $P<0.001$). By comparing the significance indices, that is, FP→CDS ($P<0.001$) and MP→CDS ($P<0.05$), we find that Hypothesis 4a receives support on the maintenance role of FP. However, the data does not demonstrate the growth role of MP in determining CS. Although the path coefficient of MP→CS (0.485) is larger than the path coefficient of FP→CS (0.359), they are both significant at 0.1% significance level. Thus, Hypothesis 4b is not supported.

In addition to the influence of CS and CDS, MP is found to have a strong influence on customer loyalty ($b=0.272$, $P<0.001$). At the same time, the results indicate that FP does not have a significant effect on customer loyalty ($b=0.095$, $P>0.05$). These results add credence to the argument that FP is not sufficient to trigger customer loyalty, whereas MP strongly enhances customer loyalty. Thus, Hypothesis 5 is supported.

Mixed results were obtained towards the effect of customers' perception of specific telecom service attributes on the

Table 3 Descriptive statistics of measurement model

Latent variable	*Items*	*Mean*	*SD*	*Loading*	*Cronbach's alpha*	*Composite reliability*
Network Quality	NQ1	4.770	1.536	0.862	0.886	0.922
	NQ2	4.756	1.530	0.839		
	NQ3	4.965	1.413	0.923		
	NQ4	5.320	1.468	0.832		
Value-added service	VAS1	5.378	1.419	0.914	0.817	0.916
	VAS2	4.829	1.434	0.925		
Customer complaint handling	CCH1	4.672	1.426	0.921	0.926	0.953
	CCH2	4.535	1.413	0.951		
	CCH3	4.489	1.406	0.927		
Customer convenience	CC1	5.209	1.371	0.912	0.817	0.916
	CC2	5.433	1.317	0.927		
Billing system	BS1	4.196	1.648	0.894	0.893	0.934
	BS2	4.057	1.636	0.925		
	BS3	4.062	1.602	0.904		
Price structure	PS1	3.782	1.588	0.932	0.856	0.933
	PS2	3.856	1.641	0.938		
Offline service quality	ESQ1	4.817	1.488	0.911	0.903	0.939
	ESQ2	4.963	1.404	0.928		
	ESQ3	4.832	1.424	0.907		
Hotline service quality	HSQ1	5.308	1.314	0.919	0.915	0.947
	HSQ2	5.258	1.275	0.930		
	HSQ3	5.184	1.309	0.926		
Online service usefulness	OUS1	4.912	1.373	0.941	0.879	0.943
	OUS2	5.127	1.368	0.948		
Online services ease of use	OEOU1	5.267	1.382	0.936	0.939	0.961
	OEOU2	5.180	1.371	0.950		
	OEOU3	5.196	1.371	0.947		
Corporate image	CI1	4.807	1.395	0.897	0.917	0.941
	CI2	4.890	1.354	0.907		
	CI3	5.249	1.275	0.865		
	CI4	4.950	1.389	0.910		
Customer satisfaction	CS1	4.966	1.396	0.948	0.945	0.965
	CS2	5.057	1.361	0.959		
	CS3	5.093	1.352	0.941		
Customer dissatisfaction	CDS1	3.418	1.424	0.950	0.913	0.958
	CDS2	3.345	1.438	0.968		
Functional perception	FP1	5.436	1.246	0.901	0.940	0.957
	FP2	5.289	1.227	0.934		
	FP3	5.333	1.213	0.924		
	FP4	5.323	1.267	0.922		
Motivating perception	MP1	4.938	1.378	0.913	0.933	0.952
	MP2	4.925	1.320	0.924		
	MP3	4.775	1.362	0.908		
	MP4	4.786	1.359	0.908		
Customer loyalty	CL1	5.387	1.367	0.896	0.902	0.940
	CL2	4.959	1.610	0.927		
	CL3	4.888	1.562	0.924		

overall evaluation of FP and MP. The results from the PLS analysis highlight the existence of four categories of telecom service attributes (i.e., hygiene factors, bivalent factors, motivating factors, and insignificant factors), resulting in a three-factor framework as shown in Figure 3. As mentioned earlier, the explained variance of FP is 63.7% and that of MP is 62.7%. Such a high level of explained variance indicates that the model has sufficient predictive power.

The analyses identified four categories among the 11 telecom service attributes:

i Hygiene factors are those factors that play a positive and significant role in shaping FP and have no significant effect on MP (Ou and Sia, 2010). Three factors fall into this category: network quality ($b=0.114$, $P<0.001$), customer convenience ($b=0.152$, $P<0.001$), and online service ease of use ($b=0.203$, $P<0.001$).

ii Motivating factors are those factors that play a positive and significant role in developing MP, and have no significant influence on FP (Ou and Sia, 2010). Only one factor, that is, price structure, is identified in this category ($b=0.132$, $P<0.01$).

iii There is a category called bivalent factors in between the above two categories. These factors have effects on both FP and MP, thus expressing translatable effects (Ou and Sia, 2010). Four factors are identified in this category: value-added service ($b_{FP}=0.085$, $P<0.01$; $b_{MP}=0.098$, $P<0.01$), hotline service quality ($b_{FP}=0.177$, $P<0.001$; $b_{MP}=0.108$, $P<0.05$), offline service quality ($b_{FP}=0.088$, $P<0.05$; $b_{MP}=0.087$, $P<0.05$), and corporate image ($b_{FP}=0.290$, $P<0.001$; $b_{MP}=0.443$, $P<0.001$).

iv There are also a few insignificant factors that have no significant contribution to both FP and MP. Three factors fall into this category: customer complaint handling ($b_{FP}=-0.054$, $P>0.1$; $b_{MP}=-0.036$, $P>0.1$), billing system ($b_{FP}=-0.055$, $P>0.1$; $b_{MP}=0.051$, $P>0.1$), and online service usefulness ($b_{FP}=-0.013$, $P>0.1$; $b_{MP}=-0.005$, $P>0.1$).

Table 4 Coexistence of customer satisfaction and customer dissatisfaction

	Low CDS	*High CDS*	*Total*
High CS	Quadrant 2	Quadrant 4	
	367 (54%)	212 (31%)	579 (85%)
Low CS	Quadrant 1	Quadrant 3	
	33 (5%)	67 (10%)	100 (15%)
Total	400 (59%)	279 (41%)	679 (100%)

Abbreviations: CS = Customer Satisfaction; CDS = Customer Dissatisfaction.

Discussion and implications

The primary objective of this research was to demonstrate the coexistence of customer satisfaction and customer dissatisfaction in telecommunication service, develop and empirically test various antecedents and outcomes of satisfaction and dissatisfaction (Hypotheses 1–5), and classify various service attributes into different categories (Hypotheses 6–16). We achieved these goals by applying the two-factor theory, negative bias theory, and cognition–effect–behaviour framework in the telecom service industry. Sixteen hypotheses were set and tested on the collected data. The results present a high degree of explained variance of all endogenous variables,

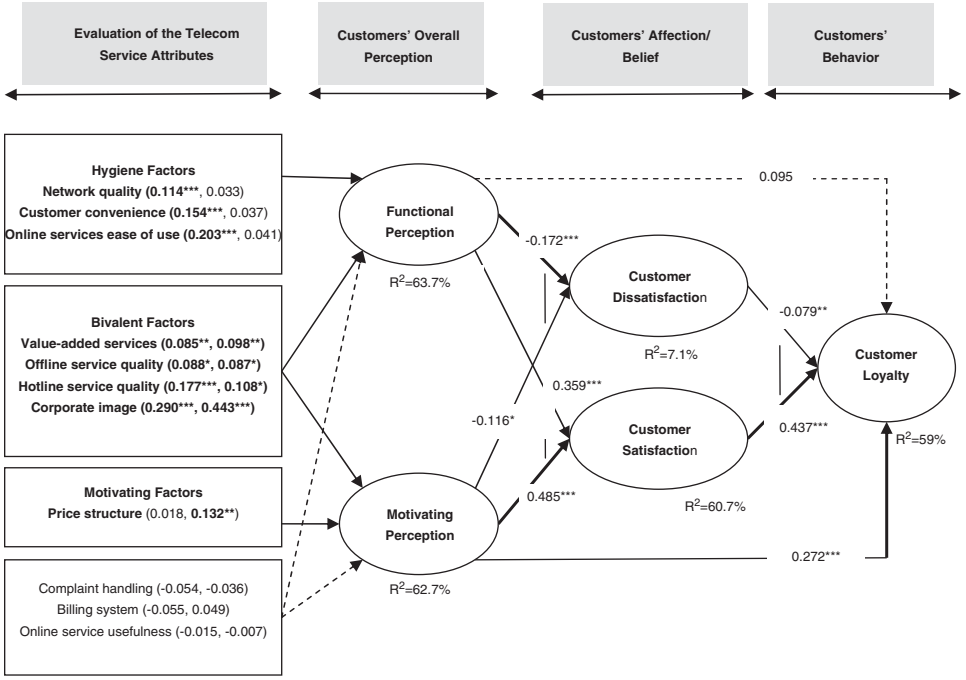

Figure 3 PLS results ($n=679$).
*$P<0.05$, **$P<0.01$, ***$P<0.001$. Paths in bold are found to be significant; paths in dashed line are not found to be significant. Under each independent variable (IV), the first set of numbers in parentheses is the path coefficient of the IVs with functional perception; the second set of numbers is the path coefficient of IVs with motivation perception.

except CDS ($R^2 = 7.1\%$). This implies that there are causal relationships among the factors in the model examined in this study.

Theoretical contributions

This research makes a few interesting contributions to the telecommunication service literature. It demonstrates that customer satisfaction and dissatisfaction can be managed simultaneously. It brings the unexpected asymmetric perspective to the negative bias theory by comparing the influence of customer satisfaction and customer dissatisfaction on customer loyalty. It provides insights into the complex interrelationships between 11 telecom service attributes, FP, MP, customer satisfaction, customer dissatisfaction, and customer loyalty constructs. It identifies the role of hygiene factors, motivating factors, and bivalent factors. We discuss these contributions below.

Coexistence of customer satisfaction and dissatisfaction

We argued that customer satisfaction and customer dissatisfaction are two totally different constructs that exist simultaneously. This research indicates that Herzberg's two-factor theory of job satisfaction can be applied in the telecom service marketing field. However, we assert that quadrants 1 and 4 (Table 4) have largely remained undiscovered in previous studies on customer satisfaction. The extended perspective in this study suggests that we should consider customer dissatisfaction separately when examining customer satisfaction.

The role of customer satisfaction and dissatisfaction

The significant influence of CS and CDS on customer loyalty as hypothesized in the research model received strong support from the data. This finding is in unison with that of previous studies. Customer satisfaction is the most important variable that explains the variation in the recommended dimension (Lam *et al.*, 2004). This suggests that CS and CDS are effective predictors of customers' loyalty behaviour. Satisfied customers are inclined to stay with their current service provider and recommend their service provider to their friends/relatives (Fornell, 1992; Bei and Chiao, 2001). On the other hand, dissatisfied customers are reluctant to remain loyal (Peeters and Czapinski, 1990; Lee, 2010).

The asymmetrical hypothesis based on negative bias theory (Baumeister *et al.*, 2001) and prospect theory (Kahneman and Tversky, 1979) was not supported. The results show opposite relationship, that is, customer satisfaction weights more heavily in terms of enhancing customer loyalty than customer dissatisfaction does in terms of diminishing customer loyalty. We conjecture that there are some other important factors that restrain dissatisfied customers from switching, such as switching barriers, and perceived power imbalance.

According to a previous study, the switching barriers develop due to switching cost, attractiveness of alternatives, and interpersonal relationships (Kim *et al.*, 2004). Consider switching cost for example: switching cost refers to the cost incurred when switching, including time, money, and psychological cost (Dick and Basu, 1994). It has been proven that high switching cost discourages switching to an alternative service provider, thereby improving customer loyalty (Jones and Sasser, 1995). Previous studies have proposed that building high switching costs is a means of customer retention (Yang and Peterson, 2004; Chadha and Kapoor, 2009). In China, three telecom operators (China Mobile, China Unicom, China Telecom), which control the entire Chinese market, have different marketing strategies from one another. This creates barriers that restrain dissatisfied customers from switching.

On the contrary, dissatisfied customers are more inclined to be loyal if they perceive lower value/lack of power in switching to the alternative service providers (Lee, 2010). For example, in acquiring professional services that usually involve technical complexity and expertise, the service provider, rather than the customer, enacts the leading role during the service encounter. Similarly, in receiving governmental services, users are not in a position to command, but are forced to practice patience as a virtue, because of lack of alternatives (Lee, 2010). In some other service contexts, where service providers exercise significant amount of judgement in providing service, customers find themselves in an uncomfortable position owing to the uncertainty of outcomes (Lovelock, 1983). The golden rule of marketing regarding the relationship between customer dissatisfaction and loyalty is generally violated whenever customers perceive themselves in a subordinate role (Lee, 2010). In the telecom service industry, only three companies control the entire telecom market in China. Customers are thus dependent on the providers' knowledge and information, and the alternatives are not easily available. Customers would not like to switch even if they are dissatisfied with the current service provider, considering all these inhibiting factors. Therefore, the lack of support for negative bias theory and prospect theory in this study is quite understandable.

The role of FP and MP

Both FP and MP have significant effect on both customer satisfaction and dissatisfaction. This is consistent with numerous cognition-based models, which assert that customers' cognitive perceptions about product or service affect customers' attitude.

In addition, the data strongly supports the idea that customer satisfaction and dissatisfaction have different determinants. In particular, customer dissatisfaction is determined most strongly by customers' FP than by their MP. And although customer satisfaction is determined by their MP and FP, the influence of MP is greater than that of FP at the same significance level. The results reveal that telecom service customers' dissatisfaction arises largely because of the inability of the service provider to provide essential functionality. On the other hand, satisfaction is developed largely because telecom service customers are motivated by the value beyond the essential functionality and also have the basic assurance offered by the smooth operation of FP. These results play an important role in providing evidence for the distinctiveness of customer satisfaction and dissatisfaction.

The importance of MP cannot be stressed strongly enough. As can be inferred from the structural model (Figure 3), apart from MP's influence in shaping customer satisfaction and a small contribution to customer dissatisfaction, the path coefficient ($b = 0.272$, $P < 0.001$) for customer loyalty is also highly significant. However, the relationship between FP and customer loyalty is found to be insignificant ($b = 0.095$, $P > 0.05$). Given the role in preventing customers' dissatisfaction evaluation, it appears that FP serves more as an 'order qualifier', whereas MP stimulates customers' loyal behaviour and serves

as an 'order winner'. These results are consistent with the definitions that order qualifier are those criteria that a company must meet for a customer to even consider it as a possible supplier, whereas order winners are those criteria that are necessary to win the order (Hill and Hill, 2009). Therefore, the underlying reason for customers' loyal behaviour is the psychological motivation provided by the service provider. Our results conform to the tenets of the hygiene-motivation theory and the three-factor framework and extend these theories to the telecom service context.

The role of hygiene factors

The results clearly classify all the service features into four categories, namely, hygiene factors, motivating factors, bivalent factors, and insignificant factors. Specifically, the hygiene factors include customers' evaluation of network quality, customer convenience, and the ease of use of online services. As depicted in the resultant model, hygiene factors only influence customers' FP significantly. This category addresses fundamental aspects of the telecom services. These factors serve to alleviate possible concerns regarding a service provider's functional performance. Moreover, these factors are perceived to create a necessarily hygienic mobile communication condition for customers but not necessarily a sufficiently motivating environment.

Network quality, as one of the hygiene factors in this study, is particularly worth mentioning. Wang *et al.* (2004) indicate that network quality is one of the most important factors influencing customer satisfaction in China's telecommunication industry. However, results in this study indicate that network quality is only a basic functional feature, and has little influence on MP. This is because the current network quality has already met customers' demand, and there is little differentiation in the network quality provided by various service providers. This indicates that hygiene factors and motivating factors may transfer to each other with the growth of technology and time.

The role of motivating factors

Only one motivating factor, namely, price structure, is found to be significant in this study. As depicted in the resultant model, motivating factors significantly influence customers' MP. This category addresses the psychological-extra aspect of the telecom service, and that of fulfilling customers' needs beyond the functional level. This category is perceived to create a sufficiently motivating environment that plays an important role in satisfaction and loyalty. In particular, price structure is one of the key factors behind selection of the telecom service provider by customers. If all hygiene and bivalent factors meet customers' need, or have no significant difference among service providers, the price structure would be the most important motivating factor.

The role of bivalent factors

Four bivalent factors were found in this study, that is, value-added service, offline service quality, hotline service quality, and corporate image. Nowadays, service providers provide several value-added services. Some of these services were developed many years ago, and are routinely used by customers. Such services play a significant role of basic hygiene conditions. However, some others have been developed recently. Although customers may not be familiar with these services, they may be interested in them. These value-added services play a motivating role and can thus contribute to both functional and motivating perception. The factors *offline service quality* and *hotline service quality* can facilitate customers in conducting their business, getting a new connection/add/cancel service options, thus contributing to FP. Similarly, customers can consult service staff and get their issues rectified. They can register their complaints, thus building relationship with the service representative, and contribute to MP. For similar reasons, corporate image can serve as a functional attribute by predicting the performance of telecommunication companies and as a motivating attribute by being a symbol of positive choice. Corporate image is also an important factor that drives the overall perceived performance of the telecommunication company (Athanassopoulos and Iliakopoulos, 2003) and thus meet customers' psychological need.

Limitations and future research

We acknowledge the limitations of this study that may limit the generalizability of its results. First, the generalizability of this study could be limited as it was conducted in Wuhan, China. The limited generalizability could also be due to the targeted participants being the subscribers of CMCC, which puts a limit on the sample size. It is possible that some of the findings of this study are idiosyncratic to these contextual features. Although there is reasonable consistency between our sample and the participants of the 29th CNNIC's survey in terms of gender, age, and monthly income, future research may examine the extent to which our findings are generalizable to other regions and customers of other telecom companies.

Second, although AVE exceeds the square of the correlation between the constructs supporting the discriminant validity, the correlation between attribute factors was somewhat high. This situation may be because of the common method variance, which potentially inflate true correlations among latent variables, as with most empirical studies. Although we have demonstrated that CMV is not a major concern in this study, future research can avoid this threat by using multi-method approach.

Third, our study focuses only on the relationship between customer satisfaction and dissatisfaction and loyalty. We have not considered other factors (such as switching barriers and perceived power imbalance) that may influence customer loyalty or moderate the relationship between customer satisfaction, dissatisfaction, and loyalty. There may also be some other important factors that play the direct or moderating role on customer loyalty. Future research can include all these factors. And it will be interesting to explore the reasons why dissatisfied customers do not switch to the alternatives.

Last, our study indicates that hygiene factors and motivating factors may transfer to each other with the development of technology and time. So it will be interesting to follow the tracks of all the service attributes and investigate the mechanism of the transfer among hygiene factors, motivating factors and bivalent factors in future. In addition, the three insignificant factors (customer complaint handling, billing system, online service usefulness) should not be ignored in future research because of the reason that they may be significant in other cultural contexts. Another interesting suggestion for future research is to examine the impact of satisfaction/dissatisfaction at the category attributes level on loyalty. A number of extant studies manipulate satisfaction/dissatisfaction as a mediator

between the evaluation of attributes and loyalty (Lim *et al.*, 2006). Investigating the direct influence of satisfaction/dissatisfaction at the attributes level on loyalty will enhance our understanding about customers' loyalty behaviour in the telecommunication industry.

Implications and conclusion

Despite these limitations, this study provides some interesting implications for practice. First, to pursue customer loyalty, telecom service providers should not only pay close attention to customer satisfaction index, but also monitor customer dissatisfaction index. Although customer satisfaction is still the most important predictor of customer loyalty (as satisfaction has a much larger influence on customer loyalty than dissatisfaction), managers should not ignore the aspect of customer dissatisfaction. The reasons behind dissatisfied customers not switching to alternatives have already been discussed. Some switching barriers and customer-perceived power imbalance restrain dissatisfied customers from defecting. Telecom service providers should not pursue loyalty by enhancing switching barriers and power imbalance, because such loyalty is spurious (Jones and Sasser, 1995). Once the switching barriers and power imbalance are removed, most customers will switch.

Second, this study provides better understanding about customer satisfaction and dissatisfaction. Our results demonstrate that satisfaction and dissatisfaction are formed via two different routes. It should be understood that both functional hygiene factors and motivating factors serve to build both satisfaction and dissatisfaction. But the difference is that customers' perception of the telecom services' functionality is a better predictor of customer dissatisfaction, while MP is a better predictor of customer satisfaction. Without fulfilling the essential functional requirements of customers, the service provider will not be able to prevent dissatisfaction and will find difficulty in maintaining satisfaction. Beyond these essential functional requirements, it appears that another set of motivating factors can stimulate customer satisfaction. Although the functional requirements are important in preventing dissatisfaction, this research indicates that functionality should no longer be considered as a sufficient condition for customer satisfaction, especially from a long-term perspective. Instead, the motivational aspect should be stressed in creating a motivating environment.

Third, this research presents the directly significant influence of FP and MP on customer loyalty. This implies that service providers can manipulate the functional and motivating factors directly to retain customers. However, the influence of MP is much greater than that of FP. Therefore, managers should also stress the motivational aspects while maintaining functional aspects simultaneously.

Finally, this study classifies the telecom service attributes obtained from interviewing customers into three categories, each of which plays a different role in customers' perception. This suggests that service providers should develop specific strategies for each category. In order to retain customers, service providers must provide basic desirable services such as network quality, customer convenience, and ease of use of online service. If such basic requirements are not met, customers are likely to assume that the mobile services do not function well. Such failure may inhibit further interaction with the service provider. In other words, managers should be aware of the maintenance role of hygiene factors and use it as a necessary prerequisite for other factors. With respect to the dual characterization of bivalent factors, it reflects customers' concerns with the quality of various services (value-added services, offline services, hotline services) and corporate image. Both these essential aspects and psychological-extra aspects should be paid close attention to by service providers. Moreover, managerial efforts should also be shifted to the motivational aspects of motivating factors (i.e., price structure as identified in this study). These efforts imply that telecom service providers should try not only for the improvement of customer-perceived service quality (which is based on network quality), such as through large amount of investment in network extension and upgradation), but also for customer acquisition and retention, such as through direct and indirect price reduction, so as to lower customer-perceived sacrifice and deliver superior customer value (Wang *et al.*, 2004). These efforts will reward the telecommunication service providers by engendering customer satisfaction, achieving competitive advantage, and sustaining the leadership position in the market.

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References

Agustin, C. and Singh, J. (2005). Curvilinear Effects of Consumer Loyalty Determinants in Relational Exchanges, *Journal of Marketing Research* **42**(1): 96–108.

Ajzen, I. (1991). The Theory of Planned Behavior, *Organizational Behavior and Human Decision Processes* **50**(2): 179–211.

Alegre, J. and Garau, J. (2010). Tourist Satisfaction and Dissatisfaction, *Annals of Tourism Research* **37**(1): 52–73.

Anderson, J.C. and Gerbing, D.W. (1988). Structural Equation Modeling in Practice: A review and recommended two-step approach, *Psychological Bulletin* **103**(3): 411.

Athanassopoulos, A.D. and Iliakopoulos, A. (2003). Modeling Customer Satisfaction in Telecommunications: Assessing the effects of multiple transaction points on the perceived overall performance of the provider, *Production and Operations Management* **12**(2): 224–245.

Aydin, S. and Özer, G. (2005). The Analysis of Antecedents of Customer Loyalty in the Turkish Mobile Telecommunication Market, *European Journal of Marketing* **39**(7/8): 910–925.

Baumeister, R.F., Bratslavsky, E., Finkenauer, C. and Vohs, K.D. (2001). Bad is Stronger than Good, *Review of General Psychology* **5**(4): 323.

Bei, L.T. and Chiao, Y.C. (2001). An Integrated Model for the Effects of Perceived Product, Perceived Service Quality, and Perceived Price Fairness on Consumer Satisfaction and Loyalty, *Journal of Consumer Satisfaction Dissatisfaction and Complaining Behavior* **14**: 125–140.

Buskirk, R.H. and Rothe, J.T. (1970). Consumerism. An Interpretation, *The Journal of Marketing* **34**(4): 61–65.

Chadha, S.K. and Kapoor, D. (2009). Effect of Switching Cost, Service Quality and Customer Satisfaction on Customer Loyalty of Cellular Service Providers in Indian Market, *ICFAI Journal of Marketing Management* **8**(1): 23–37.

Chan, J.K.L. and Baum, T. (2007). Determination of Satisfiers and Dissatisfiers Using Herzberg's Motivator and Hygiene Factor Theory: An exploratory study, *Tourism Culture & Communication* **7**(2): 117–131.

Chan, H. and Wan, L.C. (2009). Dual Influences of Moderating Variables in the Dissatisfaction Process: Theory and evidence, *Journal of International Consumer Marketing* **21**(2): 125–135.

Chin, W.W., Marcolin, B.L. and Newsted, P.R. (2003). A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study, *Information Systems Research* **14**(2): 189–217.

Chow, C.S.F. and Zhang, L.L. (2008). Measuring Consumer Satisfaction and Dissatisfaction Intensities to Identify Satisfiers and Dissatisfiers, *Journal of Consumer Satisfaction, Dissatisfaction & Complaining Behavior* **21**: 66–79.

CNNIC (2012). The twenty-ninth statistical report on internet development in China. http://www.cnnic.net.cn/hlwfzyj/hlwxzbg/201201/P020120709345264469680.pdf.

Compeau, D., Higgins, C.A. and Huff, S. (1999). Social Cognitive Theory and Individual Reactions to Computing Technology: A longitudinal study, *MIS Quarterly* **23**(2): 145–158.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology, *MIS Quarterly* **13**(3): 319–340.

Dick, A.S. and Basu, K. (1994). Customer Loyalty: Toward an integrated conceptual framework, *Journal of the Academy of Marketing Science* **22**(2): 99.

Dwyer, F.R., Schurr, P.H. and Oh, S. (1987). Developing Buyer-Seller Relationships, *The Journal of Marketing* **51**(2): 11–27.

Edward, M., George, B.P. and Sarkar, S.K. (2010). The Impact of Switching Costs upon the Service Quality-Perceived Value-Customer Satisfaction-Service Loyalty Chain: A study in the context of cellular services in india, *Services Marketing Quarterly* **31**(2): 151–173.

Fishbein, M. and Ajzen, I. (eds.) (1980). Predicting and Understanding Consumer Behavior: Attitude-behavior correspondence, in *Understanding Attitudes and Predicting Social Behavior*, Prentice Hall: Englewood Cliffs, NJ, pp. 148–172.

Füller, J. and Matzler, K. (2008). Customer Delight and Market Segmentation: An application of the three-factor theory of customer satisfaction on life style groups, *Tourism Management* **29**(1): 116–126.

Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish experience, *The Journal of Marketing* **56**(1): 6–21.

Frederick, F.R. and Sasser, W. (1990). Zero Defections: Quality comes to services, *Harvard Business Review* **68**(5): 105.

Herzberg, F., Mausner, B. and Snyderman, B.B. (1959). *The Motivation to Work*, New York: Wiley.

Herzberg, F., Mausner, B. and Snyderman, B.B. (1993). *The Motivation to Work*, New York: John Wiley and Sons, Ltd.

Hill, T. and Hill, A. (2009). *Manufacturing Strategy: Text and cases*, Basingstoke: Palgrave Macmillan.

Hunt, H.K. (1977). *Conceptualization and Measurement of Consumer Satisfaction and Dissatisfaction*, Cambridge, MA: Marketing Science Institute.

Johnston, R. (1997). Identifying the Critical Determinants of Service Quality in Retail Banking: Importance and effect, *International Journal of Bank Marketing* **15**(4): 111–116.

Jones, T.O. and Sasser, W.E. (1995). Why Satisfied Customers Defect, *Harvard Business Review* **73**(11): 88–99.

Kahneman, D. and Tversky, A. (1979). Prospect Theory: An analysis of decision under risk, *Econometrica: Journal of the Econometric Society* **47**(2): 263–291.

Khalifa, M. and Liu, V. (2002). Satisfaction with Internet-Based Services: The role of expectations and desires, *International Journal of Electronic Commerce* **7**(2): 31–49.

Kim, M.K., Park, M.C. and Jeong, D.H. (2004). The Effects of Customer Satisfaction and Switching Barrier on Customer Loyalty in Korean Mobile Telecommunication Services, *Telecommunications Policy* **28**(2): 145–160.

Kunkim, J., Hong, S., Min, J. and Lee, H. (2011). Antecedents of Application Service Continuance: A synthesis of satisfaction and trust, *Expert Systems with Applications* **38**(8): 9530–9542.

Kuo, Y.F., Wu, C.M. and Deng, W.J. (2009). The Relationships among Service Quality, Perceived Value, Customer Satisfaction, and Post-Purchase Intention in Mobile Value-Added Services, *Computers in Human Behavior* **25**(4): 887–896.

Lai, F., Griffin, M. and Babin, B.J. (2009). How quality, value, image, and satisfaction create loyalty at a Chinese telecom, *Journal of Business Research* **62**(10): 980–986.

Lam, S.Y., Shankar, V., Erramilli, M.K. and Murthy, B. (2004). Customer Value, Satisfaction, Loyalty, and Switching Costs: An illustration from a business-to-business service context, *Journal of the Academy of Marketing Science* **32**(3): 293.

Lee, J. (2010). Perceived Power Imbalance and Customer Dissatisfaction, *The Service Industries Journal* **30**(7): 1113–1137.

Lim, H., Widdows, R. and Park, J. (2006). M-Loyalty: Winning strategies for mobile carriers, *Journal of Consumer Marketing* **23**(4): 208–218.

Lovelock, C.H. (1983). Classifying Services to Gain Strategic Marketing Insights, *The Journal of Marketing* **47**(3): 9–20.

Luo, X., Li, H., Zhang, J. and Shim, J.P. (2010). Examining Multi-Dimensional Trust and Multi-Faceted Risk in Initial Acceptance of Emerging Technologies: An empirical study of mobile banking services, *Decision Support Systems* **49**(2): 222–234.

Maddox, R.N. (1981). Two-Factor Theory and Consumer Satisfaction: Replication and extension, *Journal of Consumer Research* **8**(1): 97–102.

Moore, G.C. and Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation, *Information Systems Research* **2**(3): 192–222.

Negi, R. (2009). Determining Customer Satisfaction through Perceived Service Quality: A study of Ethiopian mobile users, *International Journal of Mobile Marketing* **4**(1): 31–38.

Newman, J.W. and Werbel, R.A. (1973). Multivariate Analysis of Brand Loyalty for Major Household Appliances, *Journal of Marketing Research* **10**(4): 404–409.

Oliver, R.L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions, *Journal of Marketing Research* **17**(4): 460–469.

Oliver, R.L. (1997). *Satisfaction: A behavioral perspective on the consumer*, New York: McGraw Hill Intemational Editions, pp. 2–7.

Ou, C.X. and Sia, C.L. (2010). Consumer Trust and Distrust: An issue of website design, *International Journal of Human-Computer Studies* **68**(12): 913–934.

Peeters, G. and Czapinski, J. (1990). Positive-Negative Asymmetry in Evaluations: The distinction between affective and informational negativity effects, *European Review of Social Psychology* **1**(1): 33–60.

Poulou, M. and Norwich, B. (2002). Cognitive, Emotional and Behavioural Responses to Students with Emotional and Behavioural Difficulties: A model of decision-making, *British Educational Research Journal* **28**(1): 111–138.

Rogers, E.M. (1995). *Diffusion of Innovations,* 4th edn, New York: Free Press.

Sirdeshmukh, D., Singh, J. and Sabol, B. (2002). Consumer Trust, Value, and Loyalty in Relational Exchanges, *The Journal of Marketing* **66**(1): 15–37.

Swan, J.E. and Combs, L.J. (1976). Product Performance and Consumer Satisfaction: A new concept, *The Journal of Marketing* **40**(2): 25–33.

Taylor, S.E. (1991). Asymmetrical Effects of Positive and Negative Events: The mobilization-minimization hypothesis, *Psychological Bulletin* **110**(1): 67.

Tellis, G.J. (1988). Advertising Exposure, Loyalty, and Brand Purchase: A two-stage model of choice, *Journal of Marketing Research* **25**(2): 134–144.

Tse, D.K. and Wilton, P.C. (1988). Models of Consumer Satisfaction Formation: An extension, *Journal of Marketing Research* **25**(2): 204–212.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003). User Acceptance of Information Technology: Toward a unified view, *MIS Quarterly* **27**(3): 425–478.

Wang, Y., Lo, H.P. and Yang, Y. (2004). An Integrated Framework for Service Quality, Customer Value, Satisfaction: Evidence from China's telecommunication industry, *Information Systems Frontiers* **6**(4): 325–340.

Weiner, B. (1986). *An Attributional Theory of Motivation and Emotion*, New York: Springer-Verlag.

Wilson, A., Zeithaml, V.A., Bitner, M. and Gremler, D. (2008). *Services Marketing: 1st European edition*. McGraw Hill.

Yang, Z. and Peterson, R.T. (2004). Customer Perceived Value, Satisfaction, and Loyalty: The role of switching costs, *Psychology and Marketing* **21**(10): 799–822.

Zeithaml, V.A. (2000). Service Quality, Profitability, and the Economic Worth of Customers: What we know and what we need to learn, *Journal of the Academy of Marketing Science* **28**(1): 67.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1996). The Behavioral Consequences of Service Quality, *The Journal of Marketing* **60**(2): 31–46.

Zhang, P. and Von Dran, G.M. (2000). Satisfiers and Dissatisfiers: A two-factor model for website design and evaluation, *Journal of the American Society for Information Science* **51**(14): 1253–1268.

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