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Abstract: How to successfully implement a brand extension has been a common topic among global enterprises. Mobile internet (M-internet), a new information and communication technology, creates suitable conditions for enterprise brand extension. However, little research related to brand extension evaluation has addressed M-internet. From the perspective of the consumer, this study constructs a brand extension evaluation model based on the task-technology fit (TTF) and the Aaker and Keller model (A&K model), and analyses the influencing mechanism of brand extension evaluation by using the structural equation modelling (SEM). The final results show that technical characteristics of M-internet produce a positive effect on attitude of parent brand. Furthermore, attitude of parent brand positively influences the brand extension evaluation, brand trust and perceived fit. Lastly, brand extension evaluation is subject to the positive impact of brand trust and perceived fit in addition to attitude of parent brand.

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1   Introduction

An enterprise brand, one of the most important intangible assets of an enterprise, can improve enterprises' profitability and competitiveness. Over the last few decades, brand extension has been one of the main strategies for enterprises to launch new products. Brand extension refers to the introduction of new products and services by using an existing brand name (Swaminathan et al., 2001). Specifically, brand extension is when enterprises make full use of existing brand names and brand assets and then transfer them to new products and services by means of extension, thus greatly reducing the risk of entering a new market. In the 1990s, approximately 80% of new products were launched using the brand extension strategy (Swaminathan et al., 2001). This strategy can help improve the success rate for new products and services launched into new markets. More importantly, brand extension strategy may strengthen the position of an existing brand in consumers' minds, enhancing visibility, reputation and market coverage. However, many enterprises around the world have done their utmost to implement brand extensions, while only a small number have succeeded. It therefore appears that brand extension not only produces a negative effect but also hurts the parent brand to some extent. At present, how to successfully implement a brand extension has been a common topic among global enterprises. Mobile internet (M-internet), a new information and communication technology, creates suitable conditions for enterprise brand extension.

M-internet is the combination of mobile communication and the internet. With the rapid development of information technology, M-internet, represented by mobile terminals such as mobile phones, has become a new way to obtain information for all kinds of users. According to Analysys Data (2016) in the first half of 2016 more than 60% of global internet users were active on the M-internet every day. Additionally, in China, by February 2017 the number of M-internet users had reached 1.12 billion and 1.06 billion were mobile phone users (Ministry of Industry and Information Technology, 2017). As an emerging information service platform, the M-internet can provide a potential service and marketing channel for enterprise brand extension. Because of this, evaluating the influence factors of brand extension when using the M-internet will be an important issue. For enterprises to successfully develop a brand extension it is necessary to understand the influence mechanism of brand extension evaluation. At present, there is a large body of research concerning brand extension evaluation (Dimitriu et al., 2017; Liu et al., 2017; Michel and Donthu, 2014). Such works provide important insights into factors that may influence consumers' brand extension evaluations in a traditional information technology environment. However, little research has addressed the M-internet.

From the perspective of the consumer, this study explores the influence mechanism of brand extension evaluation within the M-internet environment based on the task-technology fit (TTF) and the Aaker and Keller model (A&K model). It constructs a research model of brand extension evaluation and analyses the influence of various factors on brand extension evaluation by using the structural equation modelling (SEM).

The remainder of this paper is organised as follows. First, we review the literature related to brand extension evaluation. Second, this paper proposes a research model and hypotheses based on the theoretical basis. Third, this paper describes the research methodology and presents analytical findings and conclusions. Finally, we present the theoretical and practical implications of these results.

2   Literature review

Academic research on brand extension originated in the late 1970s. In 1979, Tauber proposed the idea of brand extension for the first time in his paper, which was the beginning of academic research related to brand extension (Tauber, 1981). In the 1980s, more and more scholars began to engage in brand extension research. Boush (1988), Buday (1989), Kane (1987), Seminar (1987) and other scholars explored brand extension with qualitative research, enriching the theoretical system of brand extension. In the 1990s, empirical studies of brand extension emerged. Aaker and Keller (1990) tested the mediating role of perceived fit in brand extension by establishing the A&K model regarding consumers' perspective on brand extension evaluation. In recent decades, brand extension evaluation, a critical branch in the field of brand extension, has attracted much academic attention. Many scholars have carried out various studies on brand extension evaluation. Hem et al. (2014) explored how the four extension category characteristics affected consumers' attitudes towards brand extensions and found that consumers evaluated brand extensions more favourably when awareness was low or when their attitudes towards the extension category was favourable. Huang et al. (2017) examined consumers' evaluation of brand extensions by exploring the brand extension fit with the parent brand and finally found the effects were driven by a match between consumers' feelings of closeness to the extension type and the extension's closeness to the parent brand. Sood and Keller (2012) explored how alternative brand name structures influenced brand extension evaluations by using three laboratory experiments and found that brand category similarity affected brand extension evaluations. Estes et al. (2012) used a dual-process model to distinguish taxonomic feature-based similarity from thematic relation-based similarity according to the brand extension evaluation. The results indicated that taxonomic and thematic similarities independently contributed to branding professionals' and lay consumers' evaluations of real and hypothetical brand extensions.

However, the above studies did not take into account critical background factors that affect the applicability of the findings (Klink and Smith, 2001). In the research field of brand extension evaluation, the role of external validity could not be ignored (Klink and Smith, 2001). After this realisation, many scholars studied external effectiveness of brand extension evaluation within the internet environment, but related research was relatively sparse. Song et al. (2013) used a scenario-based experiment that involved a search engine and its extension to an e-commerce website and an online encyclopaedia and found that the perceived fit and perceived tie between the brand and its extension positively impacted users' evaluations of the online brand extension. Zheng et al. (2013) studied the consumer evaluation of commercial banks' mixed operation within the internet environment of China. The results showed that the parent brand quality and the perceived fit of their internet commercial bank both positively impacted consumer evaluation. Tang et al. (2008) applied Aaker and Keller's consumer evaluation model to assess the role of perceived fit between a parent B2B brand and its extension product. The final results showed that the consistency of brand concepts between the parent B2B brand and the B2C extension product was the dominant factor influencing consumer evaluations. In recent years, with the rapid development of M-internet technology in the world, mobile intelligent terminal equipment (such as mobile phones, notebooks and so forth) provide good platforms for open interaction between the M-internet and various industries. In a competitive business world, after success in one market, enterprises will constantly

launch new products and services to draw or retain users and seize new markets. To avoid high risks related to new products and services, many enterprises have tried to carry out a brand extension strategy by making use of the M-internet. Unlike brand extension based on traditional information technologies, the service attributes and characteristics of the M-internet itself produce some unique effects regarding brand extension. Therefore, considering the effects of background factors in previous studies, this research explores the influence of the M-internet on brand extension evaluation by using empirical data of users within the M-internet environment. It analyses the influence mechanism of new information technology in brand extension evaluation. The final conclusions could be used as a supplement to previous studies (Song et al., 2013; Zheng et al., 2013; Tang et al., 2008) and provide reference for the implementation of brand strategy.

3   Theoretical Basis

3.1   Connotation of M-internet and brand extension based on M-internet

So far, many scholars have defined the concept of M-internet. Hsu et al. (2007) thought that M-internet referred to mobile commerce activities, including mobile telecommunication, mobile content, entertainment service and electronic commerce relying on a mobile platform. Pedersen (2005) believed that M-internet was a mobile electronic commerce information technology. Kim et al. (2007) thought M-internet was an information and communication technology. Potential adopters of the M-internet were mobile service individuals who would consider prices and evaluate the M-internet based on its benefits and costs. From a technical point of view, most internet technologies will fully show the characteristic of network externality. In other words, the number of individuals on a network, to a large extent, determines how valuable other connected individuals find the network.

In terms of the M-internet, enterprises will choose a popular online platform which has more individuals due to the reduction of transaction costs and the maximisation of brand extension utility. Based on this perspective, brand extension and the M-internet are the most suitable choice. If enterprises can successfully adopt a brand extension strategy based on the M-internet, they will help enterprises seize new markets and increase user retention; furthermore, enterprises could also attract more potential users to use network externality of the M-internet. Meanwhile, due to the unique characteristics of internet media and mobility, brand extension based on the M-internet will have different effects compared to a traditional brand extension strategy. First, modern information and network technology, such as cloud computing, can provide high speed information transmission, accurate marketing positioning, hyperlinks and other convenient promotion channels. Second, the mobility and social characteristics of the M-internet enable individuals to disseminate brand information for the enterprise to their followers at any time and any place, which increases the efficiency of brand extension.

3.2   Task-technology fit and A&K model

TTF was first proposed by Goodhue and Thompson in 1995 (Goodhue and Thompson, 1995). It explained the ability of information technology to support tasks. According to TTF, technology could only produce effects when it was used and adapted to the task

well. Otherwise, it would not be able to achieve the desired effects (Goodhue and Thompson, 1995). Based on Metcalf's law, the value of the network was proportional to the square of the number of users, and the new technology would only become more valuable as more individuals used it (Briscoe et al., 2006). As a new technology in recent years, the innovative work pattern of the M-internet will gradually change individual behaviour. This innovative work pattern can be accepted better and faster by individuals through reasonable marketing approaches, such as brand extension.

In 1990, Aaker and Keller proposed a series of theoretical assumptions about how individuals evaluated brand extensions. In these assumptions, the relationship between the determinants of brand extension and the individual evaluation of brand extension was called the A&K model (Aaker and Keller, 1990). This model introduced the idea of perceived fit and was adopted by more and more scholars. A large amount of subsequent research was based on the A&K model. So far, many scholars have empirically studied the impact of brand extension evaluation, but most do not take into account the critical point that individual evaluation of products may depend on the use of other information technologies (James, 2006; Jalilvand et al., 2011). This study will analyse this critical point in order to supplement the lack of empirical research in this area.

4   Research hypotheses

As one of the first-mentioned factors that affect brand extension evaluation, brand attitude is characterised by consumers' perceived quality of the brand and affection towards brand products (Song et al., 2010). It should be noted that brand affection, as a cultural implication of brand, is the emotional impact of the brand on consumers, which can meet the emotional needs of consumers to some extent. This study used parent brand attitude to measure consumers' overall evaluation from the perspective of emotional needs. At present, as a widely accepted theory technology acceptance model (TAM) can explain the parent brand attitude in the field of traditional information technology. However, we cannot explain how the M-internet, which is a new information technology, affects the parent brand attitude based on TAM (Hwang and Kim, 2007). Therefore, this study chose the technical characteristics and task characteristics of TTF to analyse the influence mechanism. From the perspective of brand extension, the M-internet can be used for two purposes. One is an information publishing platform, and the other is a mobile applications loading platform. The information publishing platform is mainly used for the diffusion and dissemination of information, which displays the technical characteristics of the M-internet. Mobile applications loading platforms can implement information interaction through the mobile applications, which shows the task characteristics of the M-internet.

4.1   Technical characteristics

Technical characteristics of the M-internet refer to the computer system and support services provided by the M-internet (Goodhue and Thompson, 1995). For consumers, the advantages and convenience of the M-internet in information acquisition, information dissemination, communication and sharing will affect consumers' attitudes towards the parent brand in the process of brand extension (Aaker and Jacobson, 2001). The

significant influence of technical characteristics on parent brand attitude is only examined in research about traditional information technology (Wu et al., 2011). The more assistance and convenience the information technology provides, the more positive the consumers' attitude towards the parent brand. As an emerging information technology, the M-internet will show the general attributes and characteristics of information technology. We therefore hypothesise:

H1 Technical characteristics of the M-internet are positively related to parent brand attitude.

4.2   Task characteristics

Task characteristics of the M-internet refer to the factors that enable more users to rely more on M-internet technology (Goodhue and Thompson, 1995). The diversity, certainty, importance, autonomy and feedback of information technology are the main factors for users to use this technology, and these factors will significantly affect the attitude of consumers to a corporate brand (Oldham and Hackman, 1981). So far, there is little research on the relationship between task characteristics and brand attitude for the M-internet. This research will empirically analyse the relationship. According to the theory of social exchange, the user's behaviour is proportional to the expected return (Cropanzano and Mitchell, 2005). The stronger the task characteristics of the M-internet are, the stronger the retention of M-internet users is. In this sense, the attitude of users towards a parent brand with a brand extension is more positive. We therefore hypothesise:

H2 Task characteristics of the M-internet are positively related to parent brand attitude.

In many studies in the field of information system acceptance, attitude and behavioural intention are consistent. In reference to the research performed by Chai (2007), this study used the willingness to accept and the attitude of an extended product to measure the individuals' overall evaluation of brand extension. In this research, willingness to accept included brand trust and perceived fit, and the attitude of extended product was the attitude of an individual to the parent brand. In studying evaluation research, the halo effect theory was considered to be a kind of evaluation method. Nevertheless, this theory appeared in the studies of brands (Bendixen et al., 2004), but the halo effect theory applied to the field of brand extension was still minimal (Song et al., 2010).

4.3   Brand trust

The M-internet, as a new technology, uses its characteristics to determine the high demand of user brand trust in the process of brand extension. Brand trust refers to the reliability of a brand that meets consumers' demand (Chaudhuri and Holbrook, 2001). High brand trust means that consumers believe that the brand can help them to achieve their commitments so consumers are willing to try this brand (Chaudhuri and Holbrook, 2001). The significant impact of brand trust on user acceptance was tested in brand extension studies (Reast, 2005). According to the salient dimension of the halo effect theory, brand trust is the users' emotional security of a brand based on the M-internet. Therefore, brand trust is a significant dimension for users to evaluate brand extension of the M-internet (Fisicaro and Lance, 1990). When the users' brand trust is high, the

positive user evaluation of brand reliability will also be transferred to extended products. At this time, users' attitude and willingness to accept extended products will also be improved. We therefore hypothesise:

H3 Brand trust is positively related to brand extension evaluation.

4.4 Perceived fit

Perceived fit is defined as the degree of similarity between an extended product and a parent brand product in terms of product category and product attributes (Park et al., 1991). As a key factor in the A&K model, the significant impact of perceived fit on brand extension evaluation has been tested in most brand extension studies (Völckner and Sattler, 2006; Yu et al., 2012). According to the inadequate discrimination of the halo effect theory, the difference between parent brand product and extended product is not obvious enough, which causes different users' evaluation (Fisicaro and Lance, 1990). As a result, the users' positive attitude towards the parent brand product will be transferred to the extended product. In contrast, when the perceived fit is low, users may question the ability of an enterprise to implement a brand extension, so their attitude and willingness to accept will be low. We therefore hypothesise:

H4 Perceived fit is positively related to brand extension evaluation.

4.5 Parent brand attitude

Parent brand attitude refers to consumers' overall evaluation of a parent brand (Zimmer and Bhat, 2004). Like the general impression of the halo effect theory, when the overall impression of the parent brand is good, consumers' evaluation on extended products will be good. We therefore hypothesise:

H5 Parent brand attitude is positively related to brand extension evaluation.

Additionally, consumers' overall evaluation of the brand can be stored in their memory, which is independent of the attribute information of brand products. According to the general impression of the halo effect theory, as an overall evaluation of brand parent brand attitude can influence the perceived fit and brand trust by retrieving the memory (Hwang and Kim, 2007). If the users' attitudes towards the parent brand are positive, they will expect the parent enterprise to be more skilled and capable in providing and promoting new products, and they will also expect the parent enterprise to be more reliable in achieving value for its extended products. In this case, users' perceived fit and brand trust will be higher. We therefore hypothesise:

H6 Parent brand attitude is positively related to brand trust.

H7 Parent brand attitude is positively related to perceived fit.

The theoretical model and research hypotheses of this study are shown in Figure 1.

Figure 1   Theoretical model and basic hypotheses of this study
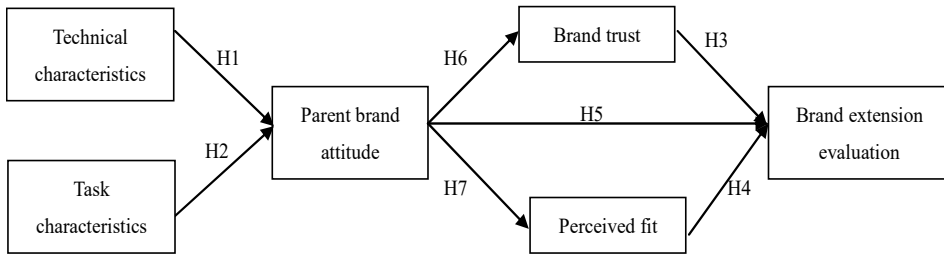
5   Methodology

This study selected Haier, a famous Chinese brand, as the parent brand. Haier was established in 1984, and initially produced only refrigerators. With the continuous expansion of its scope, Haier has expanded from refrigerators to all household appliances. In 2016, Euromonitor issued a global retail data report on large household appliances. The report showed that Haier accounted for 10.3% of retail sales in the global market, ranking first in the world.

The main reasons that this study selected Haier as its subject are as follows. First, Haier was an enterprise that used the M-internet to implement brand extension, and can therefore meet the basic requirements of analysis. Second, Haier had been implementing a brand extension for more than 20 years, and it was a successful example in the field of brand extension. We can test the research hypotheses reasonably by using the data obtained from Haier. Lastly, Haier is now the world's largest household appliances brand. The awareness and social identity of this brand are both high. This is beneficial in obtaining effective sample data for this research.

5.1   Scale design

Based on Haier's current adoption of the M-internet to implement brand extension, this study designed 18 items related to 6 variables of the theoretical model from the perspective of consumer. This scale was the 7-point Likert scale. Respondents rated items from 1 ('completely disagree') to 7 ('completely agree'). We revised the survey contents on this scale appropriately in order to make the survey questions more clear and easy to understand. The specific items on this scale are shown in Table 1.

5.2   Data collection

The practical investigation was based on Chinese samples. China is the country with the most internet users in the world. The number of M-internet users reached 1.12 billion by February 2017, which created a good environment for the implementation of online surveys. Given the feasibility and practical operability of online surveys, we placed questionnaires on the website sojump (http://www.sojump.com/), which is similar to SurveyMonkey.com or Qualtrics.com in America. This platform is a specialised online survey system in China. We chose registered members of sojump as the target

population. At present, the total number of registered members on this website is over two million and they are located in various provinces in China and overseas.

Table 1 The specific items of this scale

Variables	Items	References
Technical characteristics (TEC)	TEC1: M-internet can support me in a variety of tasks, such as information dissemination, information access, information exchange and processing.	Zhou et al. (2010)
	TEC2: M-internet can support a variety of computer systems.	
	TEC3: M-internet provides perfect service functions.	
Task characteristics (TAC)	TAC1: I use the M-internet for regular work.	Zhou et al. (2010)
	TAC2: In daily work, I often use the M-internet.	
	TAC3: Sometimes, I need to use the M-internet in an emergency situation.	
Parent brand attitude (PBA)	PBA1: I like the Haier brand.	Keller (1993)
	PBA2: I am willing to use the products and services of Haier brand.	
	PBA3: I would like to recommend the Haier brand to my friends.	
Brand trust (BRT)	BRT1: The Haier brand is trustworthy.	Delgado-Ballester et al. (2003)
	BRT2: The Haier brand makes me feel honest.	
	BRT3: The Haier brand makes me feel safe.	
Perceived fit (PEF)	PEF1: The extended products of Haier brand have similar qualities to the existing products of this brand.	Völckner and Sattler (2006)
	PEF2: The extended products of Haier brand have similar fuctions to the existing products of this brand.	
	PEF3: The extended products of Haier brand have similar application fields to the existing products of this brand.	
Brand extension evaluation (BEE)	BEE1: I think the qualities of extended products of Haier brand are good.	Cheong and Park (2005)
	BEE2: The extended products of Haier brand are welcome.	
	BEE3: I will buy the extended products of Haier brand if possible.	

An advertisement for the survey was posted for one week on public forums. To improve the data quality, each of the respondents was paid 5 Chinese Yuan as an incentive. Potential respondents were reminded not to participate in this survey if they had no experience in using the M-internet. The respondents were also requested to enter their mobile phone number for accessing the M-internet, so we could check if they had M-internet experience. In total, 265 respondents participated in this survey and 213 responses were usable. Detailed descriptive statistics are shown in Table 2.

Table 2   Descriptive statistics of the respondents' characteristics

Measure	Items	Frequency	Percentage
Gender	Female	87	40.8
	Male	126	59.2
Age	≤ 17	6	2.8
	18–28	183	85.9
	≥ 29	24	11.3
Job	Students	135	63.4
	Professional	68	31.9
	Self-employed	10	4.7

5.3   Descriptive statistics

The descriptive statistics of all measurement items in this study are shown in Table 3. We conducted Kolmogorov-Smirnov tests to examine the normality in all items by using SPSS 17.0 software. The K-S Z scores, displayed in Table 3, indicated there was significant difference between the distribution of every item and normal distribution.

Table 3   Descriptive statistics of all measurement items

Variables	Items	Mean	Standard deviation	Skewness	Kurtosis	K-S Z score	p
Technical characteristics (TEC)	TEC1	5.40	1.45	–0.83	0.24	2.72	< 0.01
	TEC2	4.63	1.57	–0.49	–0.48	2.54	< 0.01
	TEC3	4.59	1.53	–0.36	–0.56	2.20	< 0.01
Task characteristics (TAC)	TAC1	4.89	1.63	–0.45	–0.69	2.43	< 0.01
	TAC2	4.67	1.55	–0.29	–0.51	2.29	< 0.01
	TAC3	3.60	1.63	0.14	–0.67	1.93	< 0.01
Parent brand attitude (PBA)	PBA1	4.22	1.66	–0.07	–0.74	1.83	< 0.01
	PBA2	4.09	1.58	–0.08	–0.65	1.81	< 0.01
	PBA3	4.51	1.56	–0.27	–0.55	2.08	< 0.01
Brand trust (BRT)	BRT1	4.95	1.44	–0.50	–0.21	2.25	< 0.01
	BRT2	4.91	1.51	–0.36	–0.74	2.29	< 0.01
	BRT3	5.13	1.44	–0.49	–0.65	2.66	< 0.01
Perceived fit (PEF)	PEF1	4.58	1.54	–0.21	–0.76	2.31	< 0.01
	PEF2	4.13	1.61	0.11	–0.74	2.18	< 0.01
	PEF3	4.17	1.54	–0.15	–0.65	1.93	< 0.01
Brand extension evaluation (BEE)	BEE1	4.07	1.80	0.01	–0.93	1.59	< 0.05
	BEE2	4.26	1.69	–0.18	–0.82	2.03	< 0.01
	BEE3	4.25	1.78	–0.09	–1.05	2.09	< 0.01

6 Data analysis and results

6.1 Reliability and validity test

We conducted the exploratory factor analysis by using SPSS 17.0 software. The analytical results showed that the KMO value was 0.88 that exceeded the recommendation value of 0.7 (Williams et al., 2010) and approximate chi-square value was 1,860.10 (p < 0.001) in the Bartlett's test of sphericity. These results indicated that the data was suitable for exploratory factor analysis. In this analysis, we used the principal component extraction technique and varimax rotation method. Finally, six factors were extracted, which explained 72.17% of variance totally. Other analytical results are summarised in Table 4. From this table we can learn that factor loading of each item was not less than 0.7, which indicated the correlation between each item and loaded factor was strong on this scale.

In our study, we selected the composite factor reliability indicator (CFR) and the Cronbach α indicator to test the reliability of this scale. The values of two indicators should be greater than 0.7 (Royal and Hecker, 2016). After using SPSS 17.0 software and Lisrel 8.1 software for statistical analysis, the final values of CFR and Cronbach α both reached significant level, which implied the scale used in our study was reliable.

Table 4 Statistical results of some indicators

Factors	Items	Loadings	t values	AVE	CFR	Cronbach α
Technical characteristics (TEC)	TEC1	0.74	16.55	0.605	0.821	0.812
	TEC2	0.76	17.09			
	TEC3	0.83	19.19			
Task characteristics (TAC)	TAC1	0.71	15.77	0.600	0.818	0.814
	TAC2	0.78	17.81			
	TAC3	0.83	19.70			
Parent brand attitude (PBA)	PBA1	0.85	20.49	0.726	0.888	0.873
	PBA2	0.92	22.86			
	PBA3	0.78	17.88			
Brand trust (BRT)	BRT1	0.75	16.86	0.529	0.771	0.719
	BRT2	0.70	15.39			
	BRT3	0.74	16.53			
Perceived fit (PEF)	PEF1	0.80	17.88	0.609	0.824	0.820
	PEF2	0.79	17.49			
	PEF3	0.75	16.54			
Brand extension evaluation (BEE)	BEE1	0.81	18.42	0.641	0.842	0.823
	BEE2	0.83	19.00			
	BEE3	0.76	16.84			

In the validity test, we needed to test the convergent validity and discriminant validity respectively. The average variance extracted (AVE) was also employed to confirm the convergent validity, and acceptable values of AVE should be greater than 0.5 (Leng et al., 2015). All AVE values were more than 0.5 in Table 4, which indicated that the convergent validity of this scale was good.

Finally, we used the square root of the AVE to evaluate the discriminant validity. The square root of the AVE was compared with the correlations among factors (see Table 5). The results showed acceptable levels of discriminant validity since diagonal values exceeded the correlations between two factors.

Table 5   Statistical results of discriminant validity

Factors	TEC	TAC	PBA	BRT	PEF	BEE
Technical characteristics (TEC)	0.78					
Task characteristics (TAC)	0.56	0.77				
Parent brand attitude (PBA)	0.53	0.32	0.85			
Brand trust (BRT)	0.60	0.62	0.54	0.83		
Perceived fit (PEF)	0.24	0.31	0.24	0.24	0.78	
Brand extension evaluation (BEE)	0.50	0.49	0.42	0.60	0.49	0.80

6.2   Common method biases test and multiple collinearity test

We analysed the common method biases by using Harman's single factor test. The results of principal component analysis showed that the factor with the largest proportion of variance explained 40.45% of the total variance. Therefore, there were no common method biases in this study (Podsakoff and Organ, 1986). In addition, in the results of Table 5, the correlation coefficients between any two factors were less than 0.7, which means there was no serious multiple collinearity in this research.

6.3   Hypothesis test

SEM is a collection of statistical techniques that allow a set of relationships between one or more independent variables and one or more dependent variables to be examined. It has been the most important tool for hypothesis test in recent years (Ullman and Bentler, 2012). Therefore, we conducted the hypothesis test by using SEM in Lisrel 8.7 software. The main fitting indices and evaluation criteria are shown in Table 6. Comparing the values of main fitting indices with evaluation criteria values, it was found that the values of main fitting indices in our model were all acceptable, which indicated that the data and model fitted well.

Table 6   The fitting indices and evaluation criteria of research model

Fitting indices	Absolutely indices			Parsimony indices		Incremental indices		
	χ^2/df	GFI	RMSEA	PNFI	PGFI	CFI	NFI	IFI
Values of fitting indices	2.65	0.90	0.077	0.76	0.61	0.98	0.96	0.98
Evaluation criteria values (Ullman and Bentler, 2012)	< 3	> 0.9	< 0.08	> 0.5	> 0.5	> 0.9	> 0.9	> 0.9

Figure 2 shows the values of normalised path coefficients in our model. There was a significantly positive correlation between technical characteristics and parent brand attitude ($\beta = 0.76$, $p < 0.001$). Thus, H1 was supported. However, the positive correlation between task characteristics and parent brand attitude was not significant ($\beta = 0.06$,

$p > 0.05$). Therefore, H2 was not supported. Additionally, the three variables were found to be significantly related to brand extension evaluation: brand trust ($\beta = 0.32$, $p < 0.001$), perceived fit ($\beta = 0.37$, $p < 0.001$) and parent brand attitude ($\beta = 0.52$, $p < 0.001$). Thus, H3, H4 and H5 were all supported. Lastly, parent brand attitude produced significant positive effects on brand trust ($\beta = 0.60$, $p < 0.001$) and perceived fit ($\beta = 0.61$, $p < 0.001$) respectively. Thus, H6 and H7 were both supported. In this test, direct and indirect effects of the research model are shown in Table 7. Table 8 displayed the total effects and the coefficient of determination (R^2) in this model.

Figure 2 Hypothesis testing results
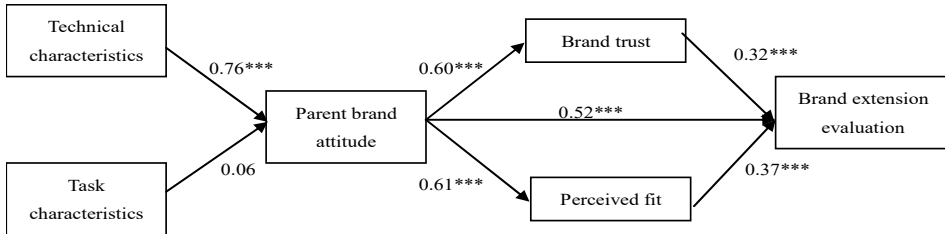
Note: *$p < 0.05$, **$p < 0.01$ and ***$p < 0.001$.

Table 7 Direct effects and indirect effects of research model

Factors	Direct effects					Indirect effects		
	TEC	TAC	PBA	BRT	PEF	TEC	TAC	PBA
Technical characteristics (TEC)	-	-	-	-	-	-	-	-
Task characteristics (TAC)	-	-	-	-	-	-	-	-
Parent brand attitude (PBA)	0.76	0.06	-	-	-	-	-	-
Brand trust (BRT)	-	-	0.60	-	-	0.46	0.04	-
Perceived fit (PEF)	-	-	0.61	-	-	0.46	0.04	-
Brand extension evaluation (BEE)	-	-	0.52	0.32	0.37	0.40	0.03	0.42

Table 8 The total effects and coefficient of determination (R^2) in research model

Factors	Total effects					R^2
	TEC	TAC	PBA	BRT	PEF	
Technical characteristics (TEC)	-	-	-	-	-	-
Task characteristics (TAC)	-	-	-	-	-	-
Parent brand attitude (PBA)	0.76	0.06	-	-	-	0.49
Brand trust (BRT)	0.46	0.04	0.60	-	-	0.42
Perceived fit (PEF)	0.46	0.04	0.61	-	-	0.44
Brand extension evaluation (BEE)	0.40	0.03	0.94	0.32	0.37	0.50

6.4   *Mediation effect test*

According to the theoretical model and statistical analysis results, the path coefficient of technical characteristics to parent brand attitude was significant ($\beta = 0.76$, $p < 0.001$), and the path coefficient of parent brand attitude to brand extension evaluation was significant ($\beta = 0.52$, $p < 0.001$), which meant that parent brand attitude played a full mediation role in our model. Additionally, brand trust and perceived fit played a partial mediation role in this model. To test the mediation effect of the three variables, similar to in the research of Wen and Ye (2014), we used the Mplus 7.0 software to use the Bootstrap method to test the significance of the above mediation effects. After setting up the repeated 2,000 Bootstrap samples and 95% bias-corrected confidence intervals, we obtained the confidence intervals of mediation effects of parent brand attitude, brand trust and perceived fit were [0.054, 0.118], [0.026, 0.074] and [0.028, 0.078] respectively. The zero point was not included in these three confidence intervals. It was proved that the full mediation effect of parent brand attitude was significant, and the partial mediation effects of brand trust and perceived fit were significant respectively.

7   Conclusions

This study combined the TTF and the A&K models to construct the theoretical model of brand extension evaluation within the M-internet environment. The final results supported the validity of our research model. In our model, the technical characteristics of the M-internet produced a positive effect on parent brand attitude. Furthermore, parent brand attitude positively influenced brand extension evaluation, brand trust and perceived fit. Lastly, brand extension evaluation was subject to the positive impact of brand trust and perceived fit in addition to parent brand attitude. However, we did not find a positive effect due to task characteristics of the M-internet on parent brand attitude.

The technical characteristics of the M-internet produce a positive effect on parent brand attitude. For M-internet users, the main advantages of the M-internet are convenience, freedom and ubiquity (Anckar and D'incau, 2002). In this technical environment, the user's views on the implementation of something are easily formed, and the user's attitude on this matter is often better (Venkatesh et al., 2003). In our research, the analytical results show that this conclusion can also be applied to the field of brand extension, indicating the M-internet, such as a traditional brand extension platform, will also have a salient influence on parent brand attitude.

Task characteristics of the M-internet do not produce a positive effect on parent brand attitude. The M-internet provides sufficient convenience and freedom for users, but if this information technology involves complex manipulation, navigation, slow response, elaborate connection procedures or inconsistent availability, then its advantages will be weakened (Venkatesh et al., 2003). In the process of brand extension using the M-internet, enterprises will make full use of the characteristics and functions of the M-internet. However, some of these characteristics and functions are not familiar or accepted by users. Based on the endowment effect of prospect theory, users need to spend a certain cost in the process of familiarising themselves with and accepting new technology (Kahneman and Tversky, 1979). Since the M-internet is a fairly new technology, users will not risk committing time, effort and money to it without having some assurance of its benefits. Under such conditions, task characteristics of the

M-internet do not demonstrate obvious effects on brand extension. Therefore, significant positive effects of task characteristics of the M-internet on parent brand attitude cannot be found.

Parent brand attitude has a significant positive influence on brand extension evaluation. This conclusion is consistent with the results of previous studies related to brand extension based on traditional information technology (Chai, 2007), indicating the M-internet, as a new technology, also shows the same general characteristics. Based on statistical analysis, the M-internet will not only have a significant impact on parent brand attitude, it will also produce a significant effect on brand extension evaluation. In addition, brand trust and perceived fit are both partial mediators between parent brand attitude and brand extension evaluation, which is consistent with the conclusions of previous studies (Song et al., 2010; Völckner and Sattler, 2006; Yu et al., 2012). The results indicate that the M-internet can strongly support the role of the parent brand in the process of brand extension. Additionally, according to this conclusion, parent brand attitude is not the only factor affecting brand extension evaluation. Brand trust, perceived fit and other factors that are not explored in this study will also have impacts on brand extension evaluation. More importantly, except for direct effects, the parent brand attitude can play significant roles in brand extension evaluation by influencing the brand trust, perceived fit or other unknown factors.

8 Implications

This research explored the influence mechanism of brand extension evaluation within the M-internet environment from the perspective of the consumer. The conclusions of these studies are novel and comprehensive, and can provide some academic supplement in the field of enterprise brand extension. The main theoretical contribution of this study is the construction of the theoretical model. Compared to the previous evaluation model, the advantages of this model are as follows. This study innovatively incorporated the technical characteristics and task characteristics of the M-internet as the critical factors which affect the attitude of the enterprise parent brand into the theoretical model. The purpose is to explore the impact of the M-internet as an exogenous factor on brand extension evaluation. The statistical analysis results show that the task characteristics of the M-internet do not have a significant impact on the attitude of an enterprise parent brand, but the influence of the technical characteristics of the M-internet cannot be ignored. On the other hand, this model focuses on the important impact of information technology and enterprise brand on brand extension evaluation. We can analyse that an individual's evaluation of an enterprise brand will depend on the use of information technology. This analysis will make up for the lack of previous studies (James, 2006; Jalilvand et al., 2011). The empirical analysis shows that the technical characteristics of the M-internet will affect the brand extension evaluation through the attitude of the parent brand.

The conclusions of this study suggest the following management implications for enterprises implementing the brand extension. First, enterprises need to completely understand the technical characteristics of the M-internet, and then promote the extended products of a parent brand by taking full advantage of this technology in information publishing, communication and sharing, and system support and service functions. In this

process, enterprises should do their utmost to maintain and enhance the user's attitude to a parent brand by using advertising, word of mouth marketing and other approaches in order to improve the brand image and brand equity. Second, to maintain the consistency of the brand's image and to improve the user's emotional transfer to the parent brand, enterprises could choose a reasonable category of extended products and try to implement a short-term brand extension strategy. Lastly, it is necessary to establish high-quality security measures and feedback mechanisms for users and enhance brand trust in order to better promote extended products.

9   Limitations and the future

There are a few limitations in this study. First, more than 60% of our subjects were students. Although these respondents are potential M-internet users, they might be constrained by monetary issues more than those holding jobs and drawing a steady income. Second, data collection was geographically limited to China. As the M-internet is a worldwide phenomenon, cross-national data collection is necessary. Future studies could expand the data collection across different geographical contexts.

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