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ORIGINAL ARTICLE

An empirical examination of the determinants of mobile purchase

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Abstract As en emerging service, mobile purchase has not received wide adoption among users. Drawing on the trust and flow theory, this research identified the factors affecting user adoption of mobile purchase. We conducted data analysis with structural equation modeling (SEM). The results indicated that contextual offering has strong effects on trust, flow, and perceived usefulness. In addition, structural assurance affects trust. Trust affects flow, which further affects perceived usefulness. These three factors determine mobile purchase intention.

Keywords Mobile purchase · Trust · Flow · Perceived usefulness

1 Introduction

The application of third generation (3G) mobile communication technologies has triggered mobile commerce development. According to a report issued by China Internet Network Information Center (CNNIC) in January 2011, the number of mobile internet users in China has reached 303 million, accounting for 66% of the internet population (457 million) [7]. Faced with this great opportunity, many enterprises have released their mobile services, such as mobile instant messaging, mobile search, and mobile purchase. For example, Taobao, the largest Chinese online consumer-to-consumer platform, has introduced mobile Taobao, which allows users to conduct purchase through their mobile phones. Dangdang, the largest Chinese online bookstore, has also built a site on the mobile Internet.

Compared to online purchase, mobile purchase frees users from temporal and spatial constraints. They can conveniently browse product information, place orders, and conduct payment at anytime from anywhere. This may promote their usage behavior. However, the user adoption rate of mobile purchase that represents a transaction application is much lower than that of entertainment applications such as mobile music and video. For example, only 4.9% of mobile internet users have adopted mobile purchase, whereas 46.2% of them have used mobile music [7]. Thus, it is necessary to identify the factors affecting user adoption and usage of mobile purchase.

Extant research has used information technology adoption theories such as the technology acceptance model (TAM) [46], innovation diffusion theory (IDT) [38], task technology fit (TTF) [51], and the unified theory of acceptance and use of technology (UTAUT) [43] to examine mobile user behavior. Factors including perceived usefulness, relative advantage, task technology fit, and performance expectancy are found to affect user adoption of mobile technologies. However, these factors are mainly instrumental beliefs, which represent extrinsic motivations. The effect of intrinsic motivations on mobile user behavior has seldom been considered. Extrinsic motivation emphasizes behavioral outcomes, whereas intrinsic motivation emphasizes the process itself. Prior research has pointed out the significant effect of intrinsic motivation on user behavior [10]. Thus, it is necessary to combine both perspectives of extrinsic and intrinsic motivations to examine mobile user behavior. When users conduct mobile purchase, they may not only expect to acquire what they ordered such as quality products and services but also

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expect to obtain a good experience. In this research, we measured intrinsic motivation with flow, which represents an optimal experience when conducting mobile purchase. In addition, due to the virtuality and potential opportunism, mobile purchase involves great uncertainty and risk [47]. Users need to build trust to alleviate perceived risk and facilitate their behavior. Considering its significant role, we include trust into the research model. The purpose of this research is to identify the factors affecting mobile purchase. We involve trust, flow, and perceived usefulness as mediators. Structural assurance, ubiquitous connection, and contextual offering are proposed to affect purchase intention through these three mediators.

The rest of this paper is organized as follows. We review relevant literature in the next section. Then, we develop research model and hypotheses in section three. Section four reports instrument development and data collection. Section five presents data analysis and results, followed by a discussion of these results in section six. We present theoretical and managerial implications in section seven. Section eight concludes the paper.

2 Literature review

2.1 Mobile user adoption

Mobile user adoption has received considerable attention from information systems researchers. Information technology adoption theories such as TAM, IDT, TTF, and UTAUT are often used as the theoretical bases. TAM proposes that perceived ease of use and perceived usefulness represent two main factors affecting user adoption of an information technology [9]. Due to its parsimony, TAM has been widely used to explain user adoption of various mobile services, such as mobile payment [6, 24], short message services [35], mobile internet [46], and mobile ticketing [39]. IDT proposes that five characteristics of an innovation including relative advantage, compatibility, complexity, observability, and trialability determine user adoption. Among them, relative advantage is similar to perceived usefulness, whereas complexity is similar to perceived ease of use. IDT has been employed to explain user adoption of multimedia message services [21] and mobile payment [38]. TTF notes that only when task characteristics fit technology characteristics will users adopt an information technology. TTF is used to examine user adoption of mobile insurance [29] and location-based services [23]. UTAUT suggests that performance expectancy, effort expectancy, social influence, and facilitating conditions predict user adoption. Extant research has drawn on UTAUT to explain user adoption of mobile technologies [43] and location-based services [49].

As an emerging service, mobile purchase has received attention from researchers. They used TAM, personality theory, and perceived value theory as the theoretical bases. Ko et al. [26] noted that ease of use, usefulness, enjoyment, and instant connectivity affect perceived value, which further affects mobile shopping intention. Lu and Su [34] found that usefulness, compatibility, enjoyment, and anxiety predict mobile shopping intention. Aldas-Manzano et al. [2] examined the effect of personality on user adoption of mobile shopping. Personality includes three variables: innovativeness, affinity, and compatibility. Kuo et al. [28] reported that service quality and perceived value affect satisfaction, further determining post-purchase intention of mobile value-added services.

2.2 Flow

Flow reflects a holistic sensation that people feel when they act with total involvement [8]. Hoffman and Novak [19] defined flow as a state that is characterized by: (1) a seamless sequence of responses facilitated by machine interactivity, (2) intrinsic enjoyment, (3) a loss of self-consciousness, and (4) self-reinforcement. Flow reflects a balance between challenges and users' skills [11]. When challenges exceed skills, users feel anxious. In contrast, when skills exceed challenges, users feel boredom. If both challenges and skills are below the threshold values, users feel apathy. When both challenges and skills exceed the threshold values and have a fit, users may experience flow.

Flow as an illusive concept includes multiple components: perceived enjoyment, concentration, and perceived control [20]. Perceived enjoyment reflects a user's pleasure and enjoyment. Concentration reflects a user's immersion and engrossment when using an information technology. Perceived control reflects a user's feelings of control over his or her activity and the surrounding environment. Flow has been adopted to explain user behavior in the contexts of online shopping [15, 27], instant messaging [52], e-learning [18], and online banking [15]. Recently, it has been used to examine user adoption of mobile games [16] and mobile TV [22]. A variety of factors have been identified to affect flow. For example, Hausman and Siekpe [17] noted that usefulness, informativeness, and entertainment affect online shoppers' flow. Guo and Poole [15] suggested that perceived complexity affects online shoppers' flow experience through balance of challenge and skills, goal clarity, and feedback.

2.3 Trust

Due to the virtuality, anonymity, and temporal and spatial separation, online transactions involve great uncertainty

and risk. Users need to build trust to alleviate perceived risk and facilitate their purchase behavior. Online trust has received considerable attention from researchers, and various factors associated with consumer, website, and company are found to affect user trust [5].

Similar to online transactions, mobile transactions also involve great risk. Thus, trust is also crucial to mobile transactions. Compared to the abundant research on online trust, there exists less research on mobile user trust. Siau and Shen [47] divided mobile user trust into two categories: initial trust and continuous trust. Factors related to mobile vendor and technology are proposed to affect mobile trust. Mobile user trust has been examined in the contexts of mobile payment [6], mobile banking [25, 36], and mobile transactions [31]. The determinants of mobile user trust include structural assurance, relative benefits [25], design esthetics [33], interactivity [31], and perceived reputation [6].

3 Research model and hypotheses

The research model is presented in Fig. 1. Structural assurance, ubiquitous connection, and contextual offering are included as the determinants of mobile purchase intention. Trust, flow, and perceived usefulness are proposed to mediate the effects of these determinants on purchase intention.

3.1 Structural assurance

Structural assurance means that there exist technological and legal structures to ensure purchase security. Compared to online purchase, mobile purchase involves greater risk because wireless networks are vulnerable to hacker attack and information interception. Users may worry whether their payment information such as credit card accounts and passwords can be safely transmitted and stored. Structural assurance including certification and legal structures may help alleviate users' perceived risk and build their trust. According to trust transference mechanism [44], users will transfer their trust in these technological and legal structures to mobile service providers. In addition, structural assurance may help reduce users' concern on payment security and increase their perceived control. Thus structural assurance will improve user experience. Structural assurance may also affect perceived utility as structural assurance ensures users to safely acquire their ordered products or services through mobile purchase. Extant research has revealed the effect of structural assurance on trust [6, 25] and flow [30]. Thus, we propose,

H1.1: Structural assurance positively affects trust.
H1.2: Structural assurance positively affects flow.
H1.3: Structural assurance positively affects perceived usefulness.

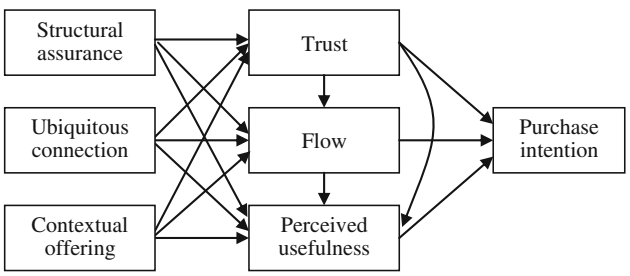

Fig. 1 Research model

3.2 Ubiquitous connection

Ubiquitous connection means that users can conduct mobile purchase at anytime from anywhere. Mobile networks and terminals have freed users from the temporal and spatial constraints and enabled them to conduct ubiquitous purchase. However, users may encounter service interruption or unavailability under some circumstances due to the unreliable network and back-end systems. Thus, providing ubiquitous services to users will demonstrate mobile service providers' ability and integrity, further affecting users' trust. Lee [31] also reported that ubiquitous connection affects user trust in mobile transactions. In addition, ubiquitous connection may affect flow experience. For example, users are browsing product information on a mobile site. If they encounter service interruption abruptly, they may feel frustrated and lack of control. This will undermine their usage experience. Ubiquitous connection may also influence perceived usefulness. If users cannot acquire ubiquitous and reliable services, they may feel that mobile purchase is useless. They probably switch back to online purchase.

H2.1: Ubiquitous connection positively affects trust.
H2.2: Ubiquitous connection positively affects flow.
H2.3: Ubiquitous connection positively affects perceived usefulness.

3.3 Contextual offering

Contextual offering means that mobile service providers can present the personalized information and services to users based on their locations. With the help of location-based services, mobile service providers can acquire users' location information [49]. Then, they can match this information with products and services and push the relevant information or services to users. This personalized service will reflect

mobile service providers' ability and benevolence, thus affecting user trust. Contextual offering may also affect users' experience as personalized services will reduce their effort spent on information search and increase their enjoyment and feelings of control. In addition, contextual offering may increase perceived utility. If mobile service providers can present the relevant product information to users based on their locations and preferences, users may feel that mobile purchase brings added value to them. This may advance their perceived utility of mobile purchase.

H3.1: Contextual offering positively affects trust.
H3.2: Contextual offering positively affects flow.
H3.3: Contextual offering positively affects perceived usefulness.

3.4 Trust, flow, and perceived usefulness

Trust reflects a willingness to be in vulnerability based on the positive expectation toward another party's future behavior [40]. Trust often includes three beliefs: ability, integrity, and benevolence. Ability means that mobile service providers have necessary knowledge and skills to fulfill their tasks. Integrity means that mobile service providers keep their promises and do not deceive users. Benevolence means that mobile service providers keep users' interests in mind, not just their own benefits. Trust will affect flow and perceived usefulness. Trust enables users to believe that mobile service providers have enough ability, integrity, and benevolence to provide a good experience to them. Trust also provides a guarantee that users will acquire their expected utility associated with mobile purchase. Extant research has revealed the effect of trust on flow [30] and perceived usefulness [13]. In addition, flow may also affect perceived usefulness. A good usage experience including perceived enjoyment may improve their evaluations on the utility of mobile purchase. Agarwal and Karahanna [1] also found that cognitive absorption (similar to flow) affects perceived usefulness of WWW. Thus, we propose,

H4: Trust positively affects flow.
H5: Flow positively affects perceived usefulness.
H6: Trust positively affects perceived usefulness.

3.5 Mobile purchase intention

Trust, flow, and perceived usefulness will facilitate users' intention to conduct mobile purchase. The effect of trust on behavioral intention has been validated in extensive literature [5]. Flow as an optimal experience also promotes behavioral intention [20]. Perceived usefulness has been found to be a variable predicting initial adoption and post-adoption [46]. Thus,

H7: Trust positively affects purchase intention.
H8: Flow positively affects purchase intention.
H9: Perceived usefulness positively affects purchase intention.

4 Method

The research model includes seven factors. Each factor was measured with multiple items. All items were adapted from extant literature to improve content validity [48]. These items were first translated into Chinese by a researcher. Then, another researcher translated them back into English to ensure consistency. When the instrument was developed, it was tested among ten users with mobile purchase experience. Then, according to their comments, we revised some items to improve the clarity and understandability. The final items and their sources are listed in "Appendix". All items were measured with a seven-Likert scale ranging from strongly disagree (1) to strongly agree (7).

Items of structural assurance were adapted from McKnight et al. [41] to reflect that there exist technological and legal structures to ensure mobile purchase security. Items of ubiquitous connection, contextual offering, trust, and purchase intention were adapted from Lee [31]. Items of ubiquitous connection reflect that users can conduct mobile purchase at anytime from anywhere. Items of contextual offering reflect that mobile sites provide the optimal information and services to users based on their location and preferences. Items of trust measure the ability, integrity, and benevolence of mobile service providers. Items of purchase intention reflect users' intention to use or continue using mobile purchase. Items of flow were adapted from Lee et al. [30] to measure the attention focus, perceived control, and enjoyment. Items of perceived usefulness were adapted from Agarwal and Karahanna [1] to reflect the living and working performance and effectiveness improvement associated with using mobile purchase.

Data were collected through an online survey. We posted messages in a few online purchase forums to invite users to participate in our survey. When they clicked the hyperlinks in the message, they were directed to the survey website. Before filling the questionnaires, they were asked to visit mobile shopping sites including Dangdang (m.dangdang.com), Jingdong (m.360buy.com), Amazon (www.amazon.cn), and Taobao (m.taobao.com). These sites represent the most popular mobile shopping sites in China. As a result, we obtained 291 responses. We scrutinized all responses and dropped those with too many missing values. Then, we got 285 valid responses. Among them, 39.3% were male and 60.7% were female. In terms of age, over half of them (54.7%) were below 20 years old.

We conducted two tests to examine the common method variance (CMV). First, we performed a Harman's single-factor test [45]. The results indicate that the largest variance explained by individual factor is 11.899%. Thus, none of the factors can explain the majority of the variance. Second, we modeled all items as the indicators of a factor representing the method effect [37] and re-estimated the model. The results indicate a poor fitness. For example, the goodness of fit index (GFI) is 0.646 (<0.90). The root mean square error of approximation (RMSEA) is 0.164 (>0.08). With both tests, we feel that CMV is not a significant problem in our research.

5 Results

Following the two-step approach recommended by Anderson and Gerbing [3], we first examined the measurement model to test reliability and validity. Then, we examined the structural model to test research hypotheses and model fitness.

First, we conducted a confirmatory factor analysis (CFA) to examine the validity. Validity includes convergent validity and discriminant validity. Convergent validity measures whether items can effectively reflect their corresponding factor, whereas discriminant validity measures whether two factors are significantly different. Table 1 lists the standardized item loadings, the average variance extracted (AVE), composite reliability (CR), and Cronbach α values. Most item loadings are larger than 0.7, and T values show that all loadings are significant at 0.001. All AVEs exceed 0.5 and all CRs exceed 0.7. Thus, the scale has a good convergent validity [4, 14]. In addition, all α values are over 0.7, showing a good reliability [42]. To examine the discriminant validity, we compared the square root of AVE and factor correlation coefficients. As listed in Table 2, for each factor, the square root of AVE is significantly larger than its correlation coefficients with other factors. Thus, the scale has good discriminant validity [12, 14].

Second, we adopted structural equation modeling (SEM) software LISREL to examine the structural model. The results are listed in Table 3. Table 4 lists some fit indices. Except GFI, other fit indices have better actual values than the recommended values. This indicates a good fitness of the research model [14]. The explained variance of trust, flow, perceived usefulness, and purchase intention is 41.7%, 42.1%, 51.6%, and 48.5%, respectively.

Table 1 Standardized item loadings, AVE, CR, and α values

Factor	Item	Standardized loading	AVE	CR	α value
Structural assurance (SA)	SA1	0.741	0.61	0.82	0.82
	SA2	0.773			
	SA3	0.820			
Ubiquitous connection (UC)	UC1	0.769	0.57	0.80	0.80
	UC2	0.815			
	UC3	0.685			
Contextual offering (CO)	CO1	0.837	0.62	0.83	0.82
	CO2	0.794			
	CO3	0.723			
Trust (TRU)	TRU1	0.771	0.71	0.88	0.87
	TRU2	0.883			
	TRU3	0.866			
Flow (FLOW)	FLOW1	0.694	0.63	0.84	0.83
	FLOW2	0.827			
	FLOW3	0.858			
Perceived usefulness (PU)	PU1	0.879	0.72	0.88	0.88
	PU2	0.877			
	PU3	0.777			
Purchase intention (PUR)	PUR1	0.756	0.66	0.85	0.85
	PUR2	0.864			
	PUR3	0.813			

Table 2 The square root of AVE (shown as bold at diagonal) and factor correlation coefficients

	SA	UC	CO	TRU	FLOW	PU	PUR
SA	**0.779**						
UC	0.515	**0.758**					
CO	0.528	0.417	**0.786**				
TRU	0.547	0.471	0.538	**0.841**			
FLOW	0.496	0.414	0.577	0.514	**0.796**		
PU	0.456	0.398	0.615	0.495	0.644	**0.846**	
PUR	0.460	0.433	0.483	0.552	0.579	0.605	**0.812**

6 Discussion

As listed in Table 3, except H1.3, H2.3, and H6, other hypotheses are supported. Both structural assurance and ubiquitous connection affect trust and flow. Contextual offering has strong effects on trust, flow, and perceived usefulness. Trust affects flow, which further affects perceived usefulness. These three factors predict mobile purchase intention.

Among the factors affecting trust, structural assurance and contextual offering have relatively larger effects. These results are consistent with previous findings [6, 25, 31]. Structural assurance represents a third-party trust mechanism. Due to the perceived uncertainty and risk involved in mobile purchase, users need to rely on these technological and legal structures to build their trust in mobile service providers. For example, users' credit card account and password information may be intercepted

Table 3 Path coefficients and their significance

Hypothesis	Path	Co-efficient	Supported or not
H1.1	Structural assurance → Trust	0.29***	Yes
H1.2	Structural assurance → Flow	0.16*	Yes
H1.3	Structural assurance → Perceived usefulness	0.03	No
H2.1	Ubiquitous connection → Trust	0.20**	Yes
H2.2	Ubiquitous connection → Flow	0.10*	Yes
H2.3	Ubiquitous connection → Perceived usefulness	0.06	No
H3.1	Contextual offering → Trust	0.30***	Yes
H3.2	Contextual offering → Flow	0.35***	Yes
H3.3	Contextual offering → Perceived usefulness	0.31***	Yes
H4	Trust → Flow	0.19*	Yes
H5	Flow → Perceived usefulness	0.38***	Yes
H6	Trust → Perceived usefulness	0.09	No
H7	Trust → Purchase intention	0.28***	Yes
H8	Flow → Purchase intention	0.24**	Yes
H9	Perceived usefulness → Purchase intention	0.32***	Yes

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

during transmission in wireless networks. Viruses and Trojan horses may also exist in mobile terminals. These security concerns will hinder user trust in mobile sites. Mobile sites can use advanced encryption and certification to engender user trust. They can also adopt relevant regulations and policy to mitigate users' perceived risk. Contextual offering means presenting personalized services to users. This demonstrates mobile service providers' ability and benevolence, thus affecting users' trust. However, mobile service providers need to acquire users' permission before they push personalized information such as location-based advertisements to users. Otherwise, users may feel that their privacy is violated [50]. This will increase their perceived risk and decrease their trust.

Contextual offering, structural assurance, and ubiquitous connection affect flow. Due to the constraints of mobile terminals such as small screens and inconvenient input, it is difficult for users to search for relevant information on the mobile internet [32]. Contextual offering can present the optimal information and services to users based on their location. This will reduce users' time and effort spent on information retrieval and increase their enjoyment and perceived control. Structural assurance will ease users' concern about purchase security and enhance their perceived control, thus improving their usage experience. Ubiquitous connection means that users can conduct purchase at anytime from anywhere. This ensures that users obtain a good experience from mobile purchase. For mobile service providers, they need to enhance their back-end systems including servers and databases to guarantee the reliable connection and services. Otherwise, if users often encounter service interruption or unavailability, they may feel a poor experience.

The results indicate that contextual offering has a significant effect on perceived usefulness. Contextual services can improve the utility derived from mobile purchase. For example, when users are in travel, mobile bookstores can recommend the books related to the tourism scene to users. This personalized service will increase users' perceived usefulness of mobile purchase. Nevertheless, mobile service providers need to improve the recommendation accuracy. Otherwise, users may lower their feelings of perceived utility. We did not find the direct effect of structural assurance and ubiquitous connection on perceived usefulness. However, both factors affect perceived usefulness through trust and flow. This indicates that trust and flow mediate the effects of both factors on perceived usefulness.

Trust affects flow, which further affects perceived usefulness. However, trust did not have a direct effect on perceived usefulness. This is contrary to previous findings [13]. The results indicate that flow fully mediates the effect of trust on perceived usefulness. Trust ensures that users can acquire a good experience, which enhances their utility associated with mobile purchase. We found that trust, flow, and perceived usefulness have significant effects on mobile purchase intention. This highlights the effects of both extrinsic and intrinsic motivations on user behavior.

Table 4 The recommended and actual values of fit indices

Fit indices	χ^2/df	GFI	AGFI	CFI	NFI	NNFI	RMSEA
Recommended value	<3	>0.90	>0.80	>0.90	>0.90	>0.90	<0.08
Actual value	2.15	0.890	0.852	0.978	0.959	0.973	0.064

χ^2/df: ratio between χ^2 and degrees of freedom; GFI: goodness of fit index; AGFI: adjusted goodness of fit index; CFI: comparative fit index; NFI: normed fit index; NNFI: non-normed fit index; RMSEA: root mean square error of approximation

7 Theoretical and managerial implications

From a theoretical perspective, this research identified the factors affecting mobile purchase intention. As noted earlier, extant research has mainly focused on the effect of extrinsic motivations such as perceived usefulness on mobile user behavior. However, the effect of intrinsic motivation on user behavior has seldom been examined. This research tries to fill the gap. We combined both perspectives of extrinsic and intrinsic motivations to examine mobile purchase intention. The results indicate that both flow as an intrinsic motivation and perceived usefulness as an extrinsic motivation have significant effects on purchase intention. This advances our understanding of mobile user behavior. In addition, flow mediates the effect of trust on perceived usefulness. This suggests that trust may not directly affect extrinsic motivation but indirectly affect extrinsic motivation through intrinsic motivation. This result needs further verification in future research. The results indicate that contextual offering has strong effects on trust, flow, and perceived usefulness. This highlights the necessity of presenting personalized services to mobile users. Future research can generalize our results to other contexts such as mobile payment and mobile community.

From a practical perspective, our results imply that mobile service providers need to consider both extrinsic and intrinsic motivations in order to facilitate user adoption of mobile purchase. They should not only improve the perceived utility of mobile purchase but also be concerned with user experience. Especially, the constraints of mobile terminals such as small screens and slow response highlight the necessity to enhance interface design in order to deliver a compelling experience to users [32]. The results indicate that contextual offering has strong effects on perceived usefulness and flow. Thus, mobile service providers can adopt location-based services to deliver the optimal information and services to users. This will improve their usage experience and perceived utility derived from mobile purchase. Besides perceived usefulness and flow, trust also has a significant effect on purchase intention. The results indicate that besides contextual offering, structural assurance and ubiquitous connection also affect user trust. This shows that mobile service providers should adopt technological and legal structures to ensure purchase security. They also need to provide reliable and ubiquitous services to users.

8 Conclusion

As en emerging service, mobile purchase has not been widely adopted by users. Drawing on trust and flow theory, this research identified the factors affecting mobile purchase intention. The results indicate that trust, flow, and perceived usefulness affect purchase intention. Contextual offering has strong effects on trust, flow, and perceived usefulness. Thus mobile service providers need to present personalized and reliable services to facilitate users' adoption and usage of mobile purchase.

This research has the following limitations. First, we conducted this research in China, where mobile commerce is developing rapidly but still in its early stage. Thus, our results need to be generalized to other countries that had developed mobile commerce. Second, the explained variance of purchase intention is about 50%. Thus, besides trust, flow, and perceived usefulness, there exist other factors possibly affecting mobile purchase, such as satisfaction and switching cost. Future research can examine their effects. Third, we mainly conducted a cross-sectional study. However, user behavior is dynamic. A longitudinal research may provide more insights on user behavior development.

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Appendix: Measurement scales and items

Structural assurance (SA) (adapted from McKnight et al. [41])

SA1: I feel confident that encryption and other technological advances on the mobile Internet make it safe for me to conduct mobile purchase.
SA2: I feel assured that legal and technological structures adequately protect me from purchase problems on the mobile Internet.
SA3: Mobile Internet is a robust and safe environment in which to conduct mobile purchase.

Ubiquitous connection (UC) (adapted from Lee [31])

UC1: I can conduct mobile purchase from anywhere.
UC2: I can conduct mobile purchase at anytime.
UC3: If needed, I can conduct mobile purchase at anytime from anywhere.

Contextual offering (CO) (adapted from Lee [31])

CO1: This mobile site provides real-time information to me.
CO2: This mobile site provides specific location information to me.
CO3: This mobile site can provide the optimal information or services to me based on my interests and location.

Trust (TRU) (adapted from Lee [31])

TRU1: This mobile site is trustworthy.
TRU2: This mobile site keeps its promise.

TRU3: This mobile site keeps customers' interests in mind.

Flow (FLOW) (adapted from Lee et al. [30])

FLOW1: When conducting mobile purchase, my attention is focused on the activity.
FLOW2: When conducting mobile purchase, I feel in control.
FLOW3: When conducting mobile purchase, I find a lot of pleasure.

Perceived usefulness (PU) (adapted from Agarwal and Karahanna [1])

PU1: Mobile purchase can improve my living and working performance.
PU2: Mobile purchase can increase my living and working effectiveness.
PU3: I feel that mobile purchase is useful.

Purchase intention (PUR) (adapted from Lee [31])

PUR 1: Given the chance, I intend to purchase from this mobile site.
PUR 2: I expect to continue purchasing from this mobile site in future.
PUR 3: I have intention to visit this mobile site to make purchase.

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