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Extending the theory of planned behavior: A study of lifestyles, contextual factors, mobile viewing habits, TV content interest, and intention to adopt mobile TV

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ABSTRACT

This study applied the theory of planned behavior (TPB) to explain the intentions of Hong Kong consumers to adopt mobile TV and their interests in its content. Using a probability sample of 644 respondents, this study not only demonstrated the robustness of TPB in explaining consumer behavior but also showed that channel deficiency, mobile viewing habits (which were moderated by perceived behavioral control), and content interest could significantly influence consumers' intentions to adopt mobile TV services. Although lifestyle types were not found a significant predictor of behavioral intention, it had strong effect on content interests in mobile TV. Limitations and practical implications are provided.

1. Introduction

In recent years, mobile viewing behavior has been affected by the sweeping popularity of smartphones and tablets, which has driven the rapid growth of mobile TV and Over-the-Top (OTT) services in many developed countries. Generally, mobile TV refers to the TV content that can be accessed on smartphones, tablets, and television sets through wireless networks (Shim et al., 2006). Because mobile TV signals are transmitted through airwaves rather than cables, subscribers are required either to download a TV application to their mobile device or to install a specialized TV set-top box that is connected to the display unit. Because they combine mobility and diverse television viewing options with the unprecedented convenience of handheld devices, the mobile TV service is believed to be the next phenomenon in global entertainment media and the telecommunication industry (e.g., Jung et al., 2009).

In the Asian mass market, mobile TV services have become popular in Japan and South Korea, and the large-scale adoption is expected to occur in mainland China (Taga et al., 2009). Although Hong Kong is a late entrant into the global mobile TV market, it has a huge potential for high subscription rates. According to Office of the Communications Authority (OFCA, 2017), of the 17.24 million mobile subscribers (a penetration rate of 234.7% as of February 2017) in Hong Kong, 15.83 million are 2.5G and 3G/4G users.

Despite the technical threshold, which could curb the mass adoption of mobile TV, many consumers in Hong Kong would be attracted to this new service because it would enable them to access many new channels. As a new form of entertainment medium, mobile TV not only delivers customized programs (e.g., Korean dramas, American reality shows, and global news)

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but also provides multiple ways of watching (e.g., at home, in transit, etc.). Its versatility, mobility, and portability have the potential to attract a large number of subscribers in Hong Kong.

1.1. Mobile TV vs. free TV in Hong Kong

Hong Kong's free TV market has been dominated by two TV stations, namely Television Broadcasts Limited (TVB) and Asia Television Limited (ATV).[1] During the golden age of television, both TVB and ATV produced many high-quality Cantonese dramas for local audiences. At the end of their workday, people would stay home to enjoy a new episode of the latest Cantonese drama. However, the duopoly of TVB and ATV restrained the vitality of the free TV market. At the time of the present study, only four terrestrial free TV channels were licensed to broadcast in Hong Kong (two in Cantonese and two in English), providing news, information, and entertainment programs to 2.5 million households. However, the insufficient number of channels and the boring content did not meet the viewing demands of local drama fans, which led to many complaints by local viewers.

In response, Hong Kong Television Network Ltd. (HKTV) applied for a terrestrial broadcast license, but it was unsuccessful. HKTV then turned to the Internet and started to provide an OTT service. Its transition received huge supports with its TV mobile application downloaded 670,000 times after one-day launch (Hawkes, 2014). In addition, the terrestrial broadcaster TVB, OTT service provider LeEco, online operator Netflix, and the sport network ASN also planned to enter the mobile TV arena. In fact, on April 18, 2016, in collaboration with 3 Hong Kong (the mobile communications division of Hutchison Telecommunications Hong Kong Holdings), TVB offered the "myTV SUPER" OTT/mobile TV service. Using a 5GB data SIM card and the high-speed, high-capacity content delivery network, the card enables mobile users to watch TVB programs from 30 thematic TV channels on mobile devices (Teoh, 2016). As a subscription based OTT/mobile TV service, myTV SUPER makes popular Hong Kong, Japanese and Korean dramas, along with classic Cantonese movies, animation, variety shows and children's program available to mobile users on the move. It is believed that the mobile TV market in Hong Kong will experience accelerated development in the near future.

1.2. Rationale for the study

Scholars in several disciplines have studied the ways in which new technologies are evaluated, adopted, and reevaluated (e.g., Ajzen, 1991; Davis, 1985; Rogers, 1995). The theory of planned behavior (TPB; Ajzen, 1991), which regards human behavior as the result of careful consideration of attitudes, the opinions of others, and available resources, has been used widely to explain the adoption of new technologies (Armitage and Conner, 1999; Sheppard et al., 1988). Skeptics, however, have refuted the TPB by arguing that human behavior is automatic or habitual (e.g., Aarts and Dijksterhuis, 2000; Bagozzi, 1981; Ouellette and Wood, 1998). They speculated that the individual's adoption of mobile TV services may result from their mobile viewing habits rather than reasoned deliberation. Thus, the present study focuses on the past behavior to test the robustness of the TPB model. Moreover, previous research has found that the factor of lifestyle affects the adoption and consumption of technology. The adoption of a new product is motivated by the need to establishing a social identity, which is mirrored in the consumer's lifestyle (e.g., Chan and Leung, 2005; Herrero et al., 2014; Leung, 1998). Previous studies have found that consumers who are innovative, motivated by achievement, and willing to experience new activities are more likely to adopt new media technologies (e.g., Li and Leung, 2014; Rogers, 1995). Accordingly, the concept of lifestyles is considered an important predictor of the adoption of mobile TV services.

Although prior research provided diverse explanations for consumers' adoption behaviors, to the best of our knowledge, no previous study has attempted to integrate lifestyles, past viewing habits, contextual factors (i.e., channel deficiency and affinity with TV drama), and the TPB to explain the adoption of mobile TV service. Thus, this exploratory study attempts to expand the scope of consumer behavior research and contribute to the extended application of the TPB.

2. Literature review

2.1. The theory of planned behavior (TPB)

Previous adoption studies approached adoption behaviors by paying close attention to individual characteristics, interpersonal factors, situational factors, and the attributes of new technologies (Rogers, 1995). It has been well documented that human behavior results from the prudent consideration of available information and motivation, from which two theoretical frameworks are derived: the theory of reasoned action (TRA) and the theory of planned behavior (TPB). In the former, attitudes and subjective norms influence behavioral intentions, and behavior is primarily shaped by attitudes (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). The theory of planned behavior (TPB), however, extends the TRA by incorporating perceived behavioral control (PBC) into the model (Ajzen, 1988, 1991).

According to PBC, people are more likely to engage in behavior that they can control. In other words, the evaluation of resources, opportunities, and specialized skills contribute to the formation of a behavioral intention. Several studies have

[1] Established as the first television service in Hong Kong, Rediffusion Television began broadcasting on 29 May 1957. ATV has been defunct since 2 April 2016.

investigated the predictive power of attitudes toward technology, perceptions of social/peer norms, and the ability to control behavioral outcomes and behavioral decisions (e.g., Armitage and Conner, 1999; Sheppard et al., 1988). Therefore, based on the TPB model (as shown in Fig. 1), the following hypotheses are stated:

H1a: Attitudes toward mobile TV are positively related to the behavioral intention to adopt mobile TV.
H1b: Subjective norms are positively related to the behavioral intention to adopt mobile TV.
H1c: PBC is positively related to the behavioral intention to adopt mobile TV.

2.2. Mobile viewing habits

According to the TPB, human social behaviors are reasoned actions based on careful consideration. This view, however, has been challenged by theorists who contend that human behavior is automatic or habitual (e.g., Aarts and Dijksterhuis, 2000; Ouellette and Wood, 1998; Ronis et al., 1989). They have argued that the current behavior, rather than being completely reasoned, is largely influenced by past behavior. For instance, in examining changes in the consumption of sweet foods, smoking, and exercise over eight months, Mullen et al. (1987) found that the prior behavior was the most powerful predictor of subsequent behaviors. Similarly, by adding measures of past behavior and PBC to the TRA, Godin et al. (1993) found that past behavior exerted an independent effect on behavioral intention, whereas PBC did not.

Several studies have conceptualized past behavior as a "habit." The repeated performance of a behavior may result in a habitual process, in which the individual will be likely to use simplified decision rules to continue the behavior (Conner and Armitage, 1998). This process could be explained by the fact that little cognitive effort is required for continued execution of a behavior (Bamberg et al., 2003). For instance, Verplanken et al. (1998) found that those who had frequently used a particular mode of transport were more likely to focus on information about habitual choices than alternatives compared to those who had enacted the behavior less frequently. Therefore, in the TPB, past behavior accounts for unique variances in intentions and present behavior, and it can function as an independent predictor of future behavior.

However, habits are considered conditioned responses to environment stimuli (Hull, 1943). Aarts et al. (1998) argued that habitual behaviors are activated by features of the situation and the context in which the behavior occurs. Therefore, only when circumstances remain relatively stable can past behavior predict a later action. In their study on the choice of travel mode, Bamberg et al. (2003) found that past behavior contributed to the choice of travel mode prior to the intervention—the introduction of a prepaid ticket—but lost its predictive power following the intervention. Furthermore, Ajzen (1991) also posited that past behavior was insufficient by arguing that PBC could play an important role in moderating the effects of past behavior on later behavior.

To examine the process by which past behavior affects TPB variables and subsequent behavior, this study incorporates a measure of past behavior in the framework of analysis and states the following hypothesis (as indicated by the thick arrow in Fig. 1):

H2: Mobile viewing habits are positively related to behavioral intention to use mobile TV, but the relationship varies according to PBC.

2.3. Lifestyles

According to Bourdieu (1984), a lifestyle consists of a system of classified and classifying practices that embody an individual's identity and values. Previous studies found that lifestyle was a predictor of media selection and use (e.g., Becker and Connor, 1981; Leung, 1998). Media consumption was found to be closely linked to not only an individual's self-image but also his/her projected "social self" (Leung, 1998). For example, Donohew et al. (1987) identified four types of lifestyles. These lifestyles had substantially different effects on the kinds of newspapers and magazines that were read and the gratifications that were sought from viewing television. Their findings showed that the focus on lifestyle provided rich insights into the nature of media consumption.

Developed by Mitchell in 1983, the values and lifestyles segmentation (VALS) model is one of the most robust and influential approaches used to examine consumer behavior. Based on Maslow's (1954) hierarchy of needs and the concept of social character (Riesman et al., 1950), in the VALS model, consumers are segmented into eight groups according to their psychological traits and demographics in order to analyze and predict their consumption choices. The eight types of consumers—innovators, thinkers, achievers, experiencers, believers, strivers, makers, and survivors—are categorized according to their primary motivations and resources. The three primary motivations for different lifestyles are ideals, achievement, and self-expression. If they are motivated by ideals, consumers are likely to value knowledge and principles; they are categorized as thinkers or believers. Those motivated by achievement are eager pursuers of products or services in order to display superiority over their peers; they are categorized as achievers or strivers. Consumers motivated by self-expression value social or physical activity, variety, and risk; they are categorized as experiencers or makers. In addition, people who do not exhibit strong motivation are categorized as survivors. Those who embrace all three primary motivations to varying degrees are categorized as innovators. Individual resources are determined by key demographics and psychological traits, such as self-confidence, innovativeness, impulsiveness, leadership, and vanity. Such resources can boost or impede consumers' expressions of their primary motivations (SRI, 2009).

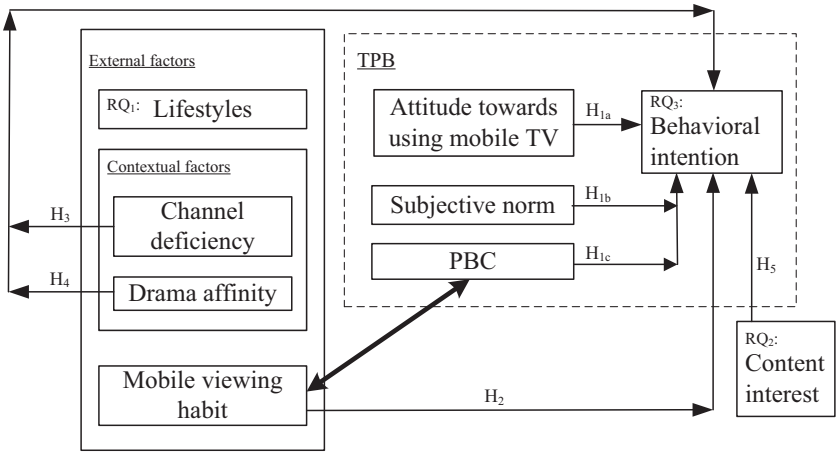

Fig. 1. Research model, hypotheses and research questions.

Previous studies that focused on the concept of values and lifestyles used VALS to examine the use of mass media, new media technology adoption, and tourism marketing (e.g., Chan and Leung, 2005). In examining the predictors of iPad adoption and intensity of iPad use in Hong Kong, Li and Leung (2014) employed the VALS approach and found that strivers had strong intentions to buy iPads, experiencers were active users of iPads, and innovators tended to use iPads for utilities, information-seeking, and interpersonal communication. Similarly, Herrero et al. (2014) used an adaptation of VALS in Spain to identify six dimensions: the search for innovation, tendencies, manual skills, intellectualism, conservatism, and leadership. Lee et al. (2009) suggested that consumer lifestyle factors (fashion consciousness, leisure orientation, Internet involvement, and e-shopping preference) are direct and indirect antecedents of consumers' intention to adopt high-tech products. Li (2013) examined the relationships between lifestyle orientations and the adoption of nine Internet-related technologies in Taiwan including IPTV, digital cable, emails, Internet instant messages, Facebook, scanners, notebooks, printers, and personal computers. The results showed that lifestyle orientations were a powerful predictor for the adoption of information-oriented and entertainment-oriented technologies.

The present study aims to identify the lifestyles of consumers in Hong Kong and to determine how lifestyle influences the intention to adopt mobile TV. But, first, the following research question is posed:

RQ1: What lifestyles similar to VALS can be identified in Hong Kong?

2.4. Contextual factors

Mobile TV is available in the mass markets of South Korea and Japan (Taga et al., 2009). A main reason is that the lifestyle of most young people in these countries is based on their need to commute (Cui et al., 2007). Consequently, they watch TV on their smartphones or tablets while using public transportation. Considering the cultural similarity of Asian countries, this unique lifestyle may also apply to workers and students in Hong Kong.

In examining mobile TV adoption in Hong Kong, two important contextual factors must be considered: channel deficiency and drama affinity. The term channel deficiency refers to the perception that the available free TV channels do not satisfy audiences' viewing demands. Specifically, deficiency refers to limited channel choices, insufficient competition, and low-quality programs. In addition, the term drama affinity refers to the emotional attachment of local viewers to Cantonese drama programs. It has been speculated that those who have high level of affinity to TV dramas (especially locally produced Cantonese dramas) are more likely to feel disconnected, bored, and disappointed when they are unable to watch it or when there are limited channels from which to choose. In Hong Kong, contextual factors are believed to play significant roles in people's behavioral intentions. Thus, the following hypotheses are stated:

H3: Channel deficiency is positively related to behavioral intention to use mobile TV.
H4: Drama affinity is positively related to behavioral intention to use mobile TV.

2.5. Mobile TV content interests

In addition to determining the predictors of the intention of adopt mobile TV, this study also examines the type of content that would be of the highest interest to consumers. Based on the content classification used in the traditional TV industry, three types of mobile TV content are identified: news and information, entertainment, and infotainment. Specifically, news and information include news and talk programs; entertainment includes dramas, movies, and reality shows; and infotain-

ment refers to sports, travel, and documentaries. A special interest in mobile TV content may motivate consumers to adopt mobile TV. Therefore, the following hypothesis is stated:

H5: The interest in mobile TV content is positively related to the behavioral intention to use mobile TV.

Because both TPB and lifestyles are predictors of people's media consumption, it is reasonable that, combined with other contextual factors, these variables affect specific content interests in mobile TV. Thus, the following research question is posed:

RQ2: To what extent do demographics, lifestyles, channel deficiency, TV drama affinity, mobile viewing habits, attitude, subjective norms, and PBC predict consumers' mobile TV content interests?

Additionally, the rationale used to predict viewing interests may also apply to predicting behavioral intentions to adopt mobile TV. To explore this underlying theoretical assumption, the following research question is posed:

RQ3: To what extent do demographics, lifestyles, channel deficiency, TV drama affinity, mobile viewing habits, attitude, subjective norms, PBC, and consumers' mobile TV content interests predict the behavioral intention to adopt mobile TV?

3. Method

3.1. Sample and sampling procedure

The data were collected from a telephone survey conducted with a probability sample of 644 respondents aged 18 years and above. The sample was randomly chosen from the most recent Hong Kong telephone directory (2013)[2] and random digit dialing technique of the last two digits was used to avoid the problem of unlisted telephone numbers using a computer-assisted telephone interviewing (CATI) system. Non-eligible respondents (i.e., those younger than 18 years), nonworking numbers, and numbers that were not answered after five attempts were excluded. The next-birthday method was used to select one respondent if more than one individual within the household met the sampling criteria. In addition, the survey instrument was pilot tested using 35 university students. Based on these pilot results, the questionnaire was revised to improve the language used, the logical flow, and the average time for completion before launching. The fieldwork was conducted in November 2014. Of the 644 completed interviews, 38.5% indicated that they sometimes, often, or very often downloaded videos to their mobile devices for later viewing. Similarly, 43.9% indicated that they sometimes, often, or very often watched streamed videos online via their smartphones or tablets. Of the sample, 48.3% was male, and the median age was between 40 and 44 years of age. The median education level was Grade 12, and the median family monthly income was US$3871–5161. The response rate was 50.1%.

3.2. Measures

3.2.1. Theory of planned behavior (TPB)

As shown in Appendix A, 15 items were used to assess the major theoretical components of TPB (Taylor and Todd, 1995), including attitude toward OTT/mobile TV, subjective norms, PBC, and behavioral intention to adopt. A seven-point Likert scale was used, where 1 = strongly disagree and 7 = strongly agree. Reliability alphas for the four variables were relatively high at 0.91, 0.94, 0.86, and 0.83, respectively.

3.2.2. Lifestyles

The well-established VALS instrument developed by SRI International was used to measure lifestyles. VALS consists of 35 items that assess different consumer segments. Because of cultural differences, some items were not applicable or did not reflect Chinese culture, values, or beliefs although Hong Kong's culture has some features in common with the west. Therefore, seven items were excluded from the final questionnaire, which contained 28 items. A four-point Likert scale was used where 1 = mostly disagree, 2 = somewhat disagree, 3 = somewhat agree, and 4 = mostly agree (see Table 1).

3.2.3. Content interest in mobile TV

Respondents were asked to indicate how interested they would be in watching eight TV genres in three content categories if they were available on OTT and mobile TV: news and information (e.g., news and talk shows; alpha = 0.75); entertainment (e.g., dramas, movies, and reality show; alpha = 0.88); and infotainment (e.g., sports, travel, and documentary; alpha = 0.81). A ten-point scale was used where 0 = not interested at all and 9 = highly interested.

[2] 2013 was the most recently published telephone directory because telephone companies stopped publishing telephone directory after 2013 in Hong Kong.

Table 1
Factor analysis of VALS.

How much do you agree with the following statements?	Factors						Mean	SD
	1	2	3	4	5	6		
Experiencers								
1. I like a lot of excitement in my life	0.82						2.27	0.97
2. I am always looking for a thrill.	0.81						2.02	0.90
3. I often crave excitement.	0.81						2.24	0.98
4. I like the challenge of doing something I have never done before.	0.65						2.49	0.94
5. I like a lot of variety in my life.	0.59						3.00	0.94
Strivers								
6. I dress more fashionably than most people.		0.78					2.10	0.79
7. I like to dress in the latest fashions.		0.73					1.76	0.81
8. I like to show off.		0.62					1.62	0.71
9. I want myself to be trendy.		0.58					2.46	0.90
Makers								
10. I like to make things with my hands.			0.82				2.60	1.02
11. I would rather make something than buy it.			0.81				2.68	1.03
12. I like making things of wood, metal, or other such material.			0.71				2.06	1.04
West-worshippers								
13. I have a sense of satisfaction when consuming imported products.				0.81			2.77	0.89
14. I often eat in fast-food restaurants such as Starbucks.				0.75			2.26	0.92
15. I prefer western arts and culture.				0.72			2.47	0.99
Thinkers								
16. I like studying art, culture, and history.					0.76		2.72	1.06
17. I am interested in theories.					0.70		2.87	1.0
18. I regard myself as an intellectual.					0.60		2.58	1.92
Innovators								
19. I am generally cautious about accepting new ideas.						0.76	1.76	0.84
20. I am aware that I am usually one of the last people in my group to accept something new.						0.70	2.58	1.04
21. I am reluctant about adopting new ways of doing things until I see them working for people around me.						0.60	2.08	1.01
Eigenvalues	3.25	2.30	2.14	2.06	1.78	1.63		
Variance explained	15.48	10.96	10.19	9.81	8.49	7.75		
Cronbach's Alpha	0.86	0.71	0.74	0.74	0.60	0.56		

Note: Scale used: 1 = Mostly disagree and 4 = Mostly agree; 62.68% variance explained; N = 644.

3.2.4. Mobile viewing habits

Two items asked respondents to indicate how often they watched (a) downloaded videos or (b) streamed videos using their mobile device (smartphone or tablet) on a five-point Likert scale where 1 = never and 5 = very often. The two items yielded an acceptable Cronbach's alpha of 0.75.

3.2.5. Channel deficiency

The respondents were asked if at the time of the study they agreed that (a) the number of free-to-air TV channels available in Hong Kong was insufficient, (b) the TV market in Hong Kong lacked competition, and (c) the quality of TV programming provided by the existing TV stations was unacceptable. A five-point Likert scale was used, where 1 = strongly disagree and 5 = strongly agree. The reliability alpha of these three items was 0.71.

3.2.6. Affinity with TV drama

The respondents were asked to suppose that TV dramas were no longer available on TV channels in Hong Kong and choose from among the following six feelings: disconnected, feeling down, bored, unfulfilled, lonesome, and disappointed. A seven-point scale was used, where 1 = very strongly and 7 = not at all. Cronbach's alpha was high at 0.94.

4. Findings

4.1. VALS in Hong Kong

A principal component factor analysis using Varimax rotation was used to examine 28 VALS items, which yielded six dimensions after the elimination of seven items that failed to cluster or cross-load to other factors. As shown in Table 1, the eigenvalue was greater than 1.0; the means, standard deviations, and the variance are explained. The six different

lifestyle types were similar to the VALS categorizations: experiencers, strivers, makers, west-worshippers, thinkers, and innovators. The reliability scores ranged from 0.56 to 0.86.

According to SRI (2009), experiencers are young, enthusiastic, self-expressive, highly resourceful, and seek variety and excitement. Strivers are trendy and fun loving, have limited resources, are strongly concerned about others' opinions, and favor stylish products that emulate the purchases of people with high material wealth. Makers are practical, constructive, and self-sufficient. They are suspicious of new ideas, and prefer value to luxury. West-worshippers refer to those who admire the western values and lifestyles and believe that consuming western products brings higher status in society. Because it is not a lifestyle in VALS, the category of west-worshippers was added to reflect the lifestyle of the people in Hong Kong. Thinkers are mature, satisfied, comfortable, and reflective individuals. They are well educated and open to new ideas, but they are conservative, practical consumers who prefer durability, functionality, and value. Innovators have abundant resources and are highly innovative. Innovators have cultivated taste, and they are successful, sophisticated, and receptive to new ideas and challenges. However, the categories of survivors, achievers, and believers did not emerge in the results probably because of cultural differences and some items might not be applicable in the Hong Kong context. In sum, the six remaining lifestyles were largely consistent with the categories defined in VALS (SRI, 2009).

4.2. Hypotheses testing

Hypotheses H1a, H1b, and H1c stated that attitudes toward mobile TV, subjective norms, and PBC, respectively, are positively related to the behavioral intention to adopt mobile TV. Presented in Table 2, the hierarchical regression results showed that after controlling for demographics, lifestyles, contextual factors, and mobile viewing habits in model 5, attitude toward mobile TV ($\beta = 0.32$, $p < 0.001$), subjective norm ($\beta = 0.34$, $p < 0.001$), and PBC ($\beta = 0.15$, $p < 0.001$) were significant predictors of the behavioral intention to adopt mobile TV. Thus, H1a, H1b, and H1c were all supported.

H2 stated that habitual mobile viewing is positively related to the behavioral intention to use mobile TV, but the relationship varied according to PBC. To test the interaction effect, an interaction term (mobile viewing habit x PBC) was added as a predictor. Presented in Table 2, the results of the hierarchical regression showed that after controlling for demographics in step 1, lifestyles in step 2, and contextual factors in step 3, mobile viewing habit ($\beta = 0.12$, $p < 0.001$) was significantly linked to the behavioral intention to use mobile TV in step 4. Combined with the TPB variables, the interaction term ($\beta = 0.05$, $p < 0.05$) in step 5 retained a significant residual effect of predicting behavioral intention to adopt mobile TV. Therefore, H2 was also supported.

H3 and H4 stated that channel deficiency and TV drama affinity, respectively, are positively related to the behavioral intention to use mobile TV. As shown in Table 2, behavioral intention to use mobile TV was first regressed on demographics in step 1, followed by lifestyles in step 2. The results showed that channel deficiency ($\beta = 0.34$, $p < 0.001$) and TV drama affinity ($\beta = 0.11$, $p < 0.001$) in step 3 retained significant residual effects on the prediction of behavioral intention to use mobile TV. Therefore, H3 and H4 were supported.

4.3. Predicting content interest in mobile TV

Similarly, three parallel regression analyses were conducted to determine the influence of demographics, lifestyles, contextual factors, mobile viewing habits, and TPB components on the interest in three different types of content on mobile TV (i.e., news and information, entertainment, and infotainment). Presented in Table 3, the results showed that respondents who indicated a high interest in news and information tended to be older ($\beta = 0.09$, $p < 0.05$), had high incomes ($\beta = 0.08$, $p < 0.01$), held positive attitudes toward mobile TV ($\beta = 0.29$, $p < 0.001$), were concerned about the opinions of others ($\beta = 0.23$, $p < 0.001$), and were confident that they would have the ability and resources to connect to the service ($\beta = 0.11$, $p < 0.01$). They also tended to be thinkers ($\beta = 0.11$, $p < 0.01$), west-worshippers ($\beta = 0.09$, $p < 0.01$), and makers ($\beta = 0.06$, $p < 0.01$) who agreed that the TV market in Hong Kong lacked competition especially free-to-air TV channels ($\beta = 0.12$, $p < 0.001$).

Respondents who expressed a high interest in entertainment on mobile TV tended to be young females ($\beta = -0.06$, $p < 0.05$) who had a strong affinity for TV drama ($\beta = 0.14$, $p < 0.001$) and felt that the choices of free TV channels in Hong Kong were inadequate ($\beta = 0.14$, $p < 0.001$). These respondents were likely to be experiencers ($\beta = 0.10$, $p < 0.001$) and strivers ($\beta = 0.10$, $p < 0.001$) who expressed positive attitudes toward mobile TV technology ($\beta = 0.26$, $p < 0.001$) and were concerned about the opinions of others regarding their adoption of mobile TV ($\beta = 0.29$, $p < 0.01$).

Respondents interested in infotainment on mobile TV were usually experiencers ($\beta = 0.15$, $p < 0.01$), west-worshippers ($\beta = 0.12$, $p < 0.001$), and thinkers ($\beta = 0.12$, $p < 0.001$) who were older ($\beta = 0.11$, $p < 0.001$) and agreed that Hong Kong TV market lacked competition ($\beta = 0.11$, $p < 0.001$). Moreover, they expressed positive attitudes toward mobile TV technology ($\beta = 0.21$, $p < 0.001$), paid high attention to other's opinions ($\beta = 0.27$, $p < 0.001$), and had sufficient resources to connect to mobile TV ($\beta = 0.08$, $p < 0.05$).

4.4. Predicting behavioral intentions to adopt mobile TV

A hierarchical regression was conducted to investigate the relative influence of demographics, lifestyles, channel deficiency, TV drama affinity, mobile viewing habits, attitudes, subjective norms, PBC, and content interest on the behavioral

Table 2
Hierarchical regression analysis explaining behavioral intention in Mobile TV with demographics controlled, theory of planned behavior variables, lifestyles, mobile viewing habits, TV drama affinity, channel deficiency, and content interests.

Predictors	Models					
	1	2	3	4	5	6
Block 1: Demographics						
Gender (M = 1)	0.15***	0.12***	0.11**	0.11**	0.06*	0.07**
Age	−0.12**	−0.05	−0.03	0.01	−0.03	0.02
Education	0.11*	0.11	0.02	0.02	0.04	0.04
Income	0.04	0.04	0.02	0.02	0.05	0.03
Block 2: Lifestyles						
Experiencer		0.24***	0.17***	0.15***	0.06*	0.02
Strivers		0.13***	0.08*	0.07*	−0.01	−0.04
Makers		0.03	0.04	0.05	−0.02	−0.04
West-worshippers		0.16***	0.11**	0.10**	0.05#	0.03
Thinkers		0.15***	0.08*	0.07*	0.01	−0.01
Innovators		−0.02	−0.01	−0.01	0.10	0.10
Block 3: Contextual factors						
Channel deficiency			0.34***	0.34***	0.12***	0.06*
TV drama affinity			0.11***	0.10**	0.02	−0.03
Block 4: Mobile viewing habits				0.12***	0.01	−0.00
Block 5: Theory of Planned Behavior Variables						
Attitude towards using mobile TV					0.32***	0.21***
Subjective norm					0.34***	0.22***
Perceived behavioral control					0.15***	0.12***
Mobile viewing habit X PBC					0.05*	0.06*
Block 6: Content interests						
News & information						0.09*
Entertainment						0.34***
Infotainment						0.02
ΔR^2	0.06**	0.10***	0.10***	0.02*	0.33***	0.07***
R^2	0.06	0.16	0.26	0.28	0.61	0.68
Adjusted R^2	0.05	0.15	0.25	0.26	0.60	0.66
F	19.22***	26.86***	25.14***	24.00***	70.13***	81.95***

Note: Figures are standardized regression coefficients. The interaction term was centered to reduce multicollinearity.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; #$p < 0.1$; N = 644.

intention to adopt mobile TV. As shown in Table 2, the final regression model found that respondents with the higher intention to adopt mobile TV tended to be males ($\beta = 0.07$, $p < 0.01$) who agreed that the free-to-air TV channels in Hong Kong were insufficient, lacked competition, and were of low quality ($\beta = 0.06$, $p < 0.05$). In general, they expressed positive attitudes toward mobile TV ($\beta = 0.21$, $p < 0.001$), were strongly concerned about friends' opinion ($\beta = 0.22$, $p < 0.001$), were confident that they had the ability and resources to connect to mobile TV ($\beta = 0.12$, $p < 0.001$), and were highly interested in the news and information ($\beta = 0.09$, $p < 0.05$) and the entertainment programs ($\beta = 0.34$, $p < 0.001$) available on mobile TV.

5. Discussion and conclusion

5.1. Lifestyle types in Hong Kong

The findings indicate that Hong Kong people could be classified into six main lifestyle types: experiencers, strivers, markers, west-worshippers, thinkers, and innovators. This classification is largely consistent with SRI's (2009) definition of lifestyles in the US. However, in the present study, because of cultural differences, the categories of believer, survivor, and achiever did not emerge. These findings can be explained by the following reasons. First, the category of believer was excluded from the questionnaire because only a small number of people in Hong Kong adhere to western religions. In fact, only 17.39% of the population comprises Catholics, Protestants, Muslims, Hindus, Sikhs, and Jewish (HKSAR Government Home Affairs Bureau, 2016). Furthermore, according to VALS, believers have low resources, are motivated by ideals, and tend to rely on their spirituality and faith for inspiration (SRI, 2009). Because Hong Kong is one of the wealthiest metropolitan cities in the world, it seems unlikely that believers would comprise a mainstream lifestyle. Furthermore, because Hong Kong people tend to accept the cultural values of countries such as the US and believe that the consumption of western products may reflect their taste and improve their social status, in lieu of believers, "west-worshippers" was included in the lifestyle measurement scale.

Second, the category of survivor did not emerge as a unique lifestyle in this study. The reason could be that because Hong Kong is an affluent society in which majority of citizens are middle class, whereas the survivor lifestyle denotes the lack of

Table 3
Regression analysis explaining content interests in mobile TV with demographics, lifestyles, contextual factors, mobile viewing habits, and TPB variables as predictors.

Predictors	Content Interests in Mobile TV		
	News & information β	Entertainment β	Infotainment β
Demographics			
Gender (M = 1)	0.02	−0.06*	0.11***
Age	0.09*	−0.16***	0.09
Education	−0.02	0.02	−0.07
Income	0.08**	0.04	0.05
Lifestyles			
Experiencers	0.06	0.10***	0.15**
Strivers	0.03	0.10***	0.04
Makers	0.06**	0.03	0.06
West-worshippers	0.09**	0.04	0.12***
Thinkers	0.11**	0.03	0.12***
Innovators	0.03	0.01	0.00
Contextual factors			
Channel deficiency	0.12***	0.14***	0.11***
TV drama affinity	−0.04	0.14***	0.01
Mobile viewing habits	−0.04	0.03	0.04
Theory of Planned Behavior Variables			
Attitude towards using mobile TV	0.29***	0.26***	0.21***
Subjective norm	0.23***	0.29**	0.27***
PBC	0.11**	0.06	0.08*
R^2	0.43	0.55	0.44
Adjusted R^2	0.42	0.54	0.43
F	29.94***	48.11***	30.96***

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; #$p < 0.06$; N = 644.

resources and motivation to use new technologies. Therefore, the lifestyle of survivors may not mirror the image of Hong Kong people. Third, a surprising finding was that the category of achievers was not a clearly identified lifestyle although it is well known that Hong Kong people are hardworking as well as peer and status conscious (Leung, 1998). A possible explanation may be that the social convention of declaring oneself as achiever is not common practice in Chinese society, and achievers typically have a "me-first" attitude, which contradicts the collectivist cultural values to which most Chinese people in Hong Kong adhere. These unexpected findings were consistent with previous studies. For example, Li and Leung (2014) examined the profile of iPad users in China and found that the lifestyle types of believers, achievers, and survivors were not identified. Similarly, Jiang and Leung (2012) examined online viewing among Chinese people and found that the lifestyles of achievers and believers did not emerge. This evidence indicates that culture plays an important role in defining lifestyles.

5.2. Factors influencing the intention to adopt mobile TV

Grounded in the TPB model, this study found that consumers' behavioral intention was significantly predicted by their attitudes toward mobile TV, perceived norms within the society, their ability (especially their technological expertise) and resources to use this new technology. Although TPB is effective in explaining consumer acceptance behavior, it is not sufficient in the study context of Hong Kong. Therefore, lifestyles, mobile viewing habits, and contextual factors were incorporated to enhance the model. Accounting for 10% of the variance in step 3, channel deficiency, together with TV drama affinity, were found to be significant predictors of behavioral intention to adopt mobile TV. This finding indicates that local audiences' intention to adopt is not only prompted by the extrinsic media environment (i.e., insufficient free-to-air TV channels) but also driven by their intrinsic emotions and feelings (i.e., affinity for TV drama viewing). Considering that TV broadcasting is a public service in Hong Kong, this finding may urge the government to reorganize the free TV market and think of other ways to fulfill the basic entertainment needs of local people. However, it was not surprising that TV drama affinity was not predictive of behavioral intention, which was indicated in the final regression model at step 6. One plausible explanation is the TPB model, which assumes that human social behaviors are reasoned and deliberate actions. In other words, whether to adopt a new technology is largely influenced by cognitive components such as attitude, subjective norm, and PBC. As an affective factor, TV drama affinity is important, but its effect was surpassed by the components of the TPB model.

In addition to contextual factors, this study also found that habitual mobile viewing was significantly related to the behavioral intention to adopt mobile TV. However, its effect was negated by the TPB variables in the final regression model. Although the adoption of mobile TV is an outcome of prudent consideration, the significant role of habit should not be

neglected as the present study found that the relationship between past and subsequent behaviors was moderated by PBC. When the respondents were confident in their ability to adopt mobile TV, their mobile viewing habits could have accentuated their future behavioral intentions. In contrast, when the respondents lacked the ability and resources necessary to acquire and use this new technology, their past behavior may not lead to later adoption behavior. This finding was consistent with Ajzen (1991), who argued that past behavior alone was inadequate to explain adoption behaviors. Thus, to increase the adoption rate, mobile TV providers should ensure that the potential consumers who have the habit of mobile viewing have little difficulty in operating the technology.

Furthermore, content interest was found to be significantly related to intention to adopt mobile TV. Specifically, audiences who exhibited greater interest in watching news and information as well as entertainment programs were more likely to show the intention to adopt mobile TV. This finding has important practical implications for mobile TV providers because it suggests that popular TV content can be used as a selling point in promoting the product.

Lastly, a surprising finding was that lifestyle types were not predictors of adoption intention. This finding was contrary to Leung and Wei's (1998) study on interactive TV (iTV) adoption, which found that consuming iTV was a means to advance the viewer's lifestyle and social identity. Such differences may partly be due to the change in the media environment in Hong Kong. In 1998, local audiences had more channels to choose from when they watched TV. At that time, iTV was viewed as a luxury technological product that could enhance social status. However, currently, because of the reduced number of television channels, mobile TV is a necessity for Hong Kong audiences.

5.3. Factors influencing content interests in mobile TV

Similar to the pattern of predicting adoption intention, three key variables in TPB emerged as the strongest predictors of content interest in mobile TV. The only exception was that PBC was not significantly related to content interest in entertainment. This insignificant relationship was because the original concept of PBC was based on Bandura's (1977) concept of perceived self-efficacy, which accounts for a major part of his social cognitive theory. People with higher levels of self-efficacy may view certain undertakings as inherently difficult, but they firmly believe that they can succeed through perseverance. Compared to entertainment content, news and information (e.g., special topics of documentaries) may require higher self-efficacy or PBC because it is cognitive content. Hence, adequate resources, opportunities, and specialized skills are needed to form a behavioral intention. Therefore, it is reasonable that the desire for entertainment content in mobile TV, which is usually passive and less cognitively intensive, may not require high levels of PBC.

In addition to the variables in the TPB model, lifestyle was also found to be a significant predictor of content interest in mobile TV. Specifically, users who were identified as makers, west-worshippers, and thinkers were more likely to watch news and information. The reason may be that thinkers value ideas and knowledge; makers view these contents as a way to learn how to protect what they perceive to be theirs; and west-worshippers want to learn about western culture, art, and fashion. In terms of entertaining TV programs, the findings indicated that experiencers and strivers were potential audiences of mobile TV. This finding is important because narrative-based programs, such as TV dramas and movies, allow viewers to experience a culturally different lifestyle. For experiencers, it is a lifestyle full of excitement and extraordinary experiences; while for strivers, it is a lifestyle that can show their superiority over others. Furthermore, the findings of the present study showed that respondents who were classified as experiencers, west-worshippers, and thinkers exhibited a higher tendency to watch sports, travel shows, and documentaries. This finding is reasonable because experiencers love physical activity; west-worshippers expect to experience a culturally different lifestyle; and thinkers prefer intellectual pursuits and enjoy historical content. These findings have important practical implications because they can help mobile TV content providers to plan personalized marketing strategies to attract different segments of audiences. Among the six identified lifestyles, it was surprising to note that innovators did not show any preference for mobile TV content. A plausible explanation is that innovators view themselves as skeptics and self-directed consumers, and they have the widest variety of interests in activities. Hence being a passive consumer of entertainment media may not be their optimal choice.

Regarding contextual factors, channel deficiency was found to be significantly related to all types of content provided by mobile TV. This finding also indicates that the current terrestrial broadcasters do not meet the basic viewing needs of local audiences. Moreover, TV drama affinity was a significant predictor of content interest in entertainment. This finding seems reasonable because the strong feeling attached to TV drama could be satisfied by watching the TV series, movies, and reality shows provided by mobile TV.

Demographically, this study also found that respondents who were older and had high family incomes exhibited higher interest in watching news and information-focused programs. Female and less educated respondents were more likely to follow TV dramas, movies, and reality shows, whereas male respondents showed a higher tendency to watch sports, travel programs, and documentaries.

5.3.1. Theoretical and practical implications

On a theoretical level, these findings underscore the value of expanding the TPB by considering the contextual factors (in particular the seriousness of channel deficiency in not having diverse programming choices in Hong Kong), the eagerness of mobile users' desire to news/information and entertainment, together with the interaction term (mobile viewing habit x PBC) and being male in explaining 66% of the variance in intention for mobile TV adoption. Although it was overpowered by the TPB in the final regression model, lifestyles also contribute significantly in explaining behavioral intention after con-

trolling for demographics. Thus, lifestyle confirms its effectiveness in explaining media adoption behavior. Furthermore, one of the primary benefits of mobile TV is its potential for incredibly high reach. With the smartphone use reaching saturation (91.8% in Hong Kong among all mobile users) among some populations, particularly young adults and students, future research should investigate how differences in lifestyles, mobile viewing habit, and content interest can predict intention to adopt mobile TV in different demographic groups.

On a practical level, the findings suggest that the operators of OTT/mobile TV should focus their attention on spreading a positive attitude toward the OTT/mobile TV technology for the opinion leaders and/or the change agents in the industry to promote this alternative choice in media consumption. Operators should also make access and operation of the service as simple and user-friendly as possible for the end-users as indicated in the component variables of the TPB. More specifically, OTT/mobile TV operators should aim at understanding how different lifestyle types are linked to content interest; this helps marketing department in designing advertising campaigns in promoting this newly introduced mobile TV subscription service. Another practical implication for mobile TV operators is to design different content types with advanced mobile TV solutions in modality, agency, interactivity, and navigability (Sundar and Limperos, 2013) to attract future mobile TV adopters in accommodating their mobile apps culture.

6. Limitations and recommendations for future research

Because this study was conducted in Hong Kong and contextual factors were incorporated in the TPB model, the external validity of the findings may be limited. The cross-sectional nature of the research design precludes assumptions of causality. To provide an accurate conclusion of causal direction, longitudinal studies and experimental designs are needed in future investigations. In addition, the participants in this study were randomly selected from a landline phone directory, which means that cell-phone-only households were neglected in the sample selection. Because there may be some differences between landline phone users and mobile phone users (e.g., mobile viewing habits), the findings of the present study may not be generalizable. Therefore, future studies should use sophisticated sampling methods (e.g., multi-stage cluster sampling or mixed sampling) to ensure the generalizability of the results. In sum, this study expands the scope of consumer behavior research and contributes to the extended application of TPB.

Appendix 1: Items for the measures for theory of planned behavior.

	Mean	SD	Alpha
Attitude toward "OTT" and Mobile TV	4.65	1.38	0.91
1. Mobile TV is a good idea.			
2. Mobile TV is a wise idea.			
3. Mobile TV can improve TV watching experience.			
4. Mobile TV will be useful.			
5. Mobile TV will be beneficial.			
Subjective Norm	3.92	1.66	0.94
6. Most people important to me think that I should watch OTT and mobile TV.			
7. Most people whose opinions I value consider that I should watch OTT and mobile TV.			
8. People who influence my behavior would approve of me if I watch OTT and mobile TV.			
Perceived Behavioral Control	4.61	1.79	0.86
9. I believe that I have the ability to connect to OTT and mobile TV when it becomes available.			
10. If I wanted to, I could easily connect to OTT and mobile TV when it becomes available.			
11. I have the resources necessary to connect to OTT and mobile TV when it becomes available.			
Behavioral intention	4.59	1.55	0.83
12. I intend to watch mobile TV when it becomes available.			
13. I will make an effort to watch mobile TV when it becomes available.			
14. It is unlikely that I will watch mobile TV when it becomes available.			
15. I will strongly recommend others to watch mobile TV when it becomes available.			

Note: Adopted from Taylor and Todd (1995), respondents were asked to indicate their level of agreement with each attribute to describe OTT and mobile TV on a seven-point scale with 1 = strongly disagree and 7 = strongly agree.

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