HOW DIFFERENT LIFESTYLES AFFECT VALUE APPRAISALS AND PURCHASE OF ICT PRODUCTS: A COMPARATIVE EMPIRICAL STUDY

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ABSTRACT

Unlike traditional information technology products mainly used in business, many new information and communication technology (ICT) products have demonstrated attributes of consumer commodities. Therefore, existing technology acceptance models (TAM) may not be sufficient to predict the usage and purchase intention of these products. To address this gap, we aim to investigate how consumer lifestyle affects consumer adoption of new ICT products. We developed a lifestyle-oriented new ICT product adoption model for consumers, to reveal how lifestyle impacts consumer evaluation of product attributes and consequently impacts their usage intention and purchase intention of new ICT products. To test our research model and hypotheses, we conducted a questionnaire survey and used structural equation modelling based on data collected from 414 respondents. Results from the empirical investigation show that consumer lifestyle affects consumer adoption of new ICT products, partially through the value preferences they form towards new ICT products along a variety of product attributes including functional attributes, symbolic attributes and cost attributes. The present study contributes to the literature regarding adoption of ICT products by fostering an understanding of the effect of consumer lifestyle on consumer adoption of new ICT products.

Keywords: Information technology adoption, Lifestyle, Functional appraisal, Cost appraisal, Symbolic appraisal

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1. Introduction

Having recognized the potentials of combining information technology and consumer insight, businesses are increasingly interested in introducing information and communication technology (ICT) products for commercial use in consumer markets following their overwhelming applications in organizational settings. Reports show that individual Americans held an average of six mobile devices, including smartphones and tablets [IDC 2012[1]], and that a total of 334.4 million smartphones were shipped worldwide in the first quarter of 2015, a rise of 16.0% from 288.3 million units in the same quarter of 2014 [IDC 2015]. These figures, along with others, point to a vast number of market opportunities that firms in the ICT industry could harness to the benefit of their bottom line. To do so, in addition to sharpening the technology weapons they have at hand for developing a technologically superior ICT product, firms would also need, among other things, an essential understanding of consumer adoption of new ICT products to ensure the successful marketing of such products in consumer markets to generate sales, revenue and thus profit.

However, knowledge about the adoption of new ICT products in the context of consumer markets is regrettably in short supply. Previous studies have put much emphasis on understanding user acceptance of information technology, primarily from the perspective of system characteristics. For example, Davis [1989] proposed the Technology Acceptance Model (TAM) to understand user acceptance of information systems and information technology. Venkatesh & Davis [2000] extended TAM to explain perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes. Venkatesh et al. [2003] further formulated and tested the Unified Theory of Acceptance and Use of Technology (UTAUT) to explain user acceptance of information technology. In general, this stream of research has contributed to and greatly enhanced our understanding of user adoption of information technology and information systems. Yet, applying TAM and its theoretical extensions to explain the adoption of new ICT products in the context of consumer markets may not suffice for the following reasons.

First, new ICT products, when introduced into consumer markets, will contain multiple product attributes which may generate value to consumers, encourage consumer adoption and effectuate transaction. In fact, consumer demands for new ICT products have become increasingly diverse and personal, requiring firms to transfer from "functional provision" to "emotional satisfaction" [Elliott & Wattanasuwan 1998], especially for smartphones [Chen et al. 2009; Kim 2008]. In addition, unlike user adoption of information technology and information systems, consumer adoption of new ICT products goes beyond usage intention to involve consumer purchase of new ICT products, making cost attributes an inevitable part of consumer ICT products. TAM-based theories, with a focus on system characteristics, could help explain the value of the information technology attribute of ICT products to consumers but hardly any other, let alone predicting consumer adoption of new ICT products.

Second, consumers may differ in the values they seek from various product attributes in a product category [Bhat & Reddy 1998; Salem Khalifa 2004; Sheth et al. 1991; Sweeney & Soutar 2001], very often owing to the lifestyle they decide to follow in order to make a statement about who they are in society and who they are not [Hogg et al. 2006], resulting in varied answers regarding whether or not to adopt an ICT product category at all. TAM-based theories, to a large extent, treat consumers as identical individuals without acknowledging their heterogeneity and are therefore limited in their power to explain how the "people" factor affects value preference and hence new ICT product adoption.

Third, consumer adoption of ICT products, in the eyes of a specific firm that supplies such products, would mean the adoption of a specific ICT product item that the firm offers to a consumer market. ICT products supplied in consumer markets may naturally hold varied technical specifications to reflect distinct market positioning efforts, which in turn is very likely to further affect, in addition to a general evaluation of what consumers pursue from the new ICT product category, their evaluation of the specific values the focal product item represents relative to its competing counterparts, and hence their adoption decision of a specific ICT product item. TAM-based theories, not taking into consideration the specificity of ICT product items, could contribute to explain the adoption of ICT products in general but are limited to some extent in their power to predict the adoption of a specific ICT product item among all new ICT products in the market.

Therefore, to further understand consumer adoption of new ICT products, it follows naturally to go beyond technology characteristics to explore how consumers heterogeneous in lifestyle respond to various new ICT product attributes to form their adoption decision of a general ICT product category and a specific ICT product item. To do so, in this paper we seek to address the research question of how consumer lifestyle affects consumer adoption of new ICT products. Specifically, we intend to answer the following two questions: (1) Will consumer lifestyle in

[1] http://www.gfk.com/pages/default.aspx

general affect consumer value preference towards new ICT product attributes and hence the subsequent adoption of an ICT product category? (2) Will consumer lifestyle affect consumer adoption of a specific ICT product item?

The remainder of this paper is organized as follows. The next section provides a literature review to establish a theoretical framework. This review is followed by the research model and hypotheses. The third section describes the research method and data collection procedure, and the fourth section reports the findings from the data analysis. Finally, the fifth section concludes the article and presents the limitations and future research directions.

2. Theoretical Background and Hypotheses

2.1. ICT Adoption Research

For over twenty years, the issue of ICT adoption has received wide research interest. In technology adoption studies, user's perception of technology products functionality is a core factor which influences usage intention and behavior. Davis [1989] presented Technology Acceptance Model (TAM) which indicated that perceived usefulness and ease of use would directly affect the attitude toward usage and actual use behavior. To overcome the limitation that TAM only focused on information system acceptance in the working environment, Venkatesh & Bala [2008] and Venkatesh & Davis [2000] further extended the TAM model to TAM2 and TAM3 models. Venkatesh et al. [2003] integrated eight models into the Unified Theory of Acceptance and Use of Technology (UTAUT) which included the main constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioral intention. Compared with previous models, the UTAUT model provided significantly better accuracy when predicting individual user acceptance of new technologies (Yu 2012; Zhou 2012). More recently, Venkatesh et al. [2012] introduced the UTAUT2 model which incorporated three constructs into the original UTAUT model: hedonic motivation, price value, and habit. Along this stream, TAM, UTAUT, and their variations have been important models even until recently [Camadan et al. 2018; Gross 2018; Kabra et al. 2017; Macedo 2017].

Extant literature on ICT adoption has focused primarily on the two aspects of "users" and "system functionality", which is robust and powerful for evaluating technologies and making comparisons between user groups of a particular technology [Joo & Sang 2013]. However, when new ICT products become consumer commodities delivering consumers multiple values with additional product attributes, functional and symbolic attributes for example, traditional ICT adoption theories with a focus on technology acceptance may not be sufficient to predict consumer usage intention and purchase intention of ICT products. We agree with other researchers who deem it highly necessary to extend technology adoption models to include additional constructs so as to better explain user behavior [Hung et al. 2003; Kim 2008; Saber Chtourou & Souiden 2010; Van Slyke et al. 2010], in particular the phenomena of consumer adoption of new ICT products [Legris et al. 2003]. To fill this gap, integrating the lens of theory of reasoned action (TRA) and introducing consumer lifestyle and product value into traditional technology adoption model, our research aims to investigate ICT adoption in the context of consumer markets, particularly in terms of the "consumer" and "value" components.

2.2. ICT Adoption in Consumer Markets

When TAM-based theories are found not to suffice to understand consumer adoption of ICT products, we trace back to where these theories originate, the theory of reasoned action (TRA), for theoretical support for the conceptualization of our research model. In fact, a number of relative theories, though not for the purpose of explaining the adoption of new ITC products in consumer markets, have been developed based on TRA to enhance the predictive accuracy of user behavior, which in a way indicates the generalizability of the theory to various contexts and thus a more generic foundation for understanding human behavior.

TRA posits that individual behavior is driven by behavioral intentions where behavioral intentions are a function of an individual's attitude toward the behavior and subjective norms surrounding the performance of the behavior. Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed. The contribution of the opinion of any given referent is weighted by the motivation that an individual must comply with the wishes of that referent. Current technology acceptance studies are still at the stage of "user-oriented" instead of "consumer-oriented", and the classification of consumer lifestyle is based on a simplified combination of multiple internal factors. According to TRA, subjective norm is an important factor determining people's behavior. In this study, therefore, we introduced two variables, namely, lifestyle [Wei 2006] and product value into TAM model to explain the ICT adoption behavior which we explain in detail in the following section. The connotation of lifestyle and product value is in line with the assumption that subjective norm determines human behavior. To be specific, people's purchase intention is influenced by the consumer lifestyle and their product value formed through the influence of external environment.

Table 1: The evolvement of the TAM and UTAUT models

Model	Reference	Collective < < < < < < < < < < < < Antecedents > > > > >> > > > > > > Individual									Moderators	Consequences	
		Social influence processes	Facilitating conditions	Cost value / price value	Usefulness / performance expectancy	Ease of use / effort expectancy	Symbolic value	Lifestyle	Habit & hedonic motivation	Cognitive instrumental processes		Intention of acceptance	Behavior of acceptance
TAM	Davis [1989]				•	•					—		•
TAM2	Venkatesh & Davis [2000]	•			•	•				•	2	•	•
TAM3	Venkatesh & Bala [2008]	•			•	•				•	2	•	•
UTAUT	Venkatesh et al. [2003]	•	•		•	•					4	•	•
UTAUT2	Venkatesh et al. [2012]	•	•	•	•	•			•		3	•	•
This study	—			•	•	•	•	•			—	•	•

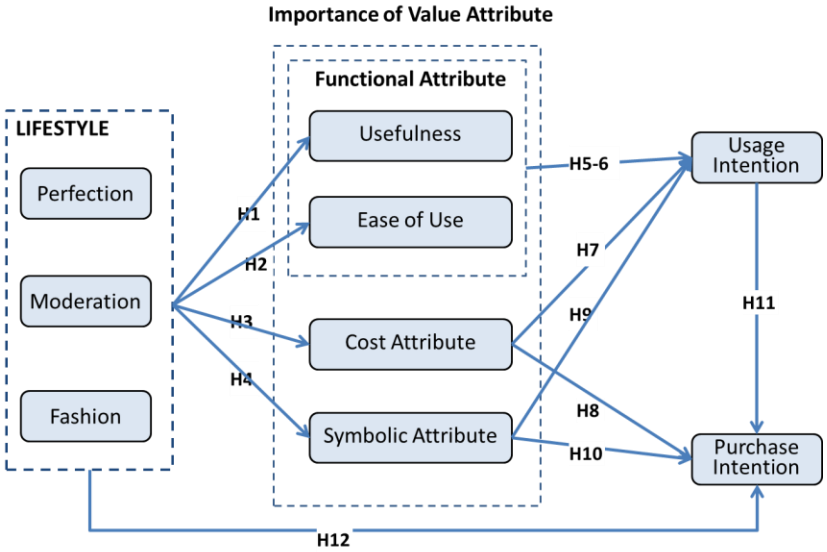

Figure 1: Conceptual Model

In line with our understanding of TRA, we expect that consumer lifestyle will influence consumer adoption of ICT products where the effect will be partially mediated by the value preferences consumers form towards new ICT products along a variety of product attributes. To build the research model for the current research, we further examine the evolvement of the TAM and UTAUT models (see Table 1). We draw a few observations from the multitude of factors that we classify as collective antecedents (e.g., social influence, facilitating conditions, etc.), individual antecedents (e.g., cognitive instrumental processes, habit & hedonic motivation, etc.), moderators, and consequences (namely intention and behavior). First, the two consequential factors, as well as the two utility-related antecedents, i.e., usefulness and ease of use, have kept nearly unchanged over the evolvement, indicating the significance of these two sets of factors in any subsequent models, and shall thus remain to be included in our model. Second, the remaining factors in Table 1, reflecting context-specific research purposes (e.g., facilitating conditions as a corporate-level attribute), have been subjected to replacement or omission when new models are developed to characterize the technology acceptance trajectory from different perspectives. Hence, following this trend of research modelling in the technology acceptance literature, for the purpose of our research, we develop our research model with consumer lifestyle as the independent variable, consumer usage intention and purchase intention as the dependent variables to measure consumer adoption of new ICT products, and consumer value preferences towards new ICT product attributes as the intermediate variables partially mediating the effect of

consumer lifestyle on consumer adoption of new ICT products (see Figure 1). We explain our conceptualization of hypotheses in detail in the following sub-sections.

2.3. Consumer Lifestyle and Value Preference towards New ICT Products

Lifestyle is a way of living or an indication of an individual's character [Sovacool & Hess 2017]. Recognizing the role of lifestyle as a distinctive model of living inclusive of behavior, interest, and opinion, Lazer [1963] claimed that consumers make different purchasing decisions according to their lifestyles. Since then, consumer lifestyle has been widely researched in terms of its measurement, antecedents and consequences. For example, Wells & Tigert [1971] developed the AIO scale (Activities, Interests, Opinions) to measure consumers' lifestyle patterns while Mitchell [1983] developed the VALS scale (Values, Attitudes and Lifestyles). Bouwman et al. [2012] examined technology acceptance in mobile communication markets and concluded that consumer lifestyle influenced their preference towards products. Krebs [2017] used Sinus-Milieus' five types of lifestyles model (post-materialist, leading, traditional, mainstream, and hedonistic) to study green electricity adoption. Leung & Chen [2017] classified Hong Kong residents into six types of lifestyles: experiencers, strivers, makers, west-worshippers, thinkers, and innovators. Li & Huang [2016] categorized lifestyles into being fashionable, life expansionist, enjoying life, preference for foreign products, and media skeptics.

In general, researchers agree that consumer lifestyle is shaped by cultural, economic, social as well as individual factors. Naturally, significant differences are reported between consumer lifestyles in China and those in western countries [Okazaki et al. 2007], and even those in the neighboring Asian countries [Park et al. 2008]. To better examine the effect of consumer lifestyle in a culture and to fit the need of a plausible empirical investigation in China following our conceptual development, we believe it is appropriate to guide our discussion to consumer lifestyle in China where we wish to conduct further empirical investigation.

To understand consumer lifestyles in China, Pan et al. [2009] developed a lifestyle scale specifically for Chinese consumers. The authors relied on literature review and expert interview to generate items and conducted a randomly sampled telephone survey to collect data. They then used both exploratory and confirmatory factor analyses to identify the defining dimensions of consumer lifestyle in China and further tested its validity in a nomological net relating consumer lifestyle to perceived value and purchasing behavior. Though the authors used a sample of smartphone users, the items used to develop the consumer lifestyle scale were not related to any particular product category, indicating that the consumer lifestyle scale is not only generic in nature but also applicable to new ICT products like smartphones. The research reported three defining dimensions of consumer lifestyle that are predictive of consumer behavior in China, which were further named fashion, perfection and moderation. The fashion dimension of consumer lifestyle is defined as consumer's attitudes, interests, and opinions that are related to the purchase of fashion products [Ko et al. 2006]. The perfection dimension of consumer lifestyle refers to people's pursuance of perfectionism, a personality trait characterized by striving for flawlessness and setting excessively high standards for performance [Bieling et al. 2004; Stoeber et al. 2007]. The moderation dimension of consumer lifestyle originates from the concept of Zhongyong or the doctrine of the mean by Confucius [Ames & Hall 2001; Sim 2007] and represents restraint, rectitude, and objectivity with the guiding principle that one should never act in excess [Legge 2009]. Consumer lifestyles in China are thus combinations of values along the three defining dimensions of fashion, perfection, and moderation.

Consumer lifestyle may affect value preferences consumers form towards new ICT products along a variety of product attributes. New ICT products, when introduced into consumer markets, often go beyond a basic raw product to contain multiple product attributes designed to facilitate sales. Acknowledging the importance of the functional attributes of usefulness and ease-of-use in TAM-related models, prior research has also reported the potential associations between functional attributes and consumer lifestyle as well as consumer adoption of high-tech products. For example, Boateng et al. [2016] discovered that consumers' lifestyle affects their perceived ease of use of online banking. Axsen et al. [2016] explicitly used functional attribute to describe lifestyle, e.g., environment- and technology-oriented lifestyles. Moreover, Lavieri et al. [2017] stated that consumers with a lifestyle of stronger technology savviness can better understand the functional reliability and superiority of a high-tech product and are subsequently more likely to form purchase intention. In addition to the widely-recognized functional attributes, marketers of new ICT products often add additional symbolic attributes and cost attributes. On one hand, symbolic attributes of products emphasize the personality traits and social representation of the individual and is one dimension of subjective norm according to the theory of reasoned action where the perception of symbolic value is largely determined by the significant others. Researchers agree that consumers not only consume commodities themselves, but also the social and cultural meanings associated with consumption [Ekinci et al. 2003; Kim et al. 2011], and that symbolic consumption refers to the consumption of products that contain symbolic values such as social expression and communication [Belk et al. 1982]. Researches like Levy [1959] and Elliott & Wattanasuwan [1998] even claim that there are two types of consumption, i.e., material consumption and symbolic consumption,

which, in a way, suggests that functional attributes and symbolic attributes are the two exclusive categories of product attributes that firms can utilize to their best advantage to deliver benefits to consumers. In fact, new ICT consumer products may contain such symbolic values as social status and lifestyles and can lead to unique consumption patterns [Pan et al. 2009; Wu & Lu 2013]. On the other hand, unlike what is presumed by traditional technology adoption models focusing on system application acceptance and usage behavior and applied in working circumstances where users do not need to purchase technology products, consumer adoption of new ICT products goes beyond usage intention to involve consumer purchase of new ICT products. Cost attributes thus become an integral part of product attributes when new ICT products are offered for consumers to purchase since firms need to name a price or a series of prices for consumers to pay in order to effectuate the exchange of these products between consumers and firms. Taken together, we argue that to facilitate sales, firms need to decide, with their design of product attributes, how much of material consumption and symbolic consumption they would like their consumers to achieve and at what costs. Therefore, they may design new ICT products to include not only functional attributes and symbolic attributes to attract consumers, but also cost attributes to effectuate transactions in consumer markets.

Yet, consumers may not consider functional attributes, symbolic attributes, and cost attributes contained in new ICT products equally important or valuable because of the lifestyle they pursue, thus forming varied value preferences towards ICT product attributes. Drawing on consumer lifestyle in China, we argue that consumers seeking high perfection in lifestyle, owning to their pursuance of perfection, may attach greater importance to functional attributes of usefulness and ease-of-use than those seeking low perfection, followed by symbolic attributes and cost attributes. Compared with those pursuing low fashion in lifestyle, consumers pursuing high fashion may feel it more valuable if new ICT products contain symbolic attributes that can directly reflect their taste in leading trends, with cutting-edge functions and high cost being the other two indirect cues. Similarly, consumers going after high moderation in lifestyle, as compared with those going after low moderation, are more likely to be practical and avoid being an extremist, attaching greater importance to practical functions [Pan et al. 2009] and reasonable price, followed by symbolic attributes as well. Taken together, we expect consumers' lifestyle to affect their value preferences toward new ICT product attributes. Specifically, we predict that consumers high along each of the three dimensions of consumer lifestyle will report higher value preference toward new ICT products along each of the three product attributes than those consumers who are low along those dimensions of lifestyle, hence the following hypotheses.

H1: *Consumer lifestyle is related to their value preference for usefulness attributes in new ICT products.*

H2: *Consumer lifestyle is related to their value preference for ease-of-use attributes in new ICT products.*

H3: *Consumer lifestyle is related to their value preference for cost attributes in new ICT products.*

H4: *Consumer lifestyle is related to their value preference for symbolic attributes in new ICT products.*

2.4. Value Preference and Consumer Adoption of New ICT Products

Consumer adoption of new ICT products shall be reflected by their decision to purchase such products, which, we argue, is likely to be affected, directly or indirectly, by the value preference they form towards new ICT products.

Past literature has demonstrated that usage intention predicts subsequent behavior under many circumstances. For example, Davis [1989] explained that usage intention affected acceptance behavior of information systems. Usage intention was typically included as the antecedent of acceptance behavior when technology acceptance was included as an independent variable [Venkatesh et al. 2003]. Evidence has also been found in scenarios that involve purchasing behavior. For example, Limayem et al. [2000] found that usage intention directly and positively influenced purchasing behavior in e-commerce. Consistent with these findings, we believe that consumer decision to purchase new ICT products is also dependent upon their intention to use such products. It is thus logical to infer that value preferences affecting consumer intention to use new ICT products shall in turn affect their subsequent decision to purchase those products. Following this logic, owing to the technical superiority new ICT products may enjoy over previous products, consumers who have higher value preference for functional attributes will tend to have greater intention to use new ICT products, and hence will be more likely to purchase them. Therefore, we expect that consumer value preference for functional attributes, usefulness attributes and ease-of-use attributes alike, will have an indirect effect on consumer decision to purchase new ICT products through their intention to use such products.

In a similar vein, consumers who attach greater importance to symbolic values are more likely to show intention to use new ICT products since the "using" of new ICT products would usually carry certain favorable social meanings to reflect who one is and who one is not in society. In addition, unlike functional attributes that consumers buy for the sole purpose of "using", sometimes the mere "possession" of new ICT products may suffice to serve the purpose of symbolize and convey the same desired social meanings, which may suggest that consumers who have higher value preference for symbolic attributes may exhibit purchase intention despite their low intention to use

them. Therefore, we expect that consumers seeking higher symbolic values are more likely to purchase new ICT products because of both an indirect influence from intention to use new ICT products and a direct influence from their value preference for symbolic attributes.

However, consumers who have higher value preference for cost attributes may have weaker intentions to use new ICT products because of the high expected cost of acquiring and maintaining new ICT products in general, particularly at its early introduction stage when demand is comparatively low and a pricing strategy of skimming is prevalent among firms for the purposes of covering high fixed cost and acquiring as much profit margin as possible per unit of sales. In addition, holding intentions to use constant, value preference for cost attributes may still affect consumer purchase decision because a higher concern for cost may increase consumer hesitation to make a deal, despite their every intention to use new ICT products, causing them to delay or abjure purchase decision. Therefore, we predict that consumers who attach greater importance to cost attributes are less likely to purchase new ICT products owning to an indirect influence from intention to use new ICT products and a direct influence from the importance they attach to cost attributes.

Taken together, we expect value preference to affect consumer adoption of new ICT products in ways that are predicted by the following hypotheses.

H5: *Consumer value preference for usefulness attributes is related to usage intention of new ICT products.*

H6: *Consumer value preference for ease-of-use attributes is related to usage intention of new ICT products.*

H7: *Consumer value preference for cost attributes is related to usage intention of new ICT products.*

H8: *Consumer value preference for cost attributes is related to purchase intention of new ICT products.*

H9: *Consumer value preference for symbolic attributes is related to usage intention of new ICT products.*

H10: *Consumer value preference for symbolic attributes is related to purchase intention of new ICT products.*

H11: *Usage intention of new ICT products is related to purchase intention of new ICT products.*

2.5. Consumer Lifestyle and Consumer Adoption of New ICT Products

As an important psychological and physiological concept, lifestyle may include such elements as appearances, habits, social relations, and values [Coreil et al. 1985] and serves as an influential factor affecting consumer behavior and decision-making process [Jih & Lee 2004]. Our discussion in the previous sub-sections mainly focuses on how consumer lifestyle may affect consumer value preference toward new ICT products and hence consumer decision to purchase. However, considering the richness of the lifestyle concept, lifestyle may also affect adoption intention and adoption behavior via other factors, e.g., aesthetics [Perry 2016], compatibilities [Al-Malkawi et al. 2016], job [Choo & Mokhtarian 2004], or trial use [Skippon et al. 2016]. We therefore believe that the effect of consumer lifestyle on purchase decision may also be attributable to factors other than value preference towards new ICT products. In other words, holding product-related evaluations constant, consumer lifestyle may still affect purchase decision. This effect, though not the purpose of our investigation, is also hypothesized as follows for the comprehensiveness of the research model.

H12: *Consumer lifestyle is related to purchase intention of new ICT products.*

3. Research Methodology

3.1. Instrument Development

A questionnaire was developed for testing the research model. The questionnaire was comprised of three parts. The first part measures consumer lifestyle, value preferences, and general intention to adopt a new ICT product category. We chose smartphones in this study as the new ICT product category because by the time our study was conducted smartphones was in its early introduction stage of product life cycle in the consumer market. The second part first briefly describes three smartphone models with product-specific information in terms of model specifications, price, and manufacturer and goes further to measure respondents' evaluation of product values (perceived value along each of the four product attributes), intention to use and willingness to purchase each model. We chose the three product models of iPhone 4S, Samsung I9003, and Huawei U8818 (see Appendix 1) as the three specific new ICT products not only because all three of them enjoyed substantial yet ordered market share, reflecting varied adoption behavior between products, but also because they displayed wide differences in terms of product specificity, which is very likely to result in varied consumer perception of product values. The third part is contributed to collect demographic data of the respondent.

We developed our questions and/or measures based on those previously used in the literature and adapted them to fit the current research scenario. In the pre-test phase, a panel of six academics, knowledgeable and experienced in designing and developing survey questionnaires, were asked to probe the questions in terms of content, wording, sequence, format, layout, and instructions, as well as the range and labelling of scales. Revisions were suggested by the panel and applied accordingly. Then, face-to-face interviews were conducted in two groups (three persons each) to understand if the content and format of questionnaire were correctly and clearly stated. Revisions were again

applied in accordance with the feedback of the two interviews. Finally, the questionnaire was pilot-tested in 2013. This resulted in collecting 80 useful responses. The collected data were then used to test the reliability, convergent validity, and discriminant validity using factor analysis. Slight adjustment was applied based on the results of the pilot test. The refined questionnaire was then used for data collection in our study. All construct measures (see Appendix 2) were anchored on 5-point Likert scales (1=strongly disagree / extremely unimportant, 5=strongly agree / extremely important). We provide measure validity and reliability in the following measurement model analysis.

3.2. Data Collection

We conducted a survey to test the research hypotheses. Before we sent our interviewers out to collect data, we trained them to make sure that they understand both the questionnaire itself and the survey procedure, minimizing potential interviewer effects. The formal large-scale survey was conducted in two major IT markets in China, one in Beijing and the other in Shanghai. Respondents were randomly selected from customers patronizing those two IT markets. It should be noted that not all customers in the two IT markets were interested in smartphones. So, our interviewers begin with a qualifier question to ask whether the customer is currently thinking about or has ever considered buying a smartphone. This allows us to ensure that suitable respondents answer the questionnaire.

Table 2：Demographic statistics of the survey (n=414)

Demographic Variables	Sample Composition		
	Items	Number of respondents	Percentage
Gender	Male	259	62.56%
	Female	155	37.44%
Age	30 and below	130	31.40%
	31 to 40	214	51.69%
	41 to 50	65	15.70%
	51 and above	5	2.21%
Education Level	Below college	119	28.74%
	Bachelor's degree	238	57.49%
	Master's degree	53	12.80%
	Doctoral degree	4	0.97%
Monthly Income	Below 2,000RMB	52	12.56%
	2,000 to 5,000RMB	228	55.07%
	5,001 to 10,000RMB	101	24.40%
	Above 10,000 RMB	33	7.97%

Overall, we collected 598 responses, of which 414 are usable. Among the 414 respondents, 259 (62.56%) are male and 155 (37.44%) female, which roughly represents the general distribution of male (58%) and female (42%) smartphone users in China in the previous year 2012.[2] Table 2 shows the profiles of respondents.

4. Data Analysis

4.1. Measurement Model Analysis

Confirmatory factor analysis (CFA) is conducted to assess convergent validity, discriminant validity, and reliability of the measurement model. The test for convergent validity is satisfactorily passed, as the average variance extracted (AVE) for all latent constructs are greater than the cut-off value of 0.50; additionally, the t-values of all indicators are above 6.45, which reveals that indicators are significant at the alpha level of 0.001 (Appendix 2). Moreover, the test for discriminant validity results in a satisfactory level, because (i) for each construct, the square root of AVE is larger than the correlations of that construct with the other constructs in the model (Table 3), and (ii) the loading of each indicator on its own latent construct is larger than any other cross loadings with other constructs [Bagozzi et al. 1991; Fornell & Larcker 1981; Johnston & Warkentin 2010]. As indicated in Table 3, the highest construct correlation is 0.318 while the lowest square root of AVE is 0.721. The second condition is also met (see Table 3). As the lowest square root of AVE among all constructs is higher than the 0.70 threshold, they are considered acceptable [Chin 1998]. Thus, the results demonstrate a satisfactory level of discriminant validity. Finally, reliability is found to be at an acceptable level. Item loadings at the 0.40 level and above are generally used in social sciences [Ford et al. 1986; Hitt et al. 1996; Jaros et al. 1993]. As Appendix 2 shows, all indicators load strongly (above 0.50) on their latent constructs [Alhidari et al. 2018]. All loadings are statistically significant. Composite reliability is greater than 0.7 for all constructs [Fornell & Larcker 1981].

[2]http://www.statista.com/statistics/467160/forecast-of-smartphone-users-in-china/

In addition, as Table 3 shows, the correlations of inter-constructs are relatively low (<0.6), indicating no undue common method bias in the data. Variance inflation factor (VIF) is also calculated to check the collinearity by following the procedure suggested by [Hair et al. 1998]. The results show that both VIFs and Full Collin. VIFs are less than 5 (see Tables 4 and 5), which demonstrates that no collinearity exists [Asher 1983; Hair et al. 1998]. Therefore, the measurement model is acceptable and the data are then used for structural model analysis.

Table 3：Discriminant validity

Construct	Lifestyle	Functional Attribute	Symbolic Attribute	Cost Attribute	Usage Intention	Purchase Intention
Lifestyle	(0.721)					
Functional Attribute	0.108	(0.725)				
Symbolic Attribute	0.198	0.196	(0.748)			
Cost Attribute	0.318	0.217	0.137	(0.784)		
Usage Intention	0.316	0.284	0.155	0.163	(1.000)	
Purchase Intention	0.108	0.246	0.106	0.116	0.313	(1.000)

Note: All correlations significant at p < 0.05 except where noted. Diagonal elements are square roots of average variance extracted.

Table 4: Variable VIFs Value

Index（VIF）	Lifestyle	Functional Attribute	Symbolic Attribute	Cost Attribute	Usage Intention
Functional Attribute	1.228				
Symbolic Attribute	1.211				
Cost Attribute	1.217				
Usage Intention	1.172	1.057	1.213	1.217	
Purchase Intention	1.125	1.011	1.161	1.148	1.145

Table 5：Full Collin. VIFs Value

Index	Lifestyle	Functional Attribute	Symbolic Attribute	Cost Attribute	Usage Intention	Purchasing Behavior
VIF	1.781	1.118	1.865	1.598	1.852	1.481

4.2. Structural Model Analysis

4.2.1. General Research Model

Although consumer lifestyle in China includes three dimensions: fashion, perfection and moderation, as discussed in Section 2.3, our main purpose of the study is to establish a general research framework to understand whether and how consumer lifestyle in general affects consumer adoption of a new ICT product category. Moreover, external validity of our study would not be compromised if we focus on the more generalizable construct itself rather than its cultural-specific dimensions. Therefore, we are more interested in the higher-order construct rather than the more specific, lower-order constructs (i.e., dimensions) in our general research. To incorporate this multidimensional construct into our analysis, we employ a hierarchical modeling approach, whereby we connect only higher-order constructs to the other factors while both the higher-order constructs and the lower-order constructs are simultaneously included in the model as latent variables. We used Warp PLS 3.0 and SPSS to analyze the data, following a two-step procedure suggested by Anderson & Gerbing [1988].

The structural model is tested by checking the overall goodness-of-fit, including APC (average path coefficient), ARS (average R-squared) and AVIF (average variance inflation factor). APC and ARS of the model are both significant (p <0.001) and AVIF is less than 5 (see Table 6), indicating the overall fit of the structural model.

Table 6：Model fit indices and P values

Index	Model
APC	APC=0.276, p<0.001
ARS	ARS=0.289, p<0.001
AVIF	AVIF=1.134, Good if < 5

The model explains 39% of the variance of usage intention, and 51% of the variance of purchase intention. Falk & Miller [1992] suggest a threshold of 33% for explained variance (i.e., R^2), thus our model demonstrates an acceptable predictability [Chin 1998]. On this basis, each individual path is examined to test our hypotheses.

Results of the path analysis (path coefficients, t-values, and R-squares) are presented in Figure 2, which indicates that all hypothesized relationships in the general research model have been significant. As expected, respondents' lifestyle in general is found to have a significant effect on their value preference for usefulness (β=0.58, p<0.001), ease of use (β=0.43, p<0.001), cost attribute (β=0.32, p<0.01), and symbolic attributes (β=0.37, p<0.01), supporting hypotheses H1, H2, H3 and H4. Consistent with hypotheses H5, H6, H7, H9, and H11, the impacts of value preferences for usefulness (β=0.43, p<0.001), ease of use (β=0.41, p<0.001), cost attributes (β=0.38, p<0.01) and symbolic attributes (β=0.33, p<0.01) on usage intention are all significant while respondents' usage intention is shown to affect their subsequent purchase intention significantly (β=0.47, p<0.001). Moreover, in support of hypotheses H8 and H10, the effects of value preferences for both cost attributes (β=0.31, p<0.01) and symbolic attributes (β=0.36, p<0.01) on purchase intention are also reported significant. Additionally, respondents' lifestyle is found to have a significant direct effect on purchase intention (β=0.37, p<0.01), supporting hypothesis H12. Finally, leaps and bound regression reveals no significant effects of the control variables on purchase intention (Appendix 3).

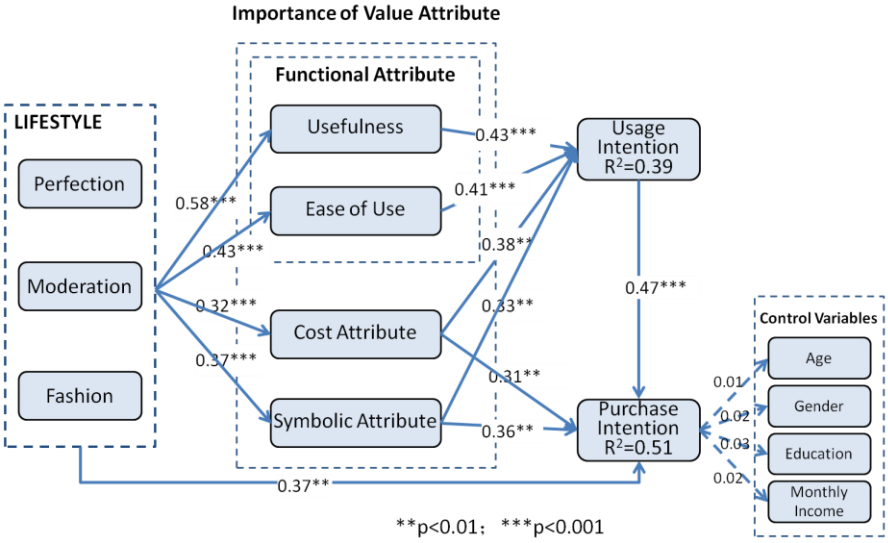

Figure 2: Results of structural modeling analysis

The above findings, therefore, support validity of our PLS model, as satisfactory levels are achieved for overall model fit and hypothesized relationships, as well as for reliability, convergent validity, discriminant validity, and R^2 for the dependent variables.

4.2.2. Comparative Models by Product

To test the predictive power of our research model at product level, two adjustments need to be made. First, although it fits our purpose to treat consumer lifestyle as a higher-order construct in our general research model to explain consumer adoption of a new ICT product category, lower-order constructs become more crucial when it comes to adoption at product level because these lower-order constructs (dimensions of consumer lifestyle) may help us understand whether consumer adoption of a specific product is sensitive to a certain dimension of lifestyle. After all, it is the responsiveness/unresponsiveness to a certain dimension of lifestyle that determines the value of consumer lifestyle to firms marketing a specific product. Second, as previously discussed, ICT products supplied in consumer markets may naturally hold varied technical specifications to reflect distinct market positioning efforts, which in turn is very likely to further affect their evaluation of the specific values the focal product item represent relative to its competing counterparts, and their subsequent adoption decision of a specific ICT product. Hence, we include in our model respondent's evaluation of how much a specific product is perceived to perform (i.e. perceived value) along each of the dimensions of value preferences. We calculate a composite index of value appraisal for each dimension by multiplying the value preference by its corresponding perceived value (Table 5), which is consistent with and similar to the treatment in multiple criteria decision making or multi-attribute utility literature where the value of each attribute is multiplied by their relative importance [Dyer et al. 1992]. Here perceived value is product dependent, and value preference (or importance) is lifestyle dependent as assessed in the general model. Prior research has shown the validity of using the multiplicative product of two components to form a joint effect factor. For example, in risk analysis research, risk is calculated by multiplying the probability of occurrence with the

cost of potential damage from the event [Baskerville 1991; Baskerville 1993]. Similarly, because user coping behavior towards loss and theft of mobile devices depends on the joint effect of his or her perceptions of the likelihood of a threat occurrence (perceived vulnerability) and its severity (perceived severity), perceived threat is also defined as the multiplication of perceived vulnerability and perceived severity [Tu et al. 2014].

We again used WarpPLS3.0 and SPSS to analyze the data. As we include in each questionnaire questions and/or measures regarding respondent's evaluation and intention toward each of the three products, the 414 valid responses allow us to conduct structural model analysis for each of the three product models.

The average path coefficient (APC), average R-squared (ARS) and average variance inflation factor (AVIF) are observed to check the goodness of fit of the structural equation models. The APC and ARS coefficients for the three models are all significant ($p<0.001$) and AVIF values are lower than 5, indicating that all three models have achieved satisfactory goodness of fit (see Table 7). In addition, in all three product-specific models, the R squared values of usage intention and purchase intention are all higher than 50%, exceeding the minimum benchmark of 33% [Falk & Miller 1992] and indicating that all three models have satisfactory explanatory power.

Table 7：Model fit indices and p values

Index	iPhone	Samsung	Huawei
APC	APC=0.247, p<0.001	APC=0.237, p<0.001	APC=0.251, p<0.001
ARS	ARS=0.696, p<0.001	ARS=0.609, p<0.001	ARS=0.642, p<0.001
AVIF	AVIF=2.625,	AVIF=2.687	AVIF=2.596

Table 8：Results for three smartphone models

	iPhone	Samsung	Huawei
To Value Attribute			
Perfection→Usefulness Appraisal	0.23*	0.23*	0.22*
Perfection→Ease of Use Appraisal	0.34***	0.32***	0.35***
Perfection→Cost Appraisal	Not Supported	Not Supported	Not Supported
Perfection→Symbolic Appraisal	0.63***	0.58***	0.61***
Moderation→Usefulness Appraisal	0.54***	0.54***	0.55***
Moderation→Ease of Use Appraisal	0.38***	0.38***	0.41***
Moderation→Cost Appraisal	0.80***	0.71***	0.71***
Moderation→Symbolic Appraisal	Not Supported	Not Supported	Not Supported
Fashion→Usefulness Appraisal	0.27*	0.18*	0.17*
Fashion→Ease of Use Appraisal	0.36***	0.39***	0.37***
Fashion→Cost Appraisal	Not Supported	Not Supported	Not Supported
Fashion→Symbolic Appraisal	0.31***	0.37*	0.40***
To Usage Intention			
Usefulness Appraisal→Usage Intention	0.38**	0.42***	0.44***
Ease of Use Appraisal→Usage Intention	0.43***	0.43***	0.43***
Cost Appraisal→Usage Intention	0.33***	0.31***	0.42***
Symbolic Appraisal→Usage Intention	0.38***	0.38***	0.36***
To Purchase Intention			
Usage Intention→Purchase Intention	0.34***	0.28**	0.28**
Perfection→Purchase Intention	0.39***	0.28**	Not Supported
Moderation→Purchase Intention	Not Supported	Not Supported	0.76***
Fashion→Purchase Intention	0.38***	0.29***	Not Supported
Cost Appraisal→Purchase Intention	Not Supported	0.42***	0.41***
Symbolic Appraisal→Purchase Intention	0.39***	0.16*	Not Supported

Results of the path analysis (path coefficients, t-values, and R-squares) for each model are presented in Figure 3 and Table 8. These results show in a nutshell that consumer lifestyle has both direct and indirect influences on consumer adoption of a specific ICT product.

Similar patterns are found across three models. Firstly, all, except three, of the hypothesized relationships between lifestyle and value appraisal have been significant across three models. The non-significant hypotheses are the relationships between perfection and cost appraisal, the one between moderation and symbolic appraisal, and the one between fashion and cost appraisal. Secondly, all hypothesized relationships between value appraisal and usage

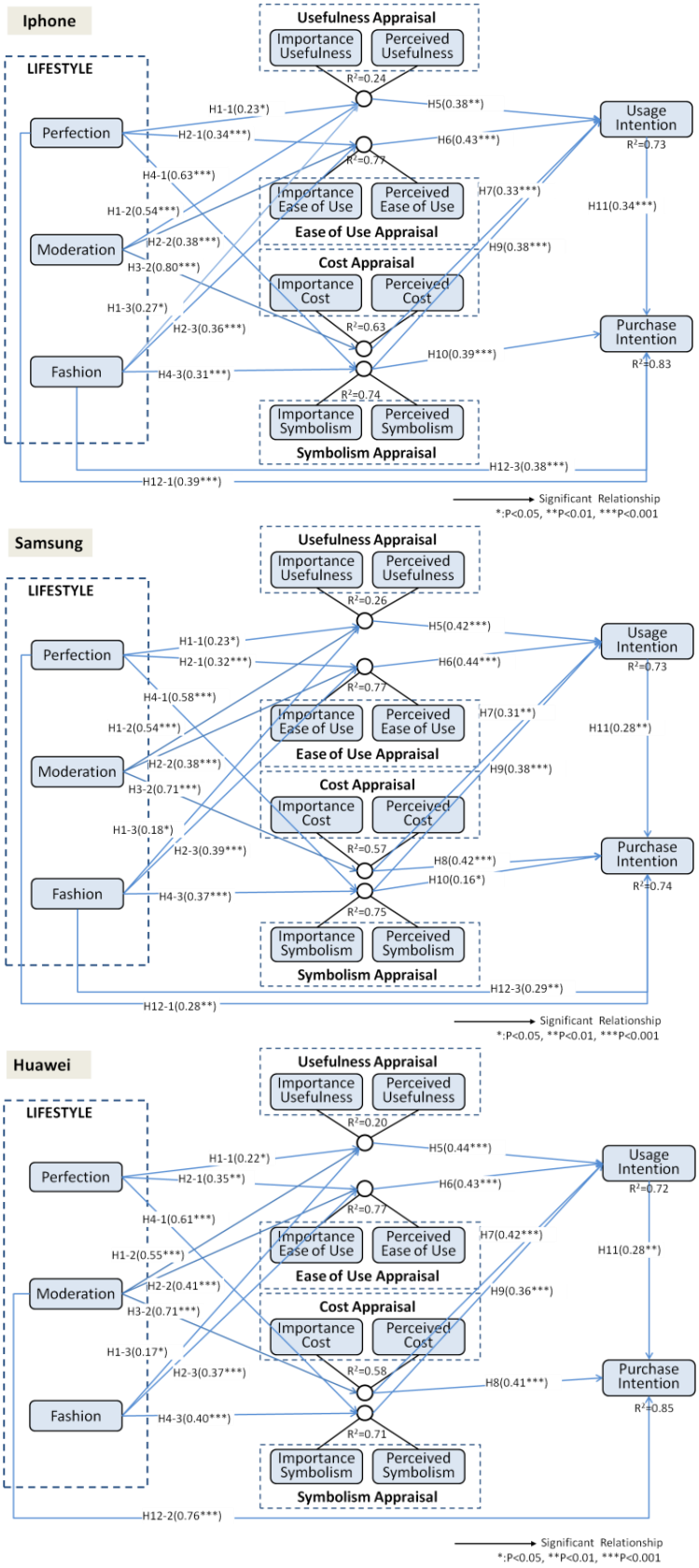

Figure 3 Comparative Models by Product

intention have been significant across three models. Thirdly, as hypothesized, the relationship between usage intention and purchase intention is also found to be significant across three models.

The results also indicate meaningful discrepancies across product-specific models. Firstly, the hypothesized direct effect between cost appraisal and purchase intention is found non-significant in the iPhone model but significant for both Samsung and Huawei, indicating that, unlike Samsung or Huawei, iPhone adoption is not directly responsive to changes in cost appraisal. Secondly, the hypothesized direct effect between symbolic appraisal and purchase intention is found significant for both iPhone and Samsung but non-significant in the Huawei model, indicating that, unlike Huawei, iPhone adoption and Samsung adoption are directly responsive to changes in symbolic appraisal. Thirdly, the hypothesized direct effects of perfection and fashion on purchase intention have been significant for iPhone and Samsung, but not for Huawei, which reveals that, unlike Huawei, iPhone adoption and Samsung adoption are sensitive to changes in the perfection and fashion dimensions of lifestyle. Finally, the hypothesized direct relationship between moderation and purchase intention has been non-significant for iPhone or Samsung but significant for Huawei, which indicates that, unlike iPhone or Samsung, Huawei adoption is sensitive to changes in the moderation dimension of lifestyle.

5. Discussion

Our research establishes a lifestyle-oriented new ICT product adoption model for consumers to reveal how lifestyle impacts consumer evaluation of product attributes and consequently impacts their usage intention and purchase intention of new ICT products, i.e. smartphones in our empirical analysis. An overview of hypothesis testing results for both the general research model and the comparative models by product are provided in Table 9. We summarize the implications of our findings for theory and practice as follows.

Table 9：Hypothesis testing results

Hypothesis	Results (General Research Model)	Results (Comparative Models by Product)		
		iPhone	Samsung	Huawei
H1	Supported	Supported	Supported	Supported
H2	Supported	Supported	Supported	Supported
H3	Supported	Partially Supported	Partially Supported	Partially Supported
H4	Supported	Partially Supported	Partially Supported	Partially Supported
H5	Supported	Supported	Supported	Supported
H6	Supported	Supported	Supported	Supported
H7	Supported	Supported	Supported	Supported
H8	Supported	Not Supported	Supported	Supported
H9	Supported	Supported	Supported	Supported
H10	Supported	Supported	Supported	Not Supported
H11	Supported	Supported	Supported	Supported
H12	Supported	Partially Supported	Partially Supported	Partially Supported

5.1. Theoretical Contributions

The present study contributes to the literature by fostering an understanding of the effect of consumer lifestyle on consumer adoption of new ICT products. First, as previous studies have put much emphasis on understanding user acceptance of information technology, primarily from the perspective of system characteristics, knowledge about the adoption of new ICT products in the context of consumer markets has been relatively scarce. In trying to fill this gap, the current study is one of the first to supply more theoretical and empirical evidences to the field of study of consumer adoption of new ICT products.

Second, our general research model hypothesizes that consumer heterogeneity in lifestyle affects consumer adoption of new ICT products both directly and indirectly. The direct and indirect effects together manage to explain a considerable proportion of variance observed in the dependent variable. Obtaining supporting results for both direct and indirect effects confirms the role of consumer lifestyle in predicting consumer adoption of ICT products, which has yet been revealed by TAM-related technology acceptance theories.

Third, our general research model also hypothesizes that consumer heterogeneity in lifestyle leads to varied value preference for functional attributes, symbolic attributes, as well as cost attributes toward new ICT products, and hence consumer usage intention and purchase intention. Obtaining supporting results linking value preference to consumer adoption of new ICT products confirms the power of Theory of Reasoned Action (TRA) in predicting individual behavior, i.e. consumer purchase intention in our study, as we build our research model based on TRA. In

addition, it also strengthens TAM-based theories by showing that both of the widely-recognized functional attributes of usefulness and ease-of-use in TAM-related models significantly affect consumer usage intention and their subsequent purchase intention. More importantly, research results in this respect also complement current ICT adoption theories and extend them into the context of consumer markets by adding symbolic attributes and cost attributes that are typical and essential in consumer markets since firms need to design new ICT products to include both functional attributes and symbolic attributes to attract consumers as well as cost attributes to effectuate transactions.

Finally, when applying our general research model to specific new ICT product items, we find enlightening results from comparative models by product. All three comparative models have achieved satisfactory model fit and explained a considerable proportion of variance observed in the dependent variable, indicating the overall predictive power of our research model at product level in addition to the previously tested category-level predictivity. Across three models, all hypothesized relationships, except for the following few, are found to be significant at product level. The non-significant hypotheses are the relationships between perfection and cost appraisal, the one between moderation and symbolic appraisal, and the one between fashion and cost appraisal. This may imply that consumers pursuing perfection and/or fashion do not differ in terms of cost appraisal while those seeking moderation in lifestyle do not differ with respect to symbolic appraisal. Comparative models have also revealed meaningful findings. For example, iPhone adoption is directly responsive to changes in symbolic appraisal and in the perfection and fashion dimensions of lifestyle while Samsung adoption is directly responsive to changes in both symbolic and cost appraisals as well as changes in the perfection and fashion dimensions of lifestyle. Huawei adoption, on the other hand, is directly responsive to changes in cost appraisal and in the moderation dimension of lifestyle. These results, taken together, supports our view that consumer adoption of a specific ICT product item is influenced by their perception of the focal product item relative to its competing counterparts, hence the difference in the effects. That being said, these comparative models further support the validity of our research model.

5.2. Managerial Implications

Our study clearly demonstrates that consumer heterogeneity in lifestyle affects consumer adoption of new ICT product categories. In general, consumer lifestyle is associated with value preferences, which in turn affects consumer adoption of a new ICT product category. Therefore, we suggest that firms could particularly benefit from developing new ICT product categories that include attributes valued by consumers of varied lifestyles, such as symbolic attributes and cost attributes, in addition to the widely-acknowledged functional attributes of usefulness and ease of use.

However, by using comparative models, our study further shows that the effect of consumer lifestyle on consumer adoption of a specific ICT product item is dependent upon their perception of the focal product item relative to its competing counterparts. On one hand, Figure 3 in particular shows that consumers pursuing perfection and/or fashion do not differ in terms of cost appraisal while those seeking moderation in lifestyle do not differ with respect to symbolic appraisal, and thus no significant effect on consumer adoption of a specific product item. On the other hand, our comparative models also reveal that adoption of a specific product item is directly responsive to changes in certain but not all dimensions of lifestyle. Recognizing the differential outcomes of consumer lifestyle dimensions on attribute appraisal and product adoption, we therefore suggest that firms exert caution and study the dimensions of consumer lifestyle carefully to benefit from harnessing lifestyle segmentation in consumer markets. After all, the very purpose of market segmentation is to divide a market into distinct groups with distinct needs, characteristics, or behavior who might require separate products or marketing mixes. Further, our study also shows that iPhone and Huawei adoptions are directly responsive to changes in symbolic appraisal and cost appraisal respectively whereas Samsung adoption is directly responsive to changes in both symbolic and cost appraisals. This means that, although functional appraisals are important to each and every lifestyle segment, firms marketing a specific new ICT product item could also differentiate their offerings along alternative combinations of symbolic and cost attributes, depending on the lifestyle segment(s) they aim to target, to induce appraisals in their favor.

5.3. Limitations and Further Research

The objective of this study was to examine how consumers heterogeneous in lifestyle respond to various new ICT product attributes to form their adoption decision of a general ICT product category and a specific ICT product item. The empirical findings of the study reveal that consumer lifestyle affects consumer adoption of new ICT product, partially through the value preferences they form towards new ICT products along a variety of product attributes including functional attributes, symbolic attributes and cost attributes.

While extensive effort has been used to address our research questions, there might remain some limitations that warrant future research attention. First, the sample of our empirical investigation is limited to consumers in China. Considering that lifestyles and value preferences may differ owing to social, cultural, and economic conditions, it is important to test our model in other social settings to confirm its generalizability. Second, this study chooses

smartphones as the new ICT product for empirical investigation. Future research may look into other ICT products in consumer markets (for example, wearable mobile devices, Chrome books from Google, or other terminals of cloud computing) to confirm the generalizability of our research model to various other consumer ICT products. Third, the focus of the study is to extend TAM model with lifestyle constructs where we integrated theory of reasoned action as the theory base for the hypotheses development. Future studies could consider factors like brand awareness and brand reputation. Besides, consumers' usage intention or purchase intention may also be influenced by friends and social norms, especially through social networks. This model could also be extended to include these factors.

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Appendix 1. Introduction of Three Smartphone Models

	Apple iPhone 4S	Samsung I9003 (Galaxy SL)	Huawei (U8818)
Picture			
Operation System	iOS 5.0	Android OS 2.2	Android OS 2.3
CPU	Apple A5(800MHz)	TI OMAP3630(1024MHz)	Qualcomm MSM7227A(1024MHz)
Memory	32GB+512MB RAM	4GB+478MB RAM	4GB ROM+512MB RAM
Screen	3.5 inch，960x640pixels	4 inch, 800x480pixels	4 inch, 480×800pixels
Battery Capacity	1420mAh	1650mAh	1350mAh
Ideal Standby Time	200 hours	750 hours	400 hours
Ideal Talk-Time	360minutes	769 minutes	400 minutes
Selling Price	5888 RMB	2450 RMB	980 RMB
Basic Functions	1, voice telephony 2, camera 3, entertainment 4, data transmission 5, business assistance	1, voice telephony 2, camera 3, entertainment 4, data transmission 5, business assistance	1, voice telephony 2, camera 3, entertainment 4, data transmission 5, business assistance
Unique Functions	Geroscope, RFID, Siri voice assistance.	Battery management, USB/Bluetooth keyboard, offline map.	Huawei input method, Huawei Widget.
Product Function	Mobile payment, GPS navigation, map, electronic compass, gravity sensors, speed sensors, light sensors, distance sensor, 3D acceleration	Map, GPS navigation, electronic compass, gravity sensors, speed sensors, distance sensor, 3D acceleration	GPS navigation, electronic compass, gravity sensors, light sensors, distance sensor, 3D acceleration
Applications	120K+ applications in APP Store, most of which are not free of charge.	140K+ Android applications, most of which are free of charge.	140K+ Android applications, most of which are free of charge.
Vendor	Apple is the largest mobile phone and computer vendor in the world, and it is also the company of highest value in global stock market. Its core business is electronic technology products. Apple has created world-famous iPod, iTunes, Mac computers and laptops, OS X operation system, iPhone, and iPad.	Samsung Electronics is the largest company in Korea. As the largest subsidiary of Samsung corporation, it has achieved favorable competitive position in global market. It has become one of the key players in global electronics product market and multimedia market.	Huawei is a leading telecom and IT solution provider in China and the world. It provides end to end solution of telecommunication networks, terminals and cloud computing and has achieved competitive advantages in such areas. Its products and solutions have been installed in over 130 countries and have served 1/3 of world population.

Appendix 2. Construct Measures

Construct	Item loading	t-Value
Lifestyle [Pan et al. 2009; Wells & Tigert, 1971]		
Perfection CR=0.961, AVE=0.883, Cronbach's α=0.932		
PS1 I am a perfectionist.	0.831	7.84***
PS2 I pursue perfection in work once I take it.	0.831	8.21***
PS3 I want a product to meet my requirements in all aspects.	0.832	8.27***
Moderation CR=0.974, AVE=0.933, Cronbach's α=0.961		
MS1 I like stable job with good welfare	0.944	6.45***
MS2 I pay much attention to the sales and discount information in shops.	0.946	7.54***
MS3 I don't like show off in public.	0.943	6.62***
Fashion CR=0.975, AVE=0.936, Cronbach's α=0.971		
FS1 Famous brand is of irresistible attraction to me.	0.863	7.91***
FS2 I pay constant attention to new product updates.	0.861	9.33***
FS3 I pay constant attention to fashion and trends.	0.854	7.87***
Functional Attribute [Davis 1989]		
Usefulness CR=0.972, AVE=0.936, Cronbach's α=0.721		
IU1 Smartphones provide me with more abundant information resources	0.812	12.17***
IU2 Smartphones can meet all sorts of information demand in my daily life.	0.785	12.24***
IU3 Using smartphones can improve my efficiency at work.	0.701	9.26***
Ease of Use CR=0.976, AVE=0.927, Cronbach's α=0.953		
IE1 Operation interfaces of smartphones are user-friendly and easy to use	0.756	16.62***
IE2 I can easily become a skilled user of smartphones.	0.697	13.75***
IE3 It's easy for me to learn to download software on smartphones.	0.537	11.27***
Cost Attribute [Luarn & Lin 2005] CR=0.964, AVE=0.898, Cronbach's α=0.935		
CA1 Cost is one of the factors that I will consider when purchasing smartphones.	0.777	7.74***
CA2 I will buy smartphones with good value for money.	0.741	9.31***
CA3 I concern about the cost related to presales and postsales services when purchasing smartphones.	0.723	8.42***
Symbolic Attribute [Zhou & Hui 2003] CR=0.957, AVE=0.909, Cronbach's α=0.936		
SA1 Different smart phones can represent distinct personalities of consumers.	0.812	7.81***
SA2 The choices of smartphones match with consumers' personalities.	0.756	9.32***
SA3 Different smartphones may change the consumers' images in other people's eyes.	0.692	8.44***

Note: 1=strongly disagree, 5= strongly agree
CR=composite reliability, AVE=average variance extracted,
*Cronbach's α=Cronbach's alpha, *** Significant at p<0.001*

Appendix 3. Leaps and Bounds Regression

In the analysis, the model included some control variables which gender and age are. In order to test the hypotheses that this research puts forward, in the process of empirical test, according to the needs of the study, the control variables are added to the initial model. Model 2 (male) and 3 (female) respectively test the influence of gender on the model. Model 4 (under 30 years old), Model 5 (30 to 40 years old), and model (over 40 years old) respectively test the influence of different ages of the model. Due to 51 years old and above account for only 0.6%, so it is classified to over 40 years old group. Leaps and bounds regression analysis result:

Assuming model to be correct

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI Rho-2
restricted model 3 （All return weight equal）	13	52.985	.000	.003	.003	.003	.002

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI Rho-2
restricted model 5 （All return weight equal）	13	18.284	.000	.001	.001	.000	.001
restricted model 6 （All return weight equal）	13	32.557	.002	.001	.002	.001	.001

According to different data in CMIN and CMIN/DF, Baseline Comparisons, RMSEA, all the indices and parameters (including CMIN/DF, NFI, RFI, IFI, TLI, CFI, RMSEA and other indicators) have no obvious change in restricted model 3 and unrestricted model 2, so restricted model 3 and unrestricted model 2 have good model fitting. From the standardized path graph and table data, restricted model 3 and unrestricted model 2 have no significant difference, which means that gender has no obvious control effect on the latent variables of value assessment to use willingness and purchase intention. The same with age restricted model analysis.

Thus, through leaps and bounds regression analysis, gender and age have no significant control influence on research model.