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**Status consumption in high tech products upgrading purchase: a study of the extended theory of planned behaviour model.**

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## **Abstract**

The smartphones' market is characterized by its fast evolving environment. In such an environment, the key concern for each company is how to continually encourage consumers to upgrade to the latest version before their existing model expires, which also highlights the importance of continual product enhancement. Consumers choose high-tech products not only for their functional values, but also for their symbolic values. This phenomenon is even more prevalent among products that tend to be conspicuously consumed. The high portability and multi-functional capabilities of smartphones make their use highly visible to users' social surroundings, and consumers may choose to upgrade their existing smartphones for the perceived symbolic values provided by newer and enhanced models. The great success of the iPhone inspired the current research to further investigate the antecedents of upgrade intention and to uncover the symbolic value that smartphones provide to consumers. Reference group conformity is not the only way to fulfill symbolic values of selected products. Consumers also have the tendency to actively express their ideal self-image through acquiring and displaying material symbols and an ideal self-image sometimes also refers to a self-image with higher social status. Building upon the Theory of Planned Behavior (Ajzen, 1991), the proposed research model also explores the possible moderating effect of status consumption on the TPB model. A survey will be administered to university students (smartphone users) to collect primary data to measure the effectiveness of the new proposed research model. The results of this study provided a better understanding of consumers' upgrading purchase intentions toward smartphones. Additionally, this study finds that status consumption is partially related to smartphone purchases, which could also be extended to other technological products categories.

## 1. INTRODUCTION

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Apple Inc. recorded 92% of the total operating income from the world's eight top smartphone makers in the first quarter 2015, and Samsung Electronics Co. only reached 15%, according to Canaccord Genuity (2015), the largest independent investment dealer in Canada. Apple and Samsung account for more than 100% of industry profits in Canaccord's calculations, because other makers broke even or lost money. However, Apple sells less than 20% of smartphones, in terms of unit sales. The disparity reflects its powerful strength to command much higher prices for its phones, but what exactly contributes to this strength remains to be explored. The market of smartphones is characterized by its fast evolving environment. For example, the release interval between every generation of iPhone is only approximately one year since October 2011 and even less than a year for Samsung's Galaxy S series since April 2011 (gsmarena, 2015).

In such an environment, the key question for each company is how to continually encourage consumers to upgrade to the latest version of their phones before their existing model expires (Okada, 2006), which also highlights the importance of continual product enhancement (Urban, Hauser, & Urban, 1993). Numerous people intended to have the new iPhone as early as possible whenever a new version was launched. The success of the iPhone can then be interpreted as Apple's strength in product enhancement and control of consumer's upgrading behavior (Grewal, Mehta, & Kardes, 2004; Kim & Srinivasan, 2009), which continually encourages consumers to upgrade from their older smartphones to a new iPhone even with a distinctively high cost.

Consumers choose the majority of products primarily for their functional values, which is realized by selected product attributes or features that also reflect the performance aspects of products (Mittal, Ratchford, & Prabhakar, 1990; Sweeney & Soutar, 2001). Consumers' upgrading decisions largely depend on improved product features (Katona, 1960; Mueller, 1958), the cost of switching from existing models to newer models (Bayus, 1988, 1991) and their experiences with earlier models. That is, consumers in an upgrading situation are always facing a first question: whether it is worth it and affordable to replace the existing products in order to gain extra functional values provided by an enhanced product. In a fast evolving context, however, consumer's final upgrading decisions maybe not solely based on enhanced features of the next product generation (Shih & Schau, 2011). Additionally, the high switching cost is normal for high-

tech products (Kim & Srinivasan, 2009) and a recent study on the upgrading behavior of mobile phones suggested that consumers' satisfaction with current products did not influence consumers upgrading intention (Tseng & Lo, 2011). Thus, apart from product features, what else may drive consumers' upgrade intentions in a fast technological evolving context, like the smartphones market, is worth investigating further.

Consumers choose branded products not only for their functional values, but also for their symbolic values (Park, Jaworski, & MacInnis, 1986; Sirgy, 1982). Corneo (2009) define symbolic value as "*personal characteristics that determine esteem the individual received from other people as well as their self-esteem*". Secord (1968) argues that "*people see their possessions as a part of or an extension of themselves*", so consumers may also gain symbolic values through the consumption and possession of products that they believe reflect their personal characteristics. Unlike the performance or functional aspects, the "personal characteristics" of products are perceived by consumers through the image of a typical product-user (Sirgy, Grewal, & Mangleburg, 2000; Sirgy & Su, 2000). Consumers distinguish different products not only through their features variability, but also through the perceived typical user image difference, which is commonly achieved through brand associations (Sirgy, 1982). However, certain products may require to be conspicuously consumed in order for consumers to gain esteem from other people (Heffetz, 2004).

The consumption related to symbolic values of branded products refers to conspicuous consumption and an expensive smartphone may very likely be consumed for both its functional and symbolic values, because its high portability and multi-functionality makes the use of smartphones more conspicuous than other high-tech product categories, such as televisions, desktop computers and even laptops. For this reason, the research on upgrading behavior in the context of upgrading high-tech products would not be conclusive without the consideration of symbolic values, especially for products that tend to be conspicuously consumed. Among existing literature on consumers' upgrading behavior, not much is known about whether consumers' desires for symbolic values for certain products will affect their intentions to upgrade and their final upgrading choices. Thus, this research aims at providing new insights to the existing literature on

upgrading behavior by studying the possible role of symbolic values among other variables on upgrade intention for enhanced high tech products.

The upgrade intention behaviour has been mainly studied for mobile phones using the Technology Acceptance Model (Huh & Kim, 2008; Tseng & Lo, 2011), by incorporating consumers' post-adoption behaviour to a model of upgrade behaviour, or by using a rational model of durables replacing decision-making model (Guiltinan, 2010). Results have not been conclusive in explaining the upgrade intention behaviour, mainly because they were limited to the consideration of innovative and basic functional usage of phones, within a rational consumer decision-making perspective. Considering that the upgrade intention behaviour for smartphones can be driven by other variables than just the functional values of the product, we choose to build our research upon the consumer behaviour model developed by Ajzen (1991), the Theory of Planned Behaviour (TPB) Model. The TPB model has been extensively used to explain behaviour in very specific and various consumption contexts and allows us to consider not only attitude towards performing a target behaviour, but also the effect of subjective norms (or perceived social pressure from society) and perceived behavioural control (or perceived ease or difficulty of performing a behaviour) on behavioural intention. The application of this model in the context of highly visible technological products can provide a different insight that seems relevant for understanding voluntary replacement or upgrade decisions that would not be solely driven by economic or functional related variables.

Furthermore, consumers have the tendency to actively express their self-image through acquiring and displaying material symbols (Gollwitzer, Wicklund, & Hilton, 1982; Sirgy, 1982). Consumers' self-expression behavior is not always raised from the tendency to show personal preference, but also from the need to reduce the inconsistency inside their self-definition or self-concept (Wicklund & Gollwitzer, 2013). That inconsistency is the difference between one's actual self-image, defined as the perception of the actual oneself (Bellenger, Steinberg, & Stanton, 1976; Green, Maheshwari, & Rao, 1969) and the ideal self-image, defined as the perception of the ideal oneself (Belch, 1978; Delozier & Tillman, 1972).

An ideal self-image sometimes also refers to a self-image with a higher social status (Sirgy et al., 2000), because one's tendency to improve social status by the consumption of certain goods has also been shown as having an important influence on consumer behaviors (Goldsmith, Flynn, & Eastman, 1996). Thus, the purchase and use of some products probably contributes to the attainment of social status and the attempts to make oneself "feel better" (Elliott, 1994; Friese & Koenig, 1993). The consumption for social status refers to status consumption, which is defined by Kilsheimer (1993) as "*the motivational process by which individuals strive to improve their social standing through the conspicuous consumption of consumer products that confer and symbolise status both for the individual and surrounding significant others*". This definition states that status consumption has some overlap with conspicuous consumption. However, O'Cass and McEwen (2004) argue that status consumption and conspicuous consumption are related but still separate constructs. Consumers' tendency to improve social status through the upgrade intention of highly visible high tech products is worth considering among other variables that can significantly influence upgrading behaviour, which to our knowledge has not been included in previous research on the subject.

This study proposes that consumers in a fast evolving high-tech environment tend to make their upgrading decision based on the perceived functional and symbolic values offered by the enhanced product, if the product itself tends to be conspicuously consumed. More specifically, the symbolic values in this context are related to consumers' potential benefit through the reference group conformity (subjective norms) and the status consumption. The adoption of an extended Theory of Planned Behavior model will allow us to test these assumptions and provide new insights to the existing explanations of upgrading behaviour mainly based on functional and rational approaches. This study is believed to be helpful in further explaining Apple's success in continually influencing consumers to upgrade their smartphones to the latest version of their iPhone, even at a distinctively high cost. Brands failing to benefit from consumers' upgrading behavior may reconsider their ability to create enough symbolic values for consumers based on the results of this research.

In the following sections of this study, section 2 presents a literature review of relevant research on upgrading behavior, the Theory of Planned Behavior model, and status consumption.

Following this, section 3 presents the proposed research model and research hypothesis. After that, section 4 focuses on the research methodology, including data collection and analyzing process. Finally, the model test results will be presented and then discussed in section 5, followed by a conclusion.

## **2. LITERATURE REVIEW**

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In this section, we present an overview of the literature on (1) consumers' upgrading behavior by focusing on identified drivers and various time of upgrading; (2) the use of well-accepted consumer behavior models (TAM and TPB) in explaining consumers' upgrading intention especially in the market of smartphones; (3) status consumption based on the understanding of consumers' self-concept; and (4) the possible moderating effect of status consumption among the constructs of the TPB model.

### **2.1 UPGRADING BEHAVIOR**

Consumers are not necessarily interested in products with longer lifetimes (Lund, 1977), and this phenomenon is even more prevalent in the context of high-tech products, which is characterized by their distinctively brief life cycle compared to other durable goods (Tseng & Lo, 2011). For example, older smartphone models are rapidly replaced by newer models with improved functions. Whenever a new version is released, consumers holding an older version of product are always facing the decision to upgrade or not. (Shih & Schau, 2011). Kim and Srinivasan (2009) defined the term upgrade as "*a consumer's second or later time purchase of an improved version of an owned product*".

In comparison to a new purchaser, the upgrader may be more knowledgeable about the product category and his or her preferences may also have evolved differently over the usage of previous generations (Tseng & Lo, 2011). Additionally, because the upgrader already has an existing product and normally the enhanced product shares the same basic functions as the earlier models (Tseng & Lo, 2011), the marginal benefit of the enhanced product will be greater for a new buyer than buyers who have an existing product (Okada, 2006). From the marketing perspective, the importance of encouraging consumers to upgrade their existing models is highlighted by the

commonly observed constraints of market saturation (Urban et al., 1993). Okada (2006) argued that:

*“In many industries, the market size typically does not expand to accommodate the proliferation of increasingly sophisticated models, so the commercial success of each generation of product enhancement depends to a large extent on current owners of the existing model who upgrade to the new model before the useful life of the existing model expires”.*

Previous literature on consumers’ upgrading behavior mainly focuses on two streams: drivers of upgrading purchases with a strong emphasis on product features (Huh & Kim, 2008; Okada, 2006; Shih & Schau, 2011) and time of upgrading purchases (Bayus, 1991; Kim & Srinivasan, 2009; Kim, Srivastava, & Han, 2001). Some researchers have been using the terms upgrading purchase and replacement purchase interchangeably without consideration of their relationships (Bayus, 1991; Kim & Srinivasan, 2009), but we argue that upgrading purchases is a distinctive part of all replacement purchases. This is due to the fact that replacement purchases can be driven by both product failure and other purely voluntary motives (Antonides, 1991). In the condition of product failure or unreliable and declining performance, consumers are granted with two options: to replace with a new and identical product or a new but improved one. Both options can be called replacement purchase behavior, but only the latter one can be regarded as an upgrading behavior. In other words, replacement purchase doesn’t have to be upgrading, but upgrading behavior is part of replacement purchase behaviors. Thus, due to the focus of this study, we tend to define the upgrading behavior as consumer’s later time purchase of an improved version of an owned product before the existing units wear out (Kim & Srinivasan, 2009), which is purely voluntary.

### **2.1.1 Drivers of upgrading**

Consumers upgrade their existing models while they are still functional for a variety of reasons. Literature on upgrading emphasize the importance of improved product features (Huh & Kim, 2008; Katona, 1960; Okada, 2006), which is the result of technology advances (Mueller, 1958). Okada (2006) further indicated that the more dissimilar the enhanced products are perceived by potential upgraders, the more likely they will finally upgrade; and focused enhancement on

selected product features is perceived as being more dissimilar than general enhancement. Hoffer and Reilly (1984) argue that consumers also upgrade due to changing fashion and style preference. For high-tech products, fashion and style are commonly reached through industrial design (Gemser & Leenders, 2001), which also depends on the technological advances in materials and manufacturing process. For example, Samsung's Galaxy S Edge series smartphones are perceived as more fashionable for having a double-side curved screen. The screen itself is the result of the advances in Organic Light-Emitting Diode (OLED) display technology, which generated a new screen material that can be curved and still remains functional. Sales promotion is also believed to have an impact on consumer's upgrading intentions through introducing new or enhanced product features to consumers (Bayus, 1991). For example, sales promotion in a retail environment is believed to have an impact on consumers' upgrading choices (Dawson, Bloch, & Ridgway, 2002), especially for those who lack sufficient knowledge about technology development (Shih & Schau, 2011). Other market surveys also indicate more specific reasons for upgrading behavior, including changed family circumstances and improved financial circumstances (Gabor & Granger, 1972; Katona & Mueller, 1955; Pickering, 1975; Wilkie & Dickson, 1985).

Consumers' experiences with earlier models also influence their desire to upgrade (Kim & Srinivasan, 2009). This is mostly due to the fact that although upgraded products normally have some innovative functions, they still share the same basic functions as older models (Tseng & Lo, 2011). For example, the evolution from mobile phones to smartphones still keeps the basic calling and texting functions. Researchers also argue that the more satisfied a consumer is with his or her current product, the more willing that consumer is to make future purchases (Caruana, Money, & Berthon, 2000; Zeithaml, 1988). Huh and Kim (2008) further highlighted that consumers who have a higher usage rate of basic functions and innovative functions of mobile phones are more likely to form the intention to upgrade. However, a subsequent study on upgrading mobile phones failed to establish any relationship between consumer's use of an older generation and the intention to purchase newer generation products (Tseng & Lo, 2011). These contradictory results indicate that: consumers' upgrading decision may not solely be based on the performance aspects or functional values of products, all the more for so products that tend to be conspicuously consumed, like mobile phones.

### **2.1.2 From functional value to symbolic value**

The performance of product features will contribute directly to the functional values (Holman, 1981) and then indirectly to symbolic values, if the product itself is to be conspicuously consumed. That is, the high performance of some product features will lead to high functional values and then gradually contribute to consumer's overall quality evaluation of the corresponding brand name, which is commonly defined as part of brand image (Dobni & Zinkhan, 1990). A positive brand image then will in turn be perceived as a guarantee of product performance. A highly recognizable brand name with a positive brand image will then be able to offer subsequent products with more positive images for possible upgrading. At this stage, it might still be the considerations of functional values that dominate consumer's upgrading choices. However, if products from certain brands can also be publically distinguished (not only from similar products of other brands, but also from older generations within the same brand) the positive product and brand images will then provide symbolic values for consumers (Heffetz, 2011). This is because brands are also perceived as communication vehicles at this stage (Holman, 1981), which enables consumers to communicate non-verbally to achieve the satisfaction of self-expression and benefit from the recognition of significant others (Belk, Bahn, & Mayer, 1982; Langer, 1997). However, other products and brands that are unable to satisfy the conditions above are more likely to be consumed solely for their functional values.

### **2.1.3 Time of upgrading**

Another stream of upgrading literature focuses on the time of upgrading, which is based on an assumption that all consumer durables will end up with being replaced by newer and enhanced models (Bayus, 1991; Shih & Schau, 2011; Venkatesh & Brown, 2001). This assumption raises two major concerns for researchers: the difference between early adopters and late adopters (Bayus, 1991); and possible reasons of upgrading delay (Venkatesh & Brown, 2001). Each time a newer and enhanced product is available on the market, consumers have to choose between staying with the current product until the next upgrade becomes available or upgrading to the latest version. (Kim & Srinivasan, 2009).

Consumers' upgrading behavior has also been shown to be part of the innovation adoption process, because new and innovative product diffusion also largely relies on potential adopters

holding older product generations. (Peres, Muller, & Mahajan, 2010). Research from this perspective revealed two major findings: the upgrade timing is largely based on new product's enhanced features and benefits relative to existing products (Danaher, Hardie, & Putsis Jr, 2001; Moreau, Lehmann, & Markman, 2001); and early adopters of one product are more likely to adopt the subsequent generations early as well (Rogers, 2010). However, Huh and Kim (2008) indicated that consumers' post-adoption usages is a better predictor than the adoption time of the previous generation. Early upgraders are also found to be associated with younger individuals and people who are more technology-sensitive (Burke, Conn, & Lutz, 1978). Bayus (1991) investigated consumers' upgrading behavior in the context of automobile purchases, the results revealed that early adopters are more concerned with styling and image, while late upgraders concerned more about cost. This result is even more valuable for our study, because both automobiles and smartphones tend to be conspicuously consumed. Thus, the style and image concern of early upgraders may due to the fact that they perceive more symbolic values than late upgraders.

Consumers' upgrading purchase are frequently delayed by their uncertainty of future technology development (Mick & Fournier, 1998), because consumers may fear that the new products they buy will soon become obsolete. This kind of fear refers to the Anticipated Regret, defined by Sandberg and Conner (2008) (IrvingJanis, 1977); Making (1977) as "*the psychological effect of various worries that beset a decision maker before any losses actually materialize*" Venkatesh and Brown (2001) also argue that consumers may delay purchases of the current best technology in favor of future technology. This phenomenon is even more prevalent in the high-tech market where it's even harder for consumers to perceive the fast pace of technology changes (Shih & Schau, 2011), due to the frequent introduction of enhanced products (Dhebar, 1996). Shih and Schau (2011) defined this frequency as the perceived rate of innovation (PRI) and concluded that "*the effect of anticipated regret will be greater under conditions of high PRI*". Another psychological barrier that may hinder upgrading is that consumers have to overcome "*the psychological costs associated with taking an existing product out of commission while it is still functional* (Okada, 2001; p.433)". However, Okada (2006) further indicated that such psychological cost will be weakened if consumers perceive that the enhanced product is dissimilar to the current model.

## 2.2 CONSUMER BEHAVIOR THEORIES AND UPGRADING BEHAVIOR

Among the existing literature on upgrading behaviors, variables that have been suggested to have an impact on either the decision to upgrade or the time of upgrading are scattered and specific without showing a tendency to form a unified construct or model. One approach was to try to understand consumers' upgrading intention and behavior by adopting an existing well-accepted consumer behavior model, such as the Technology Acceptance Model (Tseng and Lo, 2010), while some studies have focused on offering a framework for conceptualizing the upgrading decision process by integrating the potential variables suggested in previous literature with regard to upgrading (Gultinan, 2010; Huh and Kim, 2008).

The Technology Acceptance Model (TAM) measures the intention and behavior towards using a system (Davis, 1989). Perceived usefulness (defined as the extent to which a person believes that using the system will enhance his or her job performance) and perceived ease of use (defined as the extent to which a person believes that using the system will be free of effort) compose the two behavioral predictors in the TAM. According to the TAM, if consumers perceive a technology as being useful and easy to use, they will adopt that technology (Davis, 1989). Based on TAM, Tseng and Lo (2011) investigated consumer's upgrading intention from 2G mobile phones to 3G/4G mobile phones in Taiwan. Following the general rule of the TAM model, Tseng and Lo (2011) proposed that if consumers perceive a newer generation (3G/4G) as being more useful and easy to use than the current model (2G), they will have a higher intention to upgrade. However, their test results indicated that:

*“Consumers who perceived newer generation mobile phones as more useful and easier to use did not necessarily have a greater intention to upgrade in sequence. This is probably due to the fact that consumer's upgrading intention may be more closely to their perceived overall value of the product than to its ease of use or usefulness”* (Tseng and Lo, 2011; p.444).

This explanation is consistent with the fact that consumers choose products for their functional but also for their symbolic values (Park et al., 1986; Sirgy, 1982). Both ease of use and usefulness stand only for functional values of products and the overall value of products cannot be fully interpreted without the consideration on symbolic values. Thus, we argue that TAM's failure

to explain consumers' upgrading behavior is very likely due to its inability to address consumers' other concerns driven by perceived symbolic values. Moreover, TAM can be regarded as a special case of the original Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) without the consideration of subjective norms (Taylor & Todd, 1995). Additionally, TAM was established in work settings, where product's contribution to job performance is the main concern. However, multi-functional products like smartphones are used in much wider settings than job relevance activities.

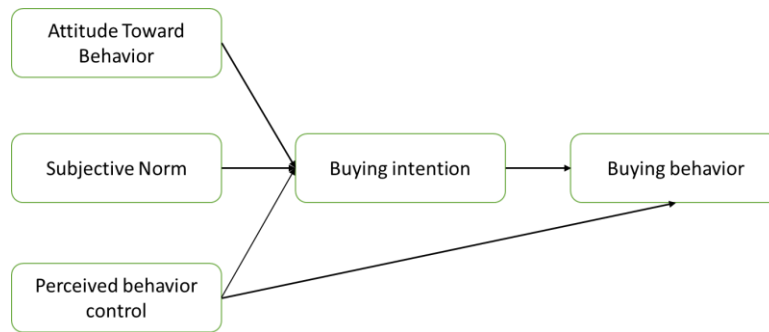
Huh and Kim (2008) suggested that consumers' post-adoption behavior also has an impact on the upgrading intention to the successive versions of innovations. In their conceptual model, Huh and Kim (2008) identify time of adoption (early adopter or late adopters of the previous generation), age, basic function usage and innovative function usage as the main variables that may influence consumers' intention to purchase next generation of products. Their model has been tested among Korean consumers with regard to their intention to purchase the next generation of multimedia phones. Their results suggest that consumers who are younger and have a higher usage rate of both basic and innovative functions are more likely to upgrade to the next generation of products. However, the adoption of early product generations is not directly linked to the purchase intention to the next generation and the relationship between adoption duration and upgrade intention is actually mediated by the users' post-adoption usage of both basic and innovative functions.

The study conducted by Gultinan (2010) proposed another conceptual framework in analyzing consumers' decision making process for product replacement or upgrading. In this framework, consumers form the concept of the net utility of product replacement by comparing the expected future benefit from the owned product and the expected future benefit from the replacement. In other words, if consumers perceived a higher future benefit of a new product than continually using the current product, they are more likely to make their decision to replace. Additionally, consumers are also believed to compare the trade-in allowance and the price of replacement in forming the final net utility of replacement. However, this decision making framework hasn't been empirically tested.

In regards to the results and the lack of explanation provided by the above models and studies, another approach needs to be considered in order to uncover the antecedents of consumer upgrading intention behaviour. Within the existing and established models, the Theory of Planned Behavior developed by Ajzen (1991) has been widely used in a variety of consumption contexts. The prediction power of Theory of Planned Behavior (TPB) has also already been supported in the high-tech environment. For example, Harrison, Mykytyn Jr, and Riemenschneider (1997) used the TPB model to explain and predict small business executives' decisions to adopt information technology (IT). Their conclusion confirmed the influence of attitude (perceived positive and negative consequences for the firm), subjective norms (social expectations), and perceived behavioral control (resources to overcome obstacles) on IT adoption in the decision process of executives. Shih and Fang (2004) adopted the TPB model to understand how an individual's belief, attitude, subjective norm and perceived behavioral control (PBC) can influence the intention to use internet banking in Taiwan. Using structural equation modeling, they found that the Attitude significantly influences the intention to adopt internet banking, however, Subjective Norm and PBC did not. They also confirmed the influence of behavioral intention on actual use of internet banking. Pavlou and Fygenson (2006) adopted the TPB model to study both the intention to gain information and the intention to purchase through e-commerce. In their statistical analysis, both attitude and perceived behavior control significantly influenced both the intention to gain information and purchase through e-commerce. Subjective norms, however, hardly had an impact on the intention to gain information and purchase. This is probably due to the fact that the behaviour of purchasing through e-commerce is less conspicuous than traditional ways of purchasing.

We choose to build our research upon the Theory of Planned Behavior (TPB) model (Ajzen, 1991) considering its predictive power of consumer intention and behaviour, and thus its potential significant explanation of smart phones upgrade behaviour. Moreover, this model allows us to consider the influence of subjective norm which relates to non-functional values and may provide an additional explanation to the upgrading behavior: consumers may intend to demonstrate membership to significant reference groups which will probably result in behaving as what the majority of such groups expected. Thus, subjective norm may reflect consumers' concerns for symbolic values of upgrading through reference group conformity (Bearden & Etzel, 1982). The

Theory of Planned Behavior (Ajzen, 1991) is also an extension of the TRA (Fishbein & Ajzen, 1975) made necessary by the original model's limitations in dealing with behaviors over which people have incomplete control. The TPB model includes thus the Perceived Behavior Control, which in the case of smartphone upgrading behaviour could have a significant influence. The TPB model includes the following constructs that affect the intention to buy and the actual buying behavior: Attitude toward the behavior, subjective norms and perceived behavior control, as presented below (figure 1 and table 1):



**Figure 1:** The Theory of Planned Behavior (Ajzen, 1991)

<b>Constructs</b>	<b>Definition</b>
Attitude toward the behavior (A)	An individual's positive or negative feelings (evaluative effect) about performing the target behavior. (Adapted from TRA)
Subjective Norm (SN)	The person's perception that most people who are important to him think he should or should not perform the behavior in question. (Adapted from TRA)
Perceived Behavioral Control (PBC)	The perceived ease or difficulty of performing the behavior.
Behavioral intention (BI)	The individual's intention to perform a given behavior.
Behavior (B)	The actual behavior performed.

**Table 1:** Constructs of TPB model

According to the TPB model, the behavior (1) is a weighted function of behavioral intention and perceived behavior control; the behavioral intention (2) is the weighted sum of the attitude, subjective norm and perceived behavioral control:

$$(1)B = w_1BI + w_2PBC$$

$$(2)BI = w_3A + w_4SN + w_5PBC$$

Thus, by adopting the TPB model, we aim at providing a more complete and clearer understanding of consumers' upgrading behaviors. However, subjective norm is not the only way to reflect symbolic values of selected products. Consumers also have the tendency to actively express their self-image through acquiring and displaying material symbols (Gollwitzer et al., 1982; Sirgy, 1982) and the product selected for self-expression also need to be conspicuously consumed (Sirgy, 1982). In the next sub section, we present a brief literature review on this concept and relate it to the TPB model in the context of smartphone upgrading behaviour.

## **2.3 SELF-CONCEPT**

### **2.3.1 The construct of self-concept**

Rosenberg (1986) argues that the term self-concept denotes the *“totality of the individual’s thoughts and feelings having reference to himself as an object.”* Self-concept also refers to how a person evaluate his or her own attributes (Solomon, Dahl, White, Zaichkowsky, & Polegato, 2014). Traditionally, researchers have discussed self-concept as both a single variable and a construct of multiple variables (Belch & Landon Jr, 1977; Bellenger et al., 1976). In the single variable vein of self-concept, researchers treated it as the perception of the actual oneself or actual self-image (Green et al., 1969; Grubb & Hupp, 1968). However, other investigators have argued that self-concept has to be conceptualized as having two components, the actual self-image and the ideal self-image. In this vein, the actual self-image is congruent with the one in the single variable self-concept tradition, and the ideal self-image is defined as the image of oneself as one would like to be (Belch, 1978; Belch & Landon Jr, 1977; Delozier & Tillman, 1972; Dolich, 1969). Solomon et al. (2014) also point out that *“the ideal self is a person’s conception of how he or she would like to be, while the actual self: is our more realistic appraisal of the qualities we do and don’t have”*.

Beyond this dual dimension of self-concept, a number of studies further indicate that the formation of one’s self-concept is not only based on how one thinks of oneself, but also how other people think of the person or the image that one believes other hold about himself, which is defined as the social self-image (Burns, 1979; Kressmann et al., 2006). That is, the formation of our self-concept is also significantly influenced by our social surroundings. Social self-image also refers to the process of imaging the reactions and projecting impression of others toward us, also known as the “looking glass self” (Cooley, 1992). However, the projected impression is not restricted to

the actual oneself, we also project impressions what we ideally would like others to hold, known as the ideal social self-image (Sirgy, 1979). Thus, Sirgy (1979) and Sirgy and Samli (1985) finally define self-concept with four components, actual self-image, ideal self-image, social self-image and ideal social self-image.

Additionally, we tend to predict different impressions from different others, depending on who we are predicting and the accuracy of our prediction (Schenk & Holman, 1980). This will probably results in forming different social self-concept in different situations. As a result, we always work hard to manage all the impressions we predicted from different others, in order to ensure an overall positive impression in our social system (Goffman, 1978) and the most apparent way of reaching that ideal impression is through the consumption of visible items (Heffetz, 2007).

### **2.3.2 Enhancing self-concept**

Self-esteem refers to the degree of congruence among different self-images inside self-concept (Sirgy, 1982). According to Onkvisit and Shaw (1987), the protection, maintenance and enhancement of our self-concept is the basic purpose of all human activity. In other words, we always need to compensate the discrepancies among different self-images in order to maintain or enhance a positive self-esteem. Because people see their possessions as part of or an extension of themselves (Secord, 1968), so one of the possible ways to maintain or enhance our self-concept is through the consumption of certain goods (Bilkey & Tucker, 1968). However, as the formation of self-concept is also influenced by our social surroundings (Burns, 1979), the discrepancies in our self-concept not only exist between actual self and ideal self, but also between the social self and ideal social self. That is, we tend to define ourselves based on what we consume and others' impressions toward our choice of consumption (Belk et al., 1982). A positive self-esteem then can be reached by consuming ideal products that are more close to the ideal self-image and creating ideal impressions that are more close to the ideal social self-image.

An ideal impression can be reached through the consumption of certain products. According to Gollwitzer et al. (1982), "*people acquire and display material symbols to compensate for perceived inadequacies in certain dimensions of their self-concept*". However, although materials consist of all the products we consume, only a portion of product can be regarded as

material symbols. Products that can be conspicuously consumed and for which their brands can be differentiated are more likely to be used as material symbols through consumers' self-expression behavior (Sirgy, 1982). Consumption of material symbols refers to the symbolic values of products. According to Corneo (2009), the symbolic value is defined as the "*personal characteristics that decide the esteem individual received from other people as well as their self-esteem*". Symbolic values perceived by consumers are also believed to have two aspects: the value of signalling to others (display personal characteristics to obtain social prestige) and value of signalling to oneself (display personal characteristics to enhance one's self-concept)(Berthon, Pitt, Parent, & Berthon, 2009). Products that have a perceived association with some ideal personal characteristics then are conspicuously consumed for their symbolic values (Heffetz, 2004).

### **2.3.3 Conspicuous consumption and status consumption**

The term conspicuous consumption was first introduced by Veblen's (1899) in the Theory of the Leisure Class, defined as "*the advertisement of income and wealth through lavish spending on visible items*". Visible items refers to products that can be easily noticed during consumption (Heffetz, 2011). The high portability of smartphones and the high volume of mobile software provide consumers with the convenience to acquire daily information and entertainment everywhere and thus making the use of smartphone highly noticeable and publically distinguishable. In the discussion of conspicuous consumption, Veblen (2007) further points out that a significant part of consumer behavior is driven by status-seeking competition and Marcoux, Filiatrault, and Cheron (1997) also state that social status demonstration is an important dimension of conspicuous consumption. Other researchers refer to the status aspects of conspicuous consumption as status consumption , which is defined as "*consumers strive to improve their social standing through conspicuous consumption*" (Goldsmith et al, 1996; p.310), a special case of conspicuous consumption (Eastman, Goldsmith, & Flynn, 1999).

However, O'cass and Frost (2002) refer status consumption to the "*process of gaining status or social prestige from the acquisition and consumption of goods that the individual and significant others perceived to be high in status*", O'Cass and McEwen (2004) further argue that status consumption and conspicuous consumption are related but still separate constructs. The way they distinguish status consumption from conspicuous consumption is through considering the

influence of consumers' self-monitoring process. Gould (1993) defined self-monitoring as *"the degree to which an individual observes and controls their expressive behaviour and either maintains or adapts self-presentation depending on certain social cues, triggering situationally appropriate behaviour"*. O'Cass and McEwen (2004) conclude that both status consumption and conspicuous consumption are affected by interpersonal influence, but self-monitoring will only have a significant positive effect on status consumption tendencies not on conspicuous consumption; and status consumption will also have an impact on conspicuous consumption. Self-monitoring is also a key part in the formation of one's self-concept (Gould, 1993).

Sirgy et al. (2000) highlight the link between self-image and social status and argue that such linkage may be activated by the consumption of a product having an image of high status. As a result, such products often provide consumers the notion that "I am a high status person." Then, the purchase of certain products will probably contribute to the attainment of social status and then making oneself feel better and closer to the ideal self (Elliott, 1994; Friese & Koenig, 1993). Thus, an ideal (social) self-image sometimes also refers to a self-image with a higher social status in one's social system (Sirgy et al., 2000). In conclusion, our self-concept requires continuous maintenance and enhancement, which can be realized through status consumption, as a result of conspicuous consumption of symbolic values of visible items. In other words, consumers' evaluation on symbolic values of certain products can also be interpreted as whether the product will help in gaining social status or not.

### **3. THE PROPOSED RESEARCH MODEL**

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#### **3.1 MODEL CONSTRUCTS**

For all the considerations above, we build our research model based on the TPB model with consideration of the possible moderating effect of status consumption. The main focus of this study is on the upgrading intention. As premier smartphones are considered as public luxuries, which are believed to be strongly influenced by brands (Bearden & Etzel, 1982), it's possible that we will also observe different levels in upgrading intention for different brands. The proposed research model provides a unique extension to the TPB model, as to our knowledge no researchers have included considerations on consumers' desire for status consumption to the TPB model (Ajzen, 1991), especially in the context of upgrading technological products. Thus, this study will provide

new insight to the application of the TPB model in this specific context. The constructs of the proposed research model are summarized in table 2:

<b>Constructs</b>	<b>Definition</b>
Attitude toward the behavior (A)	An individual's positive or negative feelings (evaluative effect) about performing the target behavior (Ajzen, 1991).
Subjective Norm (SN)	The person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975).
Perceived Behavioral Control (PBC)	The perceived ease or difficulty of performing the behavior (Ajzen, 1991).
Behavioral intention (BI)	The individual's intention to perform a given behavior (Ajzen, 1991).
Status consumption	The degree of gaining status or social prestige from the acquisition and consumption of goods that the individual and significant others perceived to be high in status (O'cass & Frost, 2002).

**Table 2:** Constructs of the research model

### 3.2 RESEARCH HYPOTHESES

According to Ajzen (1991), as a general rule, there are three kinds of considerations that guide human action, and translate into the following influences: the more favorable the attitude and subjective norms with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual's intention to perform the behavior under consideration. In the following sub sections, we consider the influence of the independent variables of our model on the behavior intention in the context of smartphone upgrading behavior.

#### 3.2.1 Attitude

Attitude has been proposed to influence behavioral intentions in the TPB model and the TRA model Ajzen (1991). In the context of this research, we expect the individual's favorable evaluations of the upgrading behavior to positively influence the upgrading intention for smartphones.

*H1: Attitude toward smartphone upgrade will positively affect consumers' intention to upgrade smartphones.*

### **3.2.2 Subjective norms**

The Subjective norms refers to a consumer's perception that most people who are important to them think he/she should or should not adopt a specific behavior. Following the general rule of the TPB model, and as expectations from others seem to play a role in the case of highly visible product consumption such as smartphones, subjective norm related to upgrading a branded smartphone is expected to positively influence the upgrading intention for smartphones.

*H2: Subjective norm will positively affect consumers' intention to upgrade smartphones.*

### **3.2.3 Perceived behavioral control**

The Perceived behavioral control is defined as the perceived ease or difficulty of buying a considered product. In the case of smartphones, the ability as well as the degree of control an individual might have on the upgrading behaviour can impact the intention to upgrade their smartphone. Thus, it is expected that the greater the perceived behavior control toward buying a smartphone, the stronger the buying intention for smartphones should be.

*H3: Perceived behavior control will positively affect consumers' intention to upgrade smartphones*

## **3.3 THE MODERATING EFFECT OF STATUS CONSUMPTION**

As stated earlier, we choose the TPB as the basic model to study consumers' upgrading behaviour for smartphones. Unlike previous studies dedicated to upgrade behaviour, the TPB model allows to take into consideration social pressure (subjective norm) that we believe can influence the upgrade behavior of highly visible products such as smartphones. Furthermore, considering that status consumption has a role to play according to our literature review, we have extended the TPB model and included status consumption in our proposed research model. , We expect to observe potential moderating effects of status consumption on the effectiveness of TPB in explaining consumers' upgrading behaviour.

### **3.3.1 Status consumption and attitude**

Consumers choose products through two types of congruence: the self-image congruence and functional congruence. Self-image congruence refers to "*the match between consumer's self-concept and the brand-user image, or product image of a given product and brand*" (Sirgy et al., 2000;p.127 ; Sirgy & Su, 2000; p.340), while functional congruence refers to the "*match between*

*the perceived functional or performance characteristics and the consumer's desired functional characteristics" (Sirgy & Johar, 1999;p.365 ; Sirgy, Johar, Samli, & Claiborne, 1991;p.252)*

Investigators have revealed that functional congruence can be biased by self-image congruence (Mangleburg et al., 1998; Sirgy, Johar, Samli, & Claiborne, 1991), because symbolic attributes of products and brands are easier to process than the functional features, which may require more related knowledge (Sirgy & Johar, 1999). As a result, consumers are more likely to evaluate the symbolic aspects of brands and products first followed by the functional aspects (Sirgy et al., 1991). Consumers' evaluation of symbolic aspects through self-image congruence is more likely to form an initial favorable or unfavorable attitude toward the brand and products, then bias the process of evaluating the performance aspects of brands and products (Kang, Hong, & Lee, 2009). Consequently, products with higher symbolic attributes are more likely to be evaluated more on their symbolic attributes than on their functional attributes. Consumer may evaluate the symbolic values of certain product through the process of status consumption, so products with an image of high status may also bias consumers' evaluation on the functional aspects of them.

As we mentioned at the very beginning in this research proposal, Apple sold only 20% of smartphones in their first quarter of 2015 and even a smaller portion belong to the expensive latest version of iPhone (iPhone 6). That means, a new iPhone is not commonly owned and can be publically distinguished (conspicuously consumed), due to its unique design and common characteristics of smartphones. Consumers may then perceive owning an expensive new iPhone as something with symbolic values or high status. The essential way to continually own a new iPhone is through continual upgrading purchases. Thus, a new iPhone is more likely to be evaluated and upgraded largely based on its symbolic (status) attributes and a consumer may form an initial favorable attitude toward it even before evaluating its functional attributes. Therefore, we expect a possible moderating effect of status consumption on the relationship between consumers' attitude and their upgrading intention for smartphones. In other words, for consumers who perceive higher potential status, a positive attitude toward upgrading their smartphone will have a stronger effect on and their intention toward upgrading.

*H4: Status consumption will positively moderate the relationship between attitude toward upgrade and intention to upgrade smartphones.*

### 3.3.2 Status consumption and subjective norm

Subjective norm refers to the influences consumers receive from significant others. Bearden and Etzel (1982) defined this kind of influence as the reference group influence and proposed the well-accepted “publicly vs. privately” and “necessity vs. luxury” product categorization. According to Bearden and Etzel (1982; p.183-194), private necessities refer to “*products consumed out of public view and owned by everyone, which is largely governed by product attributes*” such as an ordinary refrigerator. Product attributes contribute to the functional values of products. However, products that are commonly owned can hardly become something ideal and products that are out of public view won’t have any social influences. Private luxuries refer to “*product consumed out of public and not commonly owned, which is more of a matter of individual choice*”, such as an expensive and highly advanced TV. Besides the functional and symbolic values, luxury products or brands are also believed to have experiential values, which address individuals’ unique perceptions of playfulness, aesthetics and experience that products or brands provide them (Bourdieu, 1984). Consumers may choose products from this category as a result of unique taste. However, as products from this category are still consumed out of public view, consumers won’t be able to display personal characteristics related to symbolic values. As a result, private luxuries may be consumed for both their functional and experiential values.

Public necessities refer to “*product consumed publically and virtually owned by everyone*”, such as a reasonably priced car, Similar to private necessities, the product owned and used by everyone is not something ideal. But as this kind of necessities can be publically distinguished, consumers may also rely on this kind of products to display some personal characteristics. As a result, public necessities may be consumed for both functional values and symbolic values. The focus of this study is actually on public luxuries, which refers to “*products consumed in public view and not commonly owned and used*”, such as a luxury car or a premium smartphone. Products from this latter category are publically distinguishable. Public luxuries include product categories that have the potential to realize both functional values and symbolic values. Additionally, public luxuries also include the only product categories for which consumers may be subject to both strong product and strong brand influences on their choices (Bearden & Etzel, 1982). Premium smartphones, like iPhones, are more likely to fit in this category, due its high price and relative higher product visibility.

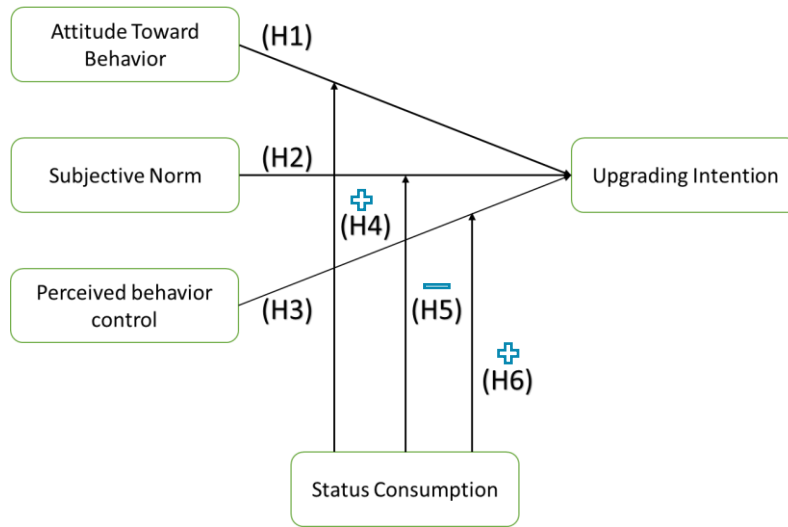
Subjective norms and status consumption actually describe two opposite direction for consumers in gaining symbolic values from certain products. Status consumption describes a process of one's active intention to subjectively impress his social surroundings by owning and displaying something with higher status, as a result of status-seeking competition (O'Cass & McEwen, 2004). In contrast, subjective norms describes a reversed process: consumers' intention are influenced by their social surroundings, as a result of confirming expectations of significant others. Thus, we suspect that consumers' desire of status consumption, as a moderating variable, will diminish the effect of subjective norm on their upgrade intention.

*H5: Status consumption will negatively moderate the relationship between subject norm and intention to upgrade smartphones.*

### **3.3.3 Status consumption and perceived behavioral control**

Perceived behavioral control refers to buying convenience, switching cost and other ease or difficulty toward upgrading to enhanced products. Perceived behavioral control is perceived to be stronger in the condition of higher convenience, low cost and other eases. However, when products are perceived to have both functional values and symbolic values, consumers may also tend to overcome more difficulties in reaching such desired products. For example, although a new iPhone is much more expensive than the majority of smartphones in the market, sometimes even with limited quantities right after the launch day, numerous "Apple Fans" were still waiting in lines in front of an Apple store for hours or even days, just in order to have the new iPhone as early as possible. This is probably because they perceived more symbolic values in having such an ideal product. Thus, we also suspect a moderating effect of status consumption on the relationship between perceived behavioral control and the upgrading intention. The proposed research model and corresponding hypotheses are shown as below (figure 2):

*H6: Status consumption will positively moderate the relationship between perceived behavioral control and intention to upgrade smartphones.*



**Figure 2:** The proposed research model

#### 4. RESEARCH METHODOLOGY

Our study focuses on examining the effectiveness of the proposed research model regarding consumers' buying intention of smartphones in the specific context of upgrades. The purposes of this section are to (1) present and describe the selected research methodology of this research, (2) explain the sample selection technique, (3) describe the procedure used in designing the instrument and collecting the data, and (4) present the statistical procedures that will be used to analyze the data.

##### 4.1 RESEARCH METHOD SELECTION

The selection of the research methodology is based on the research question and the research hypotheses. The primary concern of this study is to determine the effectiveness of TPB in explaining consumers' upgrading intention toward smartphones, and determine the moderating role of status consumption on the influence of the three main independent variables of the model on the intention behaviour. Therefore, a quantitative research approach will be adopted to answer the research question and test the extended TPB model proposed. Quantitative research focuses more on counting and classifying features and constructing statistical models and figures to explain what is observed.

## **4.2 DATA COLLECTION**

### **4.2.1 Participants**

In a February 2013 survey, 74% of Ball State college students reported using a smartphone versus 27% in 2009 (Hanley, 2013) and overall smartphone usage is still growing since then (Lunden, 2014). College students can be regarded as a good convenience sample for this study, as the majority of college students are smartphone users and they often have limited resources but are still the ones looking to possess newer smartphones. Additionally, although many products are globally available nowadays, this doesn't necessarily mean that consumers from different cultures bought them for the same reasons or use them to serve the same social functions (Wong & Ahuvia, 1998). Researchers also claim that people from different cultures can also be distinguished through their variation of self-concept concentrations (Markus & Kitayama, 1991).

Researchers have divided different self-images into two groups: the inner self (actual self-image and ideal self-image) and the outer self (social self-image and ideal social self-image) (Markus, Cross, & Wurf, 1990); and suggested that people from Eastern and Western cultures have different concentrations on either the inner self or the outer self (Markus & Kitayama, 1991). In Western societies, people have a rooted belief that individuals are inherently separate, so it's the inner self that significantly governs people's behavior, whereas people from Eastern cultures concentrate more on their relationships with significant others, which is the result of concentration on the outer self.

Hofstede (2001) also concludes that individualism is dominant among Western cultures, while Eastern culture is dominated by collectivism. In other words, people from Western cultures may be concerned more about their actual self-image and ideal self-image, while people from Eastern cultures may pay more attention to their social self-image and ideal social self-image. The products we focus on in this study are premier smartphones, which are more likely to be consumed as public luxuries and associated with a more positive social self-image for consumers. As a result, we believe that smartphones may be perceived as having more symbolic values in Eastern cultures than in Western cultures. This point is also supported by Wong and Ahuvia (1998) who suggest that Asian consumers, relative to Westerners, would place more importance on the symbolic values of certain products. By testing the proposed research model with participants from an

Eastern culture, we expect to be able to highlight the relationships among the constructs of the proposed model, especially the moderating effect of status consumption. Among different Eastern countries, the Chinese culture has been widely accepted as an extreme of Eastern culture. (Ralston, Gustafson, Elsass, Cheung, & Terpstra, 1992). Thus, we finally choose to test the proposed research model in a Chinese university, where Chinese college students will be recruited as the primary subjects for data collection.

#### **4.2.2 Data collection**

For this study, a survey was administered to a selected sample of smartphone users. A survey is designed to collect data from a specific population or a sample of that population using a questionnaire or an interview (Robson, 1993). Sample surveys serve as an important tool for collecting and analyzing information from selected individuals and are widely accepted as a key tool for conducting and applying basic social science research methodology (Rossi, Wright, & Anderson, 2013). Marketing researchers also use surveys to study consumer preference and shopping patterns (Baumeister & Leary, 1995).

Questionnaires and interviews are two major survey instruments, the choice between questionnaire and interview depends on the types of research and data needed to be collected. According to Ackroyd (1992), using a questionnaire rather than an interview method provides several distinct advantages: large amounts of information can be collected from a large number of people in a short period of time and in a relatively cost effective way; questionnaires can be carried out by the researcher or by any number of people with limited effect on its validity and reliability; the results of the questionnaires can usually be quickly and easily quantified by either a researcher or through the use of a software package

For this study, smartphone users are the target population and the number of smartphone users worldwide will surpass 2 billion in 2016, according to the eMarketer (2015). This large target population needs to be represented with a relatively large sample, so using a questionnaire survey is more plausible and affordable than conducting numerous interviews. Moreover, as we are going to test empirically a model that has already been defined, a quantitative method and a questionnaire as data collection tool are well suited for this purpose. For these reasons, a questionnaire survey

instrument will be adopted to assess the relationships between status consumption, together with the other TPB-based constructs, and the upgrading intention of smartphones. The data collection process has been approved by the Social Science and Humanities Research Ethical Board of University of Ottawa in August 2016 and the official letter of ethical approval is attached in the appendix.

#### **4.2.3 Questionnaire/Measure development**

According to Ajzen (2002), any behavior could be defined arbitrarily in terms of target, action, context and time (TACT) elements. In the case of our study, smartphones could be considered as the target and upgrading could be considered as the action. The context refers to where the action would be happening. Ajzen (2002) argues that “*Looking at behavior on only a single occasion is usually too restrictive to be of much practical value*”. For our study, consumers may either upgrade their smartphones in a retail store or order new devices online, so we don’t specify a particular context of upgrading smartphones for this study. Finally, the time element could be considered as “in the near future” or “within a year”, because, as we mentioned at the very beginning, the release interval between two generations of smartphones from major brands has been approximately of one year since 2010. Ajzen (2002) also indicated that the time element should be defined of a more general level in order to obtain enough measurements. Considering the TACT elements, we may define the behavior of interest as “Upgrading smartphones in the near future.”

Ajzen (2002) suggested using standard scaling procedures in assessing the predicted variables of TPB model and the scales much to be associated with defined TACT elements. However, in the formative stage of the final questionnaire, a pilot study is also suggested by Ajzen (2002) in order to secure reliable and internally consistent measures. That is, we will adopt the items that were directly suggested by Ajzen (2002) and some other items that have been used in previous TPB based studies for attitude, subjective norms, perceived behavioral control and behavioral intention. Those items then will be associated with the TACT elements we defined for this particular study. After that, those items will be tested in a pilot study with a relatively small sample and items with high internal consistency will be selected for the final questionnaire. Ajzen (2002) also suggested that different items assessing a given construct should be presented in non-

systematic order in the final questionnaire. Similar process will also be performed for scales measuring status consumption to ensure the internal consistency. The initial items for status consumption are adopted from Eastman et al. (1999). The initial questionnaire items are summarized in an appendix (provided separately). Data collection will be conducted using an online questionnaire instrument (Qualtrics). The complete questionnaire is attached in the appendix.

#### 4.2.4 Sample size estimation

In general, Rashidian, Miles, Russell, and Russell (2006) suggested the  $\lambda$  method in calculating the sample size for TPB based studies. The  $\lambda$  method was first introduced by Cohen (1992) and it states that (1) sample size (N) is a function of  $\lambda$  and the effect size index ( $f^2$ ). (2) The  $\lambda$  is a function of the number of explanatory variables ( $m$ ) and (3)  $f^2$  is estimated by the squared multiple correlation coefficient ( $R^2$ ). Based on this method, the preferred sample size for a TPB based study is largely decided by the predicted  $R^2$  of the multiple regression model. Rashidian et al. (2006) performed calculations for TPB based studies and concluded that the  $\lambda$  method was not responsive to variation in the parameters' estimates. Thus, they finally choose to adopt another sample size estimation method for TPB model, which is the VIF method. The VIF method was introduced by Hsieh, Bloch, and Larsen (1998), where VIF stands for *variance inflation factor*. The VIF method estimate the sample size based on correlation coefficients among different independent variables ( $r_{12}, r_{13}, r_{23}$ ) and the overall multiple regression correlation coefficient ( $r$ ), as summarized below:

$$(4) N = N' \times VIF; \quad (5) N' = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2}{1/2 \log\left(\frac{1+r}{1-r}\right)};$$

$$(6) VIF = \frac{1}{1 - p_{123}}; \quad (7) p_{123} = \frac{r_{12}^2 + r_{13}^2 - 2r_{12}r_{13}r_{23}}{1 - r_{23}^2}$$

Cohen (1992) recommended to accept 5% Type I error ( $\alpha$ ) and set power to detect difference between alternative hypothesis at 80% ( $\beta$ ) for research in behavioral science, so the corresponding z scores are:  $Z_{1-\alpha/2} = 1.96$ ;  $Z_{1-\beta} = 0.848$ . Based on the VIF method, Rashidian

et al. (2006) suggested a basic sample size of 142 for TPB studies without considering inter cluster influences and response rate. The sample size can also be determined based on one of the following rules of thumb: (1) a minimum ratio of observations to variable of 5:1, but a preferred ratio of 15:1 or 20:1 (Hair et al., 2005), and (2) multiplying the number of items (25) by 10 (Joreskog and Sorbom, 1982). Thus, considering the presented methods, we propose an appropriate sample size to be ranging from 200 to 300 respondents.

## **5. RESULTS**

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In this section, we will first present (1) basic information of the respondents recruited for this study; followed by (2) the validation process for adopted measures, finally (3) we will present the results of hypothesis testing, including the results of basic regression analysis and moderated regression analysis.

### **5.1 PROFILE OF RESPONDENTS**

The online survey instrument (Qualtrics) was administered to randomly selected smartphone users among students from a recognized Chinese University, the Jilin University in northeast China. Invitation messages were sent to selected students through a popular mobile chat app in China (WeChat), explaining the purpose of the study and requesting their participation. Students were also encouraged to share the invitation with their family members who also use smartphones and this gave more diversity in age ranges of the respondents. When students (respondents) scanned the QR code provided in the message, they were directed to the online survey instrument. Other students were invited to the survey during their breaks in regular class hours, with the same QR code displayed in front of the class. A total of 263 responses were received and 203 of all the responses were fully completed ones; the survey completion rate was approximately 77%. Besides the questions regarding the demographic information of respondents, questions that specially related to the use of smartphones were also administered to the respondents, including smartphone usage, brands and upgrading choices. Table 3 shows both the demographic and smartphone usage related information of respondents.

<i>Characteristics</i>	<i>Percent</i>	<i>Characteristics regarding the use of smartphones</i>	<i>Percent</i>
<b>Age</b>		<b>General usage</b>	
Under 18	2.5	Less than 1 year	1.5
18—24	50.7	1 year	1.5
25—34	25.1	2 years	10.8
35—44	9.9	3 years	13.8
45—54	11.8	4 years	23.3
<b>Gender</b>		5 years	11.3
Male	48.8	More than 5 years	37.9
Female	50.2	<b>Daily usage</b>	
Other	1.0	Less than one hour	1.5
<b>Education</b>		One to two hours	12.8
Less than high school	2.0	Two to four hours	36.9
High school	7.0	Four to six hours	24.1
Some college	3.0	More than 6 hours	24.6
2 year undergraduate	2.0	<b>Previous upgrade</b>	
4 year undergraduate	53.3	Never	3.0
Professional degree	27.1	Once	20.4
Doctorate	5.5	Twice	26.4
<b>Annual house income</b>		Three times	26.9
Less than ¥10,000	16.0	Four times	14.4
¥10,000— ¥39,999	21.3	Five times or more	9.0
¥40,000— ¥59,999	9.5	<b>Last time upgrade</b>	
¥60,000— ¥79,999	8.3	Less than one month ago	9.9
¥80,000— ¥99,999	8.3	1 to 3 months ago	7.9
¥100,000— ¥119,999	14.8	3 to 6 months ago	15.3
¥120,000— ¥139,999	0.6	6 to 12 months ago	24.8
¥140,000— ¥159,999	4.1	More than a year ago	42.1
More than ¥160,000	17.2		

**Table 3:** Profile of the respondents (n=203)

## 5.2 MEASURE VALIDATION

First, Table 4 provides a detailed description of the scales in measuring each of the variables, including the mean the standard deviation. According to Ajzen (2002) and Eastman et al. (1999), all the items were measured using a 7 point Likert scale:

<b>Variables</b>	<b>Measure (7 point scale)</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Upgrading intention</b>	UI-1	5.17	1.672
	UI-2	4.70	1.698
	UI-3	5.01	1.626
<b>Attitude</b>	AI-1	4.92	1.756
	AI-2	4.88	1.766
	AI-3	5.20	1.763
	AI-4	5.20	1.761
	AI-5	5.28	1.699
<b>Subjective Norm</b>	SN-1	4.19	1.594
	SN-2	4.25	1.548
	SN-3	4.20	1.541
	SN-4	4.50	1.514
	SN-5	5.02	1.396
<b>PBC</b>	PBC-1	5.19	1.512
	PBC-2	5.14	1.524
	PBC-3	5.28	1.408
	PBC-4	5.56	1.411
	PBC-5	5.21	1.537
	PBC-6	4.18	1.732
<b>Status Consumption</b>	SC-1	4.02	1.688
	SC-2	4.19	1.634
	SC-3	4.19	1.693
	SC-4	3.55	1.522
	SC-5	4.28	1.577

**Table 4:** Operational definition of variables

Measure validation was firstly examined for reliability by computing Cronbach's alpha coefficient for each construct. As shown in table 5, the Cronbach's alpha coefficients for all the variables are above the recommended 0.7 levels. We also conducted a confirmatory factor analysis using SPSS to assess convergent and discriminant validity of the measurement. The results showed that, except for one of the measures of status consumption (SI-4 with a factor loading of only 0.277 ), all the other items loaded significantly on the related constructs, with factor loadings

ranging from 0.597 to 0.933 and all significant at level  $p < 0.001$ . Thus, the SI-4 was removed from the measures of status consumption and the Cronbach's alpha has improved from 0.765 to 0.869. This high Cronbach's alpha provides the evidence supporting the convergent validity of each construct. Additionally, the factor correlation matrix showed, in table 6, that all the constructs are significantly distinct from other constructs ( $p < 0.01$  or  $p < 0.001$ ) and then supported the discriminant validity of the measurement.

<b>Variables</b>	<b>Measures</b>	<b>Standard Loadings</b>	<b>Cronbach's alpha</b>	<b>Mean</b>	<b>Standard deviation</b>
<b>Upgrading intention</b>	UI-1	0.876	0.875	4.96	1.490
	UI-2	0.926			
	UI-3	0.881			
<b>Attitude</b>	AI-1	0.687	0.932	5.09	1.511
	AI-2	0.713			
	AI-3	0.804			
	AI-4	0.871			
	AI-5	0.870			
<b>Subjective Norm</b>	SN-1	0.884	0.876	4.43	1.187
	SN-2	0.920			
	SN-3	0.899			
	SN-4	0.747			
	SN-5	0.630			
<b>PBC</b>	PBC-1	0.842	0.879	5.09	1.193
	PBC-2	0.912			
	PBC-3	0.904			
	PBC-4	0.763			
	PBC-5	0.711			
	PBC-6	0.597			
<b>Status Consumption</b>	SC-1	0.873	0.765	4.04	1.188
	SC-2	0.882			
	SC-3	0.878			
	SC-4	0.227			
	SC-5	0.720			

**Table 5:** Factor loadings and reliability tests

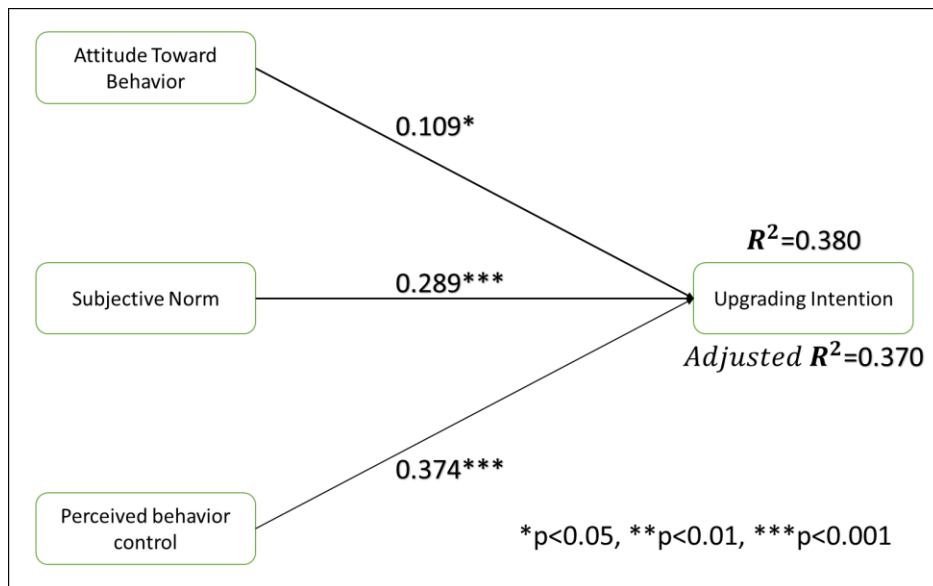
	UI	AI	SN	PBC	SC
UI	1.000				
AI	0.317***	1.000			
SN	0.484***	0.274***	1.000		
PBC	0.550***	0.344***	0.445***	1.000	
SC	0.277***	0.137**	0.427***	0.340***	1.000

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

**Table 6:** Correlation matrix

### 5.3 HYPOTHESIS TESTING

In order to test the proposed hypotheses, regression analysis was adopted for the statistical analysis of the data collected by questionnaires, as this study focuses on examining the relationships among different constructs (variables). Regression analysis includes techniques for modeling and analyzing several variables with the focus on the relationship between a dependent variable and one or more independent variables. In our research context, the dependent variable stands for the upgrading intention for smartphones, and the independent variables represent attitude towards behavior, subjective norms, and perceived behavior control. The proposed research model was tested in two stages. First, we conducted multiple regression analysis on the basic TPB model, and the results are summarized in figure 3.



### Figure 3: Results of hypothesis tests

Results show strong support for H2 and H3, that the upgrading intention was positively related to subjective norm and perceived behavioral control. However, we only found a mild relationship between attitude toward upgrading and upgrading intention. Although H1 was also supported, the impact of attitude on the upgrading intention is much weaker than the impact of subjective norm and perceived behavioral control. This means that consumers who have a higher intention to upgrade are only slightly different from the ones who don't have such intention in terms of attitude toward upgrading their smartphones. The second stage of the regression analysis includes the possible moderating effect of status consumption.

Baron and Kenny (1986) defined moderator variables as “*third variables that partition a focal independent variable into subgroups that establish its domains of maximal effectiveness in regard to a given dependent variable*”. According to these definitions, the moderating effect of status consumption will be tested using analysis of variance (ANOVA), because a moderate effect can be represented as an interaction between an independent variable and a factor that specify the conditions for its operation. In order to test the moderating effect of status consumption, the traditional test for moderators was conducted, as shown in table 7. We compared the simple regression model with three independent variables versus the moderated regression model that additionally included the interaction of these variables with status consumption. To determine a possible moderator effect, we need to test whether these interaction term are statistically significant. If the interaction terms are statistically significant, then a moderator effect will be supported. In table 6, however, none of the interaction terms is statistically significant, which means that we did not find a meaningful moderating effect of status consumption to the basic TPB model. In other words, status consumption doesn't significantly strengthen or weaken any relationships between the three independent variables and the upgrade intention.

Moderated model	Interaction terms	Standard coefficient	t-value	R <sup>2</sup>	Adjusted R <sup>2</sup>
Overall	AI×SC	-0.318	-1.112	0.397	0.376
	SN×SC	-0.314	-0.918		
	PBC×SC	-0.022	-0.053		
High on SC	AI×SC	-0.356	0.484	0.363	0.304
	SN×SC	-2.018	-1.812*		
	PBC×SC	2.328	1.692*		
High on SC and AI	AI×SC	-3.107	-2.203*	0.541	0.454
	SN×SC	-3.371	-3.021**		
	PBC×SC	4.301	4.301**		

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

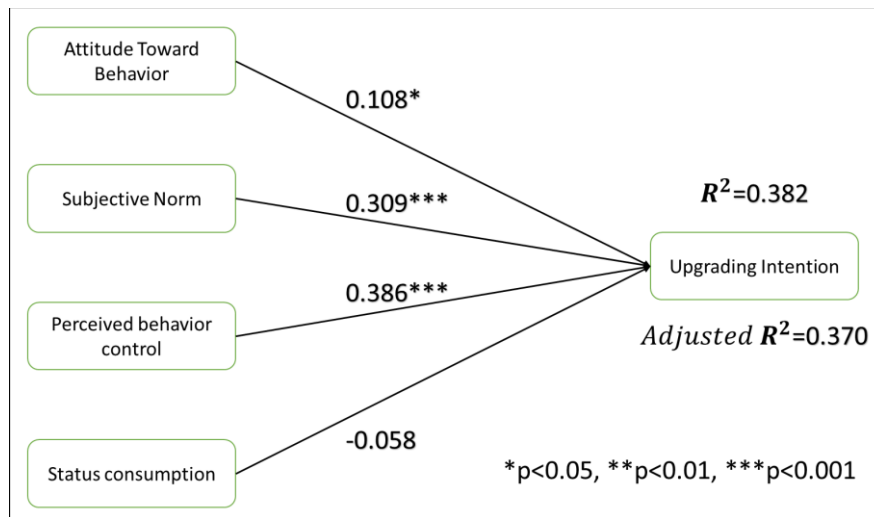
**Table 7:** Moderated regression models

Although generally the result did not support the moderating effect of status consumption, we still observe some moderating effects of status consumption in subsequent grouped regression analysis. More, specifically we divided the respondents into two subgroups based on whether they score low (1—4) or high (4—7) on status consumption. In the group of respondents with high status consumption, we found some moderating effect of status consumption on the (1) relationship between subjective norm and upgrading intention and (2) the relationship between perceived behavioral control and upgrading intention, also shown in table 7.

Among respondents who scored high on status consumption, status consumption negatively moderated the (1) relationship between subjective norm and upgrading intention and positively moderated (2) the relationship between perceived behavioral control and upgrading intention. This means that respondents in this group will consider (1) subjective norm as less important and (2) perceived behavioral control as more important in their upgrading intention as they perceived status consumption as more important. In this case, H5 and H6 are also supported. Additionally, among respondents who score high on status consumption, we also identified even stronger moderating effect of status consumption if the respondents also had a very positive attitude toward upgrading their smartphones, so H5 and H6 received even stronger support in this case. We also identified mild moderating effect of status consumption on the relation between attitude and upgrading intention. This negative moderating effect, however, contradicts the hypothesis

that status consumption will positively moderate the impact of attitude. As a result, H4 wasn't accepted even in this case.

Another possible role for status consumption in the research model is that status consumption may also function as another independent variable. For this reason, we conducted another regression analysis, which includes status consumption as another independent variable. The results are shown in figure 4.



**Figure 4:** Results of hypothesis tests including status consumption

In this regression model, however, we only found support for H1, H2 and H3, that only the basic TPB constructs (Attitude, Subjective Norm and Perceived Behavioral Control) have significant impacts on the upgrading intention toward smartphones. In other words, the direct relationship between status consumption and upgrading intention was not supported. The results of our hypothesis tests is summarized in table 8:

<b>Relationships</b>	<b>Estimate</b>	<b>Results</b>
H1: Attitude → Intention	0.109*	Accepted
H2: Subjective Norm → Intention	0.289***	Accepted
H3: Perceived Behavioral Control → Intention	0.374***	Accepted
H4: Status Consumption → Attitude—Intention		Not accepted
H5: Status consumption → Subjective Norm—Intention		Partially accepted
H6: Status consumption → Perceived Behavioral Control—Intention		Partially accepted

**Table 8:** Summary of hypothesis tests

#### 5.4 VARIATIONS ACROSS BRANDS

The survey also revealed respondents' choices of smartphone brands in use and for future upgrading. Consumers may also choose different brands for different reasons, so the model testing results may also vary according to brands choices. For this reason, we selected the three leading brands (Apple, Samsung and Huawei) from all the brands included in the questionnaire and then divided the respondents into different subgroups according to their brand choices. The percentage of respondents' brand use and upgrading intention are summarized as below (table 9):

<b>Brands</b>	<b>Current in use (percent)</b>	<b>Future upgrading intention (percent)</b>
<b>Apple</b>	<b>39.9</b>	<b>61.1</b>
<b>Samsung</b>	8.4	21.7
<b>LG</b>	0.5	2.0
<b>Huawei</b>	15.3	48.3
<b>One plus</b>	1.5	1.5
<b>Xiaomi</b>	7.9	10.8
<b>Lenovo</b>	0.5	0.5
<b>Others</b>	26.1	10.8

**Table 9:** Smartphone brand choices

As the focus of this study is on consumers' upgrading intentions, the future upgrading choices of respondents on the three brands is considered as grouping parameters. The table above revealed that 61.1% of respondents chose Apple as their future upgrading choice, 21.7% for Samsung and 48.3% for Huawei. The means and standard deviations of the model constructs according to the three leading brands are summarized in table 10.

<b>Brands</b>	<b>AI</b>	<b>SN</b>	<b>PCB</b>	<b>SC</b>	<b>UI</b>
	<b>Mean(SD)</b>	<b>Mean(SD)</b>	<b>Mean(SD)</b>	<b>Mean(SD)</b>	<b>Mean(SD)</b>
Apple	5.2919(1.4922)	4.3710(1.2888)	5.2406(1.1127)	4.2198(1.3568)	5.5105(1.4880)
Samsung	4.9727(1.5763)	4.4455(1.1819)	5.0909(1.1295)	4.3807(1.2546)	4.9394(1.4998)
Huawei	4.8796(1.5978)	4.6163(1.2053)	5.3095(1.0191)	4.2092(1.3483)	5.0646(1.4467)

**Table 10:** Means and SDs of branded model constructs

First of all, we tested the basic TPB model for the three brands and the results and supported the impact of attitude, subjective norm and perceived behavioral control varied according to brands, as shown in table 11.

<b>Regression model</b>	<b>Variable</b>	<b>Standard coefficient</b>	<b>t-value</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>
Apple	AI	0.107	1.372	0.376	0.360
	SN	0.343	4.363***		
	PBC	0.345	4.353***		
Samsung	AI	-0.093	-0.628	0.278	0.224
	SN	0.312	1.921*		
	PBC	0.333	2.149*		
Huawei	AI	0.021	0.239	0.408	0.389
	SN	0.402	4.179***		
	PBC	0.318	3.365***		

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

**Table 11:** Summary of regression analysis according to brands

The result above revealed that subjective norm and perceived behavioral control are still the two major influences on upgrading intention, but their impacts are much stronger for Apple and Huawei than for Samsung. Interestingly, subjective norm has stronger effects on upgrade intention for Huawei than for Apple. However, in the test of the moderating effect of status consumption, we didn't observe any strong impact of status consumption, as a moderator or even

as another independent variable. This result is contrary to our expectations, especially for Apple, because we thought people may still reveal more status concerns for symbolic and expensive products, such as the iPhone. The reason for this discrepancy will be discussed later in the next section.

## **6. DISCUSSION**

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### **6.1 FINDINGS**

The findings of this study are partly in accordance with our expectations. For the basic TPB model, as hypothesized, all the three major constructs had positive influences on the upgrading intention for smartphones. However, the impact of attitude was much weaker than the impact of subjective norms and perceived behavioral control. The explanation for the lack of a strong relation between attitude and upgrading intention could lie in the influences of the fast evolving environment of the smartphone market. That is consumers could very well have a positive attitude toward upgrading their smartphones, but considering the wish value left in the product that they currently use, they have no clear intention to upgrade in the near future. Our survey results also indicated that nearly 60% of respondents upgraded their smartphones within the last 12 months, which is approximately equivalent to the average time interval between the release dates of two generations of smartphones. Further grouped regression analysis also confirmed that attitude is a strong predictor of upgrading intention among respondents whose last smartphone upgrading was at least 12 months ago. However, the impact of attitude is much lower among respondent who upgraded their smartphone within the last 12 months. Additionally, as we discussed in the literature review, consumers may also delay their upgrading in favor of future technology, as a result of anticipated regret (Sandberg & Conner, 2008), especially in a market where the perceived rate of innovation is relatively higher (Shih & Schau, 2011).

One of the major focuses of this study is the role of status consumption in the context of upgrading smartphones. However, we only found partial support for the moderating role of status consumption. That is status consumption only has its moderating effect in the condition of high level of status consumption, and even stronger moderating effect when people in this category also have high score on attitude toward upgrading their smartphones. In other words, status consumption will not have any significant moderating effect for consumers who scored low on

the measures of status consumption. However, the test results with conditions at least partially confirmed two of our hypotheses. That is status consumption will negatively moderate the relationship between subjective norm and upgrading intention and positively moderate the relationship between perceived behavioral control and upgrading intention.

The reason why we did not generally observe strong effect of status consumption, as an independent variable, could possibly lie in the specific time period of data collection. The data collection started from September 5<sup>th</sup> 2016 and ended approximately one month later. During that period, there were two major events in the market of smartphones. First, Apple released their new iPhone 7 and iPhone 7 plus. Second, Samsung experienced serious safety problems (battery explosions) on their new Galaxy Note 7. Apple and Samsung are the two leading brands in the current smartphone market and the only two manufacturers that offered successful premier products, such as the iPhone series of Apple and the Galaxy series of Samsung, which would normally cost more than a thousand dollar for an unlocked version. As we discussed earlier, we expected to observe the significance of status consumption, especially among brands like Apple and Samsung. However, the test result did not indicate any strong influence of status consumption, even for respondents who selected Apple or Samsung as their future upgrading choices.

When respondents are asked to evaluate the measures of status consumption, such as “*I would purchase a new and upgraded smartphone because it has status*”, they need to have a target in their mind, in other words, have a specific brand and product in their mind. During the period of data collection, products like the iPhone 7 and Galaxy Note 7 were advertised as the new and best products for the two brands and then could be regarded as the most possible status related products. However, both the iPhone 7 and the Galaxy Note 7 have their own problems that may prevent themselves from being linked with status, as presented further here.

First of all, the iPhone 7 has received major improvement, including a faster CPU, an enhanced fingerprint scanner and water and dust resistance. However, the basic appearance design hasn't been changed since two years ago. In other words, consumers can hardly distinguish iPhone 7 from older generations and some online comments even refer the iPhone 7 as the iPhone 6s. In addition, the iPhone 7 family has a significant lower sales comparing the iPhone 6s family in the first months after their release dates.

According to Okada (2006), consumers are more willing to upgrade if they perceive the new product as more dissimilar to the older model. This conclusion may not only work for the functional aspects of new products, but also for the symbolic aspects of new products, especially for highly visible products like smartphones. Consumers may also be more willing to upgrade if they perceive the newer models are significantly different from the older ones, especially in terms of appearance. Observing a difference in the appearance of new products is the easiest way to distinguish them from older ones and the status builds on the possession of new and enhanced products can also be realized more easily via the difference on appearance. As a result, the lack of difference between the iPhone 7 and the older generations may prevent the new product from being distinguished from older generations and then make it harder to realize the benefit on status for having new products. At the end, consumers may decide not to upgrade because of the difficulties in realizing symbolic values by having new products. Consumers may also have the same difficulties for Samsung's Galaxy Note 7, because it's nearly impossible to build any status by possessing something that is physically dangerous. Thus, in summary, the possible reason we were unable to observe the impact of status consumption could be that: (1) during the data collection period, the two leading brands in the market of smartphones, Apple and Samsung, either didn't provide new high-end products that can be easily distinguished or engaged in way serious safety problems; (2) consumers then may have projected difficulties in building status by upgrading to the corresponding products; (3) when respondents were asked to evaluate the measures of status consumption, they may have failed to find an ideal product with status in the current smartphone market and then had difficulties in making their judgements on the status consumption of smartphones.

## **6.2 IN TERMS OF THEORY BUILDING**

The TPB model has been applied to various product and service categories, including many technological products and services enabled by advances in technologies. In comparison with those studies, we observed that the majority of TPB-based studies in the high-tech sector only investigated general intentions of adopting technologies and related services, without a focus on specific products or brands. For example, Pavlou and Chai (2002) studied consumers' general online transactions intentions without a specific focus on products or brands involved. Morris, Venkatesh, and Ackerman (2005) investigated individual's intention in adopting workplace software without providing a detailed description about the software itself. Thus, in

terms of theory building, the variation we added to the application of the TPB model comes from the fact that we focused on a specific product category (smartphones) and considered the possible differences across brands in the process of data collection process.

Additionally, we also found that the impact of the three TPB constructs significantly varied across different behavioral intention that were previously studied and our testing results revealed a relatively lower impact of attitude and stronger impact of subjective norm and perceived behavioral control. Some of the TPB-based studies in the high-tech sector are summarized in table 12:

<b>TPB based Studies</b>	<b>Intention studied</b>	<b>AI</b>	<b>SN</b>	<b>PBC</b>
Pavlou and Chai (2002)	Online transaction	0.55**	0.24**	0.23*
George (2004)	Internet purchasing	0.403***	0.020	0.192**
Shih and Fang (2004)	Internet banking	0.82***	0.11	0.05
Morris et al. (2005)	Work place software	0.28***	0.18*	0.17*
Lu, Zhou, and Wang (2009)	Instant messaging software	0.29**	0.23**	0.22**
Harrison et al. (1997)	Executive's IT adoption	0.29**	0.24**	0.19*
<b>This study</b>	<b>Upgrading smartphones</b>	<b>0.109*</b>	<b>0.289***</b>	<b>0.374***</b>

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

**Table 12:** TPB based studies

In terms of consumers' upgrading behavior for mobile devices, we then compared our test results with the similar study on consumers' upgrading intention toward mobile phones by Tseng and Lo (2011). As an application of the TAM model, Tseng and Lo (2011)'s study failed to show any strong relationships among the two major constructs of the TAM model (perceived usefulness and perceive ease of use) and consumers' intention to upgrade their mobile phones. Thus, based on our test results, we can conclude that the TPB model is more capable than the TAM model in explaining consumers' upgrading intention toward mobile devices, such as mobile phones or smartphones.

As we adopted the measures of status consumption from Eastman et al. (1999), we then intended to compare our test results with similar studies concerning the measures and impact of status consumption. In their proposition of the measures, Eastman et al. (1999) conducted several studies separately to test the effectiveness of the measures with brands in various product

or service categories, including beer, restaurants, automobiles, shops, electronics and clothing. In their study on electronics brands, several brands, including Alpine, Carver, Emerson, Kenwood, Pioneer, and Sony, were selected to test whether status consumption had an impact on their purchase. Their overall test results indicate that status consumption has an impact on the purchase of the brands above, with a overall standard coefficient of 0.18 at  $p < 0.05$  level. However, Eastman et al. (1999) didn't examine variations across brands, nor did they differentiate product categories among the selected brands (brands selected offer products in a variety of categories). Thus, comparing our test results with the results from studies above can hardly generate any meaningful results. Additionally, the measures of Eastman et al. (1999) haven't been systematically tested in various settings by subsequent researchers who cited the study of Eastman et al. (1999). In fact, most of the studies only relied on the work of Eastman et al. (1999) to define status related behaviors. Thus, this study can also be regarded as a starter of the systematic test of such measures for future studies of status consumption, which will probably give meaningful results.

### **6.3 IMPLICATIONS FOR PRACTICES**

This research examined what influences the upgrading intention for smartphones, with a special consideration on the possible role of status consumption. The test results indicated that subjective norms and perceived behavioral control are the two major variables that influence consumers' upgrading intention toward smartphones and status consumption has a moderating effect only for respondents that scored high on status consumption and attitude. We believe that this first helps interpreting the success of some smartphone manufacturers in the past few years when the market of smartphone dramatically expanded. For example, Apple's success in commanding high price for their iPhones for some consumers may probably be due to encouraging interpersonal influences among their reference groups, which will then become positive subjective norms influences that encourage potential consumers to upgrade to an Apple's product. Additionally, the strong impact of perceived behavioral control may also supports the importance of Apple's financing options for their products, especially for students who have limits on their budget, and the easy access to their own retail store, which will finally give more control for consumers to upgrade.

For other smartphones makers, the significant impact of subjective norm and perceived behavioral control on upgrading intention will probably persuade them to reconsider their current marketing strategies, such as hardware and cost performance competition, and switch to branding strategies that emphasizes the importance of symbolic values of their products and give more controls for consumers in choosing their products, such as easy access to products and finance options for high- end products. Additionally, the moderating effect of status consumption indicates that companies in the market of smartphones need to pay extra attention on the possible status attached to their products. For example, some manufacturers may need to show much bigger improvement on their new products, especially in the appearance design, and in the symbolic values associated to their brands, in order to convey more status.

#### **6.4 LIMITATIONS**

The primary limitation of the chosen research methodology comes from the criticism about convenience sampling techniques. The most obvious limitation of convenience sampling is sampling bias, because the sample is not representative of the entire population. Upon the sampling bias, systematic bias also exists, due to the constant difference between the results from the convenience sample and the theoretical results from the entire population. As a result of such sampling limitations, making inferences about the entire population will be harder, comparing to other probability sampling techniques. This also results to a low external validity of the study. The convenience sample for this study, however, can be regarded as a good convenience sample, as college students and people of similar age stand for the majority of smartphone users. Additionally, the descriptive statistics of measurements indicated that the variations on each measures are relatively small and thus may prevent the data from generating meaningful results. Finally, this study only considered one single product category, the smartphones, which prevent the test results to be meaningful for other product categories.

#### **6.5 FUTURE RESEARCH**

Due to the limitations of this study, we first encourage future research on this topic to be conducted with a more general population, instead of merely college students, in order to improve the predicting power of the research model. Second, the data collected for this study is from consumers of an extreme collectivistic culture, the Chinese culture, so future studies may

also be conducted in a different culture settings, such as Canada and the US as representatives of western and individualistic cultures. The study of Pavlou and Chai (2002) has already confirmed the significant difference of the impacts of attitude and subjective norm, when they applied the TPB model separately in China and the US. They found that attitude played a more important role in affecting the behavioral intention in the US, while subjective norms and perceived behavioral control had stronger influences on the same intention in China. Thus, if we further apply the proposed research model in a western culture, such as Canada and the US, it's highly possible that we will discover a stronger influence of attitude, but a weaker impact of subjective norms at the same time.

Apart from sampling techniques and culture differences, whether the proposed research model will reveal different results across different product categories is also worth further investigating. The upgrading intention for technological products with lower product visibility, such as television, desktop computers and other home appliances, may be less relative to symbolic value driven constructs, such as subjective norm and status consumption. From a more general perspective, the status consumption we examined in this study is the pure status by possessing certain products. Status itself, however, is not merely the result of possession, personal capabilities can also generate status within one's social groups. In the market of high-tech products, such personal capabilities can be interpreted as the ability to operate sophisticated equipment, such as using some professional software or tools. Thus, future studies on status consumption should also include consumers' behavioral intention towards sophisticated products.

## **7. CONCLUSION**

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Based on the TPB model, this study aims to improve our understanding of consumers' upgrading behavior toward high-tech products by testing an extended TPB model with extra considerations given to the role of status consumption. The proposed model adopted the measures for status consumption from Eastman et al. (1999) and tested the possible impact of status consumption as a moderating variable. An empirical study was conducted and results indicated that attitude, subjective norms and perceived behavioral positively affected consumers' upgrading intention toward smartphones. Among the three constructs, the impact of subjective norm and

perceived behavioral control was much stronger than the one of attitude, which was beyond our expectations. Status consumption has been supported to have moderating effect only for respondents who score high on the measures of status consumption and an even stronger moderating effect for respondents who also scored high on attitude. This study also aims to encourage future study on further understanding consumers' upgrading behavior, especially for high-tech products that tend to be conspicuously consumed.

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## 9. APPENDIX

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### 9.1 Questionnaire

Q1: Are you currently a smartphone user?

- Yes (1)
- No (2)

Q2: How long have you been using smartphones?

- Less than a year (1)
- 1 year (2)
- 2 years (3)
- 3 years (4)
- 4 years (5)
- 5 years (6)
- More than 5 years (7)

Q3: How much on average do you use your smartphone every day?

- Less than one hour (1)
- one to two hours (2)
- Two to four hours (3)
- Four to six hours (4)
- More than 6 hours (5)

Q4: What smartphone brand do you current have or use?

- Apple (1)
- Samsung (2)
- LG (3)
- Huawei (4)
- One Plus (5)
- Xiaomi (6)
- Lenovo (including Motorola) (7)
- Other, please specify: (8) \_\_\_\_\_

Q5: How many times have you upgraded your smartphone?

- Never (1)
- Once (2)
- Twice (3)
- Three times (4)
- Four times (5)
- More than 5 times (6)

Q6: What was the last time you upgraded your smartphone?

- Less than one month ago (1)
- 1 to 3 months ago (2)
- 3 to 6 months ago (3)
- 6 to 12 months ago (4)
- More than a year ago (5)

Q7: Please indicate your degree of agreement or disagreement with the following statements:

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
In general I have a strong interest in smartphones (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphones are very important to me (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get bored when other people talk to me about smartphones (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphones are very relevant to me (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8: Behavioral intention: Please read the following statements carefully and indicate your agreement or disagreement using the 7 points scale below:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I intend to upgrade my smartphone in the near future. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I plan to upgrade my smartphone in the near future. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will try to upgrade my smartphone in the near future. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9: What are the smartphone brands you might consider for your future upgrading? (You can check more than one brand if it applies)

- Apple (1)
- Samsung (2)
- LG (3)
- Sony (4)
- Huawei (5)
- One Plus (6)
- Xiaomi (7)
- Lenovo (including Motorola) (8)
- Other, Please specify:..... (9)

Q10: Attitude For the following statements, please indicate your answer on the following scales:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Upgrading my smartphone in the near future is a bad: good idea (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upgrading my smartphone in the near future is a foolish: wise idea (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I dislike: like the idea of upgrading my smartphone in the near future (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upgrading my smartphone in the near future would be unpleasant: pleasant (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upgrading my smartphone in the near future would be unenjoyable: enjoyable (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11: Subjective Norm: Please read the following statements carefully and indicate your agreement or disagreement using the 7 points scale below:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
People who influence my behavior would think that I should upgrade my smartphone in the near future. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who are important to me would think that I should upgrade my smartphone in the near future. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is expected of me that I upgrade my smartphone in the near future. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The people in my life whose opinions I value would approve me to upgrade my smartphone in the near future. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Many people like me will upgrade their smartphone in the near future (5)	○	○	○	○	○	○	○
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	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I would be able to upgrade my smartphone in the near future. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have the resources and the knowledge and the ability to upgrade my smartphone in the near future. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I wanted to I could upgrade my smartphone in the near future. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is mostly up to me whether or not I upgrade my smartphone in the near future. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upgraded smartphones are generally available in the stores where I usually shop (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The price of upgraded smartphones is not a problem affecting the upgrade of my smartphone (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Q13: Status consumption: Please read the following statements carefully and indicate your agreement or disagreement using the 7 points scale below:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I would purchase a new and upgraded smartphone just because it has status. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in new smartphones with status. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would pay more for an upgraded smartphones if it had status. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The status of an upgraded smartphone is irrelevant to me. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An upgraded smartphone is more valuable for me if it has some snob appeal. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14: What is your age?

- Under 18 (1)
- 18 - 24 (2)
- 25 - 34 (3)
- 35 - 44 (4)
- 45 - 54 (5)

Q15: What is your gender?

- Male (1)
- Female (2)
- You don't have an option that applies to me. I identify as (please specify) : (3)

\_\_\_\_\_

Q16: What is your primary language?

- English (1)
- French (2)
- Chinese (3)
- Other, please specify:..... (4)

Q17: What is the highest level of education you have accomplished?

- Less than high school (1)
- High school graduate (2)
- Some college (3)
- 2 years undergraduate degree (4)
- 4 years undergraduate degree (5)
- Professional degree (6)
- Doctorate (7)

Q18: Where do you currently reside ?

- China (1)
- Canada (2)
- United States (3)
- Others (4)

Q19: What is your current annual household income in Chinese Yuan?

- Less than ¥10,000 (1)
- ¥10,000 - ¥39,999 (2)
- ¥40,000 - ¥59,999 (3)
- ¥60,000 - ¥79,999 (4)
- ¥80,000 - ¥99,999 (5)
- ¥100,000 - ¥119,999 (6)
- ¥120,000 - ¥139,999 (7)
- ¥140,000 - ¥159,999 (8)
- More than ¥160,000 (9)