Predicting smartphone brand loyalty: Consumer value and consumer-brand identification perspectives

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ABSTRACT

With the growth and competition of the smartphone industry, developing a better understanding of what drives consumers' loyalty to smartphone brands has become an important issue for academics and practitioners. This study hypothesizes four determinants of smartphone brand loyalty based on the perspectives of consumer value and consumer-brand identification. Furthermore, this study also explores the moderating effects of age and gender differences on the determination process of smartphone brand loyalty. Data collected from 157 respondents was tested against the research model using a partial least squares (PLS) approach. The results indicate that functional value, emotional value, social value, and brand identification have a positive influence on smartphone brand loyalty. Of the two moderators, results show that age enhances the emotional value-brand loyalty and social value-brand loyalty linkages but weakens the brand identification-brand loyalty relationship. However, gender does not play a moderating role in the determination of smartphone brand loyalty. The results of this study provide several important theoretical and practical implications for smartphone brand management.

1. Introduction

With the proliferation of the competing brands in the marketplace, keeping consumers loyal is an imperative for marketing managers (Jones & Sasser, 1995). Researchers have devoted a considerable amount of effort investigating this issue. They have advocated that the notion of brand loyalty should be extended from patronage behavior to psychological commitment (Oliver, 1999), and both attitudinal loyalty and behavioral loyalty contribute to pro-brand consequences. Attitudinal loyalty may be positively associated with patronage intention, word-of-mouth, acceptance of premium price, and resistance to counter-persuasion, while behavioral loyalty may lead to greater market share and increased profitability (Chaudhuri & Holbrook, 2001; Shankar, Smith, & Rangaswamy, 2003).

Standing on various theoretical grounds, researchers have investigated the reasons for brand loyalty, but two viewpoints have received greater amount of attention. The first is consumer value theory, which claims that value perception is the pivotal predictor of brand loyalty (Kim, Gupta, & Koh, 2011; Sweeney & Soutar, 2001). Consumers remain loyal if they perceive superior

value from a given brand (Hansen, Beitelspacher, & Deitz, 2013). The second viewpoint is the identification approach, which puts consumer-brand identification (hereafter referred to as brand identification) as the antecedent of brand loyalty (Bhattacharya & Sen, 2003; Tuškej, Golob, & Podnar, 2013). Consumers stick with a given brand once they identify themselves with the attributes of the brand (Stokburger-Sauer, Ratneshwar, & Sen, 2012). Some studies have further contended that both viewpoints may positively result in brand trust and then brand loyalty (He, Li, & Harris, 2012), supporting claims that these are the foundations of brand loyalty.

Although researchers generally recognize the predictive power of consumer value and brand identification, managers may face a dilemma about resource allocation because the two viewpoints offer different guidelines for business practice. Strategies derived from consumer value theory encourage managers to emphasize product development and to communicate the advantages of the product attributes to consumers (Karjaluoto, Jayawardhena, Leppäniemi, & Pihlström, 2012), whereas strategies derived from the identification approach may drive managers to create an attractive brand identity and to organize a community for intimate consumer-brand and consumer–consumer interactions (Stokburger-Sauer et al., 2012). As managers may have to reconcile these marketing campaigns to generate synergies, it is crucial to differentiate the effects of consumer value and consumer-brand identification on brand loyalty. Therefore, an integrated analysis

with loyalty determinants should aid in understanding the determinant priority and the allocation of marketing resources.

In addition, studies on brand loyalty have argued for the necessity of taking individual heterogeneity into consideration (Floh, Zauner, Koller, & Rusch, 2014). Model validation and/or hypotheses testing with entire samples may suffer from aggregation bias, and the effectiveness of marketing campaigns may not be realized as expected. Compared with mass marketing, targeted marketing might generate revenues and profits more efficiently. As such, individual heterogeneity needs to be considered in the analyses of brand loyalty. A moderation specification of individual heterogeneity can help managers tailor better loyalty programs and enrich existing knowledge. A review of prior studies reveals that age and gender are two typical variables of individual heterogeneity (Venkatesh & Morris, 2000), and this study investigates *whether* and *how* the effects of loyalty determinants differ across age and gender categories.

To sum up, this study has two main objectives:

1. To understand the relative influence of determinants (i.e., value and identification) on brand loyalty.
2. To understand the moderating effects of individual heterogeneity (i.e., age and gender) on the relationships between value/identification and loyalty.

To achieve the two objectives, this study uses the smartphone industry in Taiwan as the research context. In Taiwan, smartphones have overwhelmed feature phones in use, and hold 71% of the mobile phone market in terms of supply in the third quarter of 2012 (Information Data Center, 2012). A recent survey from Google (2013) reported that the penetration rate of smartphones was 51% in the first quarter of 2013, an increase of 19% over the same period in 2012. Given that smartphones have growth potential in Taiwan and brands are a crucial factor in smartphone marketing (Arruda-Filho, Cabusas, & Dholakia, 2010), the research context is appropriate. The results of this study may provide strategic suggestions for smartphone marketing.

The rest of this article proceeds as follows. Firstly, the literature review describes the two theoretical viewpoints and illuminates their underlying concepts. Then, Section 3 introduces the research model and proposes the hypotheses regarding the direct and moderating effects on brand loyalty. The research method is described in Section 4, including sampling, measurement development, and the examination of common method variance. Section 5 reports the empirical results. Lastly, the discussion of results, theoretical and managerial implications, limitations, and directions for further research are presented in Section 6 and the conclusions are in Section 7.

2. Literature review

2.1. Consumer value theory

Consumer value is the cornerstone of a successful transaction, and it motivates consumers to purchase repeatedly (Holbrook, 1994). The expectation disconfirmation paradigm suggests that once consumers have satisfactory experience with a product, they have better value expectations and tend to repurchase the same product in the future instead of switching (Anderson & Srinivasan, 2003). Yang and Petersson (2004) indicated that value is a superordinate goal and positively regulates loyalty behavior, which is at the subordinate level.

In Zeithaml (1988)'s exploratory study, the notion of consumer value was found to be evolutionary and may originate from utility theory in economics, which assumes consumers' purchase

decisions are based on product evaluations. According to the principle of utility maximization, a product/brand that has superior attributes than other alternatives is chosen because product performance is expected to better satisfy consumers' needs. Needs gratification is viewed as consumer value. Thus, product quality, which refers to "consumers' judgment about a product's overall excellence or superiority" (Zeithaml, 1988:3), is conceptually close to product benefits (i.e., what consumers *get* from the product) and consumer value. Products with high quality evaluations are believed to deliver more benefits to consumers, and consumers perceive great value (Zeithaml, Berry, & Parasuraman, 1996). In this vein, notions of product quality, product benefit, and consumer value were initially seen as equivalent (Zeithaml, 1988).

However, as research on consumer value increases, researchers have recognized that there are nuanced differences between these three constructs. Zeithaml (1988) proposed and elaborated a new definition of consumer value; it essentially involves a give-get tradeoff. Consumers evaluate value according to the product's benefits, which are derived from the perceived quality of product attributes, and the mental, physical, and financial sacrifices generated from product acquisition and usage (Cronin, Brady, & Hult, 2000). Both benefits and sacrifices are indispensable pillars of consumer value and contribute to consumer value with positive and negative effects respectively (Lin, Sher, & Shih, 2005). If perceived benefits outweigh perceived sacrifices, consumers view a potential transaction as being valuable (Yang and Petersson, 2004). Based on equity theory, the positive trade-off between benefits and sacrifices creates a feeling of fairness for consumers, who are then more willing to repurchase the product. Thus, high perceived value is accompanied by loyalty behaviors (Cronin et al., 2000).

In addition, many researchers have examined whether or not there are product benefits other than functional and economic ones. Hirschman and Holbrook's (1982) well-known study found that consumers may receive symbolic, hedonic, or esthetic value from shopping processes and/or product usage. Their narrative illustration expanded consumer value beyond the functional benefits and inspired a whole new stream of research. Next, Sheth, Newman, and Gross (1991) suggested a detailed typology including functional, emotional, social, conditional, and epistemic value by synthesizing theories of economics, sociology, psychology, and marketing. Extending Sheth et al.'s (1991) work, Pihlström and Brush (2008) demonstrated that conditional and epistemic values were the antecedents of monetary, convenience, emotional, and social value. Babin, Darden, and Griffin (1994) developed a simplified but generalized value structure with two dimensions consisting of utilitarian and hedonic components. Similarly, Sweeney and Soutar (2001) decomposed consumer value into functional (i.e., quality and value for money), emotional, and social value in the retailing context. Based on Sweeney and Soutar (2001)'s value classification, Kim et al. (2011) argued that there are six types of consumer value. Price utility and functional quality are related to functional value, aesthetics and playfulness are related to emotional value, and social self-image expression and social relationship support are related to social value.

Two interesting findings may be summarized from the studies just described. First, consumer value is generally specified with these three types of value (i.e., functional, emotional, and social) despite an increasing number of studies that have attempted to tap into the nature of each value type (Karjaluoto et al., 2012; Pihlström & Brush, 2008). Second, the definition of functional value has expanded from physical performance/quality (Sheth et al., 1991) to physical performance/quality and value for money (Kim et al., 2011; Sweeney & Soutar, 2001). Since value for money is concerned with monetary sacrifice, the newly-defined functional value may be conceptually equivalent to Zeithaml (1988)'s *give-get* definition. The result is that consumer value, which contains functional,

emotional, and social components, seems to be an appropriate framework because it includes all major benefits simultaneously.

2.2. Brand identification approach

The brand identification approach was conceptually developed from the consumer-company identification approach (Bhattacharya & Sen, 2003), which posits that the extent to which consumers identify with a brand relates to extra-role behaviors (e.g., recommendation or new consumer recruitment) and in-role behaviors (e.g., product utilization or repurchase; Ahearne, Bhattacharya, & Gruen, 2005). According to Lam, Ahearne, Hu, and Schillewaert (2010:129), brand identification is defined as "consumers share the same self-definitional attributes with a brand". This definition suggests that brands possess a distinct identity/personality (Donavan, Janda, & Suh, 2006; Stokburger-Sauer et al., 2012). Brands present an extrinsic cue with which consumers can infer the quality of a product. Brands also project an intrinsic identity that is manipulated by brand managers to differentiate it from competitors (Sung & Choi, 2010; van Rekom, Jacobs, & Verlegh, 2006). For example, Heineken, a famous beer brand, may have connotations of "sober, serious, successful, and a little aloof" (Kotler, Ang, Leong, & Tan, 2003:421). The personification of a brand enables consumers to interact with and establish relationships with the brand (Fournier, 1998).

Prior studies have expounded two mechanisms that motivate consumer brand identification. One is the need for consistency (Kressmann et al., 2006). Consumers may search for a brand with a salient identity that matches their actual self (He et al., 2012). High identity similarity/congruence between consumers and a brand facilitate strong consumer belongingness and generate brand identification (Lam, Ahearne, Mullins, Hayati, & Schillewaert, 2013). The second mechanism is the need for self-esteem. Consumers can help form their ideal identity/self-image by means of purchasing an idiosyncratic brand (He et al., 2012). The closer consumers approach their ideal self, the better they feel, which helps raise self-esteem (Kressmann et al., 2006). Thus, a brand that matches a consumer's ideal self can earn his/her attachment.

2.3. Individual heterogeneity: age and gender differences

Individual heterogeneity is the variation that results from demographics, personality, and socio-cultural influences (Quesenberry & Trauth, 2012). Personal distinctiveness, or internal causality, governs individuals' presentation of consistent attitudes and behaviors towards specific objects or events. Of the individual heterogeneities, demographics are salient variables that are often used in studies examining technology adoption (Venkatesh & Morris, 2000) and consumer value (Deng, Lu, Wei, & Zhang, 2010). This current study looks into the moderating effects of age and gender.

Age affects individuals' attitudes and behaviors. These differences originate from the bio-physical and psychological changes that occur as age increases (Deng, Mo, & Liu, 2014). For example, Carstensen, Isaacowitz, and Charles (1999) suggested that individuals in various life stages have unique awareness of the passage of time. Younger people are more future-oriented, and they perceive time as *time since birth* and *open-ended*, while more elder counterparts are present-oriented and perceive time as *time left in life* and *limited*. Different perspectives of the passage of time cause older people to emphasize socioemotional experience and younger people to focus on skills and knowledge. Erikson (1959)'s 8-stage psychosocial development elucidated that individuals in each stage confront different identity crises and significant relationships, and thus they have different psychosocial needs.

In a similar vein, gender also produces distinctive attitudes and behaviors in men and women. According to gender socializa-

tion theory, individuals are nurtured under gender roles that drive individuals to acquire masculine/feminine concepts and relevant skills, and thus develop varied value systems (Mason & Mudrack, 1998). Self-construal theory claims that sex-specific self construal causes individuals to process information differently (Meyers-Levy & Loken, 2015; Okazaki & Mendez, 2003a). For instance, men are perceived as independent and self-oriented while women are viewed as dependent and relationship-oriented. Venkatesh and Morris (2000) claimed that men and women process information using different socially-constructed cognitive structures, and they demonstrated that behavioral patterns are linked to gender. They found that the effect of perceived usefulness on behavioral intention was greater for men than for women because men are more task-oriented. Women likely suffer from IT anxiety and conform to reference groups; thus, the effects of perceived ease of use and subjective norms on behavioral intentions were stronger for women than for men.

Taken together, this current study recognizes the differences associated with age and gender, and it explores how age and gender differences might moderate the effects of consumer value and brand identification on brand loyalty.

3. Hypotheses

3.1. The specification of research model

The research model is illustrated in Fig. 1. Brand loyalty is defined as consumers' favorable attitude toward a brand that results in intentions to repurchase and recommend (Anderson & Srinivasan, 2003). To understand the relative importance of the determinants of brand loyalty, this study specifies that consumer value and brand identification directly influence brand loyalty. Consumer value is the consumer's overall evaluation of the utility of a product/brand (Zeithaml, 1988), including functional, emotional, and social values (Sweeney & Soutar, 2001). Functional value, which is analogous to utilitarian value, is the benefits gained from a product/brand based on its functional performance and value for money. Specifically, the definitional scope of functional value covers the get-give trade-off idea of perceived value. Emotional value, which is equivalent to hedonic value, refers to the feelings or the affective status aroused by a product/brand (Kim et al., 2011). In general, emotional value is generated from product usage/exploration and product appearance. Finally, social value is the extent to which a product/brand enhances consumers' social well-being and interpersonal relationships, and it is rooted in the symbolic meanings of the product/brand (Rintamäki, Kanto, Kuusela, & Spence, 2006). All three value types are unique and interrelated (Sweeney & Soutar, 2001).

Viewing brand identification as "a psychological state of perceiving, feeling, and valuing his or her belongingness with a brand," Lam et al. (2010:130) conceptualized it as a second-order formative construct with three reflective sub-dimensions. Because that affective brand identification may blend with other constructs such as brand love, and that evaluative brand identification is similar to brand attitude and it is likely to be the result of identification, this study follows Stokburger-Sauer et al. (2012) and considers brand identification as consumers' perception of both entities' identities at the cognitive level. This means that consumers' brand identification is a psychological state rather than a process, and it positively determines brand loyalty (Rocereto & Mosca, 2012; Stokburger-Sauer et al., 2012). Lastly, individual heterogeneity is considered to alter the effects of the four determinants on brand loyalty; therefore, the moderating effects of age and gender are examined.

Some studies are interested in the relationships between consumer value and brand identification. In Lam and Shankar's (2014)
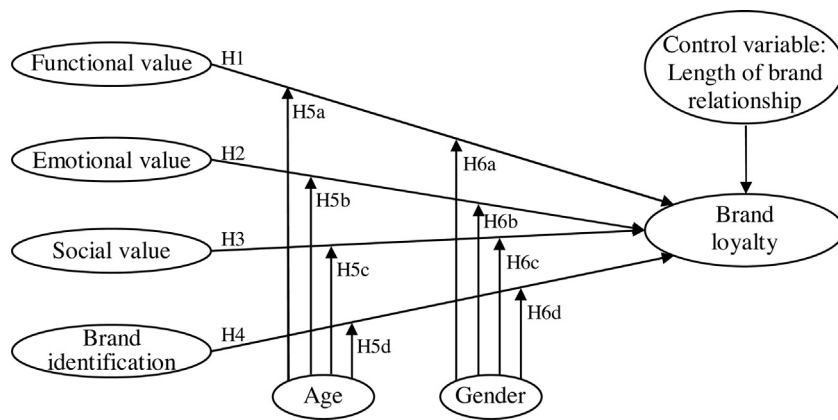
Fig. 1. Research model.

study, brand attachment, which was defined as a brand's resonance with a consumer's self-concept and provides consumers a sense of security similar to the notion of brand identification, was found to be an outcome of consumer value. However, He et al. (2012) and So, King, Sparks, and Wang (2013) found evidence that brand identification was the antecedent of consumer value. Considering the determinant priority of brand loyalty is our main research inquiry and the relationship between consumer value and brand identification appears to be controversial, this study focuses on *how much* consumer value and brand identification impact brand loyalty instead of their interrelationships, and *how* the effects of loyalty determinants change in varied age and gender.

3.2. The effects of consumer value on brand loyalty in the context of smartphone consumption

Studies on technology marketing have recognized that a technology product has a combination of tangible and intangible attributes. By grouping all the attributes into performance, appearance, and communication attributes, Lee, Ha, and Widdows (2011) suggested that technology products might deliver value to consumers via these three attribute types. Consumers gain functional value if the attribute performances of a technology product are useful, easy to use, and innovative. A technology product with attractive appearance, novel material, and atypical design positively elicits consumers' feelings, and offers consumers emotional value. Furthermore, a technology product may be a symbol itself and/or carry symbolic meanings, enabling consumers to communicate to their lifestyle and beliefs to others, thus acquiring social value. Exploring the attributes of mobile phones, Horváth and Sajtos (2002) identified utility/usefulness, experience/enjoyment of use, and communicative power/expression as three main product-related consumer responses. These three responses are similar to those mentioned by Lee et al. (2011).

A smartphone is a state-of-the-art technology product. By integrating components such as processor, camera, display panel, battery, and memory/storage capacity into a handheld device, a smartphone is a telecommunication device and a tool that can be used to listen to music, edit documents, take and record pictures, and study (Liao & Hsieh, 2013; Park & Han, 2013). Also, a smartphone has a connection to the Internet for access to online services like e-mail, maps, information searches, and location-based services (Okazaki & Mendez, 2013a). Thus, a smartphone is able to deliver various functional benefits to consumers.

Prior studies have found evidence of relationship between functional benefit and brand loyalty, and they reported that a brand that offers high functional value earns consumers' preference and

loyalty. Thus, the relationship between functional value and brand loyalty is hypothesized as follows:

H1. Functional value positively relates to brand loyalty.

In addition to functional value, consumers may experience emotional value such as playfulness and pleasure from smartphone usage and exploration (Alba & Williams, 2013; Arruda-Filho et al., 2010). Liao and Hsieh (2013) also pointed out that the fashionable and aesthetic appearance of smartphones contributes emotional value. Pihlström and Brush (2008) revealed when consumers perceive greater emotional value in a product/brand, they show more brand loyalty as measured by repurchase intentions, willingness to pay, and positive word-of-mouth. Thus, the relationship between emotional value and brand loyalty is hypothesized as follows:

H2. Emotional value positively relates to brand loyalty.

Consumer may perceive social value from smartphones. Recruiting iPhone users as interviewees, Arruda-Filho et al. (2010) conducted a netnographic analysis and found that consumers may experience social value from the possession and usage of smartphones. They may view the possession of an iPhone as a symbol of luxury and higher social status (Liao & Hsieh, 2013). In addition, the sharing of smartphone usage experience aids consumers' interpersonal interactions. When consumers perceive higher social value from a product/brand, they show greater brand loyalty behaviors such as disseminating positive information and accepting premium prices (Pihlström and Brush, 2008). Thus, the relationship between social value and brand loyalty is hypothesized as follows:

H3. Social value positively relates to brand loyalty.

3.3. The effect of brand identification on brand loyalty in the context of smartphone consumption

Some studies have found that mobile phones are surrogates for self-identity expression (Mannetti, Pierro, & Livi, 2002; Walsh & White, 2007; Walsh, White, & Young, 2010). By using personalized ringtones and decorations, consumers are able to extend their personality to mobile phones. From a brand management standpoint, Lam et al. (2010) similarly observed that smartphone brands hold unique identities and may accord with or enhance the consumer's identity. Furthermore, results from Stokburger-Sauer et al.'s (2012) study, which surveyed four product categories (i.e., cell phones, athletic shoes, soft drinks, and grocery stores), confirmed that high brand identification is able to turn consumers into brand loyalists and prevent consumers from switching to other brands. Thus, the relationship between brand identification and brand loyalty is hypothesized as follows:

H4. Brand identification positively relates to brand loyalty.

3.4. The moderating effect of age

Harverila (2012) and Kumar and Lim (2008) argued that the motivational need for mobile phone usage is age-specific, and the effects of the three value types and brand identification on brand loyalty may vary with consumers' age (Barutçu, 2007; Coates, 2001; Park, Eisingerich, & Park, 2013; Persaud & Azhar, 2012). In the context of mobile phone consumption, younger consumers are more enthusiastic users of smartphones compared with elder consumers. As indicated by Coates (2001), younger consumers use more smartphone phone functions, such as texting, satellite navigation, and photo editing, whereas elder consumers tend to use them for communication. Complex functions, user-unfriendly menus, and unclear usage instructions may hinder elder consumers from exploring many smartphone applications, which might cause elder consumers to perceive less functional and emotional value (Kurniawan, 2008). On the contrary, younger consumers may "engage in high level . . .. mobile phone use" (Walsh et al., 2010, p. 194), and are more likely to appreciate its fashion-designed appearance (Park et al., 2013; Srivastava, 2005). Barutçu (2007) also found that the younger consumers were more accepting of mobile entertainment services than elder consumers. This suggests that younger consumers might receive more functional and emotional value from their smartphones than elder consumers, and the relationship between functional value/emotional value and brand loyalty may vary as consumers' age is considered. More generally stated, the effects of functional/emotional value on brand loyalty may increase as age decreases.

Furthermore, studies have suggested that younger consumers are more susceptible to social influence from peers and friends than elder consumers (Smetana, Campione-Barr, & Metzger, 2006), and shared norms and standards strongly guide their consumption behaviors. Walsh and White (2006) stated that displaying a mobile phone in public improved younger consumers' status among peers. As for the usage of smartphones, Persaud and Azhar (2012) demonstrated that younger consumers were more involved in social networking activities than elder consumers. According to Erikson's (1959) theory of psychosocial development, younger consumers (especially at the adolescent stage) have a stronger need for identity, so they tend to express themselves with their material possessions and identify with brands that represent their values and beliefs (Syed & Nurullah, 2011; Walsh et al., 2010). Similarly, Sheldon and Kasser (2001) claimed that age was negatively associated with the demand for identity. Thus, younger consumers may favor social value and brand identification more than elder consumers, and the relationship between social value/brand identification and brand loyalty may vary as consumers' age is considered. The effects of social value and brand identification on brand loyalty may increase as age decreases.

In summary, this study proposes the following hypotheses:

H5a. The positive relationship between functional value and brand loyalty is greater when age decreases.

H5b. The positive relationship between emotional value and brand loyalty is greater when age decreases.

H5c. The positive relationship between social value and brand loyalty is greater when age decreases.

H5d. The positive relationship between brand identification and brand loyalty is greater when age decreases.

3.5. The moderating effect of gender

Previous studies and theories have shown that gender has large influence on consumer values, preferences, and behaviors. Okazaki and Mendez (2013a,b); Okazaki and Mendez (2013a,b) explained that male and female consumers may have different value preferences and identification needs, and Hasan (2010) recognized that men and women display diverse perceptions and attitudes. For example, Dittmar, Beattie, and Friese (1995), found that men were more activity-focused and placed higher emphasis on functional value, while women were more relationship-oriented and focused on emotional and social value. Dittmar (2005) also declared that emotional value and identity-related factors were more important for women than for men while shopping.

In the context of mobile phone consumption, Syed and Nurullah (2011) reported that men tended to treat mobile phones as toys, which means the functional and emotional value that men gain from smartphone usage is more closely linked to product exploration and experience than women. In addition, Syed and Nurullah (2011) found that women were more likely to use mobile phones for communication and relationship maintenance. In a related direction, Walsh and White (2007) found evidence that social influence and normative pressure might be the main drivers of women's mobile phone use. Dittmar (2005) maintained that identity-related factors are more important for women than for men while shopping; therefore, brand identification might have a stronger impact on women's smartphone purchase decisions. More generally, women favor social value and brand identification more than men. As men may receive more functional and emotional value from their smartphones than women, and women may favor social value and brand identification more than men, the relationships between the four determinants and brand loyalty may vary as gender is considered.

In summary, this study proposes the following hypotheses:

H6a. The positive relationship between functional value on brand loyalty is greater for men than for women.

H6b. The positive relationship between emotional value on brand loyalty is greater for men than for women.

H6c. The positive relationship between social value on brand loyalty is greater for women than for men.

H6d. The positive relationship between brand identification on brand loyalty is greater for women than for men.

4. Methods

4.1. Measures

There were five sets of measures developed for the major constructs in this study. The measures for the three value types were adopted from Kim et al.'s (2011) comprehensive work, and each value had four items extracted from corresponding types (e.g., social value was measured with two items from social self-image expression and two from social relationship support) to make the measures as balanced as possible. The measure for brand identification was taken from Stokburger-Sauer et al. (2012) and contained three items. This measure provides a richer operationalization of cognitive brand identification than that of Lam et al. (2010), which directly assesses identity similarity using a Venn diagram and a verbal item. Lastly, the measure for brand loyalty was developed from the studies by Anderson and Srinivasan (2003) and Zeithaml, Berry, and Parasuraman (1996). The four chosen items took both the commitment element and the comparison element into consideration (Dick & Basu, 1994; Oliver, 1999). To ensure better measurement quality and mitigate the negative effect of response

Table 1
Measures and reliability.

Construcuts and items	Loading	α	CR
Functional value (Kim et al., 2011)		0.91	0.94
FV1	X smartphones have an acceptable standard of quality.	0.93	
FV2	X smartphones are reliable in their performance.	0.92	
FV3	X smartphones possess a degree of quality that is satisfactory.	0.95	
FV4	X smartphones offer value for money.	0.75	
Emotional value (Kim et al., 2011)		0.86	0.90
EV1	I like the way X smartphones look.	0.84	
EV2	X smartphones are not catching. (R)	0.81	
EV3	Using X smartphones is interesting to me.	0.83	
EV4	Using X smartphones gives fun to me.	0.86	
Social value (Kim et al., 2011)		0.82	0.88
SV1	Using X smartphones enhances my self-image to others.	0.88	
SV2	Using X smartphones improves the way I am perceived.	0.84	
SV3	Using X smartphones does not help me maintain my social relationships with others. (R)	0.69	
SV4	Using X smartphones enhances my social relationships with others.	0.81	
Brand identification (Stokburger-Sauer et al., 2012)		0.83	0.90
BI1	I feel a strong sense of belonging to X smartphones.	0.87	
BI2	X smartphones are like a part of me.	0.88	
BI3	X smartphones have a great deal of personal meaning for me.	0.85	
Brand loyalty (Anderson and Srinivasan, 2003; Zeithaml et al., 1996)		0.91	0.94
BL1	I believe that X smartphones are my favorites.	0.88	
BL2	I say positive things about X smartphones to other people.	0.86	
BL3	I recommend X smartphones to someone who seeks my advice.	0.89	
BL4	When I need to make a purchase, X smartphones are my first choice.	0.92	

Note: 1. (R) denotes that an item is in a reverse form.
2. The loadings were derived from the direct effect model.

fatigue, this study interlaced the items and two items were constructed in reverse form. All the construct terms were concealed in order to reduce social desirability bias. Table 1 lists all the measurement items. All the items were reflectively specified and responses utilized 7-point Likert scales (Viswanathan, Sudman, & Johnson, 2004). Respondents answered these items in terms of their experience with their most-used smartphone.

Based on the authors' reviews and discussions, the measures were translated from English into Chinese to collect responses. All the authors have rich user/consumer research experience in IS and marketing fields. Taking research context into consideration instead of literal translation, the translation equivalence was achieved with greater possibilities (Douglas & Craig, 2007). The language of the translated questionnaire was made with the consensus of all the authors. A pretest of questionnaire was conducted to check whether respondents would have any difficulties in comprehension or find items ambiguous (Boudreau, Gefen, & Straub, 2001). After feedback from the pretest (a convenience sample of 6 smartphone users), refinements were made to the language of SV3 and SV4 and the questionnaire was then finalized.

4.2. Control variable

Similar to the effect of length of patronage on store loyalty in service and retailing contexts revealed by Jones, Mothersbaugh, and Beatty (2000), there may be a positive relationship between length of brand relationship and brand loyalty in the product context (Kressmann et al., 2006). Hence, length of brand relationship was included in the analytic model as a control variable for effect purification. Data was gathered from respondents' answer to the question, "*How long have you been using your most-used smartphone?*" (Jones et al., 2000).

4.3. Data collection and consumer profile

An online survey was created to collect data. Respondents were voluntary recruits from the largest bulletin board system in Taiwan (telnet://ptt.cc). Only Internet surfers who were smartphone users were qualified to participate in this study. Access to the online questionnaire was via a link embedded in the post. The website (http://www.mysurvey.tw/) which hosted the questionnaire restricts every computer to one response. To encourage participation, respondents who provided usable responses were entered into a lottery; respondents had a one in three chance of winning a gift voucher as a reward. The survey was open for one month and a total of 179 responses were obtained. Of these, 22 samples were invalid because of logical inconsistencies between their responses to the reverse items and other items. Thus, the total number of valid responses was 157. This number satisfied the rule of thumb for using the partial least squares (PLS) method, which suggests that sample size should be at least ten times the number of items in the most complex construct or should be larger than 150 (Gefen, Straub, & Boudreau, 2000; Haenlein & Kaplan, 2004; Urbach & Ahlemann, 2010). The power analysis also sustained our sample sizes met the minimum size requirement ($n = 137$) to detect minimum R^2 values of 0.10, under 5% significance level, 80% statistical power, and the maximum number of items/independent variables in the measurement and structural models are four (Hair et al., 2014).

The demographics of the respondents are displayed in Table 2. About 55% of the respondents were male. Their ages ranged from 17 to 58, and the average age of the sample was about 27 years old. The age distribution showed that 68% respondents were in the 21–30 group. The average monthly disposable income was around US$664. More than 90% of the respondents held bachelor's degrees or higher. Table 2 shows respondents' mobile phone consumption. On average, they bought a new mobile phone every 2.48 years, and had 1.20 smartphones and 0.68 feature phones simultaneously. The number of the smartphones they had was twice as much as that of the feature phones, which was similar to the market share suggested by Information Data Center (2012) mentioned earlier. Lastly, 39% (25/64) of the respondents who had purchased two or more smartphones bought their phones from the same brands, while only 19% (29/156) of the respondents who had purchased two or more

Table 2
Demographics of respondents ($n = 157$.)

Characteristics	Frequency (%)	Mean (SD)
Gender		
Male	86 (54.8%)	
Female	71 (45.2%)	
Age (years)		26.98 (6.60)
Below 20	15 (9.6%)	
21–30	107 (68.2%)	
31–40	29 (18.5%)	
41–50	4 (2.5%)	
Above 51	2 (1.3%)	
Education level		
High school diploma	8 (5.1%)	
Junior college	4 (2.5%)	
Bachelor's degree	109 (69.4%)	
Master's degree	36 (22.9%)	
Occupation		
Public employee	12 (7.6%)	
Manufacturing	21 (13.4%)	
Service	33 (21.0%)	
Student	72 (45.9%)	
Others	19 (12.1%)	
Disposable income (USD)		664.01 (569.15)
How often do you buy a new mobile phone? (years)		2.48 (0.77)
How many smartphones do you have?		1.20 (0.45)
How many feature phones do you have?		0.68 (0.82)
Are the last feature phone and the last smart phone you bought the same brand?		
Yes, they are the same brand.	29 (18.5%)	
No, they are not the same brand.	127 (80.9%)	
I never bought a feature phone.	1 (0.6%)	
I never bought a smartphone.	0 (0.0%)	
Are the last two smartphones you bought the same brand?		
Yes, they are the same brand.	25 (15.9%)	
No, they are not the same brand.	39 (24.8%)	
I bought a smartphone once.	93 (59.2%)	
How long have you been using your most-used smartphone? (years)		1.47 (0.95)

Note: (1) USD $\doteqdot$ 30 ND.

mobile phones bought the same brands for their last smartphones and last feature phones.

4.4. Common method variance (CMV)

Common method variance (CMV), which results in spurious relationships between variables, is a concern for all self-reported questionnaires. As Podsakoff, MacKenzie, Lee, & Podsakoff (2003) suggested, this study attempted to control for the CMV effect in the development and design of the survey questionnaire by counterbalancing item order, improving item comprehension (i.e., through pretesting), protecting respondent anonymity, and reducing evaluation apprehension. Also, Harman's single-factor test was used to examine whether CMV had occurred statistically (Podsakoff et al., 2003). The results of exploratory factor analysis revealed that all the items did not converge into a single factor, but the first factor accounted for 53.43% variance of the items. Further confirmatory factor analysis which is an alternative of exploratory factor analysis (Malhotra, Kim, & Patil, 2006; Podsakoff et al., 2003), was performed and the results showed that the five-factor model ($\chi^2_{(142)} = 485.52$, GFI = 0.76, AGFI = 0.68, CFI = 0.95, IFI = 0.95, RMSEA = 0.12, RMR = 0.074, NFI = 0.93, and NNFI = 0.94) yielded better goodness of fit than the one-factor model ($\chi^2_{(152)} = 884.49$, GFI = 0.58, AGFI = 0.47, CFI = 0.90, IFI = 0.90, RMSEA = 0.20, RMR = 0.098, NFI = 0.88, and NNFI = 0.88). This indicates that the CMV effect might be properly controlled and the survey data was acceptable for PLS analyses.

5. Results

The PLS method, which is variance-based structural equation modeling and is a distribution-free technique (Hair, Sarstedt, Ringle, & Mena, 2012), was used to analyze the data. The results were produced using the SmartPLS 2.0 M3 package (Ringle, Wende, & Will, 2005).

5.1. Measurement model

Table 1 presents the psychometric properties of the measures. The values of Cronbach's α and composite reliability (CR) ranged from 0.82 to 0.94, indicating that the five sets of measures had strong internal consistency (Henseler, Ringle, & Sinkovics, 2009). The factor loadings were all above 0.69, suggesting that around or more than half of the variance of an item was attributed to its corresponding construct (Chin, 1998). Thus, indicator reliability was adequate. Average variance extracted (AVE) values were all higher than the threshold value (0.5) with the minimum value being 0.65 (see Table 3), therefore, convergent validity was evident.

Discriminant validity was assessed using the Fornell-Larcker criterion and cross-loadings (Urbach & Ahlemann, 2010). As shown in Table 3, the AVE value of each construct was superior to its corresponding squared correlations, demonstrating that constructs were discriminable. The results also showed that each item loaded on its designated construct without cross-loadings. Accordingly, discriminant validity was satisfactory.

Table 3
Descriptive statistics and discriminant validity.

	M	SD	FV	EV	SV	BI	BL
FV	5.07	1.03	0.79				
EV	5.24	0.94	0.55	0.70			
SV	4.27	1.07	0.27	0.30	0.65		
BI	4.50	1.27	0.31	0.34	0.56	0.75	
BL	4.77	1.27	0.53	0.58	0.45	0.52	0.79

Note: Diagonal elements and off-diagonal elements represent average variance extracted and shared variance, respectively.

5.2. Structural model

Table 4 shows the results of the model evaluation. The estimation of standardized path coefficients was based on the path weighting scheme. The significance testing was based on 1000 bootstrapped samples and the option of construct level changes (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). First the effect of control variable was checked. Model 1 shows that consumers' length of brand relationship had a significant positive impact on brand loyalty ($\gamma = 0.24$, $p < 0.01$). Next, Model 2 examines the effects of the four determinants and found that functional value ($\gamma = 0.26$, $p < 0.001$), emotional value ($\gamma = 0.32$, $p < 0.001$), social value ($\gamma = 0.14$, $p < 0.05$), and brand identification ($\gamma = 0.28$, $p < 0.001$) predicted brand loyalty with statistical significance and explained 73.17% of the variance. These results support H1, H2, H3, and H4. Furthermore, Models 3 and 4 take the product-indicator approach to test moderating effects (Chin, Marcolin, & Newsted, 2003) and found that only age strengthened the emotional value-loyalty and social value-loyalty linkages while weakening the relationship between brand identification and loyalty. Thus, H5d is supported, but H5a, H5b, and H5c are not supported. Gender differences did not exert any moderating effect across the four hypothesized relationships. Thus, H6a, H6b, H6c, and H6d are not supported.

Moreover, this study assessed the strength of the moderating effects by evaluating effect sizes (Urbach & Ahlemann, 2010). The definition of effect size is "the degree to which the phenomenon is present in the population" (Cohen, 1988), and 0.02, 0.15, and 0.35 are the respective values to identify whether the effect is small, medium, or large. Based on the formula of $f^2 = (R^2_{modelwithmoderator} - R^2_{modelwithoutmoderator})/(1 - R^2_{modelwithmoderator})$, age had a medium effect size (0.23), while gender (0.05) had a small one.

To further understand how the moderating role of age functions, respondents were divided into two groups using latent scores of age. Considering the range of ages in the sample was 17–58 and the average age was 27, a middle-aged group (positive latent scores) and younger group (negative latent scores) were found and showed distinct patterns, which are shown in Figs. 2–4. Fig. 2 shows that the slope for the middle-aged group was steeper than the younger group, indicating that the impact of emotional value on brand loyalty was stronger for middle-aged consumers than for younger consumers. An increase in emotional value would lead to greater brand loyalty of middle-aged consumers, compared with younger consumers. It was also the case in the relationship between social value and brand loyalty, which is presented in Fig. 3.

Moreover, both Figs. 2 and 3 reveal that as emotional value/social value increased, the differences in brand loyalty between the middle-aged consumer group and the younger consumer group also increased. A comparison between Figs. 2 and 3 indicate that the intersection occurred at a lower social value (see Fig. 3) than emotional value (see Fig. 2). At a given level of emotional value/social value, the difference gap in brand loyalty between the two consumer groups was wider in the case of social value, compared with the emotional value case.
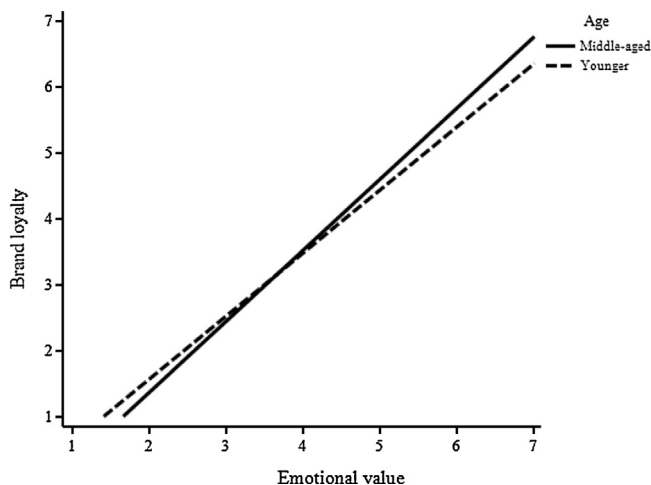

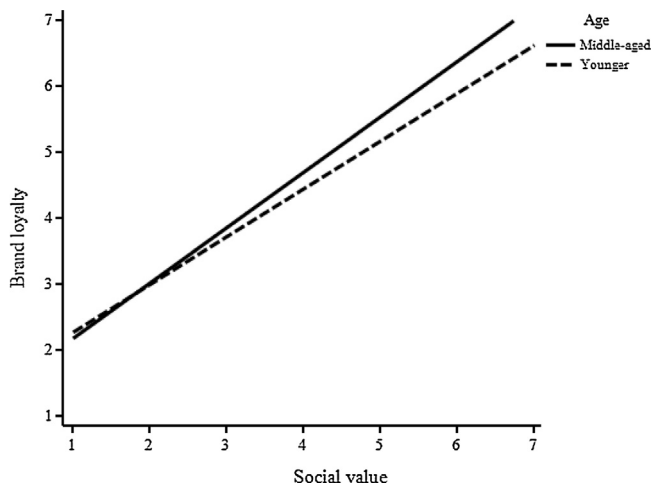**Fig. 2.** The moderating effect of age on the relationship between emotional value and brand loyalty.

Fig. 3. The moderating effect of age on the relationship between social value and brand loyalty.
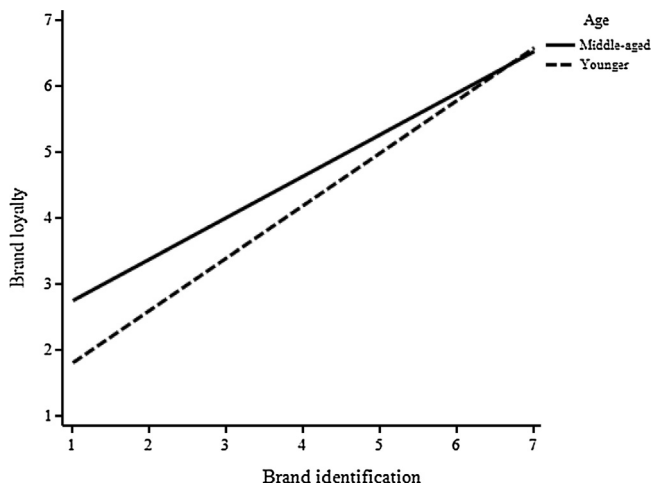

Fig. 4. The moderating effect of age on the relationship between brand identification and brand loyalty.

Table 4
Model evaluation.

Variable	Expected sign	Model 1	Model 2: direct effect	Model 3: age	Model 4: gender
Length of brand relationship	C.V. (+)	0.24** (3.19)	0.02 (0.54)	0.01 (0.35)	0.03 (0.58)
Age	M.V.	–	–	0.13* (2.45)	–
Gender	M.V.	–	–	–	−0.08 (1.81)
Functional value	H1 (+)	–	0.26*** (3.66)	0.25** (3.05)	0.25** (3.18)
Emotional value	H2 (+)	–	0.32*** (4.91)	0.30*** (4.15)	0.31*** (4.48)
Social value	H3 (+)	–	0.14* (2.08)	0.14* (2.29)	0.15* (1.99)
Brand identification	H4 (+)	–	0.28*** (4.09)	0.31*** (4.53)	0.29*** (4.05)
Functional value × age	H5a (¡Đ)	–	–	−0.12 (1.35)	–
Emotional value × age	H5b (−)	–	–	0.22* (2.29)	–
Social value × age	H5c (−)	–	–	0.29* (2.54)	–
Brand identification × age	H5d (−)	–	–	−0.22* (2.00)	–
Functional value × gender	H6a (+)	–	–	–	0.09 (1.11)
Emotional value × gender	H6b (+)	–	–	–	−0.05 (0.67)
Social value × gender	H6c (−)	–	–	–	−0.02 (0.27)
Brand identification × gender	H6d (−)	–	–	–	0.01 (0.11)
$R^2_{brandloyalty}$ = effect		5.92%	73.17%	78.25%	74.52%
size (f^2)				0.2336	0.0530

Note. (1) The numbers in parentheses refer to *t*-values derived from 1000 bootstrapped samples.
(2) * Denotes $p < 0.05$; ** denotes $p < 0.01$; *** Denotes $p < 0.001$. Two-tailed test.
(3) C.V. is the abbreviation for "control variable"; M.V. is the abbreviation for "moderator variable"; n.s. refers to no significant difference.
(4) The formula for calculating the effect size is based on Cohen (1988). $f^2 = (R^2_{modelwithmoderator} - R^2_{modelwithoutmoderator})/(1 - R^2_{modelwithmoderator})$.

In contrast, Fig. 4 shows that the younger consumer group had a steeper slope than the middle-aged consumer group. It indicates that the younger were more sensitive in brand loyalty than the middle-aged as the brand identification increased. Interestingly, even though the impact of brand identification on brand loyalty was stronger for the younger consumers, the middle-aged consumers consistently maintained a higher brand loyalty than the younger consumers until the brand identification reached higher levels. The gap between the two groups became smaller as brand identification increased.

6. Discussion

6.1. Discussion of the results

While consumer value and brand identification might dominate the formation of brand loyalty, there is little understanding regarding their relative importance. The roles of age and gender differences in influencing these relationships are less examined. For these reasons, this study intends to know the determinant priority of brand loyalty and takes age and gender differences into account. The two theories are expected to be elaborated through consumer segmentation, and the results may provide marketing managers with more exquisite and feasible strategic directions to guide the deployment of their resources.

The empirical results of this study revealed that consumer value (i.e., functional value, emotional value, and social value) and brand identification positively predicted brand loyalty. Emotional value was evaluated to be most influential to brand loyalty, and was followed by brand identification, functional value, and social value. The relative importance of the top three determinants were close, and was nearly twice as much as that of social value. As expected, the results further showed that age moderated the effect of brand identification on brand loyalty, and the effect of brand identification was getting greater as age decreased. Surprisingly, against our expectations, the effect of functional value on brand loyalty did not change as age increased. A possible reason may explain the insignificant effect of age differences. Most respondents in this study were middle-aged and younger consumers (17–58 years old), and they had all experienced rapid technological changes in their lifetimes and might have had high acceptance of smartphones (Deng et al., 2014). Persaud and Azhar (2012)'s study reported that younger consumers (13–24 years old) used smartphones mainly for tex-

ting, photo-taking, and video-viewing, and middle-aged consumers (35–54 years old) engaged in smartphone activities for the use of e-mail, maps, news and information, and banking. Similar to Persaud and Azhar (2012), the ease of use of the handheld smartphone may contribute middle-aged and younger consumers to experience multiple benefits from smartphone usage. Both consumer groups emphasize functional value equally, and functional value might thus contribute to brand loyalty without age differences.

In addition, this study failed to predict the effect of age differences on the relationship between emotional value and brand loyalty. That is, age significantly strengthened the effect of emotional value on brand loyalty, and the effect of emotional value on brand loyalty was greater as age increased. Our findings were different from the studies of Barutçu (2007) and Coates (2001), which evidenced that younger consumers were more likely to benefit from the exploration of new mobile technology and enjoy mobile entertainment services. As with the explanation mentioned earlier, both middle-aged and younger consumers may experience functional value equally. Compared with younger consumers, middle-aged consumers may confront more complicated challenges and tasks from work and daily life. The functional value experienced from smartphone usage may help middle-aged consumers to manage these challenges and tasks efficiently and effectively and gain much more pleasure. This result may also be explained by the socioemotional selectivity theory which suggests that older people are in search of emotion-related goals and material (Charles, Mather, & Carstensen, 2003). Thus, the effect of emotional value on brand loyalty was greater as age increased.

Opposite to the results of Persaud and Azhar (2012), this study showed the moderating influence of age on the relationship between social value and brand loyalty was positive. The social value middle-aged consumers perceive led to greater brand loyalty than younger consumers. The result of this study may be in line with Churchill and Moschis's (1979) argument that social consumption motivation increases with age and human development maturity. Thus, the symbolic representations of brands might be more important for middle-aged consumers to earn social status and to foster interpersonal relationships. Our results may also echo the finding of Heckhausen (1997) that middle-aged consumers were, compared with younger consumers, in pursuit of community goals, and thus social value is more crucial for them. By and large, the effects of emotional value, social value, and brand identification on brand loyalty varied with age.

Though Syed and Nurullah (2011) stated that the men and women have different mobile phone usage patterns, this study found that the moderating effect of gender was absent in all the predicted relationships between brand loyalty and the four predictors. These results support Leong, Ooi, Chong, and Lin's (2013) findings of no significant differences between men and women in the adoption of mobile entertainment services, and it also agrees with Albert, Merunka, and Valette-Florence's (2013) findings that there was no gender effect on the relationship between brand identification and brand commitment. There may be two possible reasons for our results. First, the gender indifferences may be attributed to the culture in terms of masculinity and feminine. Masculinity/feminine is a dimension which Hofstede (1991) identified to evaluate national culture, and refers to the degree to which gender inequalities are espoused by a society (Srite & Karahanna, 2006). Zhou, Dai, & Zhang (2007) addressed that a masculine culture tends to show greater gender inequalities or gender divide, and the social gender roles are distinctly constructed. Oppositely, the social gender roles in a feminine culture may be highly overlapped. The respondents in this study were recruited in Taiwan, which is a less masculinity society with a scores of masculinity/feminine evaluation (i.e., 45) compared with the 51 sampled countries ($M_{countries}$ = 51.24) (Erumban & de Jong, 2006). Thus, the effects of gender differences did not significant in the relationships between the four determinants and brand loyalty. The second reason might be related to the research context in which smartphone brands were under evaluation. Though Venkatesh and Morris (2000) find that the reasons to use computers in the workplace may vary between men and women, gender differences may not significantly exist in the context of smartphone use which is not mandatory (Yol, Serenko, & Turel, 2006). Similar to the view that gender effects may not always exist or function in the same direction across product types (Dittmar, 2005), contextual factors, such as voluntary and mandatory use, may influence the occurrence of gender differences. To sum up, many researchers announce that men and women show different mobile phone usage patterns. Most of their arguments are based on observations or qualitative evidence (Lemish & Cohen, 2005; Srivastava, 2005; Syed & Nurullah, 2011; Walsh & White, 2007). Unlike these studies, the results of this study which were analyzed with survey data found no gender differences in any of the four relationships.

6.2. Theoretical implications

The empirical findings of this study have five main theoretical implications. First, this study validates that consumer value and brand identification are two dominant grounds to predict consumers' loyal intentions. Specifying consumer value which is classified into three distinct types (i.e., functional, emotional, and social value) and brand identification as the determinants of brand loyalty jointly, our results show that 73% variance of brand loyalty is explained. The higher the value and identification consumers perceive, the greater commitment to repurchase and recommend a given brand will be. Specifically, emotional value, brand identification, and functional value have higher influence on brand loyalty than social value with nearly twice the magnitude (see Models 2–3 in Table 4). This finding implies that smartphone brand loyalty may primarily depend on individual-related factors rather than interpersonal factors.

Second, this study provides evidence for the effect of consumer value on brand loyalty with the 3-value framework. The significance of functional value, emotional value, and social value indicates that consumers stay with a certain smartphone brand based on a variety of value evaluations. The explanatory power of consumer value appears not only in a retailing context (Sweeney & Soutar, 2001) but also in a technology product context. Lee et al.

(2011) argue that product attributes which are classified as performance, appearance, and communication attributes are related to consumers' approach behavior in the context of high-technology products, and Horváth and Sajtos (2002) consider the three product-related consumer responses (utility/usefulness, experience/enjoyment of use, and communicative power/expression) positively lead to the buying behavior of mobilephone. Based on consumer value theory, this study may extend the two studies and elaborate that the three product attributes deliver corresponding value to consumers and prompt them to purchase the product of a brand repeatedly.

Third, prior studies on self-brand relationship suggest shortening the distance between consumers and brand identity by figuring out consumer identity and brand identity respectively. One major criticism of this suggestion is a brand may confront a variety of consumer identities, and it limits the generalizability of empirical results and their practical applicability (Geuens, Weijters, & De Wulf, 2009). Brand identification is a consumer's subjective evaluation of self-brand congruence. In accordance with He et al.'s (2012) findings, the results of this study do imply that brands will successfully earn consumers' loyalty via their perceived identification while purchasing smartphones. The establishment of a salient brand identity may be more contributive to gain consumers' perceived identification.

Fourth, this study verifies the existence of moderating role for age differences but not for gender differences. Not all demographics are excellent predictors to segment consumer behaviors. Similar to Dittmar's claims (2005) that the effect of gender differences is product-specific, our findings may corroborate that greater care is necessary while using gender as a moderator.

Lastly, this study developed moderating hypotheses of age mainly based on prior studies on mobilephone usage and age-related theories. The results revealed that three of the four hypotheses were observed significantly, and the effects of emotional value/social value/brand identification on brand loyalty changed as age increased. Only the effect of age differences in the relationship between brand identification and brand loyalty met our expectation. It indicates that aging is a highly complex process and involves various development stages. Our results may imply that the determinants of brand loyalty may change from identity-driven to emotional/social value-driven (see Figs. 2–4 and the statements in Section 5.2). A joint consideration of age-related theories may prevent from the dilemma of age stereotype and provide a better predictability by clearly identifying the need of an individual in a given stage (Deng et al., 2014).

6.3. Managerial implications

As our investigation in Table 2 indicates, 39% respondents revealed that the brand which they chose in their last two smartphone shopping experiences were the same while only 19% respondents agreed that in their last shopping of feature phone and smartphone. Patronage and cross-buying of the same brand were not common behaviors for consumers when shopping for mobile phones, which suggests that a higher marketing effort is needed.

Given that consumer value and brand identification contribute to brand loyalty, smartphone marketers should not only deliver functional, emotional, and social value to consumers, but also establish brand identity in terms of attractiveness, distinctiveness, and salience to earn consumers' identification with the brand (Kim, Han, & Park, 2001). Considering the relative importance of the four loyalty drivers, smartphones managers have to put more emphasis on the individual-related drivers (i.e., functional value, emotional value, and brand identification). This study indicates that out of the three individual-related drivers, emotional value is the most significant, followed by brand identification, and lastly, functional value.

Therefore, managers should allocate their resources relative to their importance. Furthermore, the results may imply that the younger consumers may show brand loyalty because of brand identification and the middle-aged consumers may favor emotional/social value and then tend to repurchase and recommend. Smartphone managers should communicate identity attractiveness to younger consumers and emotional and social value to the middle-aged and the elderly. Finally, a further look at Figs. 2 and 3 indicate that when there was low emotional value/social value, younger consumers had higher brand loyalty than middle-aged consumers. This situation was reversed in the case of brand identification (see Fig. 4). Once a smartphone brand *currently* fails to deliver better emotional value/social value to consumers, younger consumers may be the target market. Similarly, middle-aged individuals should be the target consumers for smartphones which receive less brand identification.

6.4. Limitations and future research

Several limitations exist in the present study. The first is that this study adopted non-probability sampling and recruited participants from the Internet. There was considerable overlap between Internet users and smartphone users in Taiwan. Even though 73.6% of Internet users held smartphones (Phycos, 2013), the sample might not represent the population of smartphone users. Ideally, a representative sample needs to be utilized by future studies. Second, this study oversampled highly-educated individuals, which may lead to biased results. Thus, if this research study is to be applied, one should be aware of the sampling bias. Third, this study is not fully free of CMV threat. Our results of CFA-based Harman's test showed the control of CMV was acceptable, but those of EFA-based one were slightly against the criterion. Cautions need to be taken when generalizing the findings of this study to other situations. Future studies are also suggested to assess CMV effects with more delicate approaches such as MTMM or marker-variable techniques (Malhotra et al., 2006). Fourth, this study was conducted in the smartphone consumption context, which is a high-involvement product (Walsh, White, Cox, and Young, 2011). The role of product involvement in influencing consumer-brand identification has been noticed by previous studies (e.g., Stokburger-Sauer et al., 2012), generalization of this study's findings may be restricted. Future studies may address this limitation by examining the proposed hypotheses in the context of different product involvement levels or by controlling the effects of product involvement in the analysis.

Fifth, this study defined age from the perspective of chronological age. It has been suggested that cognitive age is a predictor of consumer behavior. People think, feel, and act according to their perceived age (Chang, 2008). In the light of this alternative perspective, future studies are encouraged to investigate the effects of age differences from the viewpoint of cognitive age. Sixth, in addition to demographics, consumer traits such as lifestyle and innovativeness are predictive moderators or classifiers in studies on mobilephone shopping (Sell, Mezei, & Walden, 2014) and situational variables such as switching cost may bias the effects consumer value/brand identification on brand loyalty (Jones et al., 2000). More academic effort is needed to explore the moderating effect of individual differences and situational variables. Seventh, the empirical evidence of this study was derived from Taiwanese smartphone users. Given that cultural differences may influence consumers' value preferences and needs for identification (Park & Rabolt, 2009), future studies are needed to examine this issue. They are advised to recruit respondents from various cultural backgrounds. Lastly, the competition in smartphone industry is not only between brands but also between platforms (Bellman, Potter, Treleaven-Hassard, Robinson, & Varan, 2011). Platform preferences may influence consumers'

brand choices. In this regard, future studies may examine the effects of platform preferences on the proposed relationships.

7. Conclusions

Based on consumer value theory and brand identification approach, this study identified functional value, emotional value, social value, and brand identification as the determinants of brand loyalty. To understand what the priority of the four loyalty determinants is and how the relationships between the four loyalty determinants and brand loyalty change in varied age and gender, the research model of this study was tested in the context of smartphone consumption with a surveyed sample of 157 respondents.

The results showed that there were positive relationships between the four determinants and brand loyalty. Emotional value was related to brand loyalty with the strongest effect, and then were the brand identification, functional value, and social value sequentially. Furthermore, these positive relationships changed while taking consumers' age into consideration. The relationship between brand identification and brand loyalty was stronger for younger consumers than for middle-aged consumers. As age increased, the effects of emotional value/social value on brand loyalty were getting greater. Emotional value and social value were more influential in forming brand loyalty for middle-aged consumers, compared with younger consumers. Finally, gender did not moderate the four determinants-brand loyalty relationships. To sum up, as various theoretical perspectives are used to investigate consumers' brand loyalty, this study finds that individual-related factors (i.e., functional value, emotional value, and brand identification) may have better predictability of smartphone brand loyalty than interpersonal factors (i.e., social value). Age, instead of gender, appears to be more influential in the segmentation of smartphone consumers while building brand loyalty. Our findings may help practitioners in smartphone industry to develop effective marketing strategies and campaigns.

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