How perceived value drives the use of mobile financial services apps

Authors: Heikki Karjaluoto, Aijaz A. Shaikha, Hannu Saarijärvi & Saila Saraniemi

Abstract

Mobile information services have revolutionized business models and service delivery methods by facilitating consumer access to information and order placement via mobile apps. In developed markets, mobile banking (m-banking) and mobile payment (m-payment) applications have replaced text-based mobile services. However, extant research has not addressed these mobile financial services apps (MFSAs) adequately from the perspective of consumer behavior. Thus, the present study developed and tested a series of hypotheses related to the antecedents of perceived value of MFSA use; it also examined how such use affects the development of customers' overall relationships with banks. Our hypotheses were tested using two samples (N=992; N=524) comprising different types of MFSA end-users in one of the leading countries in digital banking, Finland. The results supported most of the hypotheses and revealed that self-congruence and new product novelty are the principal drivers of perceived MFSA value. In addition, the findings show that the perceived value of MFSAs yields strong positive effects on customers' overall satisfaction and commitment to their bank. The present study's key managerial implication is that banks' investments in developing MFSAs result in improved relationships with customers and increased business.

Keywords: Mobile financial services apps; Perceived value; Personal innovativeness; Self-congruence; New product novelty

1. Introduction

M-banking and m-payment apps are recognized far and wide as highly critical components of mobile information services, providing a host of value-added and technology-based financial services to consumers. These services include, but are not limited to, funds transfers, balance inquiries, buying insurance, paying utility bills, receiving critical service alerts, messaging personal banking advisors, and saving beneficiary information.

M-banking – which refers to the execution of financial and non-financial transactions using a mobile device, such as a cell phone or tablet (Shaikh & Karjaluoto, 2015) – has received greater attention from consumers recently, as it offers high usability, usefulness, and a personalized banking experience. On the other hand, m-wallet is an advanced m-application that includes several elements (e.g., m-payments) that contain information related to membership, including loyalty cards, and the ability to store both personal and sensitive information, including passports, credit card information, PIN codes, and encrypted online shopping accounts (Hepola, Karjaluoto, & Shaikh, 2016).

Finland, the context of this study, reports a near 90% adoption rate for individual online banking service usage among consumers between 15 and 79 years old, and approximately three out of four (77%) adults in Finland own a smartphone that is not their primary device for accessing the Internet (Statistics Finland, 2018). Since 2016, the number of logins via m-banking apps has surpassed logins via desktop computers in Finland (Danske Bank, 2016). In addition, OP (2017), one of the largest financial groups in Finland, reports that in December 2017, m-banking received the distinction of being consumers' primary service delivery channel for accessing banking services (with over 18 million logins), followed by online banking (with 9 million logins) and m-wallet logins (over 2.5 million).

The present study's purpose is multifold. First, a cursory analysis of consumer and information systems (IS) literature has suggested that individual acceptance of IS technology, such as m-banking services, occurs as both a central and recurrent theme in end-user research. Second, a great deal of extant research (e.g., Cruz, Barretto Filgueiras Neto, Munoz-Gallego, & Laukkanen, 2010; Laukkanen & Lauronen, 2005; Shaikh & Karjaluoto, 2015) has examined mobile financial services (MFS) and their many facets, such as m-banking and m-payment services. Third, a great deal of research on MFS (e.g., Glavee-Geo, Shaikh, & Karjaluoto, 2017; Shareef, Baabdullah, Dutta, Kumar, & Dwivedi, 2018) has chosen user pre-adoption and resistance (e.g., Laukkanen & Kiviniemi, 2010) perspectives, with a focus on users' intent to access web- and text-based MFS. To date, little empirical evidence exists regarding the consequences of online banking use from the perspective of mobile app usage. Fourth, through a meta-analysis on m-banking-services adoption, Baptista and Oliveira (2016) have shown that many relevant studies in this field come from Asia or South Africa, and that only a few recent studies have been conducted in countries in which digital banking and payment adoption is more mature. They concluded that more research is needed on the antecedents and consequences of m-applications' adoption and use. Thus, the present study intends to answer these calls for more research.

Against this backdrop, the present study contributes to the ongoing debate concerning MFSA usage. In addition, this study advances our knowledge of the antecedents and consequences of perceived value (PV) in the MFSA context. This study develops a detailed series of hypotheses concerning the effects of personal innovativeness (PI), self-congruence (SC), perceived risk (PR), and new product novelty (NPN) on PV, as well as between PV and customer relationship metrics (measured as overall satisfaction and commitment). Relatively little research has considered how the PV of using m-applications affects the wider perspective of customer relationships. Specifically, extant literature has not considered the effects of m-application use on the relationship between m-application users and service providers. Thus, our study intends to fill this gap by discussing the effects of use on customers' overall satisfaction and their commitment to their service providers.

The remainder of this study proceeds as follows. Next, we present the theoretical background by discussing the principal study constructs and their application in the MFSA field. Subsequently, we present the research model and hypotheses. Thereafter, the research methodology is outlined, followed by a presentation of the results and finally a discussion of both the theoretical and managerial implications of

the findings, as well as the study's limitations. We conclude with recommendations for future research.

2. Theoretical background

2.1. Mobile financial services

Due to the increasing importance and usage of MFS in developed, emerging, and developing countries, examining consumer responses in adopting and using MFS has become many scholars' research priority (Yen & Wu, 2016; Lee, Park, Chung, & Blakeney, 2012; Peffers & Tuunanen, 2005). The present study considers MFS to consist of two major digital banking channels: m-banking and m-wallet (also referred to as m-payments). Financial and non-financial firms have developed and deployed various mechanisms to access and use MFS. For example, m-banking services – considered to be the most value-adding and important m-commerce applications (Singh & Srivastava, 2018) – can be accessed through texts or SMS, mobile Internet, and downloadable mobile applications. Although text/SMS banking provides limited service options, downloadable m-banking apps provide wider and more cost-effective service options, as well as greater protection. Consequently, MFSAs have become very popular in developed countries, such as Finland, which have advanced infrastructure and Internet connectivity. These MFSAs, because of their increasing ubiquity, convenience, and innovative options for banking and making payments virtually anytime, anywhere, have achieved vast market potential.

2.2. Perceived value (PV)

PV offers a basis for understanding consumer behavior in the contexts of e-services (Li & Mao, 2015) and mobile IS (Shaikh & Karjaluoto, 2016). Zeithaml (1988, p.4) defined PV as "the global evaluation of the consumer regarding the utility of the product based on the perception of what is received in exchange for what is given." The top priority for any business is to create value for customers while extracting value for the firm (Kumar & Reinartz, 2016). PV is the fundamental basis for many organizational activities, and it is considered essential to a firm's success due to its significant impact on brand loyalty (García-Fernández, Gálvez-Ruíz, & Vélez-Colón, 2018). PV also represents the aggregation of benefits that the customer is seeking, expecting, or experiencing, as well as the possible undesired consequences resulting from them (Kumar & Reinartz, 2016).

PV has been conceptualized as both a unidimensional and multidimensional construct (Yeh, Wang, & Yieh, 2016). Following Sweeney and Soutar's (2001) scale-development study, PV often has been conceptualized through multiple dimensions, such as utilitarian, to include quality, price, and emotional and social value (Kim & Han, 2011; Li & Mao, 2015; Pihlström & Brush, 2008). Therefore, PV eventually can be approached through two broad dimensions: utilitarian and hedonic (Im, Bhat, & Lee, 2015). In the context of mobile data services, Kim & Han (2011) argue that utilitarian value is related closely to the effectiveness and efficiency resulting from the use of a particular service in accomplishing any everyday task and, therefore, widely is considered very instrumental in nature. On the other hand, hedonic value is considered non-instrumental, experiential, and effective, resulting

from the pleasure and fun derived from use, rather than task completion (Kim & Han, 2011; Li & Mao, 2015). Together, these value dimensions provide a strong conceptual lens through which to view and understand consumer perceptions and behaviors.

2.3. Antecedents of perceived value

2.3.1 Personal innovativeness (PI)

Personal innovativeness (PI) originally is derived from the Diffusion of Innovations Theory, one of the oldest social-science theories (Rogers, 1962). PI refers to the degree to which an individual is early in adopting new ideas compared with the average member of his or her social system (Leicht, Chtourou, & Youssef, 2018). Similarly, PI is considered a personal trait (Thakur, Angriawan, & Summey, 2016), normally associated with risk-taking consumers when they try new innovations and services, such as MFSAs.

PI is a central factor that affects the adoption of IS, and research has examined it in relation to perceived ease of use and perceived usefulness (Thakur & Srivastava, 2014; Karjaluoto, Töllinen, Pirttiniemi, & Jayawardhena, 2014), and technological innovativeness and gadget lovers (Thakur et al., 2016). In a study conducted on business-to-business (B2B) sales managers' willingness to use mobile CRM, Karjaluoto et al. (2014)) found that PI affects perceived ease of use, but not perceived usefulness, directly. Avlonitis and Panagopoulus (2005) said innovative consumers have more experience using different IS, which explains its positive effects on ease of use.

2.3.2 Self-congruence (SC)

Until recently, research on SC with services and brands focused on offline aspects (Wallace, Buil, & de Chernatony, 2017). Scholarly research on IS has broadened exploration of SC to consider online services as well. The terms "self-congruence (SC)," "self-image congruence," "self-congruity," and "image congruence" are used interchangeably in IS literature (Hepola et al., 2016). The concept of SC widely is considered to be important for understanding the relationship between consumers, brands, and brand outcomes (Kressmann, Sirgy, Hermann, Huber, Huber, & Lee, 2006).

According to Japutra, Ekinci, and Simkin (2017), SC reflects consumers' perceptions of the fit between self-concept, which can be either actual or ideal, and brands' or services' personality or image. SC has multidimensionality, but for the sake of the present study, the perspective of "actual" SC is adopted because it represents "the real me" of the consumer. Thus, it has been found to yield a higher emotional attachment with the brand (Malär, Krohmer, Hoyer, & Nyffenegger, 2011). SC exists when the stereotype of the typical user of a brand (brand-user image or brand personality) matches with a consumer's self-concept (Cowart, Fox, & Wilson, 2008; Kressman et al., 2006, Sirgy et al., 1997). This match implies that the use of the brand enhances a consumer's self-esteem (Malhotra, 1988) and self-consistency (Ericksen & Sirgy, 1989). Self-concept is multi-dimensional, reflecting different perspectives of the self: actual self-image, ideal self-image, social self-image, and ideal social self-image (Sirgy, 1982).

SC plays a critical role in many evaluations and brand outcomes, such as assessments of user satisfaction, PV, and brand loyalty (Loh, Ahmad, Kadir, & Alam, 2015; Shaikh & Karjaluoto, 2016). If a brand is closely connected with one's sense of self, he or she, as a consumer, is more likely to trust it (Jahn, Gaus, & Kiessling, 2012). Zhang, Benyoucef, and Zhao (2015) found that consumers could develop a sense of SC by following a brand's microblog. Furthermore, the importance of SC has been demonstrated in the adoption of mobile services (Hepola et al., 2016). However, SC's effects have yet to be applied widely to explain consumer behavior in the mobile app context.

2.3.3. Perceived risk (PR)

PR refers to a perceived negative consequence that arises from the purchase of a new product or service (Karjaluoto et al., 2014; Dholakia, 2001). In the technology acceptance context, risk affects consumers' confidence in their intentions and behavior, and this uncertainty grows when the probabilities of outcomes are unknown (Im, Yongbeom, & Han, 2008). PR has been a major research topic in IS and marketing literature, and its effects on various aspects of consumer behavior, related to both technology adoption and usage, have been investigated in the m-banking (Glavee-Geo et al., 2017), m-wallet (Amoroso & Magnier-Watanabe, 2012), and electronic banking[1] (Zhang, Weng, & Zhu, 2018) contexts.

Thakur and Srivastava (2014) discussed the three dimensions of PR (security, privacy, and monetary risk) that affect m-payment adoption. Although research has shown that PR negatively affects attitude (Akturan & Tezcan, 2012) and intention toward technology adoption (Thakur & Srivastava, 2014), more information is needed on its effects on technology acceptance (see DelVecchio & Smith, 2005), especially in the MFSA context.

2.3.4. New product novelty (NPN)

The novelty dimension of a new product refers to the degree to which a product is perceived differently from other products in terms of the product's newness and uniqueness (Im et al., 2015). NPN and meaningfulness (or appropriateness) are conceptualized as two dimensions of creativity (Amabile, 1988) that should be studied separately (Im & Workman, 2004). Moreover, of these two, the novelty dimension provides easier and faster consumer assessment (Rubera, Ordanini, & Mazursky, 2010). Therefore, this study concentrates on this dimension of creativity. Im et al. (2015) stated that NPN effects have been studied thus far mostly from the perspective of managers. In addition, they noted that, although the effects from new product creativity remain rather unknown, the novelty might be related more to the evaluation of the hedonic value of the product, rather than the utilitarian value.

2.4. PV outcomes: Overall satisfaction and commitment

Overall satisfaction aims to capture either cumulative or integrated satisfaction and, thus, refers to an overall assessment based on a consumer's total experience with a product and/or service (Garbarino & Johnson, 1999). It not only addresses the

[1] In Zhang, Weng, and Zhu's (2018) study electronic banking referred to both online banking and m-banking.

functionalities of products and/or services, but also extends the perspective to all interactions between a customer and the company and its offerings over time.

Like trust, commitment is another critical component of successful customer relationships (Shaikh, Karjaluoto, & Chinje, 2015; Dwyer, Schurr, & Oh, 1987; Morgan & Hunt, 1994), as it concerns the level of attachment between customers and the firm. Commitment can be defined as an "enduring desire to maintain a valued relationship" (Moorman, Zaltman, & Deshpande, 1992, p. 316). Based on employee-commitment literature, Garbarino and Johnson (1999) suggested that personal identification, psychological attachment, concern for the future welfare of the organization, and loyalty are the key components of commitment. This idea aligns with affective commitment, which further emphasizes personal interaction, trust, and reciprocity (Gustafsson, Johnson, & Roos, 2005).

3. Research model and hypotheses development

Building on the theories of PV, its antecedents and outcomes, and their application in the MFSA context (Baptista & Oliveira, 2016; Shaikh & Karjaluoto, 2016), the proposed conceptual model (Figure 1) suggests that four central antecedents to PV exist: PI, SC, NPN, and PR. Moreover, the research model suggests that PV is positively related to customers' overall satisfaction with and commitment to their bank. We controlled the model for the effects of gender, age, and income, and the following subsections explain these linkages and propose hypotheses for testing these direct effects.

[Insert Figure 1 about here]

3.1 Personal innovativeness on perceived value

An understanding of the linkage between PI and PV is important because customers who are willing to explore the opportunities of a new IS also can perceive and expect more value from using innovative services, such as m-applications. As stated earlier, PI affects technology adoption via perceived ease of use and usefulness. Venkatesh, Morris, Davis, and Davis (2003) discussed how innovative users are more likely to form a favorable perception of the usability of a system, and Karjaluoto et al. (2014) proposed that PI might be more important in driving adoption of mobile CRM in its earlier stages.

Although a direct relationship between PI and PV, to our knowledge, has not been addressed earlier, PV, as a construct, shares many similar aspects with perceived ease of use and perceived usefulness—two constructs affected by PI (Avlonitis & Panagopoulos 2005; Lu, Liu, Yu, & Wang, 2008). In line with this discussion, PI is likely to drive PV in the MFSA context. Thus, we propose the following hypothesis:

H1: Personal innovativeness is related positively to the perceived value of MFSAs.

3.2 Self-congruence on perceived value

To maintain the PV of the brand, as well as satisfy the customer, it is important to build a strong brand image and create both self- and brand-image congruity (Farhat

& Khan, 2012) among present and potential customers. It is essential for service firms to compete through creativity, innovation, and assessment of consumers' current and ever-changing values. When these values reflect consumers' self-image congruently, firms are likely to create a sustainable market, as well as achieve sustainable growth and continued consumption of their products and services. Extant research (e.g., Shaikh & Karjaluoto, 2016) has found a direct and significant relationship between SC and PV in the MFSA context. Thus, we propose the following:

H2: Self-congruence is related positively to the perceived value of MFSAs.

3.3 Perceived risk on perceived value

The negative effect of PR on PV and purchase intention is well-established in literature (Chiu, Wang, Fang, & Huang, 2014). Snoj, Pisnik Korda, and Mumel (2004) argued that PR has a substantial, yet reverse, effect on PV in the mobile-phone adoption context. In a survey of online store customers in Taiwan, Chiu et al. (2014) found that a higher level of risk weakens the effects of utilitarian value on repurchase intentions and strengthens the effects of hedonic value on repeat purchase intentions. Similar findings also were reported by Shaikh and Karjaluoto (2016), who found a significant negative relationship between PR and PV in the m-banking context. In addition, Karjaluoto et al. (2014) found that risk is an important driver of mobile CRM system adoption among sales managers. Therefore, we want to further test the relationship in the MFSA context and propose the following:

H3: Perceived risk is related negatively to the perceived value of MFSAs.

3.4. New product novelty on perceived value

The dimensions of creativity rarely have been studied and compared with other consumer evaluations such as PV (Im et al., 2015). Instead, utilitarian and hedonic value have been related to innovativeness. For example, in the IS field, Etemad-Sajadi and Ghachem (2015) found that, although innovativeness was influenced simultaneously by the hedonic and utilitarian value of webpage avatars, the effects from utilitarian value yielded greater importance. Im et al. (2015) said consumers' creativity assessments are critical, particularly in how they relate to product or service evaluations. Thus, they tested the effects of NPN on PV in the context of retail, particularly on cell phone and athletic shoe purchases. Their results indicated that novelty does not affect hedonic value consistently. Furthermore, they said NPN affects hedonic value indirectly via coolness.

Im et al. (2015) indicated a need for further research on the effects of novelty on PV. Accordingly, the present study examines these rather unknown effects from novelty on PV in MFSAs. Thus, we propose the following:

H4: New product novelty is related positively to the perceived value of MFSAs.

3.5 Relational outcomes of perceived value: Overall satisfaction and commitment

As stated previously, PV is a central predictor of customer loyalty (Sweeney & Soutar, 2001; Yeh et al., 2016). Oliveira, Faria, Thomas, and Popovič (2014) argued that m-information services foster customer relationships and provide holistic customer experiences. The positive relationships between PV and overall satisfaction (Chen & Chen, 2010) and commitment (Pura, 2005) also have been confirmed in literature. In the MFSA context, Amoroso and Magnier-Watanabe (2012) found that the PV offered by m-wallet apps in Japan contributed to positive attitudes toward using m-wallets, as well as reinforced behavioral intentions to use them.

Pura (2005) analyzed the direct effects of PV on commitment regarding the use of location-based m-services. She found that both behavioral intentions and commitment are influenced significantly by the PV of m-services. In the broader context, marketing literature (e.g., Luarn & Lin, 2003; Parasuraman & Grewal, 2000) has discussed the positive effects from PV on various aspects of loyalty, such as commitment.

Because research has not addressed adequately the link between the PV obtained from using MFSAs and bank-customer relationship development, this study aims to examine these rather unknown effects further. Therefore, we propose the following:

H5: The perceived value of MFSAs is related positively to overall satisfaction toward the bank that employs them.

H6: The perceived value of MFSAs is positively related to commitment to the bank that employs them.

4. Research methodology

4.1 Data collection

We tested our hypotheses using two different samples that were drawn from m-application users: One consisted of m-banking application users, and the other included users of a newly launched m-wallet application. The rationale for using the two samples is two-fold. First, these apps (m-banking and m-wallet) were chosen for this study because they are the apps that the banks offered. Second, two types of apps are expected to enhance our results' validity. Data were collected using a survey instrument during a six-week period in the summer of 2015 via the participating financial organization's website. The m-wallet application contained information related to personal banking accounts, payment cards, and a user's favorite shops, based on the user's location.

A total of 1,516 valid responses were received, most of which were m-banking-application users (N=992), whereas the remainder were m-wallet application users (N=524). The sample (see Table 1) mirrored the Finnish population in terms of gender (the adult population in Finland is 51% female) and income (the average monthly income in Finland is 2,330 EUR), but was skewed toward younger consumers. Approximately 86% of our sample was between 18 and 49 years old, whereas that figure is approximately 50% of the entire population (Statistics Finland,

2018). The respondents were experienced users of MFSAs, with approximately 11% having less than three months of experience with the applications.

[Insert Table 1 about here]

In the m-banking application sample, approximately 65% had used the application for more than one year, whereas in the m-wallet-application sample, 75% had used the application for more than six months. To compare the results reliably between the two groups, we evaluated the measurement invariance (Rigdon, Ringle, & Sarstedt, 2010; Vandenberg & Lance, 2000), which considered that the measured constructs were comparable between the two groups (Steinmetz, Schmidt, Tina-Booh, Wieczorek, & Schwartz, 2009). We tested the compositional invariance using a nonparametric MICOM procedure with 5,000 permutations (Henseler, Ringle, & Sarstedt, 2016). No "c" values of the multiple indicator measures were significantly different from 1 ($p > 0.05$), which established partial measurement invariance.

To assess response bias, the responses of the first 20% of respondents were compared with the responses of the last 20%. No significant differences were found between the two groups' responses (at the $p < 0.05$ level), indicating that nonresponse bias was not an issue in the study.

Common method variance (CMV) often is present in self-reported survey studies using a single data source. Several steps were taken to ensure that the CMV would not threaten our results (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). First, we alternated the order of items in the questionnaire, separated the predictor and criterion variables, and hid respondents' identities. Second, in line with Liang, Saraf, Hu, and Xue (2007), we ran the PLS model with a method factor. This analysis revealed that the average factor loadings were 0.754 (m-banking application sample) and 0.749 (m-wallet application sample), and that the average variances explained by the common method construct measured only 0.004 (m-banking application sample) and 0.006 (m-wallet application sample), which indicated that common method bias (CMB) did not significantly affect our results.

4.2 Measurement Scales

The study was conducted in Finland, and the survey instrument was translated from English into Finnish by a native Finnish-speaking researcher. To ensure consistency, the survey instrument was translated back to English by a different researcher. Slight linguistic changes to survey items were made during the questionnaire's screening process. At the end of the process, three managers from a financial institution checked the survey's text to match the terms with those used in the financial industry.

Established scales were used to measure the study constructs. PI was measured with three items adapted from Lu, Yao, and Yu (2005). Items measuring SC were taken from Sirgy (1985). PR was measured with a scale adopted from Karjaluoto et al. (2014), including three items. The items for measuring NPN (six items), utilitarian value (five items), and hedonic value (five items) were derived from Im et al. (2015). Measures for the two outcome constructs, overall satisfaction and commitment, were taken from Garbarino and Johnson (1999). The experience of usage was measured

by asking, “How long have you been using the m-banking (or m-wallet) application?” and using a six-item scale ranging from “1 = Less than three months” to “6 = over four years” to categorize answers. All constructs were reflective measurement scales. A list of the items appears in Appendix A.

To test the research model, the data were analyzed using SmartPLS 3.2.7 (Ringle, Wende, & Becker, 2015). PLS-SEM was used for three reasons. First, this study focused on predictions. As pointed out by Hair, Hult, Ringle, and Sarstedt (2017), factor indeterminacy makes covariance-based SEM unsuitable for prediction purposes. Second, our study was exploratory in a broad sense, examining several new relationships such as those between PI and PV, and between NPN and PV. Third, many of the variables were not distributed normally. In such cases, PLS-SEM is the recommended approach (Hair et al., 2017, p. 23).

5. Results

5.1 Measurement model

Both the reliability and validity of the measures were assessed by evaluating the factor loadings, composite reliability (CR), and average variance extracted (AVE). As shown in Table 2, both the CR and AVE met the criteria set in the literature, and the factor loadings were high (>0.50) in all cases except for one loading being just below the cut-off criterion (see Appendix A for factor loadings). Discriminant validity was assessed by comparing the square root of AVE in each latent variable with the other constructs. The results (Table 2) suggest that discriminant validity, when achieved as the square root of AVE, was higher than the correlation between any two latent constructs (Fornell & Larcker, 1981). In addition, the heterotrait-monotrait ratios of correlations (HTMT) all were below the recommended cut-off criterion of 0.90 (Henseler, Ringle, & Sarstedt, 2015). In addition, all the items had the highest factor loadings in the construct they were intended to measure.

[Insert Table 2 about here].

5.2 Structural model

With respect to the models’ predictive relevance, the Stone-Geisser criterion (Q^2) values all were above zero, indicating the models’ predictive relevance (Henseler, Ringle, & Sinkovics, 2009). In addition, the R^2 values for utilitarian and hedonic value were all close to or higher than 0.40, indicating close to mediocre predictive accuracy (see Figure 2) (Henseler et al., 2009). As noted by Hair et al. (2017, p. 199), in consumer behavior studies, R^2 values of 0.20 are considered high. Thus, the two models’ predictive accuracy is acceptable.

[Insert Figure 2 about here]

The results supported most of the hypotheses in both samples (see Figure 2). The analysis revealed that, of the four antecedents of PV, SC and NPN made the greatest impact on PV. SC yielded the greatest effect in both samples on utilitarian value ($\beta_{\text{m-banking}} = 0.450$, $p < 0.01$; $\beta_{\text{m-wallet}} = 0.404$, $p < 0.01$), whereas NPN yielded the greatest effect on hedonic value in both samples ($\beta_{\text{m-banking}} = 0.446$, $p < 0.01$; $\beta_{\text{m-wallet}} = 0.468$, $p < 0.01$). These findings confirmed both H2 and H4. With respect to

H1, which proposed a positive relationship between PI and PV, two of the four tested effects were significant. In the m-wallet sample, PI yielded a small negative effect on utilitarian value (β = -0.095, $p < 0.01$), whereas its effect on hedonic value was not significant. In the m-banking sample, PI yielded a small, but significant, effect on hedonic value (β = 0.054, $p < 0.05$). Thus, based on this controversial evidence, we must reject H1 and conclude that PI does not significantly affect PV in this context. The results concerning H3 (PR on PV) confirmed the negative effects of risk on value in the m-banking sample, with risk negatively related to both utilitarian value (β = -0.209, $p < 0.01$) and hedonic value (β = -0.134, $p < 0.01$). In the m-wallet sample, risk was only significant in affecting utilitarian value (β = -0.154, $p < 0.01$). Thus, we found partial support for H3. Hypotheses 5 and 6 were both supported by the data. The effects were significant in both samples, which confirmed that both utilitarian and hedonic value drive overall satisfaction with and commitment to banks. In both samples, utilitarian value was a stronger predictor of overall satisfaction than hedonic value, whereas hedonic value yielded a stronger effect on commitment in both samples. Finally, with respect to direct effects, we also tested how overall satisfaction and commitment are related. The correlation coefficients between the constructs ($r_{\text{m-banking}}$ = 0.694, $p < 0.01$; $r_{\text{m-wallet}}$ = 0.720, $p < 0.01$) were significant and high. The path coefficients ($\beta_{\text{m-banking}}$ = 0.613, $p < 0.01$; $\beta_{\text{m-wallet}}$ = 0.699, $p < 0.01$) further confirmed that overall satisfaction is a strong driver of commitment in the context of MFSAs.

Although we did not hypothesize the groups' differences, we examined how the path coefficients differed between the two groups (m-banking vs. m-wallet). By using the partial least squares multi-group analysis (PLS-MGA) method with 5,000 subsamples, we found statistically significant differences in only three cases. Among m-wallet users, the effect of NPN on utilitarian value was stronger ($\Delta\beta$ = 0.170, $p < 0.01$). In addition, the path coefficients differed with respect to the relationship between PI on utilitarian value ($\Delta\beta$ = 0.112, $p < 0.01$) and PR on hedonic value ($\Delta\beta$ = 0.112, $p < 0.01$). In sum, these findings indicated that only minor differences existed between the path coefficients in the two samples.

Regarding the control variables, most of the effects were not significant. Only gender yielded a significant effect on commitment in both samples, and the effect was positive, which means that men are slightly more committed to their banks. Another significant positive effect was between age and commitment in the m-wallet sample, which indicated that the older the respondents were, the more commitment they showed.

6. Discussion

This study contributes to emerging literature on the use of MFSAs by empirically demonstrating that the PV of the use of MFSAs is related positively to the development of the bank-customer relationship. Our research model adds to extant research in this field because it is among the first to hypothesize that the usage of MFSAs might yield positive effects on overall customer relationship development with the service provider. In addition, this study offers a novel contribution by comparing two different sets of MFSA users (i.e., m-banking and m-wallet). Notably, utilitarian value yielded the strongest effects on customers' overall

satisfaction with their bank in both samples, whereas hedonic value was a stronger predictor of commitment to the bank in both samples.

6.1. Theoretical contributions

The present study's findings contain two major theoretical contributions. First, they build on literature on PV and its antecedents by demonstrating that SC and NPN are significant drivers of both utilitarian and hedonic value in the context of MFSAs. This further confirms the positive effects from SC on PV (Shaikh & Karjaluoto, 2016) and the effects from NPN on PV (Im et al., 2015). Our findings concerning NPN show that it affects both utilitarian and hedonic value positively, but its effect is stronger on hedonic value, as research also has indicated (Im et al., 2015).

Our findings also contribute to literature on PI by showing that in this study, PI exerted little effect on PV. This could be explained by the fact that PI might be a more important variable in the early stages of adoption (Karjaluoto et al., 2014). Our study examined experienced users of m-banking (60% used the app for more than one year) and m-wallet (50% used the app for more than one year) apps. Regarding PR, in line with literature (e.g., Chiu et al., 2014; Shaikh & Karjaluoto, 2016), we confirmed the negative effect from risk on PV in three of four tested paths.

Second, our results offered new insights into how the PV of MFSAs is related positively to the development of the bank-customer relationship. We linked PV with two robust relationship marketing constructs – overall satisfaction and commitment (Garbarino & Johnson, 1999). Interestingly, the two value constructs – utilitarian and hedonic value – had complementary roles in driving the relationship: Utilitarian value predicted more overall satisfaction, whereas hedonic value yielded a stronger effect on commitment. Altogether, the results indicate that the more value a user perceives from MFSAs, the more positively he or she rates his or her relationship with the bank regarding overall satisfaction and commitment. Therefore, our findings confirmed earlier studies' findings (e.g., Oliveira et al., 2014; Pura, 2005; Spiteri & Dion, 2004), which reported that increased PV directly leads to increased overall customer satisfaction.

6.2. Managerial implications

Our findings hold significant implications for decision makers in the financial industry. MFSAs are becoming the mainstream banking delivery channel in mature financial markets, and logins on m-apps have, in many cases, already bypassed those done on desktop computers. Therefore, our results offer the following two important aspects of understanding consumer behavior regarding MFSAs.

It is widely known that the PV of an offering is an important variable for creating customer loyalty. However, less is known about how certain antecedents drive PV. Our study showed that PI yields a limited effect on PV. This could be explained by the fact that both samples in this study included experienced MFSA users; therefore, PI did not become an important variable in our study. For managers, this finding confirms that MFSAs currently are being used by a variety of different age groups; as such, adoption of these technologies, especially in developed countries, is increasing. Our results also showed that the higher the SC, the higher the PV. This

finding should help with planning advertising for MFSA users' self-concept. Advertising appeals that are congruent with a person's self-concept are more effective than incongruent appeals (Hong & Zinkhan, 1995; Hosany & Martin, 2012). Thus, creating such appeals leads to a higher PV for the apps. Furthermore, PR yielded a larger negative effect among m-banking app users. This might indicate that m-wallet users are less risk-averse and more willing to try new features on the app. Therefore, we encourage financial services providers to target their advertising efforts toward mobile users by emphasizing the service used (m-banking vs. m-wallet), such as by using more risk-related ad appeals. Finally, with respect to the antecedents of PV, our findings clearly show that perception of a product's novelty positively affects the value perceived. Thus, we encourage financial services managers to focus on improving their apps further by creating an impression of novelty. In line with other studies, managers should understand that novelty has a stronger relation with the hedonic dimension of value, and from there, it goes further, to relationship commitment.

In addition, our study's findings are among the first to show that the PV of MFSAs is positively related to customer loyalty in terms of growing overall satisfaction and commitment. Therefore, creating and delivering superior customer value to digital customers will increase the value of business organizations (Spiteri & Dion, 2004), such as banks. Our findings also note that utilitarian value is more important in driving overall satisfaction toward the bank than the hedonic value dimension. In consumer-behavior and IS literature (e.g., Van der Heijden, 2004; Wu & Lu, 2013), the importance of hedonic and utilitarian systems and applications has been recognized widely. Although a distinction between the underlying natures of these two systems also has been established, an application can have both hedonic and utilitarian features and capabilities. However, research (e.g., Van der Heijden, 2004) has suggested that hedonic features play a key role in increasing the initial acceptance and future use of otherwise utilitarian applications. Therefore, IS and marketing executives at banks should consider including hedonic features in either utilitarian or productivity-oriented m-applications such that, if a consumer either rejects or refuses utilitarian features, banks and application developers still can gain user acceptance with the help of hedonic features to increase usage. In sum, bank managers who wish to improve their overall satisfaction ratings should focus on providing utilitarian value through their m-apps. It also should be noted that hedonic value is an important driver of commitment.

6.3. Limitations and further research

It is important that we evaluate our findings regarding certain limitations, which can be addressed in future studies. The central limitation, which is common in other survey studies that are not longitudinal, is that the full dynamism of PV and its outcomes cannot be captured. Thus, our empirical findings related to the hypotheses testing provide merely correlational, rather than causal, proof of the relationships. Future studies should study causal linkages between the variables by adopting an experimental and/or longitudinal research framework to gain full causal insights. In addition, although our empirical data set was large and representative of the Finnish population in terms of gender, we used a convenience sample. Therefore, those who participated in the survey might not represent the opinions of all MFSA users in Finland. Furthermore, it is possible that other factors might influence PV and overall

satisfaction and commitment. Thus, future studies should expand our research model and incorporate new variables. Finally, we encourage future researchers in the field of MFSAs to examine different countries. Although Finland is at the forefront of online banking and MFSA adoption and usage, studies also should explore markets in which adoption is not as advanced. A special aspect of Finland is that the nation has a long history of online banking usage, thereby providing a rich subject pool from which to find participants who use MFSAs. However, we encourage researchers to examine other markets, such as emerging markets, in which mobile, branchless, and other payment avenues are quickly emerging as the most preferred banking channels for conducting financial transactions.

7. Conclusion

In this study, we examined the direct effects from PI, SC, PR, and NPN on PV, including the effects of PV on overall satisfaction and commitment. An investigation of these effects in the context of MFSAs is important because banking is moving swiftly from other digital channels toward mobile ones. This study is among the first to test these effects among experienced MFSA users in a mature market. Our findings add to literature by highlighting the following three points: 1) Of the four tested predictors of PV, SC and NPN are the main drivers of PV in the MFSA context; 2) PR yields a greater effect among m-banking users than among m-wallet users; and 3) utilitarian value is the main driver of overall satisfaction, whereas hedonic value is a stronger predictor of commitment.

References

Akturan, U., & Tezcan, N. (2012). Mobile Banking Adoption of the Youth Market: Perceptions and Intentions. *Marketing Intelligence & Planning*, 30(4), 444−459.

Amabile, T. M. (1988). A Model of Creativity and Innovation in Organizations. *Research in Organizational Behavior*, 10, 123–167.

Amoroso, D. L., & Magnier-Watanabe, R. (2012). Building a Research Model for Mobile Wallet Consumer Adoption: The Case of Mobile Suica in Japan. *Journal of Theoretical and Applied Electronic Commerce Research*, 7, 94−110.

Avlonitis, G. J., & Panagopoulos, N. G. (2005). Antecedents and Consequences of CRM Technology Acceptance in the Sales Force. *Industrial Marketing Management*, 34, 355−368.

Baptista, G., & Oliveira, T. (2016). A Weight and a Meta-Analysis on Mobile Banking Acceptance Research. *Computers in Human Behavior*, 63, 480−489.

Chen, C. F., & Chen, F. S. (2010). Experience Quality, Perceived Value, Satisfaction and Behavioral Intentions for Heritage Tourists. *Tourism Management*, 31, 29−35.

Chiu, C. M., Wang, E. T., Fang, Y. H., & Huang, H. Y. (2014). Understanding Customers' Repeat Purchase Intentions in B2C E-commerce: The Roles of Utilitarian Value, Hedonic Value and Perceived Risk. *Information Systems Journal*, 24, 85−114.

Cowart, K. O., Fox, G. L., & Wilson, A. E. (2008). A Structural Look at Consumer Innovativeness and Self-congruence in New Product Purchases. *Psychology & Marketing*, 25, 1111−1130.

Cruz, P., Barretto Filgueiras Neto, L., Munoz-Gallego, P., & Laukkanen, T. (2010). Mobile Banking Rollout in Emerging Markets: Evidence from Brazil. *International Journal of Bank Marketing*, 28(5), 342−371.

Danske Bank (2016). Quarterly Report January-June 2016. https://www.danskebank.fi/fi-fi/tietoa-danske-bankista/media/Julkaisut/Documents/Danske %20Bank%20Oyj%20-%20Tilinpäätökset%20ja%20tulokset/Danske%20Bank%20Oyjn% 20osavuosikatsaus%202016.pdf. Accessed 10.05.17.

DelVecchio, D., & Smith, D. C. (2005). Brand-Extension Price Premiums: The Effects of Perceived Fit and Extension Product Category Risk. *Journal of the Academy of Marketing Science*, 33(2), 184−196.

Dholakia, U. M. (2001). A Motivational Process Model of Product Involvement and Consumer Risk Perception. *European Journal of Marketing*, 35(11/12), 1340−1360.

Dwyer, F. R., Schurr, P. H., & Oh, S. (1987). Developing Buyer-seller Relationships. *Journal of Marketing*, 51, 11−27.

Ericksen, M. K., & Sirgy, M. J. (1989). Achievement Motivation and Clothing Behavior of Working Women: A Self-Image Congruence Analysis. *Journal of Social Behavior and Personality*, 4(4), 307−326.

Etemad-Sajadi, R., & Ghachem, L. (2015). The Impact of Hedonic and Utilitarian Value of Online Avatars on E-Service Quality. *Computers in Human Behavior*, 52, 81−86.

Farhat, R., & Khan, B. M. (2012). Effect of Brand Image & Self Image Congruency on Brand Preference & Customer Satisfaction. *International Journal of Marketing and Technology*, 2, 92−102.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18, 39−50.

Garbarino, E,. & Johnson, M. S. (1999). The different Roles of Satisfaction, Trust, and Commitment in Customer Relationships. *Journal of Marketing*, 63, 70−87.

Glavee-Geo, R., Shaikh, A. A., & Karjaluoto, H. (2017). Mobile Banking Services Adoption in Pakistan: Are There Gender Differences? *International Journal of Bank Marketing*, 35(7), 1090−1114.

García-Fernández, J., Gálvez-Ruíz, P., Fernández-Gavira, J., Vélez-Colón, L., Pitts, B., & Bernal-García, A. (2018). The Effects of Service Convenience and Perceived Quality on Perceived Value, Satisfaction and Loyalty in Low-Cost Fitness Centers. *Sport Management Review*, 21(3), 250−262.

Gustafsson, A., Johnson, M. D., & Roos, I. (2005). The Effects of Customer Satisfaction, Relationship Commitment Dimensions, and Triggers on Customer Retention. *Journal of Marketing*, 69, 210−218.

Hair, J. F. Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 2nd ed., Thousand Oaks, Sage.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135.

Henseler, J., Ringle, C.M., & Sarstedt, M. (2016). Testing Measurement Invariance of Composites Using Partial Least Squares. *International Marketing Review*, 33, 405−431.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The Use of Partial Least Squares Path Modeling in International Marketing, in Advances in International Marketing, R.R. Sinkovics & P.N. Ghauri (Eds.), Bingley, UK: Emerald Group, pp. 277-320.

Hepola, J., Karjaluoto, H., & Shaikh, A. A. (2016). Consumer Engagement and Behavioral Intention towards Continuous Use of Innovative Mobile Banking Applications - Case Study of Finland. *Proceedings of International Conference on Information Systems (ICIS-2016)*, Dublin, Ireland, December 11-14, 2016.

Hong, J.W., &, Zinkhan, G. M. (1995). Self Concept and Advertising Effectiveness: The Influences of Congruency, Conspicuousness and Response Modes. *Psychology & Marketing*, 12(1), 53−77.

Hosany, S., & Martin, D. (2012). Self-Image Congruence in Consumer Behavior. *Journal of Business Research*, 65(5), 685−691.

Im, S., Bhat, S., & Lee, Y. (2015). Consumer Perceptions of Product Creativity, Coolness, Value and Attitude. *Journal of Business Research*, 68, 166−172.

Im, S., & Workman, J.P., Jr. (2004). Market Orientation, Creativity, and New Product Performance in High-Technology Firms. *Journal of Marketing*, 68(2), 114−132.

Im, I., Yongbeom, K., & Han, H-J. (2008). The Effects of Perceived Risk and Technology Type on Users' Acceptance of Technologies. *Information & Management*, 45, 1−9.

Jahn, S., Gaus, H., & Kiessling, T. (2012). Trust, Commitment, and Older Women: Exploring Brand Attachment Differences in The Elderly Segment. *Psychology and Marketing*, 29(6), 445−457.

Japutra, A., Ekinci, Y., & Simkin, L. (2017). Self-Congruence, Brand Attachment and Compulsive Buying. *Journal of Business Research* (In press). DOI https://doi.org/10.1016/j.jbusres.2017.08.024

Karjaluoto, H., Töllinen, A., Pirttiniemi, J., & Jayawardhena, C. (2014). Intention to Use Mobile Customer Relationship Management Systems. *Industrial Management & Data Systems*, 114, 966−978.

Kim, B., & Han, I. (2011). The Role of Utilitarian and Hedonic Values and Their Antecedents in a Mobile Data Service Environment. *Expert Systems with Applications*, 38(3), 2311−2318.

Kressmann, F., Sirgy, M.J., Hermann, A., Huber, F., Huber, S., & Lee, D-J. (2006). Direct and Indirect Effects of Self-Image Congruence on Brand Loyalty. *Journal of Business Research*, 59(9), 955−964.

Kumar, V., & Reinartz, W. (2016). Creating Enduring Customer Value. *Journal of Marketing*, 80(6), 36−68.

Laukkanen, T., & Lauronen, J. (2005). Consumer Value Creation in Mobile Banking Services. *International journal of mobile Communications*, 3(4), 325−338.

Laukkanen, T., & Kiviniemi, V. (2010). The Role of Information in Mobile Banking Resistance. *International Journal of Bank Marketing*, 28(5), 372−388.

Li, M., & Mao, J. (2015), Hedonic or Utilitarian? Exploring the Impact of Communication Style Alignment on User's Perception of Virtual Health Advisory Services. *International Journal of Information Management*, 35(2), 229−243.

Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management. *MIS Quarterly*, 31, 59−87.

Lee, Y. K., Park, J. H., Chung, N., & Blakeney, A. (2012). A Unified Perspective on the Factors Influencing Usage Intention toward Mobile Financial Services. *Journal of Business Research*, 65(11), 1590−1599.

Leicht, T., Chtourou, A., & Youssef, K. B. (2018). Consumer Innovativeness and Intentioned Autonomous Car Adoption. *The Journal of High Technology Management Research*, 29 (1), 1−11.

Loh, M., Ahmad, M., Kadir, S. A., & Alam, S. S. (2015). Influence of Customer Values And Self-Image Congruity On Customer Behavior-Based CRM Performance. *Management and Marketing Journal*, 13, 23−44.

Luarn, P. & Lin, H. H. (2003). A Customer Loyalty Model for E-Service Context. *Journal of Electronic Commerce Research*, 4, 156−167.

Lu, J., Yao, J.E., & Yu, C.S. (2005). Personal Innovativeness, Social Influences and Adoption of Wireless Internet Services via Mobile Technology. *Journal of Strategic Information Systems*, 14, 245−268.

Lu, J., Liu, C., Yu, C.-S., & Wang, K. (2008). Determinants of Accepting Wireless Mobile Data Services in China. *Information & Management*, 45(1), 52−64.

Malhotra, N. K. (1988). Self-Concept and Product Choice: An Integrated Perspective. *Journal of Economic Psychology*, 9(1), 1−28.

Malär, L., Krohmer, H., Hoyer, W. D., & Nyffenegger, B. (2011). Emotional Brand Attachment and Brand Personality: The Relative Importance of the Actual and The Ideal Self. *Journal of Marketing*, 75(4), 35−52.

Moorman, C., Zaltman, G., & Deshpande, R. (1992). Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organizations. *Journal of Marketing Research*, 29, 314−328.

Morgan, R. M., & Hunt, S. D. (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*, 58, 20−38.

Oliveira, T., Faria, M., Thomas, M. A., & Popovič, A. (2014). Extending the Understanding of Mobile Banking Adoption: When UTAUT Meets TTF and ITM. *International Journal of Information Management*, 34, 689−703.

OP (2017). OP Ryhmän toimintakertomus ja tilinpäätös 2017, (OP Group's Annual Report and Financial Statement 2017), https://uusi.op.fi/documents/209474/28185340/OP+Ryhmän+toimintakertomus+ja+tilinpäätös+2017/b559dcb9-86bc-425b-acc8-0396b01c2f22. Accessed 28.03.18.

Parasuraman, A., & Grewal, D. (2000). The Impact of Technology on the Quality-Value-Loyalty Chain: A Research Agenda. *Journal of the Academy of Marketing Science*, 28, 168−174.

Pihlström, M., & Brush, G.J. (2008). Comparing the Perceived Value of Information and Entertainment Mobile Services. *Psychology & Marketing*, 25(8), 732−755.

Peffers, K., & Tuunanen, T. (2005). Planning for IS Applications: A Practical, Information Theoretical Method and Case Study in Mobile Financial Services. *Information & Management*, 42(3), 483−501.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88, 879−903.

Pura, M. (2005). Linking Perceived Value and Loyalty in Location-based Mobile Services. *Managing Service Quality*, 15, 509−538.

Rigdon, E.E., Ringle, C.M., & Sarstedt, M. (2010). Structural Modeling of Heterogeneous Data with Partial Least Squares, in *Review of Marketing Research*, N.K. Malthora (ed.), Bingley, UK: Emerald Group, 255−296.

Ringle, C.M., Wende, S., & Becker, J.-M. (2015). SmartPLS 3. Boenningstedt: SmartPLS GmbH, http://www.smartpls.com. Accessed 18.4.2018.
Rogers, E. M. (1962). *Diffusion of innovation.* New York: Free Press.
Rubera, G., Ordanini, A., & Mazursky, D. (2010). Toward a Contingency View of New Product Creativity: Assessing the Interactive Effects of Consumers. *Marketing Letters*, 21(2), 191–206.
Shaikh, A.A.**,** & Karjaluoto, H. (2015). Making the Most of Information Technology & Systems Usage: A Literature Review, Framework and Future Research Agenda. *Computers in Human Behavior*, 49, 541–566.
Shaikh, A. A., & Karjaluoto, H. (2016). Mobile Banking Services Continuous Usage--Case Study of Finland. *Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS 2016)*, Tung X. Bui ja Ralph H. Sprague Jr. (eds.), IEEE Computer Society, (pp. 1497−1506).
Shaikh, A. A., Karjaluoto, H., & Chinje, N. B. (2015). Continuous Mobile Banking Usage and Relationship Commitment–A Multi-Country Assessment. *Journal of Financial Services Marketing*, 20(3), 208−219.
Shareef, M. A., Baabdullah, A., Dutta, S., Kumar, V., & Dwivedi, Y. K. (2018). Consumer Adoption of Mobile Banking Services: An Empirical Examination of Factors According to Adoption Stages. *Journal of Retailing and Consumer Services*, 43, 54−67.
Singh, S., & Srivastava, R. K. (2018). Predicting the Intention to Use Mobile Banking in India. *International Journal of Bank Marketing*, 36(2), 357−378.
Sirgy, M. J., Grewal, D., Mangleburg, T. F., Park, J. O., Chon, K. S., Claiborne, C. B., Johar, J. S., & Berkman, H. (1997). Assessing the Predictive Validity of Two Methods of Measuring Self-image Congruence. *Journal of the Academy of Marketing Science*, 25, 229−241.
Sirgy, M. J. (1985). Using Self-congruity and Ideal Congruity to Predict Purchase Motivation. *Journal of Business Research*, 13, 195−206.
Sirgy, M. J. (1982). Self-Concept in Consumer Behavior: A Critical Review. *Journal of Consumer Research*, 9(3), 287−300.
Snoj, B., Pisnik Korda, A., & Mumel, D. (2004). The Relationships among Perceived Quality, Perceived Risk and Perceived Product Value. *Journal of Product & Brand Management*, 13, 156−167.
Spiteri, J. M., & Dion, P. A. (2004). Customer Value, Overall Satisfaction, End-User Loyalty, and Market Performance in Detail Intensive Industries. *Industrial Marketing Management*, 33(8), 675−687.
Statistics Finland. (2018). Official Statistics Finland (SVT): Väestön tieto- ja viestintätekniikan käyttö [online publication]. Helsinki: Statistics Finland. Accessed 20.4.2018.
Steinmetz, H., Schmidt, P., Tina-Booh, A., Wieczorek, S., & Schwartz, S.H. (2009). Testing Measurement Invariance Using Multigroup CFA: Differences Between Educational Groups in Human Values Measurement. *Quality & Quantity*, 43, 599−616.
Sweeney, J.G., & Soutar, G.N. (2001). Consumer Perceived Value: The Development of a Multiple Item Scale. *Journal of Retailing*, 77(2), 203−220.
Thakur, R., & Srivastava, M.. (2014). Adoption Readiness, Personal Innovativeness, Perceived Risk and Usage Intention across Customer Groups for Mobile Payment Services in India. *Internet Research*, 24(3), 369−392.

Thakur, R., Angriawan, A., & Summey, J. H. (2016). Technological Opinion Leadership: The Role of Personal Innovativeness, Gadget Love, and Technological Innovativeness. *Journal of Business Research*, 69(8), 2764−2773.
Van der Heijden, H. (2004). User Acceptance of Hedonic Information Systems. *MIS Quarterly*, 28, 695−704.
Vandenberg, R. J., & Lance, C. E. (2000). A Review and Synthesis of the Measurement Invariance Literature: Suggestions, Practices, and Recommendations for Organizational Research. *Organizational Research Methods*, 3, 4−70.
Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425−478.
Wallace, E., Buil, I., & de Chernatony, L. (2017). Consumers' Self-Congruence with a "liked" Brand: Cognitive Network Influence and Brand Outcomes. *European Journal of Marketing*, 51(2), 367−390.
Wu, J., & Lu, X. (2013). Effects of Extrinsic and Intrinsic Motivators on Using Utilitarian, Hedonic, and Dual-purposed Information Systems: A Meta-analysis. *Journal of the Association for Information Systems*, 14, 153−191.
Yeh, C. H., Wang, Y. S., & Yieh, K. (2016). Predicting Smartphone Brand Loyalty: Consumer Value and Consumer-Brand Identification Perspectives. *International Journal of Information Management*, 36(3), 245−257.
Yen, Y. S., & Wu, F. S. (2016). Predicting the Adoption of Mobile Financial Services: The Impacts of Perceived Mobility and Personal Habit. *Computers in Human Behavior*, 65, 31−42.
Zhang, Y., Weng, Q., & Zhu, N. (2018). The Relationships Between Electronic Banking Adoption and Its Antecedents: a Meta-Analytic Study of the Role of National Culture. *International Journal of Information Management*, 40, 76−87.
Zhang, K. Z. K., Benyoucef, M., & Zhao, S. J. (2015). Consumer Participation and Gender Differences on Companies' Microblogs: A Brand Attachment Process Perspective. *Computers in Human Behavior*, 44, 357−368.
Zeithaml, V. A. (1988). Consumer Perceptions of Price, Quality and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52, 2–22.

Table 1. Demographic Profile of the Respondents

	m-banking		m-wallet	
	N	%	N	%
Gender				
Female	529	53.3	277	52.9
Male	463	46.7	247	47.1
Total	992	100.0	524	100.0
Age				
18–25	180	18.1	114	21.8
26–34	278	28.0	172	32.8
35–49	344	34.7	164	31.3
50–64	165	16.6	64	12.2
65 or older	25	2.5	10	1.9
Total	992	100.0	524	100.0
Household income (gross EUR)				
Below 1000	69	7.0	47	9.0
1001-2000	112	11.3	67	12.8
2001-3000	183	18.4	105	20.0
3001-4000	154	15.5	86	16.4
4001-5000	125	12.6	58	11.1
5001-6000	114	11.5	51	9.7
6001-7000	81	8.2	43	8.2
7001-8000	72	7.3	30	5.7
8001-9000	30	3.0	12	2.3
9001-10000	17	1.7	9	1.7
10001 or more	35	3.5	16	3.1
Total	992	100.0	524	100.0
Experience of use				
Less than 3 months	107	10.8	58	11.1
3-6 months	76	7.7	73	13.9
6-12 months	169	17.0	133	25.4
1-2 years	334	33.7	260	49.6
2-4 years	261	26.3	-	-
Over 4 years	45	4.5	-	-
Total	992	100.0	524	100.0

Table 2. Discriminant Validity, Means and Standard Deviations

m-banking	AVE	CR[a]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
PI[b] (1)	0.652	0.881	**0.808**										
SC[c] (2)	0.874	0.916	0.367	**0.885**									
PR[d] (3)	0.696	0.871	-0.155	-0.297	**0.834**								
NPN[e] (4)	0.776	0.954	0.202	0.329	-0.137	**0.881**							
UV[f] (5)	0.815	0.956	0.251	0.578	-0.370	0.361	**0.903**						
HV[g] (6)	0.785	0.948	0.241	0.414	-0.265	0.543	0.515	**0.886**					
OSAT[h] (7)	0.829	0.660[h]	0.103	0.363	-0.281	0.342	0.480	0.399	**0.911**				
COM[i] (8)	0.746	0.922	0.094	0.349	-0.239	0.414	0.408	0.448	0.694	**0.864**			
Gender (9)	n/a[i]	n/a	0.290	-0.037	-0.007	-0.061	-0.068	0.025	-0.066	-0.126	**n/a**		
Age (10)	n/a	n/a	-0.021	-0.346	0.117	0.003	-0.185	-0.046	-0.107	-0.036	0.053	**n/a**	
Income (11)	n/a	n/a	0.168	-0.036	-0.008	0.041	0.044	0.032	-0.007	-0.033	0.158	0.346	**n/a**
Mean			4.09	5.25	3.22	4.05	5.95	4.39	5.86	5.51	n/a	n/a	n/a
s.d.			1.84	1.47	1.61	1.19	1.24	1.17	1.08	1.35	n/a	n/a	n/a

m-wallet	AVE	CR[a]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
PI[b] (1)	0.810	0.868	**0.796**										
SC[c] (2)	0.870	0.920	0.282	**0.891**									
PR[d] (3)	0.717	0.846	-0.008	-0.257	**0.807**								
NPN[e] (4)	0.946	0.957	0.285	0.477	-0.271	**0.888**							
UV[f] (5)	0.913	0.935	0.120	0.585	-0.352	0.559	**0.861**						
HV[g] (6)	0.936	0.951	0.278	0.528	-0.203	0.623	0.587	**0.892**					
OSAT[h] (7)	0.821	0.697[h]	0.139	0.375	-0.242	0.456	0.504	0.393	**0.919**				
COM[i] (8)	0.893	0.925	0.116	0.328	-0.210	0.429	0.374	0.379	0.720	**0.869**			
Gender (9)	n/a[i]	n/a	0.181	-0.126	-0.023	0.054	-0.074	-0.026	-0.057	-0.084	**n/a**		
Age (10)	n/a	n/a	-0.022	-0.397	0.165	-0.131	-0.261	-0.212	-0.106	-0.035	0.086	**n/a**	
Income (11)	n/a	n/a	0.245	-0.126	0.106	0.040	-0.087	-0.044	-0.028	-0.057	0.204	0.334	**n/a**
Mean			4.38	5.20	3.13	4.81	5.62	4.74	5.89	5.45	n/a	n/a	n/a
s.d.			1.73	1.44	1.63	1.35	1.31	1.28	1.07	1.42	n/a	n/a	n/a

Notes:

[a] CR = Composite reliability; [b] PI – Personal innovativeness; [c] SC – Self-congruence; [d] PR – Perceived risk; [e] NPN – New product novelty; [f] UV – Utilitarian value; [g] HV – Hedonic value; [h] OSAT = Overall satisfaction; [i] COM – Commitment; [h] correlation coefficient (construct calculated with two indicators): composite reliability cannot be computed; [i] n/a – Not applicable. Construct measured with a single indicator; composite reliability and AVE cannot be computed.

Appendix A: Measurement Scales

Constructs and items	Factor loadings m-banking	Factor loadings m-wallet
Personal innovativeness[a]		
If I heard about a new mobile app for financial services, I would look for ways to experiment with it.	0.892	0.907
Among my peers, I am usually the first to explore new mobile applications on my smartphone and/or tablet.	0.819	0.840
I like to experiment with new mobile applications for financial services.	0.862	0.886
In general, I am hesitant to try out new mobile applications for financial services[g]	0.632	0.474
Self-congruence[b]		
People similar to me use m-banking (m-wallet).	0.890	0.914
I can identify with people who prefer m-banking (m-wallet) to other forms of banking.	0.888	0.877
The image of a typical user of m-banking (m-wallet) is highly consistent with how I see myself.	0.909	0.881
Perceived risk[c]		
I would worry about how reliable m-banking (m-wallet) app would be.	0.909	0.890
I would be afraid that m-banking app (m-wallet app) would not provide me the benefits I expected.	0.667	0.635
I would be concerned about security risks.	0.903	0.871
New product novelty[d] *(Compared with other competing products, this application)*		
is radically different	0.833	0.853
can be considered as revolutionary	0.882	0.871
is really out of the ordinary	0.909	0.896
provides something not commonly found	0.904	0.926
incorporates new ideas/concepts	0.865	0.881
has unique features	0.889	0.901
Perceived value[d]		
Utilitarian value (Please evaluate your attitude toward this product for the following items: This product is…)		
• ineffective – effective	0.885	0.834
• not helpful – helpful	0.909	0.890
• not functional – functional	0.916	0.823
• not necessary – necessary	0.884	0.870
• impractical – practical	0.918	0.886
Hedonic value (Please evaluate your attitude toward this product for the following items: This product is…)		
• not fun – fun	0.863	0.893
• dull – exciting	0.883	0.855
• not delightful – delightful	0.901	0.905
• not thrilling – thrilling	0.905	0.911
• not at all enjoyable – enjoyable	0.878	0.897
Overall satisfaction[e]		
How would you rate your overall satisfaction with X?	0.924	0.948
How would you rate X compared with other banks on the overall satisfaction	0.897	0.889
Commitment[f]		
I am proud to be a customer of X	0.893	0.882
I feel a sense of belonging to X	0.869	0.888
I care about the long-term success of X	0.853	0.851
I am a loyal patron of X	0.840	0.856

Scale sources:

[a] Personal innovativeness – Lu *et al.* (2005); [b] Self-congruence – Sirgy (1985); [c] Perceived risk – Karjaluoto *et al.* (2014); [d] New product novelty and Perceived value – Im *et al.* (2015); [e] Overall satisfaction – Garbarino and Johnson (1999); and [f] Commitment – Garbarino and Johnson (1999)
[g] Reverse coded

List of Figures

Figure 1: Theoretical Model

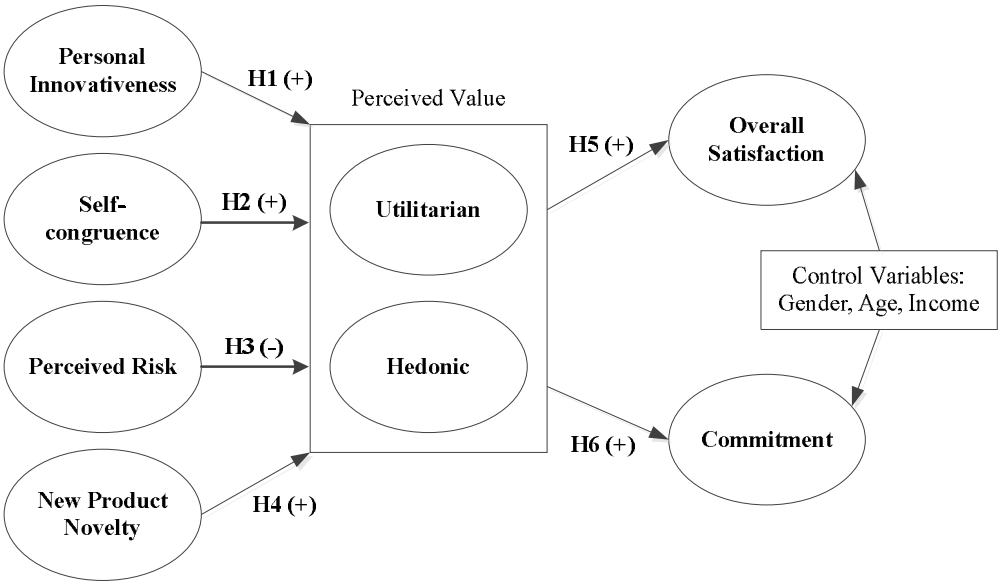

Figure 2: Structural Model