

A mixed methods empirical exploration of

UK consumer perceptions of trust, risk and usefulness of mobile payments

1. Introduction

Cash is an established payment method but adoption of new electronic payments such as mobile payments arises when consumers identify a perceived relative advantage (Riquelme & Rios, 2010). A mobile payment is a financial exchange between 2 parties using wireless technology that is supported by the widespread adoption of consumer based technology (Ling, 2004) together with self-service technology adoption (Bolton and Saxena-Iyer, 2009). However, existing academic literature includes mobile payments within mobile commerce and mobile banking (Jacob, 2007) although the European Payments Council (2012) mobile payment definition is broad enough in scope to cover the latest payment instrument developments that include contactless payments through cards and other consumer devices.

Widespread consumer adoption of mobile payments has occurred in the Far East (Diniz *et al.*, 2011), but widespread adoption in the UK has yet to occur which may reflect a different payment culture for UK consumers. However, the range of innovative consumer focused technology devices with mobile payment capability continues to rapidly evolve and currently includes tablet computers, phablets, watches and glasses (Apple, 2014; Samsung, 2014; Swatch, 2015). Whilst UK consumers have adopted self-service technology including smart phones and portable computing devices (Ondrus and Pigneur, 2007) mobile payments is a relatively new phenomenon for UK consumers and addressing UK consumer concerns is critical to widespread adoption.

Whilst consumer oriented technology has become an integral part of today's society (Drucker, 2011) trust and risk may be key factors affecting UK consumer intention to adopt mobile payments. However, both trust and risk are complex concepts that are not well understood

(Yan *et al.*, 2009) although consumer trust is a perception that the best interests of an individual will be upheld by an organisation in any situation (Roy and Shekhar, 2010) and consumers can trust, or distrust, various inter-related parts of a complex phenomenon such as mobile payments. Furthermore, trust can be segmented into initial trust and experiential trust (Kim *et al.*, 2009) and these two aspects of trust are influenced by different factors whilst a consumer's initial trust in mobile payments influences perceived risk (Kim and Prabhakar, 2004).

Trust is a key factor in a consumer's intention to use mobile payments according to Yan *et al.* (2009) although trust is taken for granted by consumers most of the time (Bews and Rossouw, 2002). However, as mobile payments is a new innovation for UK consumers, initial trust does not exist as UK consumers have no prior experience although initial trust can be based upon an organisation's reputation (McKnight *et al.*, 2002). As a result, initial trust of mobile payments by UK consumers may be based upon a risk assessment that is undertaken whilst consumer guarantees have an increased importance with payment transactions using electronic channels such as mobile payments (Kim and Prabhakar, 2004).

Perceived risk is based upon two different perspectives; the probability of something happening; and the consequences of the outcome should that risk actually happen (Cunningham, 1967). However, consumers minimise the risk aspects that lead to adoption (Peter and Tarpey, 1975) whilst the perceived level of risk diminishes when trust exists between the parties involved in a mobile payment (Featherman and Pavlou, 2003).

As a result, understanding the influence of trust and risk on UK consumer payment behaviour is important for the successful widespread adoption of mobile payments in the UK.

2. Theoretical Background

Mobile payments requires a mobile device to “initiate, authorize and/or confirm an exchange of financial value” that can replace payments made with cash, cheque or payment cards (Zhong, 2009, p.80). Furthermore, mobile payments do not restrict themselves to payments via a mobile phone (Karnouskos and Vilmos, 2004) as a mobile payment is based upon a portable device that has the relevant technology with wireless capability to transfer money electronically between two parties (Bourreau and Verdier, 2010; Turowski and Pousttchi, 2004). As a result, this includes Europay, MasterCard and VISA (EMV) contactless smart cards, although similar terms like proximity or remote payments are also used. Mobile payments entail a complex environment (Rochet and Tirole, 2002) and is a relatively new and continually evolving payment method in the UK (MasterCard, 2012; VocaLink, 2013) with various mobile payment organisations currently establishing different UK consumer services (Apple, 2014; Samsung, 2014).

Consumer perceptions of mobile and other electronic payments vary across social and cultural contexts (Singh, 2000) whilst measuring perceptions is both subjective and complex (Hackley, 2003) although perceptions of trust and risk affect consumer behaviour intentions which are a good predictor of adoption (Jackson *et al.*, 1997). However, the need for trust only arises when risk is perceived or identified (Mayer *et al.*, 1995) whilst trust and risk are inter-related in a consumer’s decision making process (Morrison and Firmstone, 2000) with trust used by consumers as a method to address perceived risk (Gefen, 2000). Trust has been identified as a key factor in consumer’s intention to use mobile payments and has an increased level of importance with consumer payments (Pousttchi, 2003) whilst the perceived level of risk diminishes when trust exists between the parties (Featherman and Pavlou, 2003). In addition, consumer trust of a payment system is influenced by factors including anonymity, security, and the reputation of the mobile payment organisation (Arvidsson, 2014).

Trust in the organisation providing mobile payments is a key determinant of success (Xu and Gutierrez, 2006) and includes banks, card companies, mobile network operators (MNOs) and other payment service providers (Kim *et al.*, 2010). Consumer trust in a mobile payment provider is critically influenced by the organisation's reputation (Anderson and Weitz, 1989). In addition, a positive reputation of an organisation increases consumer trust in the absence of any first-hand knowledge or experience (Lohse and Spiller, 1998). Trust in a mobile payment organisation is a key factor in the consumer decision making process (Gefen *et al.*, 2003). However, the impact of trust is higher than that of perceived risk particularly in consumer decisions on payment transactions that are perceived as higher risk (Roy and Shekhar, 2010).

Perceived usefulness is a key factor in mobile banking adoption (Mohammadi, 2015; Mortimer *et al.*, 2015; Koenig-Lewis *et al.*, 2010) whilst initial trust has a positive and direct effect on perceived usefulness with mobile banking (Zhou, 2011). Furthermore, the provision of a payment guarantee significantly increases consumer trust in the organisation which positively affects perceived usefulness (McKnight *et al.*, 2002) but also reduces perceived risk (Gu *et al.*, 2009) whilst trust and credibility are crucial in reducing perceived risk (Koenig-Lewis *et al.*, 2010).

UK consumers have no previous experience of, or trust in mobile payments whilst a lack of trust in mobile payments is a barrier to adoption although initial trust, directly and indirectly, can positively affect mobile payment adoption (Zhou, 2014). However, perceived trust has a substantial positive effect on reducing perceived risk in internet banking (Grabner-Krauter and Faullant, 2008) and banking organisations have previously been identified as a preferred trusted mobile payments provider whilst MNOs and other small companies are not considered trustworthy (Dahlberg *et al.*, 2003).

Consumer interest in mobile payments is influenced by perceived technology risks (De Ruyter *et al.*, 2000) although consumers are unlikely to be able to assess the technology risks and as a result make a subjective assessment (Frewer *et al.*, 2011). The key risks for mobile payments made through a smart phone include ease-of-use, convenience, security, privacy and reliability according to Chang *et al.* (2009). However, wireless networks are more vulnerable to security attacks and interceptions (Crabbe *et al.*, 2009) and as a result, mobile payments can expose consumers to a higher degree of security and privacy risks (Chong *et al.*, 2012). These risks can lead to increased consumer anxiety and an increase in the perceived security risk, although most consumers only perceive security from a subjective perspective (Eze *et al.*, 2008). Furthermore, consumers believe that many mobile payment solutions are insecure and have an increased risk whilst security levels that apply to mobile payments do not match the higher security standards required for EMV smart cards (Eze *et al.*, 2008) and security risks include theft and loss or damage to mobile devices. Perceived security risk has a dominant effect on consumer intention to adopt a mobile payment service in various countries including Australia, USA and Finland (Featherman and Pavlov, 2003) whilst consumers identify security concerns due to the perceived greater risk of uncertainty and a loss of control (Lu *et al.*, 2011).

A mobile payment has a higher risk profile as the consumer loss can include the device, privacy, personal data, the payment transaction itself and the consumer's financial assets which further increases the perceived risk (Schierz *et al.*, 2010). Consumers are unable to meaningfully assess and differentiate the various risks of mobile payments and consumer risk assessment is more difficult with very limited prior experience (Zhao *et al.*, 2008) although perceived risk negatively affects a consumer's adoption intention (Chen, 2008). However, mobile payment adoption is optional as consumers can continue to use existing forms of payment (Lu *et al.*, 2011).

3. Research Model and constructs

The TAM assesses the core human psychological aspects of technology adoption (Davis, 1989) with a focus early in the outcome chain (Igbaria, Schiffman & Wieckowski, 1994) and as a result, is a more effective model for exploring UK consumer interest in mobile payments when compared to other models (Mathieson, 1991). The TAM has been widely used in empirical studies of mobile banking (Maroofi *et al.*, 2013) and mobile payments (Swilley, 2010), although no UK consumer studies have been identified. However, the two cognitive response constructs of perceived ease of use and perceived usefulness are not sufficient in their own right to explain an individual's acceptance of technology (Mathieson, 1991) although perceived usefulness is a vital element in encouraging consumers to change their habits (Ho and Ko, 2008). The inclusion of trust and risk constructs to the Technology Acceptance Model (TAM) are believed to be crucial to the successful adoption of mobile payments by UK consumers, although these constructs are not yet well explored in mobile banking literature according to Koenig-Lewis *et al.* (2010).

Consumer perception of risk is an important influence when adopting a new technology service such as mobile payments (Laforet and Li, 2005) whilst key risks for mobile payments made through a phone include ease-of-use, convenience and security (Chang *et al.*, 2009). Furthermore, perceived risk has been included as an additional construct to the TAM in various studies (Koenig-Lewis *et al.*, 2010) and as a result, an additional construct of perceived risk influencing perceived usefulness is included in the conceptual model. In addition, consumer perception of trust is also an important aspect when adopting a new technology service such as mobile payments as trust has an effect on perceived usefulness with internet banking (Suh and Han, 2002). Furthermore, perceived trust has been included as an additional construct to the TAM in previous studies (Gefen, 2004) and as a result, an additional construct of perceived trust influencing perceived usefulness and a further construct of perceived trust influencing perceived risk are included in the conceptual model. These three additional risk

and trust constructs are added to the TAM in order to explore the following research propositions:

- Perceived trust has a positive influence on perceived usefulness.
- Perceived trust of a bank will be higher than that of other mobile payment providers.
- Perceived risk has a negative influence on perceived usefulness.

The conceptual model used in this research is identified below with the original TAM constructs highlighted although this research paper only considers trust, risk and perceived usefulness as identified.

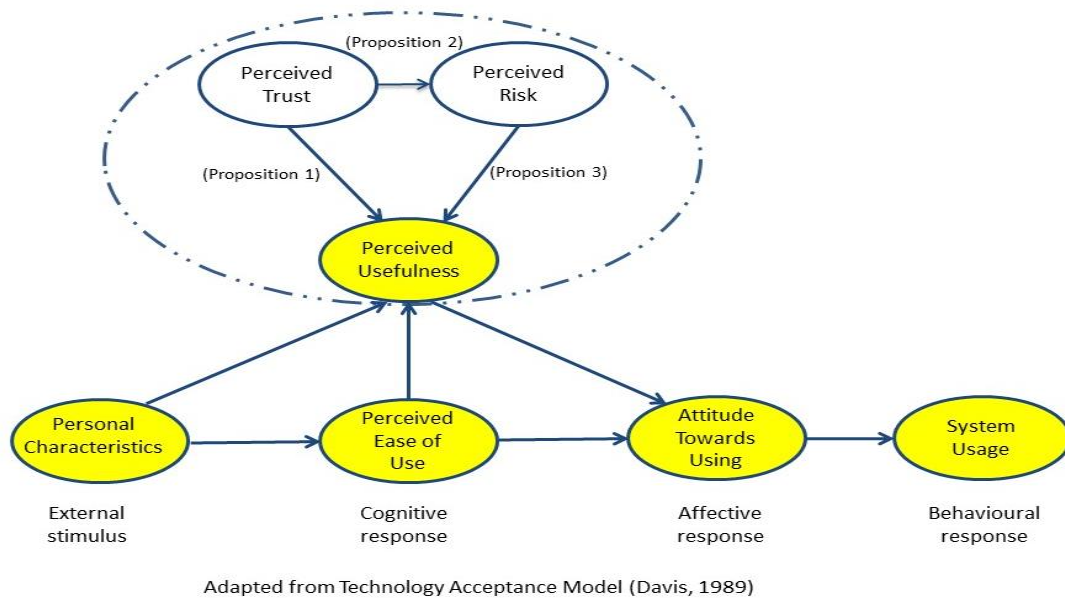


Figure 1 – Conceptual Model

4. Research Methodology

An exploratory sequential mixed methods research design is used with a questionnaire as the first research instrument followed by semi-structured interviews which are complementary methods that support each other (Field, 2013). The use of mixed methods research as part of a post-positivist philosophy and a social constructionist ontology allows sense to be made of the subjective and socially constructed meanings of mobile payments data obtained from participants (Denzin and Lincoln, 2011).

A number of questions are adapted from previous mobile payments research as this is an effective approach to ensure that the empirical data addresses the research objectives (Bryman, 2012) and the questionnaire is made available through Facebook and mobile payment groups on LinkedIn to reach consumers with a technology and mobile payments interest (Dillman, 2007). However, in order to obtain the views of consumers who do not use electronic channels, other consumers complete the questionnaire in a face to face environment in the Chester area of the UK. As a result, this research strategy supports the potential to reach a reasonable number of participants from diverse backgrounds and to obtain a broad spectrum of data (Hackley, 2003). The questionnaire answer options are based upon a six-point attitude scale with polar opposites of strongly agree through to strongly disagree with consistency in response answer direction across all the questions which produces good answer reliability compared to other scales (Tittle and Hill, 1967). The use of a six-point scale requires each respondent to commit to either a positive or negative perspective which is a personal judgment measuring instrument (McIver and Carmines, 1981) although the answers only reflect the perception of the truth based upon the participants' feelings at that moment (Dyer, 1995). More complex scoring methods have shown to possess no advantage whilst increasing the number of answer options provides minimal improvement in answer reliability (Lozano *et al.*, 2008).

Quantitative analysis of the questionnaire data is undertaken on the ordinal data obtained through the Likert scale questions which reflect the respondent's subjective criteria (Bryman, 2012). The ordinal questionnaire data is allocated a numerical code that ranges from 1 for strongly disagree through to to 6 for strongly agree dependent upon the respondent's answer to each question as this supports the mathematical mean calculations with a mathematical mean mid point of 3.5. The numerical findings are used to assist in the production of a semi-structured interview guide that is used in the subsequent qualitative interviews. Each interview explores the key consumer perceptions of trust, risk and usefulness of mobile

payments that are identified from the questionnaire data analysis (Gall *et al.*, 2006). The subsequent qualitative data obtained from the interviews supplements and validates the quantitative questionnaire data analysis (Miles *et al.*, 2014) as consumer perceptions cannot actually be measured and any cause and effect can only be hypothetical (Ritchie and Lewis, 2003).

Purposeful interview sampling is used with interviewees selected based upon a number of criteria including close at hand, easy to access, available at the right time and different age ranges (Gerson and Horowitz, 2002). An exploratory interview design is used as this produces data from which substantial meaning and understanding are created (Carson *et al.*, 2005) whilst investigative interview questions are used as this provides a flexible design that leads to a discovery of the unexpected (Gerson and Horowitz, 2002). Each interview uses a collaborative interview design that supports the sharing of reflection and enquiry (Douglass and Moustakas, 1985). An informal interview approach is also used as this establishes rapport and gains trust whilst creating a more natural conversational environment that is conducive to open and honest communication (O'Leary, 2004). In addition, prompts and probes are used to encourage elaboration of the interviewee's response (Sarantakos, 2005). Content analysis is undertaken on the qualitative interview data in order to identify any comparable and contrasting themes from which new knowledge is identified (Miles *et al.*, 2014).

5. Analysis and Findings

A range of participant data is obtained and analysed as shown in the Table 1 below:

		<u>Questionnaire</u>	<u>Interview</u>
Age	16-24	3	1
	25-34	5	0
	35-44	25	1
	45-54	30	4
	55-64	20	3
	65+	18	1
	Total	101	10
Gender	Male	51	4
	Female	48	6
	Not Disclosed	2	0
	Total	101	10
Education	GCSE/O Levels	13	2
	A levels	13	1
	BA/BSc	25	1
	Post-Grad	45	6
	Prefer not to say	5	0
	Total	101	10

Table 1 - Respondent Data

Whilst questionnaire data is obtained from 120 participants, 15 of these are non-UK participants and are excluded which results in a total of 101 usable questionnaire responses that include 53 submitted electronically through LinkedIn and Facebook whilst the remaining 48 are obtained in a face to face environment. 78% of the 101 questionnaire respondents are aged from 35 to 64 years old of which 31.7% are in the 45 to 54 year old age range compared to 17.5% of the UK adult population. In addition, 3% of the questionnaire respondents are aged from 16 to 24 years old compared to 14.5% in the UK adult population. Furthermore, 69.4% of the questionnaire respondents hold one or more degree qualifications whilst 44.6% also hold a post-graduate degree with minor variations in the findings identified following analysis of the nominal data.

Ten semi-structured interviews are completed with interviewees having an age range of 18 to 76 years old and a range of educational qualifications from GCSEs to post-graduate degrees. Each of the 10 interviewees is allocated a pseudonym name to protect the identity

of the actual participant (British Educational Research Association, 2004) with the 1st interviewee allocated a randomly chosen name starting with the letter A and the last interviewee allocated a name starting with the letter J, although each random name chosen retains the gender of the original interviewee. Text content extracts of the interviewee data are used to aid understanding with interview quotations used to justify the qualitative findings together with the relevant quantitative findings (Schilling, 2006). This use of each interviewee's precise words acknowledges, but also limits how research accounts are "always constructed by the researcher on the basis of the participants' accounts" (Maxwell, 2012, p.49) whilst supporting the research findings through each interviewee's personal account.

5.1 Perceived trust has a positive effect on the perceived usefulness of mobile payments for UK consumers.

Over 23% of UK questionnaire respondents believe that their personal information is not safe and secure in varying degrees with a mean average of 4.13 whilst the interviewee responses show a much wider variation in the belief that personal information is safe. The varied interview responses on trust of personal information include Beccie who says that 'I need to be absolutely certain that the security is protected... the ability to pay with the device (*mobile phone*) is great but I am not sure about the security of my information... there is no benchmark for technology trust'. In addition, Julia says 'I am comfortable with perceived usefulness of mobile payments... touch and go is dead easy but I have concerns related to the security on my personal information'. This is consistent with Isla who says 'I have concerns in a mobile environment about data and security. It is a bit frightening and you do feel at times as though it is big brother watching you'. However, Graham identifies a personal information concern related to the organisation collecting the personal information when he says 'I am OK with the wireless environment and security as long as the organisation I am giving my details to is secure... I am not comfortable sometimes releasing my details to somebody I don't know'.

UK consumers generally have various degrees of trust in organisations related to security of their personal information which is consistent with Eriksson *et al.* (2005) who identify that Estonia consumers trust a bank to keep their personal data safe and secure; Linck *et al.* (2006) for perceived security of mobile payments with German consumers; and Gu *et al.* (2009) for trust in mobile banking services. However, the UK consumer perspective of trust is inconsistent with US consumers who are concerned about mobile payment organisations collecting too much personal information (Dewan and Chen, 2005).

When considering consumer trust, establishing initial consumer trust is critical to the successful adoption of mobile payments (Zhou, 2014) which is consistent with Julie who says 'the brand and company reputation would be used as determining factors' which is a strong influence on initial consumer trust according to Li *et al.* (2008). Trust is a key factor with Malaysian consumers according to Yan *et al.* (2009) whilst trust directly and indirectly affects a Chinese consumer's intention to use mobile payments (Lu *et al.*, 2011) although not all consumers trust in the same manner. Whilst 77% of UK questionnaire respondents believe that their personal information is safe and secure in various forms a number of interviewees indicate varying degrees of trust including Julia who says 'I am pretty trusting; if not over-trusting. I buy things online and it doesn't worry me' whilst Edward says 'I have no concerns that my money is safe'. Furthermore, mobile payment services have already been adopted in a number of countries around the world (Ondrus and Pigneur, 2005) and as a result, this adoption also engenders a degree of trust with UK consumers as identified by Hope who says 'mobile payments are already in use in other regions around the world... (*which*) adds to trust'.

A number of companies are involved in the provision of mobile payments and an association with the global VISA and MasterCard brands can generate UK consumer trust which is identified by Hope who says that 'there are multiple companies in the (*mobile payment*) food chain... and VISA and MasterCard engender trust'. In addition, Freddie identifies that UK

consumer trust exists in current payment organisations when he says ‘trust (*is created*) in an organisation that takes a payment with PIN security’ which is also consistent with Graham who says ‘I trust the scenario where it is chip and PIN with putting in your PIN code as being secure’.

Over 89% of UK questionnaire respondents agree in various forms that a mobile payment guarantee generates trust with a mean average of 5.07 which is consistent with Zhou, 2014. The questionnaire findings on payment guarantee are predominantly consistent with the interview findings including Hope who says ‘my security concerns decrease with a payment guarantee’. Furthermore, a number of UK consumers perceive that non-financial institutions have to comply with the standard UK banking regulations that provide consumer protection including Charlie who says ‘the substance (*of the payment guarantee*) might not be what we perceive it to be... with inaccurate (*UK*) consumer perceptions of indemnities. PayPal get the benefit of the indemnity through the existing UK banking infrastructure but that payment guarantee don’t actually exist with these (*PayPal*) payments’.

Whilst payment guarantees positively influence trust for UK consumers this is dependent upon these UK consumers being aware of and understanding the payment guarantees within the existing legal and regulatory frameworks (Cheney, 2008). However, a number of UK consumers indicate that they are not aware of the contactless payment guarantees provided by UK banks including Charlie who says ‘I am not aware of the bank guarantee on contactless payments’ and Julia who says ‘I am not aware of the bank’s payment guarantee’.

5.2 Perceived trust of a UK bank by consumers will be higher than perceived trust of other mobile payment providers:

Nearly 87% of UK questionnaire respondents indicate trust in a UK bank for mobile payments in varying degrees with a mean average of 4.68. The questionnaire findings are also generally consistent with the interview findings where 50% of interviewees expressed a positive

perspective for a UK bank including Edward who says 'my trust in established (*UK*) financial institutions is quite high following my previous experience... although I would have a different attitude to a small foreign bank'. However, a number of interviewees expressed their trust in UK banks in different ways including Hope who says '(*I*) trust established companies for mobile payments... but VISA and MasterCard (*brands*) engender trust'. In addition, Edward says 'I stick with what I know as it works. It's secure, it's safe... and my level of trust in a global brand is higher' which is consistent with Beccie who says 'there is a significant effect of trust with well-known brands in the UK'.

When considering trust in MNOs, 87% of UK questionnaire respondents trust a UK bank but only 65% trust a MNO and this is also reflected in the mean average of 4.68 for trust in a UK bank but only 3.90 for trust in a MNO. The questionnaire findings are generally consistent with the interview findings including Julia who says 'the least trust would be the T-Mobile type (*MNO*) but I wouldn't be too worried (*about any payment organisation*)'. In addition, Edward shows a lack of trust in MNOs when he says 'I wouldn't choose to use new entrants so it wouldn't affect me even if market flooded with them... I stick with what I know as it works. It's secure, it's safe'. These UK consumer findings are generally inconsistent with Kim et al. (2009) who identify that Korean consumers have a similar trust for banks and MNOs.

However, 78% of UK questionnaire respondents indicate trust in another payment company such as Google or PayPal with a mean average of 4.19 whilst the questionnaire findings are generally consistent with the interview findings. This trust in established well-known companies is identified by Diana who says 'I would trust Google and PayPal as much as I would trust Lloyds Bank. You can't really judge which is safer... as you have no knowledge as a consumer to compare security'. In addition, Hope says '(*I would*) trust established companies for mobile payments' whilst Edward says 'the level of trust in a global brand is higher' which is consistent with Julia who says 'I trust big organisations... the brand and company reputation would be used as determining factors'. However, whilst UK consumers identify risks with

various payment organisations, some of these payment organisations are still used as indicated by Diana who says 'I have to use PayPal because I use EBay, but I only use these payment companies because I am forced to do so. I adopt these because I have no other choice'. The

Furthermore, age, gender or educational qualifications of UK consumers have no influence on UK consumer trust in mobile payments which is consistent with Jarvinen (2014) who identifies that consumers generally trust UK banks independent of age or educational qualifications.

5.3. Perceived risk has a negative effect on the perceived usefulness of mobile payments for UK consumers:

Over 87% of UK questionnaire respondents indicate that mobile phone payments have risks in some form with a mean average of 4.47 whilst 82% of UK questionnaire respondents believe that contactless card payments also have risks in some form with a mean average of 4.43. These findings are generally consistent with the interview findings although Isla puts perceived risk into perspective when she says 'I don't know enough about it (*risk*) to know what I should be worried about to be honest'. In addition, UK consumers have concerns on phone theft and data loss including Hope who says 'I have fraud concerns with the loss of the (*smart phone*) device' whilst Julia says 'risk relates to leaving the mobile phone and someone picks it up and start to use it (*for mobile payments*)'. Furthermore, Hope also expresses concern at being targeted by thieves when she says 'with the phone on view it may lead to my (*smart*) phone being targeted by robbers and stolen'. This is consistent with Julia who says '(*smart phone*) devices could become very attractive to thieves... and being out and about increases the risk'. In addition, Beccie suggests that 'risk is based upon the type of device with access to more data on phone... (*as*) the more complex the device the more complex personal data and the higher risk associated with it'. The UK consumer concerns related to mobile

phone loss including fraudulent payment transactions is consistent with US consumer concerns identified by Chin et al. (2012).

When considering contactless payments, a card payment with PIN authentication is widely adopted by UK consumers (Ward, 2006) and, as a result, the benefits of UK consumers adopting a new electronic contactless payment method are not clear (Englund & Turesson, 2012). Nearly 82% of UK questionnaire respondents indicate that contactless card payments have risks although perceived risk is not a key influence for contactless cards with Taiwan consumers (Wang & Lin, 2008). The questionnaire findings are generally consistent with the interview findings including Julia who says 'entering my PIN offers a degree of security whereas if your card is stolen they (*fraudsters*) could make several purchases on tap and go... which is a slight concern'. In addition, Graham says 'it is incredibly insecure where you just swipe your card and the payment will go through... if someone stole your card then they could just swipe. I would never subscribe to that then *as I'd never trust it*'. This concern is consistent with Freddie who says 'it would be easy to steal money using the (*contactless*) card but most of the time I can't really see that being an issue' whilst Isla says 'it (*contactless*) just makes me feel nervous and if you found somebody's card you could just use it... It feels less secure and doesn't appeal'. Furthermore, Alison says 'you don't have to enter your PIN or sign anything... without a PIN there has to be a risk'. Despite the availability and awareness of contactless payments Edward says 'I never use the contactless facility as I always enter my PIN to validate the payment even though I am aware of touch and go as the PIN entry provides me with a level of security... and it is only a few seconds for PIN entry. I am not in that much of a rush and I stick with what I know'. This UK consumer payment habit is consistent with consumers in Spain who continue to make conventional payments after they had received their contactless card (La Caixa, 2012).

Furthermore, a number of interviewees identify mobile phone data risk as a concern including Beccie when she says 'we need to be careful... as risk is based upon the type of device with more personal data on a smart phone... the more complex the device the more personal data and the higher risk associated with it'. This is consistent with Julia who says 'the security of all your information on the smart phone... and the implications if you lost it (*smart phone*)... the ability to pay easily... You are setting yourself up for big security issue with it (*personal data*) all in one place'. In addition, Charlie says 'I have some concerns about the security risk with smart phones' and Hope says 'I have fraud concerns with the loss of the payment device'.

6. Discussion and Implications

Despite the widespread adoption of consumer based technology (IDC, 2014; Ling, 2004), UK consumers identify a number of risks with mobile payments although trust can offset these risks which positively influences perceived usefulness which is consistent with Iranian consumers and mobile banking (Mohammadi, 2015). Perceived usefulness is a key influence on consumer adoption of various self-service technologies (Kaushik & Raham, 2015; Mortimer *et al.*, 2015; Yadav *et al.*, 2015). Mobile payment interest is negatively influenced by UK consumer perceptions of technology and security risks including the lack of PIN authentication although the benefits and advantages can outweigh the risks for UK consumer in some very specific scenarios e.g. queue avoidance in high volume situations including Transport for London and Mersey tunnel toll. Identifying and meeting a specific UK consumer need for mobile payments increases perceived usefulness and this encourages UK consumers to change their choice of payment method (Sathye, 1999) and overcomes barriers to adoption (Meuter *et al.*, 2000). As a result, perceived trust positively influences perceived usefulness and mobile payment organisations will need to focus on identifying the specific benefits of mobile payments to UK consumers as mitigating risk and increasing trust does not compensate for the absence of usefulness (Eriksson *et al.*, 2005).

UK consumers have an increased level of trust in established UK banks compared to other mobile payment providers whilst the VISA and MasterCard brand association also contributes to UK consumer trust which is consistent with Arvidsson (2014) and Eriksson *et al.* (2005). Furthermore, UK consumers also perceive their personal information is safe with UK banks and other established organisations whilst UK consumers indicate a lack of trust towards unknown mobile payment organisations or new market entrants (Li *et al.*, 2008). As a result, established UK banks can use this increased level of UK consumer trust to market their mobile payment service offering to their existing UK consumers but can also to use this trust to secure new mobile payment customer relationships.

UK consumers identify significant concerns related to the risk of lost or stolen payment instruments as well as contactless payments with no PIN authentication. UK consumers believe that this will lead to their financial loss from subsequent fraudulent transactions, although existing contactless payment guarantees are provided by UK banks that address this concern. However, UK consumers indicate a lack of awareness of existing contactless payment guarantees provided by UK banks although these payment guarantees significantly increase UK consumer trust which is consistent with Gefen *et al.* (2003 and Laforet and Li (2005). Risk has a negative effect on perceived usefulness of mobile payments for UK consumers which is consistent with Mortimer *et al.* (2015) on mobile banking. As a result, UK banks and other mobile payment organisations need to ensure that UK consumers are fully aware of, and understand any payment guarantees that are provided as this can be used to overcome UK consumer resistance to mobile payments and leads to wider adoption.

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