THE PERCEPTION OF MOBILE PAYMENT SYSTEMS AND MEASURING THE EFFECTS OF DIGITAL NUDGING

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BOĞAZİÇİ UNIVERSITY

2022

THE PERCEPTION OF MOBILE PAYMENT SYSTEMS AND MEASURING THE EFFECTS OF DIGITAL NUDGING

Thesis submitted to the

Institute for Graduate Studies in Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts

in

Management

by

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Boğaziçi University

2022

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and Measuring the Effects of Digital Nudging

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June 2022

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ABSTRACT

The Perception of Mobile Payment Systems

and Measuring the Effects of Digital Nudging

This thesis is a study on the perception of mobile payment systems and measuring the effects of digital nudging techniques. The thesis aims to explore the relationships between risk perception, mobile payment systems usage, trust in mobile payments, positive and negative factors for mobile payment systems. Furthermore, in the second part of the study, it has been investigated whether trust in mobile payments and mobile payment systems usage differ according to different digital nudging techniques. Two different online surveys were conducted with 241 university students in Turkey with each student filling out one type of the surveys. In the first part of the survey, the questions were the same, while in the second part, the questions changed and different digital nudging techniques were applied. According to the results of both studies, significant positive relationships were found between risk perception and mobile payment systems usage, risk perception and trust in mobile payments, mobile payment systems usage and trust in mobile payments, mobile payment systems usage and positive factors for mobile payment systems. In the second part, it was found that mobile payment usage and trust in mobile payments differ significantly according to different digital nudging techniques. It was found that trust in mobile payments differs according to different informative data, mobile payment usage differs according to positive data, trust in mobile payments and mobile payment usage differ according to a case, mobile payment usage differs according to the structure and the priority of answers.

ÖZET

Mobil Ödeme Sistemleri Algısı ve Dijital Dürtme Yöntemlerinin Etkisinin Ölçülmesi

Bu tez, mobil ödeme sistemleri algısı ve dijital dürtme yöntemlerinin etkisinin ölçülmesi için yapılan bir çalışmadır. Bu tezin amacı, risk algısı, mobil ödeme sistemleri kullanımı, mobil ödeme sistemlerine olan güven, mobil ödeme sistemleri için olan pozitif ve negatif faktörlerin arasındaki ilişkiyi incelemektir. Aynı zamanda, çalışmanın ikinci kısmında mobil ödeme sistemleri kullanımı ve mobil ödeme sistemlerine olan güvenin sorularda verilen farklı dijital dürtme yöntemlerine göre farklılık gösterip göstermediği incelenmektedir. İki farklı anket hazırlanmış ve toplamda Türkiye'deki 241 üniversite öğrencisiyle çevrim içi anket yapılmıştır, her öğrenci tek bir tip anketi doldurmuştur. Anketlerin ilk bölümünde sorular aynı olmakla beraber ikinci bölümünde sorular değişmekte ve farklı dijital dürtme yöntemlerinin olduğu sorular bulunmaktadır. İki anketin sonuçlarına göre risk algısı ve mobil ödeme sistemleri kullanımı, risk algısı ve mobil ödeme sistemlerine olan güven, mobil ödeme sistemleri kullanımı ve mobil ödeme sistemlerine olan güven, mobil ödeme sistemleri kullanımı ve mobil ödeme sistemleri için olan pozitif faktörler arasında anlamlı ve pozitif bir ilişki bulunmuştur. İkinci bölümde ise mobil ödeme sistemlerine olan güven ve mobil ödeme sistemleri kullanımının farklı dijital dürtme yöntemlerine göre anlamlı bir farklılık gösterdiği görülmüştür. Mobil ödeme sistemlerine olan güvenin farklı bilgi veren veri kullanımına göre, mobil ödeme sistemleri kullanımının pozitif bir veri içeren bilgi kullanımına göre, mobil ödeme sistemlerine olan güvenin ve mobil ödeme sistemleri kullanımının mobil ödemelerle ilgili bir vaka içeren bir yazı kullanımına göre ve mobil ödeme sistemleri kullanımının cevapların yapısı ve sıralamasına göre farklılık gösterdiği görülmüştür.

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CHAPTER 1

INTRODUCTION

Mobile payment services have become largely adopted in the Turkish market due to the rise in smartphone penetration. Mobile payment systems include all payment and financial transactions made through mobile applications such as mobile banking applications, e-commerce mobile applications, bill payment applications and digital wallets (Goddard, 2021). It has been stated that, an estimated 30% of e-commerce transactions are done with smartphones in Turkey in 2019 and various users state that they would continue to use mobile for online shopping (J. P. Morgan, n.d.). According to the report, mobile commerce was expected to grow at a compound annual growth rate of 39.7% by 2021 in Turkey (J. P. Morgan, n.d.). Subsequently, in 2020, due to the impact of Covid-19, health concerns led people to a tendency to use digital commerce applications and mobile payment systems for their financial transactions and shopping while they stayed at home. According to a study conducted by McKinsey & Company in 2020 on Turkey, participants reported that they would continue using online banking platforms more even after the end of the pandemic (Euart, Hilal, & Panek, 2020). Accordingly, it can be said that digital payments have become a habitual feature of daily life. Recently, according to a report by E-Commerce Information Platform in Turkey (E-Ticaret Bilgi Platformu), in 2021 70% of people used mobile applications for their e-commerce transactions in Turkey (E-Ticaret Bilgi Platformu, 2022).

While digital payments saw enormous growth and mobile e-wallets usage was on the rise, the digital environment made the transactions much easier and more convenient for users (Saleem, 2017). However, the inherent risks of digital payment

systems necessitate more caution than ever (Saleem, 2017). According to the study at Asia Pacific region conducted by Mastercard, consumers tried at least one new payment technology in a year and were willing to continue using these systems (Mastercard, 2021). However, 27% of people stated that they had encountered fraud issues and 79% of people said that they would try new payment methods only if they were perceived as secure (Mastercard, 2021). In the same study, common reasons for not trying new payment systems were security and data privacy concerns (Mastercard, 2021). Furthermore, in Singapore, e-commerce fraud cases went up by 74% in the first half of 2020 (Bala, 2021). These cases show that although mobile payments offer much convenience, trust and security concerns are significant challenges to mobile payments.

Kim, Mirusmonov, and Lee (2010) stated that ease of use and usefulness are affecting user's adoption of mobile payment largely according to the results of their study. Shaikh and Karjaluoto (2015) found that perceived usefulness is an important factor for mobile banking adoption according to their literature review. Pal, Herath, De, and Rao (2021) indicated that convenience has a large impact on mobile payment usage. According to a study by Simon Kucher & Partners; Ke, Chung, Li, and Furgiuele (n.d.) stated that ease-of-use, speed and rewards in mobile payment systems are significant factors for mobile payment adoption while social factors (the usage of their friends and celebrities) have minimal impact.

Featherman and Pavlou (2003) explored the negative effects of perceived risk on e-service adoption. Kim, Tao, Shin, and Kim (2010) found that trust and security have effects on e-payment systems usage. Pal, Herath, De, and Rao (2021) conducted a study for exploring the effects of risk and convenience on mobile payment usage and they found that convenience has a larger impact on usage.

Thaler and Sunstein (2008) indicated that people's choices are highly affected by the way the selections are offered to them. Nudges are described as small adjustments to the choice environment for shifting individual behaviors without forbidding any options by Thaler and Sunstein (2008). Weinmann, Schneider, and vom Brocke (2016) defined digital nudging as the use of user-interface techniques to alter people's behaviors in digital decision environment. Weinmann et al. (2016) gave various examples of nudging in their study. Jesse, Jannach, and Gula (2021) conducted a study for nudging people into healthier food choices in online context and they found that default options, social norm nudges, highlighting options and warning nudges (giving information about calories) have effects on people's food choices. Huang, Chen, Hong, and Wu (2018) conducted a study for exploring the effects of simple request, monetary incentive, relational and cognitive capital nudging techniques in users' social sharing of content in digital platforms. Huang et al. (2018) found that monetary incentive, relational and cognitive capital nudging techniques have effects on social sharing, while simple request has negative effects on social sharing. Mallas, Xenos, and Karavasili (2021) tested the impacts of digital nudges using two different surveys in stress and anxiety context. Mallas et al. (2021) used positive and negative photographs in each survey to understand how these affect people's choices, they used default options, gave positive and negative informative texts before some of the questions, offered more positive and more negative levels of answers and used charts that show different artificial data of people's choices on the same questions.

1.1 Purpose of the research

The purpose of this study is understanding the relationships between risk perception, trust and security in mobile payments, mobile payment systems usage, positive factors and negative factors for mobile payment systems. In the second part of the study, I attempt to investigate how different digital nudging techniques generate differences in the participants' answers about mobile payment systems usage and their trust in mobile payments. For these purposes, two different surveys are conducted with university students with each student filling out one type of the survey. In the first part, questions are the same for both groups and in the second part, questions change and different digital nudging techniques are used.

1.2 Contribution of the research

This research can be used by academicians for further studies on mobile payment behaviors and behavioral science and by the practitioners in the field that is offering mobile payment services, it can help them to examine the relationships between risk perception, trust and security and the mobile payment usage, which factors encourage the usage of mobile payments and which factors hinder the adoption of mobile payments. On the basis of this information, practitioners in the field can develop better mobile payment systems that fulfil the needs of the users. Furthermore, in this study digital nudging methods are applied in a questionnaire about mobile payment systems for Turkish participants. To the best of our knowledge, this study is one of the initial attempts to use digital nudging techniques in a questionnaire format in mobile payment systems context in Turkey. This study will show whether mobile payment systems usage and trust in mobile payments differ according to the questions with different digital nudging techniques, in this

study the effects of digital nudging techniques will be investigated. Academicians can use this design for further studies and practitioners in the field can gain insights into how to present options to their users.

The following chapters are organized as follows: Chapter 2 will present literature review on digital nudging and mobile payment systems. Chapter 3 will explain the methodology and the design of the current study. Chapter 4 will focus on the results of the study. In Chapter 5, the results of the study will be discussed with the implications and the limitations of the study.

CHAPTER 2

LITERATURE REVIEW

Literature review was conducted regarding digital nudging and mobile payment systems topics according to the goals of the research. Firstly, nudging and digital nudging concepts, numerous digital nudging experiments and digital nudging in questionnaire design were searched. Secondly, relevant literature and reports for mobile payment systems were analyzed. In the literature research, we tried to investigate which factors positively and negatively affect the use of mobile payment systems, and the effects of risk, trust and security on mobile payment systems usage were examined.

2.1 Digital nudging

Thaler and Sunstein (2008) stated that people's choices are highly affected by the way the options are presented to them. Thaler and Sunstein (2008) defined nudges as small adjustments to the choice environment for changing people's behaviors without forbidding any options. Weinmann, Schneider, and vom Brocke (2016) stated that digital nudging is about the use of user-interface techniques to change people's behaviors in the digital decision environment. There are various means of digital nudging. Weinmann et al. (2016) include many examples of nudging in a digital context, where decision environment designers try to affect people's behaviors.

Schneider, Weinmann, and vom Brocke (2018) observed the effects of digital nudges in a series of experiments about reward-based crowdfunding such as the ones conducted by Simons, Weinmann, Tietz, and vom Brocke (2017); Tietz, Simons,

Weinmann, and vom Brocke (2016); and Weinmann, Simons, Tietz, and vom Brocke (2017). Tietz et al. (2016) conducted an experiment on the decoy effect. Zhang and Zhang (2007) stated that if there are two brands and a third brand (which is inferior to the second one) is introduced to the market, this inferior option creates a shift in the preferences of the consumers and this effect that the inferior choice creates is called the decoy effect. According to their results, Tietz et al. (2016) found that presenting the decoy with the intended outcome led people to choose the intended outcome more. Jung and Kellaris (2004) stated that the scarcity effect is about the effect of scarcity on the attractiveness of an item and people think of scarce items as precious. Weinmann et al. (2017) used limited reward for nudging people in their experiment and people chose the option with the limited reward more. Christenfeld (1995) stated that when people are presented with an array of choices, they are inclined to choose the option in the middle. In the experiments about crowdfunding, Simons et al. (2017) found that regardless of the scale of the choices, people selected the middle options more and they state that positioning the rewards affects the amount of money collected.

Huang, Chen, Hong, and Wu (2018) made an experiment to understand the role of different nudging techniques for users' online social sharing of content in online platforms. Huang et al. (2018) tried to explore the effect of simple request, monetary incentive, relational and cognitive capital nudging techniques. As discussed by Berger and Schwartz (2011), as word of mouth is extremely valuable for sales, organizations usually use word of mouth in their marketing campaigns. Nahapiet and Ghoshal (1998) referred to relational capital as personal relations people have established together while they referred to cognitive capital as developed knowledge among people. Huang et al. (2018) conducted the experiment with a

website, they showed no message to the first group of participants, while a simple request message to share the webpage was shown to the second group, a monetary incentive was offered to the third group, the relational capital technique was used with the fourth group and the cognitive capital technique for sharing the information with their friends was used with the fifth group. According to their results Huang et al. (2018) found that the group that was given monetary incentive showed the highest sharing rate, followed by the groups with which the cognitive capital technique and relational capital technique were used. On the other hand, Huang et al. (2018) found that the simple request group showed the lowest sharing rate, even compared to the control group that received no messages at all. Huang et al. (2018) stated that although using social capital can be used as a costless alternative to monetary incentives, using a simple request pop-up creates a bad user experience.

Zhang (2021) worked on designing a mobile app to improve young people's digital financial literacy. To engage the users and keep them using the mobile app, the author used digital nudges. Zhang (2021) asked questions about users' risk tendencies and their knowledge about digital financial services.

Jesse, Jannach, and Gula (2021) designed a digital study to nudge people into healthier food choices in an attempt to understand the effectiveness of five different nudges with 225 users in a recipe website from which users selected a recipe. Jesse et al. (2021) used a default option, highlighted one option in a different color, used a social norm nudge (they added 90% of people chose this to one of the options), and they used a hybrid nudge which included defaulting one option and also applying social nudge. Finally, Jesse et al. (2021) used warning nudges, giving information about the calories of the dishes in the desserts category. Jesse et al. (2021) found that when using hybrid nudge, users selected the nudged item in about 58% of the

situations. Jesse et al. (2021) also found the warning nudge to be effective, with 44% of users altering their choice when the warning was presented to them and in 75% of the situations people preferred the recipe that contained fewer calories. Moreover, their results showed that in default nudge, the nudged item was selected in 35% of the cases, while in highlighting nudge it was 24% and in social nudge it was 23% (Jesse et al., 2021).

Mallas, Xenos, and Karavasili (2021) conducted a study to test the impact of digital nudges using two different surveys about anxiety with 230 responses. Mallas et al. (2021) used a positive and a negative version of the survey for different participants, with all participants filling out one type of survey. Mallas et al. (2021) first used positive and negative photographs in four questions to elicit emotional response; questions were the same for both groups and the nudge was successful in one of those four questions. Mallas et al. (2021) used default options as nudging techniques in four questions; the nudge was successful in one of those four questions. In the positive version Mallas et al. (2021) used a positive informative text and in the negative version they used a negative informative text in the questions. In one of the two questions, the nudge was successful. In two of the questions Mallas et al. (2021) offered more positive levels of answers in the positive nudging one and more negative levels of answers in the negative nudging one. Mallas et al. (2021) found out that when they used more positive answers in the positive one and more negative answers in the negative one, the nudge was successful in one of the questions. In one question Mallas et al. (2021) used pie charts containing different artificial data about other people's choices on same question, they found out that when they presented an option as the most popular choice, this option was selected most among the

participants. In the second part of my survey adapted from Mallas et al. (2021), I used different digital nudging techniques for each group.

2.2 Mobile payment systems

There are various articles in the literature regarding mobile payment systems. Childers, Carr, Peck, and Carson (2001) found that usefulness, ease of use, convenience, spending less time are significant predictors of online shopping behaviors of people. Childers et al. (2001) adapted the constructs from the Technology Acceptance Model (TAM), from Davis (1989).

Kim, Mirusmonov, and Lee (2010), based on a survey to explore the factors affecting adoption of mobile payments by consumers, looked at individual attributes about consumers and the features of mobile payment systems, categorizing them according to usefulness and ease of use. Kim, Mirusmonov, and Lee (2010) stated that ease of use and usefulness influenced people's adoption significantly. Kim, Mirusmonov, and Lee (2010) stated that individual characteristics, convenience and accessibility are considerable factors for easiness of usage.

Featherman and Pavlou (2003) investigated the negative implications of risk on acceptance of e-service platforms. Featherman and Pavlou (2003) observed that performance-risk was the most significant factor that negatively affected the e-service adoption.

Kim, Tao, Shin, and Kim (2010) studied a model for the effects of the perceived trust and security of consumers on the usage of e-payment systems. Kim, Tao, Shin, and Kim (2010) collected and analyzed data from 219 people in Korea, concluding that there are effects of trust and security on the usage of e-payment services.

In a literature review conducted by Shaikh and Karjaluoto (2015) on mobile banking use and theories for predicting consumer's tendency to adopt these systems, the authors found that perceived usefulness, suitability with lifestyle and device are influencing the consumer's tendency to use mobile banking widely.

Liébana-Cabanillas, Muñoz-Leiva, and Sánchez-Fernández (2018) examined the factors that influence mobile payment systems adoption by social media users. Trust, risk perceived by the users, benefits for the people and the social norms were investigated in an online survey conducted with users participating social media (Liébana-Cabanillas et al., 2018).

Pal, Herath, De, and Rao (2021) studied effects of risk and convenience on mobile payment usage finding that convenience had a larger impact on mobile payment usage compared to the perceived risk.

According to a study by Simon Kucher & Partners; Ke, Chung, Li, and Furgiuele (n.d.) found that ease-of-use, speed, rewards and social factors (usage of friends and celebrities) in mobile payment systems could affect the usage of the mobile payment services.

Common Cents Lab (CCL) at Center for Advanced Hindsight at Duke University and Center for Applied Research in Finance (CARF) at Boğaziçi University (2020) conducted an unpublished global project. With the support of behavioral science studies, this project aims to contribute to the financial welfare of people in Turkey by enabling them to acquire the habit of paying their bills regularly (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020). The goal of this project is to enable people to pay their bills on time, quickly and in a secure way with a mobile application by a fintech company

(CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020).

CHAPTER 3

RESEARCH METHODOLOGY

In this chapter, the purpose of the research, data collection and the survey, hypotheses, population and sampling of the survey, limitations of the study and data analysis methods will be discussed.

3.1 Purpose of the research

In the light of information from the research on literature, in the study it is aimed to explore the relationships between risk perception, trust and security in mobile payments, mobile payment systems usage, positive factors and negative factors for mobile payment systems. Moreover, in the second part of the study we investigate whether trust in mobile payments and mobile payment systems usage differ according to the questions with different digital nudging techniques. The consequences of different informative data on mobile payment systems, positive informative data on digital wallets, a text containing a case regarding mobile payment platforms, and the structure and priority of answers are investigated with these nudging questions. Hypotheses are generated to be investigated through a survey. Two different surveys are conducted with university students with each student filling out one type of the survey. In the first part, questions are the same for both groups and in the second part, questions change and different digital nudging techniques are used.

3.2 Data collection

Two online surveys are designed for university students, each participant receiving only one type of survey. The first and the second version of the survey can be seen in Appendix A and Appendix B, and Appendix C includes the approval of Ethics Committee for the study. The first part of the survey is the same for both groups. In the first part, there are questions to ascertain their risk tendencies, mobile payment systems usage, their risk and trust perceptions of mobile payments, the factors that contribute to mobile payment systems usage and the factors that can prevent the use of mobile payments. In the second part of the survey, questions change in each survey, different nudging techniques are used to understand how these different nudging techniques affect their perceptions of mobile payments and digital wallets, as well as their trust for these services.

Risk perception scale:

In the first part of the study, first there is risk perception scale. There are questions about risk tendencies of participants designed as follows; questions that were given on a five-point Likert scale (1 = never, 5 = always), one multiple choice question; the first, third and fifth questions are taken and adapted from Zhang (2021), the second question is taken and adapted from Fogel and Nehmad (2009); Pan and Zinkhan (2006), the fourth question is taken and adapted from Fogel and Nehmad (2009); Pan and Zinkhan (2006); and Zhang (2021). Fogel and Nehmad (2009) found that people who take part in social networking sites have greater risk-taking tendencies compared to the ones who do not. Fogel and Nehmad (2009) had taken risk-taking tendency scale from the study by Pan and Zinkhan (2006), who explored whether low risk takers had less tendency to trust e-stores. In this part, we tried to understand

if they are inclined to take risks in daily life, if they tend to take high risks in cases where they would get high returns and if they take calculated risks.

Mobile payment systems usage scale:

In mobile payment systems usage scale, there are questions about mobile payment and digital wallet usage, to which the responses are investigated on a five-point Likert scale (1 = never, 5 = always). These questions are taken and adapted from the article of Kim, Tao, Shin, and Kim (2010) and from an unpublished study entitled "Behavioral Science Global Project" by CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020). The participants are asked if they use mobile payment services and digital wallets and if they are willing to use mobile payment systems in the future.

Trust in mobile payments scale:

The next scale is trust in mobile payments, in this scale there are questions based on statements about risk and trust perceptions for mobile payments assessed on a five-point Likert scale (1 = never, 5 = always). These questions are taken and adapted from Kim, Tao, Shin, and Kim (2010) and Zhang (2021). Risk and trust in mobile payments items (Q1, Q4, Q5, Q6, Q7, Q8 and Q9 in this part) are taken and adapted from Kim, Tao, Shin, and Kim (2010). Awareness of fraud and theft risks in mobile payment systems and being able to calculate pros and cons in mobile payment systems questions (Q2 and Q3 in this part) are taken and adapted from Zhang (2021).

Positive factors for mobile payment systems scale:

In positive factors for mobile payment systems scale, there are questions about the positive factors for mobile payment usage are presented to the participants in a five-point Likert scale format. To investigate the positive factors for mobile payment systems usage, the question related to the ability of paying from mobile payment systems anywhere and anytime is taken and adapted from Kim, Mirusmonov, and Lee (2010); the question relating to ease of use and convenience is taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers, Carr, Peck, and Carson (2001); Kim, Mirusmonov, and Lee (2010); Pal, Herath, De, and Rao (2021); Shaikh and Karjaluoto (2015); discounts and rewards are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Ke, Chung, Li, and Furgiuele (n.d.); de Kerviler, Demoulin, and Zidda (2016); Mimouni-Chaabane and Volle (2010); speed factor is taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers et al. (2001); Ke et al. (n.d.); social factor (usage of acquaintances) is taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Ke et al. (n.d.).

Negative factors for mobile payment systems scale:

In negative factors for mobile payment systems scale, there are questions about the negative factors for mobile payment usage presented on a five-point Likert scale format. Regarding negative factors for mobile payment usage, the question related to risk is taken and adapted from Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal, Herath, De, and Rao (2021); the question related to hardships with

the use of technology is taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); not finding systems convenient (difficult to understand/too time-consuming) is taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); absence of face-to-face contact in case of problems is taken and adapted from Kim, Tao, Shin, and Kim (2010); the question related to cases of stolen personal and financial information is taken and adapted from Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal, Herath, De, and Rao (2021); the question related to risks of fraud and theft is taken and adapted from Featherman and Pavlou (2003); Pal et al. (2021); Zhang (2021).

Second part of the study: Digital nudging:

In the second part of the study, there are four questions that use digital nudging methods which are all taken and adapted from the study by Mallas, Xenos, and Karavasili (2021). Mallas et al. (2021) evaluated the effects of different digital nudging techniques in their study related to stress and anxiety. In this part, participants are given different information and cases about mobile payment systems and they are requested to rate their trust in mobile payments and indicate their preference for using mobile payments in these cases. The cases of using different informative data, using a text that contains a case related to mobile payments, the structure and priority of answers on perception of mobile payments and digital wallets are investigated in these questions.

In the first version in the second part, the first question examines whether different informative data affect trust in mobile payments. The data are presented in a positive way in the first question. The data of an unpublished study in 2021 (Evcil,

2021), in Turkey were shown to the participants. In this unpublished study, the participants were requested to score their trust in mobile payments. According to the results, 94% of respondents stated that they trust mobile payments on average and more than average. We also showed a pie chart to the participants showing 94% of people trusting (colored in green) and 6% of people not trusting (colored in red) the mobile payments and a table showing the trust scores from 1 to 5 and the number of people selecting each option. Then, we asked participants to rate their trust in mobile payments on a five-point Likert scale. In the second version, in the same question data are presented without a comment in a table and a pie chart, showing trust scores from one to five and the number of people selecting each option. Then, we asked participants to rate their trust in mobile payments on a five-point Likert scale. The nudging technique is taken and adapted from Mallas et al. (2021) and the trust in mobile payments question is taken and adapted from the unpublished study by CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020).

In the first version of the second part, in the second question the effect of giving positive informative data on the perception for digital wallets is investigated. The second question gives respondents an informative text about the expected increase in digital wallet usage in mobile payment systems (Boku Inc., 2021). In this question, participants are asked to select their perceptions for digital wallet usage on a five-point Likert scale from very negative to very positive. In the second version, the same question is asked to participants but this time there is no informative text given to participants before the question. The participants are only requested to choose their perception for digital wallet usage. The nudging method is taken and adapted from Mallas et al. (2021) and the digital wallet perception question is taken

and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020).

In the first version of the second part, the third question gives a fictional case about mobile payments. In this question, the effect of giving a case on mobile payment usage will be evaluated. This case is about an e-commerce mobile application used by many people in which you get discounts and incentives for using this application. However, this company faces cyber-attack and personal information of people excluding their card information is leaked to the Internet by these attackers. The case states that many people continue to use this application due to discounts, rewards and service quality (speed, customer experience etc.). After the case, there is a sentence that states "I will keep using this application." and the participants are asked to choose the best option on a five-point Likert scale from never to always. In the second version, in the case there is no information about discounts, rewards, service quality and speed. The case just states the cyber-attack and leakage of personal information excluding card information to the Internet. Below the case, there is the same sentence that states "I will keep using this application." with the five-point Likert scale from never to always. The nudging method is taken and adapted from Mallas et al. (2021), and the positive factors in the case discounts, rewards, speed and social proof (the information that many people are still using the application) are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers, Carr, Peck, and Carson (2001); de Kerviler, Demoulin, and Zidda (2016); Mimouni-Chaabane and Volle (2010) studies; and Ke et al. (n.d.) report. The case of stolen information is taken and adapted from Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); and Pal et al. (2021).

In the first version of the second part, the case of the structure (having more positive and more negative answers) and the priority of answers are evaluated with the fourth question. This question presents a fictional case to the participants. In this case, there is a mobile application in which you pay from a digital wallet in the mobile application for your purchases related to groceries, electronics, clothing and meals. You can make your payments wherever you are, easily and quickly; with your transactions, you can gain incentives, discounts in specific products and free shipping. When you use the digital wallet, you need to register with your name and give your data of credit card. However, the service providers of this mobile application do not make any necessary security updates. The participants are asked if they would continue shopping from this mobile application. In the first version, there are four answers where the participants need to select one of the options that suits them best. There are two positive, one neutral and one negative answers in this order. In the second version, the case is the same as in the first version; in the second version there are two negative, one neutral and one positive answers in this order. The effects of having more positive and more negative options in the answers and the order of answers are evaluated with this question. The nudging methods in the fourth question are taken and adapted from Mallas et al. (2021), convenience factors are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers, Carr, Peck, and Carson (2001); Kim, Mirusmonov, and Lee (2010); Pal, Herath, De, and Rao (2021), discounts and incentives are adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); de Kerviler, Demoulin, and Zidda (2016); Mimouni-Chaabane and Volle (2010) studies; and Ke et al. (n.d.) report. Security factors are taken and adapted from Featherman and Pavlou (2003);

Kim, Tao, Shin, and Kim (2010); Lim, Kim, Hur, and Park (2018); and Pal et al. (2021), and the security update part is taken and adapted from Lim et al. (2018); Pal et al. (2021).

3.3 Hypotheses

Hypotheses are generated according to the findings from the literature review.

H1: Mobile payment systems usage and risk perception are related.

H2: A relationship exists between risk perception and trust in mobile payments.

H3: A relationship exists between risk perception and positive factors for mobile payment systems.

H4: A relationship exists between negative factors for mobile payment systems and risk perception.

H5: Mobile payment systems usage and trust in mobile payments are related.

H6: Mobile payment systems usage and positive factors for mobile payment systems are related.

H7: Mobile payment systems usage and negative factors for mobile payment systems are related.

H8: There is a relationship between trust in mobile payments and positive factors for mobile payment systems.

H9: There is a relationship between trust in mobile payments and negative factors for mobile payment systems.

H10: Trust in mobile payments differs according to different informative data in the question.

H11: Mobile payment systems usage differs according to positive informative data in the question.

H12: Trust in mobile payments and mobile payment systems usage differ according to a text containing a case about mobile payment systems in the question.
H13: Mobile payment systems usage differs according to the structure and the priority of answers in the question.

3.4 Population and sampling

The target population of the research is university students aged 18 to 24 in Turkey. The total number of young people in age group 15-24 was 12,893,750 in Turkey (Türkiye İstatistik Kurumu, 2021). In 2020-2021 academic year, the total number of university students is 8,240,997 (Yükseköğretim Bilgi Yönetim Sistemi, n.d.). The required sample size is calculated according to the formula by Wolf, Harrington, Clark, and Miller (2013). The required sample size is approximately 200 people. Data were collected through an online survey with each student filling out one type of the surveys. The convenience sampling method was used for this study. Participants were assumed to be of a specific level of digital and financial literacy and we investigated if they responded differently to digital nudging methods regarding mobile payment systems.

3.5 Limitations of the study

It is impossible to conduct the research with the research population, when the limitations of time and place are considered, these situations constitute the limitations of the study.

3.6 Data analysis

For statistical analyses Statistical Package for the Social Sciences (SPSS) 24.0 program was used. When the data of the studies were evaluated alongside with the descriptive statistical techniques, the suitability of quantitative data to normal distribution was tested with skewness and kurtosis values. For comparing two groups with normal distribution Independent Sample T Test was used while for three and more groups which do not show normal distribution Kruskal Wallis Test was used. Pearson Correlation Test was used for determining the relationship between the scales. Significance was evaluated on $p < 0.01$ and $p < 0.05$ levels.

CHAPTER 4

RESULTS

In this part, demographic profile of respondents, the scales and the results of the hypotheses of the two surveys are presented. Two surveys are distributed to the different participants, the participants filled out only one type of the survey. Questions in the first part are the same for both surveys, in the second part the questions differ in each survey.

4.1 Demographic profile of respondents

Data were collected from 241 university students over 18 years of age through an online survey with each student filling out one type of the surveys. The first version of the survey was filled out by 126 students, while the second version of the survey was filled out by 115 students. Nearly half of the participants were male (n = 117) and nearly half of them were female (n = 124). The participants were undergraduate students and between the ages of 18 to 24.

4.2 First survey

4.2.1 Scales of the first survey

Risk perception scale:

The items in the risk perception scale are taken and adapted from Fogel and Nehmad (2009); Pan and Zinkhan (2006); Zhang (2021). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in

Table 1 for risk perception scale. Calculated KMO is 0.777 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 1. Results of KMO and Bartlett's Test for Risk Perception Scale in Study 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.777
	Chi-Square	153.833
	Df	6
	Sig.	< 0.001

The items in the scale in Table 2 are taken and adapted from Fogel and Nehmad (2009); Pan and Zinkhan (2006); Zhang (2021). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 2. According to the analysis, explained variance ratio of this factor is measured as 56.918. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair, Black, Babin, & Anderson, 2019).

In Table 3, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Mobile payment systems usage scale:

The items in the mobile payment systems usage scale are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Kim, Tao, Shin, and Kim (2010). The evaluation of Kaiser-Meyer

Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 4 for mobile payment systems usage scale. Calculated KMO is 0.785 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study for the related scale.

Table 2. Results of Exploratory Factor Analysis for Risk Perception Scale in Study 1

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Risk Perception Scale			
In daily life, I am inclined to take risks.	0.870		
In situations where I may get high returns, I am inclined to take high risks.	0.877	2.227	56.918
Before I take risks in a specific topic, I can calculate its pros and cons.	0.796		
After I calculate returns, I take risks if it is logical.	0.770		

Table 3. Results of Cronbach's Alpha for Risk Perception Scale in Study 1

	Cronbach's Alpha
Risk Perception Scale	0.729

Table 4. Results of KMO and Bartlett's Test for Mobile Payment Systems Usage Scale in Study 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.785
	Chi-Square	267.088
	Df	6
	Sig.	< 0.001

The items in the scale in Table 5 are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Kim, Tao, Shin, and Kim (2010). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 5. According to the analysis, explained variance ratio of this factor is measured as 65.651. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

In Table 6, Cronbach's Alpha findings regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Trust in mobile payments:

The items in trust in mobile payments scale are taken and adapted from Kim, Tao, Shin, and Kim (2010); Zhang (2021). The measurement of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 7 for trust in mobile payments scale. Calculated KMO is 0.727 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 5. Results of Exploratory Factor Analysis for Mobile Payment Systems Usage in Study 1

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Mobile Payment Systems Usage Scale			
I regularly utilize mobile payment systems.	0.920		
I will continue to regularly utilize mobile payment systems in the future.	0.931	2.626	65.651
In future, I expect mobile payment usage to increase more.	0.759		
I regularly use digital wallet applications.	0.7992		

Table 6. Results of Cronbach's Alpha for Mobile Payment Systems Usage Scale in Study 1

	Cronbach's Alpha
Mobile Payment Systems Usage Scale	0.806

Table 7. Results of KMO and Bartlett's Test for Trust in Mobile Payments Scale in Study 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.727
	Chi-Square	349.662
	Df	36
	Sig.	< 0.001

The items in the scale in Table 8 are taken and adapted from Kim, Tao, Shin, and Kim (2010); Zhang (2021). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 8. According to the analysis, explained variance ratio of this factor is measured as 57.738. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

In Table 9, Cronbach's Alpha findings regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Positive factors for mobile payment systems scale:

The items in this scale are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers, Carr, Peck, and Carson (2001); Ke, Chung, Li, and Furgiuele (n.d.); de Kerviler, Demoulin, and Zidda (2016); Kim, Mirusmonov, and Lee (2010); Mimouni-Chaabane and Volle (2010); Pal, Herath, De, and Rao (2021); Shaikh and Karjaluoto (2015). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 10 for positive factors for mobile payment systems scale. Calculated KMO is 0.758 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 8. Results of Exploratory Factor Analysis for Trust in Mobile Payments Scale in Study 1

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Trust in Mobile Payments Scale			
I find mobile payment systems secure.	0.756		
I am aware of fraud and theft risks when I am using mobile payment systems.	0.556		
I can calculate pros and cons before I am using mobile payment systems.	0.580		
I believe that the information I provide for mobile payment systems are helpful for secure payments.	0.721		
I am not worried about my personal data to be stolen in mobile payments systems.	0.568	3.396	57.738
I trust security mechanisms of the mobile payment system I use.	0.717		
Personal information that I provide in mobile payments systems have not been stolen due to mobile payment usage.	0.552		
I have not encountered any temporary or permanent technical problems when I use mobile payments.	0.565		
I have enough information sources or contacts in case of questions or problems related to mobile payment usage.	0.692		

Table 9. Results of Cronbach's Alpha for Trust in Mobile Payments Scale in Study 1

	Cronbach's Alpha
Trust in Mobile Payments	0.806

The items in the scale in Table 11 are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers et al. (2001); Ke et al. (n.d.); de Kerviler et al. (2016); Kim, Mirusmonov, and Lee (2010); Mimouni-Chaabane and Volle (2010); Pal et al.

(2021); Shaikh and Karjaluoto (2015). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 11. According to the analysis, explained variance ratio of this factor is measured as 58.429. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

Table 10. Results of KMO and Bartlett's Test for Positive Factors for Mobile Payment Systems in Study 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.758
	Chi-Square	380.042
	Df	10
	Sig.	< 0.001

Table 11. Results of Exploratory Factor Analysis for Positive Factors for Mobile Payment Systems in Study 1

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Positive Factors for Mobile Payment Systems Scale			
The ability of using mobile payment systems anywhere and anytime is an important factor for my mobile payment usage.	0.818		
The convenience and easiness of usage are important factors for my mobile payment usage.	0.873		
Discounts and rewards in mobile payment systems are significant determinants for my usage.	0.789	2.921	58.429
Using mobile payment systems allows me to complete my transactions faster and save time.	0.832		
The mobile payment usage of my acquaintances is an important factor for my mobile payment usage.	0.768		

In Table 12, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Table 12. Results of Cronbach's Alpha for Positive Factors for Mobile Payment Systems in Study 1

	Cronbach's Alpha
Positive Factors for Mobile Payment Systems	0.776

Negative factors for mobile payment systems scale:

The items in the negative factors for mobile payments systems scale are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal, Herath, De, and Rao (2021); Zhang (2021). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 13 for negative factors for mobile payment systems scale. Calculated KMO is 0.753 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 13. Results of KMO and Bartlett's Test for Negative Factors for Mobile Payment Systems in Study 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.753
	Chi-Square	382.626
	Df	15
	Sig.	< 0.001

The items in the scale in Table 14 are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal et al. (2021); Zhang (2021). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 14. According to the analysis, explained variance ratio of this factor is measured as 55.924. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

Table 14. Results of Exploratory Factor Analysis for Negative Factors for Mobile Payment Systems in Study 1

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Negative Factors for Mobile Payment Systems Scale			
Mobile payments are risky, so I use these systems less.	0.803		
Having hardships with the use of technology makes me use mobile payments less.	0.704		
I do not find mobile payment systems convenient (difficult to understand/too time-consuming), so I use mobile payment systems less.	0.770		
Absence of face-to-face contact when I have problems related to mobile payments makes me use mobile payments less.	0.735	3.355	55.924
There are cases about stolen personal and financial information in various mobile payment systems, so I am using these systems less.	0.753		
Risks of fraud and theft in mobile payments make me use mobile payments less.	0.718		

In Table 15, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Table 15. Results of Cronbach's Alpha for Negative Factors for Mobile Payment Systems in Study 1

	Cronbach's Alpha
Negative Factors for Mobile Payment Systems	0.841

4.2.2 Analysis of the first survey

H1: Mobile payment systems usage and risk perception are related.

Table 16 presents a positive and statistically significant ($p = 0.001 < 0.01$) relationship between risk perception and mobile payment systems usage. Measured correlation coefficient ($r = 0.480$) shows that risk perception and mobile payment systems usage are related. As a consequence, risk perception increases as mobile payment systems usage increases. Hypothesis is accepted.

Table 16. Pearson Correlation for H1 in the First Survey

	Risk Perception	
	r	**p**
Mobile Payment Systems Usage	0.480	0.001**

r = Pearson Correlation **p < 0.01

H2: A relationship exists between risk perception and trust in mobile payments.

Table 17 demonstrates that a positive and statistically significant ($p = 0.001 < 0.01$) relationship is found between risk perception and trust in mobile payments. Measured correlation coefficient ($r = 0.435$) shows that risk perception and trust in

mobile payments are related. As a result of this, risk perception increases as trust in mobile payments increases. Hypothesis is accepted.

H3: A relationship exists between risk perception and positive factors for mobile payment systems.

Table 18 exhibits a positive and statistically significant ($p = 0.001 < 0.01$) relationship between risk perception and positive factors for mobile payment systems. Measured correlation coefficient ($r = 0.409$) shows that there is a relationship between them. Consequently, we may say that risk perception increases as positive factors for mobile payment systems increase. Hypothesis is accepted.

Table 17. Pearson Correlation for H2 in the First Survey

	Risk Perception	
	r	**p**
Trust in Mobile Payments	0.435	0.001**

r = Pearson Correlation **p < 0.01

Table 18. Pearson Correlation for H3 in the First Survey

	Risk Perception	
	r	**p**
Positive Factors for Mobile Payment Systems	0.409	0.001**

r = Pearson Correlation **p < 0.01

H4: A relationship exists between negative factors for mobile payment systems and risk perception.

Table 19 shows that there exists no statistically significant relationship between risk perception and negative factors for mobile payment systems ($p > 0.05$). Hypothesis is rejected.

Table 19. Pearson Correlation for H4 in the First Survey

	Risk Perception	
	r	**p**
Negative Factors for Mobile Payment Systems	-0.098	0.275

r = Pearson Correlation

H5: Mobile payment systems usage and trust in mobile payments are related.

Table 20 presents a positive and statistically significant ($p = 0.001 < 0.01$) relationship between mobile payment systems usage and trust in mobile payments. Measured correlation coefficient ($r = 0.623$) shows that there is a relationship between mobile payment systems usage and trust in mobile payments. As a result of this, mobile payment systems usage increases as trust in mobile payments increases. Hypothesis is accepted.

H6: Mobile payment systems usage and positive factors for mobile payment systems are related.

Table 21 exhibits that a positive and statistically significant ($p = 0.001 < 0.01$) relationship is found between mobile payment systems usage and positive factors for mobile payment systems. Measured correlation coefficient ($r = 0.560$) shows that there is a relationship between positive factors for mobile payment systems and mobile payment systems usage. As a consequence, mobile payment

systems usage increases as positive factors for mobile payment systems increase. Hypothesis is accepted.

Table 20. Pearson Correlation for H5 in the First Survey

	Mobile Payment Systems Usage	
	r	**p**
Trust in Mobile Payments	0.623	0.001**

r = Pearson Correlation **p < 0.01

Table 21. Pearson Correlation for H6 in the First Survey

	Mobile Payment Systems Usage	
	r	**p**
Positive Factors for Mobile Payment Systems	0.560	0.001**

r = Pearson Correlation **p < 0.01

H7: Mobile payment systems usage and negative factors for mobile payment systems are related.

Table 22 reveals that a negative and statistically significant ($p = 0.001 < 0.01$) relationship exists between mobile payment systems usage and negative factors for mobile payment systems. Measured correlation coefficient ($r = -0.246$) shows that there is a relationship between negative factors for mobile payment systems and mobile payment systems usage. With respect to this, mobile payment systems usage decreases as negative factors for mobile payment systems increase. Hypothesis is accepted.

Table 22. Pearson Correlation for H7 in the First Survey

	Mobile Payment Systems Usage	
	r	**p**
Negative Factors for Mobile Payment Systems	-0.246	0.001**

r = Pearson Correlation **p < 0.01

H8: There is a relationship between trust in mobile payments and positive factors for mobile payment systems.

Table 23 reveals a positive and statistically significant ($p = 0.001 < 0.01$) relationship between trust in mobile payments and positive factors for mobile payment systems. Measured correlation coefficient ($r = 0.554$) shows that a relationship is found between trust in mobile payments and positive factors for mobile payment systems. As a result of this, trust in mobile payments increases as positive factors for mobile payment systems increase. Hypothesis is accepted.

Table 23. Pearson Correlation for H8 in the First Survey

	Trust in Mobile Payments	
	r	**p**
Positive Factors for Mobile Payment Systems	0.554	0.001**

r = Pearson Correlation **p < 0.01

H9: There is a relationship between trust in mobile payments and negative factors for mobile payment systems.

According to Table 24, no statistically significant relationship exists between trust in mobile payments and negative factors for mobile payment systems ($p > 0.05$). Hypothesis is rejected.

Table 24. Pearson Correlation for H9 in the First Survey

	Trust in Mobile Payments	
	r	**p**
Negative Factors for Mobile Payment Systems	-0.129	0.169

r = Pearson Correlation

H10: Trust in mobile payments differs according to different informative data in the question.

In Table 25, numbers above show the trust scores that people gave. Score 1 was given very rare, so scores 1 and 2 were combined as score 2. Table 25 shows that according to the answers given to the first nudge question, a statistically significant difference is found for trust in mobile payments ($p < 0.01$). The scale attitudes of people that gave high trust scores are higher. Hypothesis is accepted.

H11: Mobile payment systems usage differs according to positive informative data in the question.

Score 1 was given very rare, so scores 1 and 2 were combined as score 2. Table 26 shows that according to the answers given to the second question, a statistically significant difference is found for mobile payment systems usage ($p < 0.01$). The scale attitudes of those whose perceptions are positive are higher. Hypothesis is accepted.

Table 25. Kruskal Wallis Test for H10 in the First Survey

	Nudge Question 1				
	2	3	4	5	
	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	[a]p
Trust in Mobile Payments	2.79 ± 0.7 (3)	3.2 ± 0.66 (3.22)	3.71 ± 0.44 (3.78)	3.94 ± 0.42 (4)	0.001**

[a]Kruskal Wallis Test **p < 0.01.

Table 26. Kruskal Wallis Test for H11 in the First Survey

	Nudge Question 2				
	2	3	4	5	
	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	[a]p
Mobile Payment Systems Usage	3.47 ± 1.03 (3.6)	3.49 ± 0.61 (3.5)	4.04 ± 0.44 (4)	4.4 ± 0.43 (4.4)	0.001**

[a]Kruskal Wallis Test **p < 0.01.

H12: Trust in mobile payments and mobile payment systems usage differ according to a text containing a case about mobile payment systems in the question.

Table 27 shows that according to the answers given to the third question, a statistically significant difference is found for mobile payment systems usage and trust in mobile payments ($p < 0.01$). The scale attitudes of people that would continue using the service according to the case is higher. Hypothesis is accepted.

Table 27. Kruskal Wallis Test for H12 in the First Survey

	Nudge Question 3					
	1	2	3	4	5	
	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	[a]p
Mobile Payment Systems Usage	3.88 ± 0.81 (3.8)	4.05 ± 0.46 (3.9)	3.54 ± 0.72 (3.5)	4.2 ± 0.36 (4.2)	4.08 ± 0.45 (4.2)	0.001**
Trust in Mobile Payments	3.47 ± 0.84 (3.67)	3.66 ± 0.61 (3.83)	3.21 ± 0.53 (3.22)	3.78 ± 0.42 (3.78)	3.94 ± 0.39 (4)	0.001**

[a]Kruskal Wallis Test **p < 0.01.

H13: Mobile payment systems usage differs according to the structure and the priority of answers in the question.

In Table 28, “No” shows people who would not use the application and “Yes” shows people who would use the application. Table 28 shows that according to the answers given to the fourth question, a statistically significant difference is found for mobile payment systems usage ($p < 0.01$). The scale attitudes of people that would use the application according to the given options are higher. Hypothesis is accepted.

The full list of the results of the hypotheses of the first survey are demonstrated in Table 29. Eleven out of thirteen hypotheses are accepted as reported in the results of the first study.

Table 28. Independent Sample T Test for H13 in the First Survey

	Nudge Question 4		
	No	Yes	
	Mean ± Sd (Median)	Mean ± Sd (Median)	[b]p
Mobile Payment Systems Usage	3.89 ± 0.67 (3.9)	4.01 ± 0.56 (4)	0.001**

[b]Independent Sample T Test **p < 0.01.

4.3 Second survey

4.3.1 Scales of the second survey

Risk perception scale:

The items in the risk perception scale are taken and adapted from Fogel and Nehmad (2009); Pan and Zinkhan (2006); Zhang (2021). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 30 for risk perception scale. Calculated KMO is 0.724 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

The items in the scale in Table 31 are taken and adapted from Fogel and Nehmad (2009); Pan and Zinkhan (2006); Zhang (2021). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 31. According to the analysis, explained variance ratio of this factor is measured as 50.801. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

Table 29. The Results of the Hypotheses in the First Survey

Hypothesis	Result
H1: Mobile payment systems usage and risk perception are related.	Accepted
H2: A relationship exists between risk perception and trust in mobile payments.	Accepted
H3: A relationship exists between risk perception and positive factors for mobile payment systems.	Accepted
H4: A relationship exists between negative factors for mobile payment systems and risk perception.	Rejected
H5: Mobile payment systems usage and trust in mobile payments are related.	Accepted
H6: Mobile payment systems usage and positive factors for mobile payment systems are related.	Accepted
H7: Mobile payment systems usage and negative factors for mobile payment systems are related.	Accepted
H8: There is a relationship between trust in mobile payments and positive factors for mobile payment systems.	Accepted
H9: There is a relationship between trust in mobile payments and negative factors for mobile payment systems.	Rejected
H10: Trust in mobile payments differs according to different informative data in the question.	Accepted
H11: Mobile payment systems usage differs according to positive informative data in the question.	Accepted
H12: Trust in mobile payments and mobile payment systems usage differ according to a text containing a case about mobile payment systems in the question.	Accepted
H13: Mobile payment systems usage differs according to the structure and the priority of answers in the question.	Accepted

In Table 32, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Table 30. Results of KMO and Bartlett's Test for Risk Perception Scale in Study 2

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.724
	Chi-Square	105.602
	Df	6
	Sig.	< 0.001

Table 31. Results of Exploratory Factor Analysis for Risk Perception Scale in Study 2

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Risk Perception Scale			
In daily life, I am inclined to take risks.	0.721		
In situations where I may get high returns, I am inclined to take high risks.	0.821	2.032	50.801
Before I take risks in a specific topic, I can calculate its pros and cons.	0.500		
After I calculate returns, I take risks if it is logical.	0.823		

Table 32. Results of Cronbach's Alpha for Risk Perception Scale in Study 2

	Cronbach's Alpha
Risk Perception Scale	0.757

Mobile payment systems usage scale:

The items in the mobile payment systems usage scale are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Kim, Tao, Shin, and Kim (2010). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in

Table 33 for mobile payment systems usage scale. Calculated KMO is 0.732 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 33. Results of KMO and Bartlett's Test Results for Mobile Payment Systems Usage Scale in Study 2

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.732
	Chi-Square	307.329
	Df	6
	Sig.	< 0.001

The items in the scale in Table 34 are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Kim, Tao, Shin, and Kim (2010). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 34. According to the analysis, explained variance ratio of this factor is measured as 70.414. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

In Table 35, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Trust in mobile payments:

The items in the trust in mobile payments scale are taken and adapted from Kim, Tao, Shin, and Kim (2010); Zhang (2021). The evaluation of Kaiser-Meyer Olkin

Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 36 for trust in mobile payments scale. Calculated KMO is 0.837 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 34. Results of Exploratory Factor Analysis for Mobile Payment Systems Usage Scale in Study 2

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Mobile Payment Systems Usage Scale			
I regularly utilize mobile payment systems.	0.917		
I will continue to regularly utilize mobile payment systems in the future.	0.956	2.817	70.414
In future, I expect mobile payment usage to increase more.	0.870		
I regularly use digital wallet applications.	0.553		

Table 35. Results of Cronbach's Alpha for Mobile Payment Systems Usage Scale for Study 2

	Cronbach's Alpha
Mobile Payment Systems Usage Scale	0.807

The items in the scale in Table 37 are taken and adapted from Kim, Tao, Shin, and Kim (2010); Zhang (2021). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 37. According to the analysis, explained variance ratio of this factor is measured as

51.967. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

Table 36. Results of KMO and Bartlett's Test for Trust in Mobile Payments Scale in Study 2

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.837
	Chi-Square	305.581
	Df	36
	Sig.	< 0.001

In Table 38, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Positive factors for mobile payment systems scale:

The items in the positive factors for mobile payment systems scale are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers, Carr, Peck, and Carson (2001); Ke, Chung, Li, and Furgiuele (n.d.); de Kerviler, Demoulin, and Zidda (2016); Kim, Mirusmonov, and Lee (2010); Mimouni-Chaabane and Volle (2010); Pal, Herath, De, and Rao (2021); Shaikh and Karjaluoto (2015). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 39 for positive factors for mobile payment systems scale. Calculated KMO is 0.813 for this factor. KMO value needs to be larger than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 37. Results for Exploratory Factor Analysis for Trust in Mobile Payments in Systems in Study 2

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Trust in Mobile Payments Scale			
I find mobile payment systems secure.	0.671		
I am aware of fraud and theft risks when I am using mobile payment systems.	0.539		
I can calculate pros and cons before I am using mobile payment systems.	0.612		
I believe that the information I provide for mobile payment systems are helpful for secure payments.	0.653		
I am not worried about my personal data to be stolen in mobile payments systems.	0.576	3.77	51.967
I trust security mechanisms of the mobile payment system I use.	0.778		
Personal information that I provide in mobile payments systems have not been stolen due to mobile payment usage.	0.699		
I have not encountered any temporary or permanent technical problems when I use mobile payments.	0.565		
I have enough information sources or contacts in case of questions or problems related to mobile payment usage.	0.701		

Table 38. Results of Cronbach's Alpha for Trust in Mobile Payments Scale in Study 2

	Cronbach's Alpha
Trust in Mobile Payments Scale	0.814

The items in the scale in Table 40 are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers et al. (2001); Ke et al. (n.d.); de Kerviler et al. (2016); Kim, Mirusmonov, and Lee (2010); Mimouni-Chaabane and Volle (2010); Pal et al.

(2021); Shaikh and Karjaluoto (2015). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 40. According to the analysis, explained variance ratio of this factor is measured as 64.336. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

Table 39. Results of KMO and Bartlett's Test for Positive Factors for Mobile Payment Systems Scale in Study 2

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.813
	Chi-Square	313.123
	Df	10
	Sig.	< 0.001

Table 40. Results of Exploratory Factor Analysis for Positive Factors for Mobile Payment Systems in Study 2

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Positive Factors for Mobile Payment Systems Scale			
The ability of using mobile payment systems anywhere and anytime is an important factor for my mobile payment usage.	0.900		
The convenience and easiness of usage are important factors for my mobile payment usage.	0.899		
Discounts and rewards in mobile payment systems are significant determinants for my usage.	0.801	3.217	64.336
Using mobile payment systems allows me to complete my transactions faster and save time.	0.820		
The mobile payment usage of my acquaintances is an important factor for my mobile payment usage.	0.631		

In Table 41, the results of Cronbach Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Table 41. Results of Cronbach's Alpha for Positive Factors for Mobile Payment Systems Scale in Study 2

	Cronbach's Alpha
Positive Factors for Mobile Payment Systems Scale	0.844

Negative factors for mobile payment systems scale:

The items in the negative factors for mobile payment systems scale are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal, Herath, De, and Rao (2021); Zhang (2021). The evaluation of Kaiser-Meyer Olkin Measure of Sampling Adequacy and Bartlett Sphericity Test is presented in Table 42 for negative factors for mobile payment systems scale. Calculated KMO is 0.835 for this factor. KMO value needs to be higher than 0.5 to be used for factor analysis (Kurnoga Živadinović, 2004). This value is accepted as a proper value for our study.

Table 42. Results of KMO and Bartlett's Test for Negative Factors for Mobile Payment Systems Scale in Study 2

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.835
	Chi-Square	482.546
	Df	15
	Sig.	< 0.001

The items in the scale in Table 43 are taken and adapted from CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal et al. (2021); Zhang (2021). The items in the scale were developed in one factor as a result of the exploratory factor analysis. Each item's factor loading, the eigenvalue and the explained variance ratio of factors are presented in Table 43. According to the analysis, explained variance ratio of this factor is measured as 69.737. As expected, explained variance ratio in social sciences in exploratory factor analysis should be more than 50% (Hair et al., 2019).

Table 43. Results of Exploratory Factor Analysis for Negative Factors for Mobile Payment Systems Scale in Study 2

Factors/Items	Factor Loading	Eigen value	Explained Variance (%)
Negative Factors for Mobile Payment Systems Scale			
Mobile payments are risky, so I use these systems less.	0.825		
Having hardships with the use of technology makes me use mobile payments less.	0.776		
I do not find mobile payment systems convenient (difficult to understand/too time-consuming), so I use mobile payment systems less.	0.847		
Absence of face-to-face contact when I have problems related to mobile payments makes me use mobile payments less.	0.830	4.184	69.737
There are cases about stolen personal and financial information in various mobile payment systems, so I am using these systems less.	0.878		
Risks of fraud and theft in mobile payments make me use mobile payments less.	0.852		

In Table 44, the results of Cronbach's Alpha regarding the study are demonstrated, alpha is between 0.7 and 0.99 for the scale. These results exhibit that internal consistency is appropriate and can be accepted (Tavakol & Dennick, 2011).

Table 44. Results of Cronbach's Alpha for Negative Factors for Mobile Payment Systems Scale in Study 2

	Cronbach's Alpha
Negative Factors for Mobile Payment Systems Scale	0.912

4.3.2 Analysis of the second survey

H1: Mobile payment systems usage and risk perception are related.

Table 45 presents a positive and statistically significant ($p = 0.001 < 0.01$) relationship between risk perception and mobile payment systems usage. Measured correlation coefficient ($r = 0.421$) shows that a relationship between mobile payment systems usage and risk perception was found. Subsequently, risk perception increases as mobile payment systems usage increases. Hypothesis is accepted.

Table 45. Pearson Correlation for H1 in the Second Survey

	Risk Perception	
	r	p
Mobile Payment Systems Usage	0.421	0.001**

r = Pearson Correlation **p < 0.01

H2: A relationship exists between risk perception and trust in mobile payments.

Table 46 reveals a positive and statistically significant ($p = 0.001 < 0.01$) relationship between trust in mobile payments and risk perception. Measured correlation coefficient ($r = 0.405$) shows that a relationship was found between trust

in mobile payments and risk perception. As a result of this, risk perception increases as trust in mobile payments increases. Hypothesis is accepted.

Table 46. Pearson Correlation for H2 in the Second Survey

	Risk Perception	
	r	p
Trust in Mobile Payments	0.405	0.001**

r = Pearson Correlation **p < 0.01

H3: A relationship exists between risk perception and positive factors for mobile payment systems.

Table 47 demonstrates that a positive and statistically significant ($p = 0.001 < 0.01$) relationship exists between risk perception and positive factors for mobile payment systems. Measured correlation coefficient ($r = 0.284$) shows a relationship was found between positive factors for mobile payment systems and risk perception. As a consequence, risk perception increases as positive factors for mobile payment systems increase. Hypothesis is accepted.

Table 47. Pearson Correlation for H3 in the Second Survey

	Risk Perception	
	r	p
Positive Factors for Mobile Payment Systems	0.284	0.001**

r = Pearson Correlation **p < 0.01

H4: A relationship exists between negative factors for mobile payment systems and risk perception.

Table 48 shows that no statistically significant relationship was found between negative factors for mobile payment systems and risk perception ($p > 0.05$). Hypothesis is rejected.

Table 48. Pearson Correlation for H4 in the Second Survey

	Risk Perception	
	r	p
Negative Factors for Mobile Payment Systems	-0.039	0.676

r = Pearson Correlation

H5: Mobile payment systems usage and trust in mobile payments are related.

Table 49 exhibits that a positive and statistically significant ($p = 0.001 < 0.01$) relationship was found between mobile payment systems usage and trust in mobile payments. Measured correlation coefficient ($r = 0.583$) shows that there is a relationship between mobile payment systems usage and trust in mobile payments. As a result of this, mobile payment systems usage increases as trust in mobile payments increases. Hypothesis is accepted.

Table 49. Pearson Correlation for H5 in the Second Survey

	Mobile Payment Systems Usage	
	r	p
Trust in Mobile Payments	0.583	0.001**

r = Pearson Correlation **p < 0.01

H6: Mobile payment systems usage and positive factors for mobile payment systems are related.

Table 50 demonstrates a positive and statistically significant ($p = 0.001 < 0.01$) relationship between mobile payment systems usage and positive factors for mobile payment systems. Measured correlation coefficient ($r = 0.552$) shows that there exists a relationship between mobile payment systems usage and positive factors for mobile payment systems. Consequently, mobile payment usage increases as positive factors for mobile payment systems increase. Hypothesis is accepted.

H7: Mobile payment systems usage and negative factors for mobile payment systems are related.

Table 51 shows that no statistically significant relationship was found between mobile payment systems usage and negative factors for mobile payment systems ($p > 0.05$). Hypothesis is rejected.

Table 50. Pearson Correlation for H6 in the Second Survey

	Mobile Payment Systems Usage	
	r	p
Positive Factors for Mobile Payment Systems	0.552	0.001**

r = Pearson Correlation **p < 0.01

Table 51. Pearson Correlation for H7 in the Second Survey

	Mobile Payment Systems Usage	
	r	p
Negative Factors for Mobile Payment Systems	-0.081	0.390

r = Pearson Correlation

H8: There is a relationship between trust in mobile payments and positive factors for mobile payment systems.

Table 52 reveals that a positive and statistically significant ($p = 0.001 < 0.01$) relationship was found between trust in mobile payments and positive factors for mobile payment systems. Measured correlation coefficient ($r = 0.453$) shows a relationship between trust in mobile payments and positive factors for mobile payment systems. As a result of this, trust in mobile payments increases as positive factors for mobile payment systems increase. Hypothesis is accepted.

H9: There is a relationship between trust in mobile payments and negative factors for mobile payment systems.

Table 53 exhibits that no statistically significant relationship was found between trust in mobile payments and negative factors for mobile payment systems ($p > 0.05$). Hypothesis is rejected.

Table 52. Pearson Correlation for H8 in the Second Survey

	Trust in Mobile Payments	
	r	p
Positive Factors for Mobile Payment Systems	0.453	0.001**

r = Pearson Correlation **p < 0.01

Table 53. Pearson Correlation for H9 in the Second Survey

	Trust in Mobile Payments	
	r	p
Negative Factors for Mobile Payment Systems	-0.112	0.232

r = Pearson Correlation

H10: Trust in mobile payments differs according to different informative data in the question.

In Table 54, numbers above show the trust scores that people gave. Score 1 was given very rare, so scores 1 and 2 were combined as score 2, also score 5 was given very rare so scores 4 and 5 were combined as score 4. Table 54 shows that according to the answers given to the first nudge question, a statistically significant difference was found for trust in mobile payments ($p < 0.01$). The scale attitudes of people that gave high trust scores are higher. Hypothesis is accepted.

Table 54. Kruskal Wallis Test for H10 in the Second Survey

	2	3	4	
	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	[a]p
Trust in Mobile Payments	2.92 ± 0.75 (2.94)	3.1 ± 0.6 (3)	3.64 ± 0.55 (3.67)	0.001**

[a]Kruskal Wallis Test **p < 0.01.

H11: Mobile payment systems usage differs according to positive informative data in the question.

In Table 55, score 1 was given very rare, so scores 1 and 2 were combined as score 2, also score 5 was given very rare so scores 4 and 5 were combined as score 4. Table 55 shows that according to the answers given to the second question, mobile payment systems usage does not show a statistically significant difference ($p > 0.01$). Hypothesis is rejected. There was no nudge in this question in the second survey.

Table 55. Kruskal Wallis Test for H11 in the Second Survey

	2	3	4	
	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	[a]p
Mobile Payment Systems Usage	3.28 ± 0.75 (3.5)	3.58 ± 0.86 (3.75)	4.38 ± 0.56 (4.25)	0.501

[a]Kruskal Wallis Test

H12: Trust in mobile payments and mobile payment systems usage differ according to a text containing a case about mobile payment systems in the question.

Score 5 was given very rare so scores 4 and 5 were combined as score 4 in Table 56. Table 56 shows that according to the answers given to the third question, a statistically significant difference was found for mobile payment systems usage and trust in mobile payments ($p < 0.01$). The scale attitudes of people that would continue using the service according to the case is higher. Hypothesis is accepted.

Table 56. Kruskal Wallis Test for H12 in the Second Survey

	1	2	3	4	
	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	Mean ± Sd (Median)	
Mobile Payment Systems Usage	3.96 ± 0.88 (4)	3.99 ± 0.91 (4)	3.84 ± 0.84 (4)	4.19 ± 0.73 (4.13)	0.001**
Trust in Mobile Payments	3.41 ± 0.73 (3.56)	3.08 ± 0.62 (3.11)	3.52 ± 0.61 (3.44)	3.72 ± 0.67 (3.61)	0.001**

[a]Kruskal Wallis Test **p < 0.01.

H13: Mobile payment systems usage differs according to the structure and the priority of answers in the question.

In Table 57, “No” shows people who would not use the application and “Yes” shows people who would use the application. Table 56 shows that according to the answers given to the fourth question, a statistically significant difference was found for mobile payment systems usage ($p < 0.05$). The scale attitudes of people that would use the application according to the given options are higher. Hypothesis is accepted.

Table 57. Independent Sample T Test for H13 in the Second Survey

	No	Yes	
	Mean ± Sd (Median)	Mean ± Sd (Median)	
Mobile Payment Systems Usage	3.91 ± 0.86 (4)	4.45 ± 0.42 (4.25)	0.043**
[b]Independent Sample T Test	**p < 0.05.		

Table 58 demonstrates the list of the hypothesis results of the second survey. Nine out of thirteen hypotheses are accepted according to the second survey test results.

Table 58. The Results of the Hypotheses in the Second Survey

Hypothesis	Result
H1: Mobile payment systems usage and risk perception are related.	Accepted
H2: A relationship exists between risk perception and trust in mobile payments.	Accepted
H3: A relationship exists between risk perception and positive factors for mobile payment systems.	Accepted
H4: A relationship exists between negative factors for mobile payment systems and risk perception.	Rejected
H5: Mobile payment systems usage and trust in mobile payments are related.	Accepted
H6: Mobile payment systems usage and positive factors for mobile payment systems are related.	Accepted
H7: Mobile payment systems usage and negative factors for mobile payment systems are related.	Rejected
H8: There is a relationship between trust in mobile payments and positive factors for mobile payment systems.	Accepted
H9: There is a relationship between trust in mobile payments and negative factors for mobile payment systems.	Rejected
H10: Trust in mobile payments differs according to different informative data in the question.	Accepted
H11: Mobile payment systems usage differs according to positive informative data in the question.	Rejected
H12: Trust in mobile payments and mobile payment systems usage differ according to a text containing a case about mobile payment systems in the question.	Accepted
H13: Mobile payment systems usage differs according to the structure and the priority of answers in the question.	Accepted

CHAPTER 5

DISCUSSION AND CONCLUSION

Recently, mobile payment systems usage has increased rapidly. While mobile payment systems provide ease and benefits to users; risk, trust and security in these systems are critical factors for the users (Bala, 2021; Mastercard, 2021; Saleem, 2017).

Firstly, this study aims to explore the relationships between risk perception, trust, mobile payment systems usage, positive and negative factors for mobile payment systems. Furthermore, with two different survey designs in the second part, different digital nudging techniques are applied in each survey to examine whether the mobile payment systems perception of university students in Turkey differs with different digital nudging techniques. In total, 241 university students between the ages of 18 to 24 participated to the study. They were divided into two groups and received two different surveys with each student filling out one type of survey. In the first part, the questions were the same for both groups and in the second part, they received different questions with different digital nudging techniques. Digital nudging techniques are used in a survey on mobile payment systems for Turkish university students in this study, to the best of our knowledge, which is one of the initial attempts to incorporate digital nudging methods in a survey format on mobile payment systems topic for the said group.

In the results of both studies, a significant positive relationship was found between risk perception and mobile payment systems usage. The risk tendencies of users rise as mobile payment systems usage also increases. These findings are in line with the study by Fogel and Nehmad (2009). These results show that new mobile

payment services can be first marketed to the users whose risk tendencies are higher. Psychometric assessment can be used to understand the risk profile and confidence level of the users, as in the study of Zhang (2021). Furthermore; Kim, Mirusmonov, and Lee (2010) investigated the individual differences of the users, categorizing the participants as early and late adopters. New payment services may be first marketed and offered to the users with high risk-taking attitudes according to the results of these studies, they can be selected as the target audience as they may be more willing to adopt new payment services.

A significant positive relationship was found between risk perception and trust in mobile payments in both studies. The users' risk tendencies increase as trust in mobile payments also increases. These findings are parallel to the findings of Pan and Zinkhan (2006). According to the results of our study, we may say that people who are inclined to take risks in life have more trust in mobile payments.

A significant positive relationship exists between risk perception and positive factors for mobile payments in the results of first and the second studies. It has been found that risk perception increases as positive factors for mobile payment systems increase. However, no relationship was found between risk perception and negative factors for mobile payment systems in either study.

In both studies, the results show a significant positive relationship between mobile payment systems usage and trust in mobile payments. Mobile payment systems usage increases as trust in mobile payments increases. These findings are similar to the findings of Culnan and Armstrong (1999); Kim, Tao, Shin, and Kim (2010); Miyazaki and Fernandez (2000). It has been stated by Kim, Tao, Shin, and Kim (2010) that since trust and security are important for users, mobile payment service providers can focus on protection, trust and security in the systems, give

importance to the technical process of security, show this care to the users to encourage them to keep using mobile payment systems, and support users in security related topics.

The results of both studies reveal a significant positive relationship between mobile payment systems usage and positive factors for mobile payment systems. This study shows that, mobile payment systems usage increases as positive factors for mobile payment systems increase. These results are consistent with the findings from the studies by Childers, Carr, Peck, and Carson (2001); de Kerviler, Demoulin, and Zidda (2016); Kim, Mirusmonov, and Lee (2010); Mimouni-Chaabane and Volle (2010); Pal, Herath, De, and Rao (2021); Shaikh and Karjaluoto (2015) and the report of Ke, Chung, Li, and Furgiuele (n.d.). Kim, Mirusmonov, and Lee (2010) articulated that mobile payment service providers may leverage the effects of less costly attributions such as designing more convenient and user-friendly mobile payment services, or designing faster processes, thereby enabling increased usage of mobile payment systems as in the studies of CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Childers et al. (2001); Ke et al. (n.d.); de Kerviler et al. (2016); Kim, Mirusmonov, and Lee (2010); Mimouni-Chaabane and Volle (2010); Pal et al. (2021); Shaikh and Karjaluoto (2015).

In the first study, a significant negative relationship was found between mobile payment systems usage and negative factors for mobile payment systems. Mobile payment systems usage decreases as negative factors for mobile payment systems increase. The results of our study demonstrate similar results with the studies of Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal, Herath, De, and Rao (2021). However, according to the second study, no significant relationship

was found between mobile payment systems usage and negative factors for mobile payment systems. The results of the second survey deviate from the results of Featherman and Pavlou (2003); Kim, Tao, Shin, and Kim (2010); Pal et al. (2021). Mobile payment services providers can focus on the security of the systems and design the services in a secure way, the services can also be developed to provide convenience to users, and users can be supported in case of problems and security issues (Featherman and Pavlou, 2003; Kim, Mirusmonov, and Lee, 2010; Kim, Tao, Shin, and Kim, 2010; Pal et al., 2021).

In the results of both studies, a significant positive relationship exists between trust in mobile payments and positive factors for mobile payment systems. Trust in mobile payments increases as positive factors for mobile payment systems increase. However, neither study observed a relationship between trust in mobile payments and negative factors for mobile payment systems.

In the second part of the study, there are questions in which digital nudging techniques are applied. There are two different surveys and the digital nudging techniques differ in each survey.

In the second part, in the first question, data is presented in a positive way in the first study and in the second one data is presented without a comment. In the first and the second study, according to the answers given to the first question, trust in mobile payments shows a statistically significant difference. We can conclude that, trust in mobile payments differs according to the first question and the hypothesis is accepted. In the first version, the trust level is higher than the second one. Accordingly, we can say that presenting data in a positive way may generate a difference in the answers. These findings overlap with the findings of Mallas, Xenos, and Karavasili (2021). As a result of this, mobile payment service providers may

present data to the users in a positive way to increase users' trust in the mobile payment systems and increase their usage of the systems. Furthermore, people give importance to the opinions of the majority, and social factors may influence people's choices according to the studies of the CCL at Center for Advanced Hindsight at Duke University and CARF at Boğaziçi University (2020); Huang, Chen, Hong, and Wu (2018); Jesse, Jannach, and Gula (2021); Mallas et al. (2021) and Ke et al. (n.d.) report; consequently, when mobile payment service providers offer an option to the users they can present the number or the percentage of people who chose that option compared to the other options.

In the second question, positive informative data was given in the first study and no data was given in the second study before the question. In the first study, according to the answers given by the participants to the second question, mobile payment systems usage shows a statistically significant difference and the hypothesis is accepted. However, in the second study, regarding the answers given by the participants to the second question, mobile payment systems usage does not show a statistically significant difference and the hypothesis is rejected. As a result of this, we can say that when we give positive informative data, there is a difference in the answers of the participants. However, if we do not give positive informative data, no difference was found in the answers of the participants and a perception would not be generated. These findings are in line with the findings of Mallas et al. (2021). Accordingly, mobile payment service providers may provide positive data in their communication with the users to create perception and increase their use of mobile payment systems.

In the third question, a case about mobile payment systems was given to the participants and they were asked if they would continue using the service. In both

studies, looking at the answers given to the third question, trust in mobile payments and mobile payment systems usage show a statistically significant difference. The hypothesis is accepted in both studies. In the first study, trust level is higher than the second one; we can say that a case related to mobile payment systems may generate difference in the answers. These findings are in line with the findings of Mallas et al. (2021). Consequently, mobile payment service providers may present and focus on the positive factors in their communication with the users to increase trust in mobile payments (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al., 2001; Ke et al., n.d.; de Kerviler et al., 2016; Kim, Mirusmonov, & Lee, 2010; Mimouni-Chaabane & Volle, 2010). These findings are also consistent with the findings of Pal, Herath, De, and Rao (2021), in that they show that even if users are aware of the risks of the systems they use, they may continue to use them for the benefits derived from using those services.

In the fourth question, the effects of the structure and the priority of answers are investigated. In the first and the second study, according to the answers given to the fourth question, mobile payment systems usage shows a statistically significant difference. These findings are consistent with the findings of Mallas et al. (2021). In the second version, the mobile payment systems usage level is higher than the first one. This case may be due to people giving more importance to the benefits they derive from using these systems than to the risks and the security problems they encounter when they use these systems as in the study of Pal, Herath, De, and Rao (2021). Mobile payment service providers may also change their structure and priority of selections to influence people's choices regarding their new products or offerings in the systems.

This study investigated the relationships between risk perception, trust, mobile payment systems usage, and positive and negative factors for mobile payment systems. Moreover, with two different survey designs in the second part, different digital nudging techniques are applied in each survey for Turkish university students. Positive relationship was found between risk perception and mobile payment systems usage, risk perception and trust in mobile payments, mobile payment systems usage and trust in mobile payments, mobile payment systems usage and positive factors for mobile payment systems in both studies. A negative relationship was found between mobile payment systems usage and negative factors for mobile payment systems in the first study. In this study, it has been concluded that trust in mobile payments and mobile payment systems usage differ according to the questions with different digital nudging techniques. In this study, it has been found that giving informative data, a text containing a case related to mobile payments, the structure and the priority of answers may generate differences in the answers.

This study's goal is to contribute to the literature on mobile payment systems and behavioral science studies. Mobile payment systems factors, trust and security in mobile payments can be further investigated and the digital nudging design can be used by academicians for further studies. According to our best knowledge, this study constitutes one of the initial attempts in application of digital nudging design in a questionnaire format, in the context of mobile payment systems used by Turkish university students. For practitioners in the field, this study can be helpful in designing mobile payment systems to fulfil the needs of the users and they can use trust and security, convenience, speed and incentive features in their systems and also focus on these features in their communication with the users to increase the usage of these platforms (CCL at Center for Advanced Hindsight at Duke University

& CARF at Boğaziçi University, 2020; Childers et al., 2001; Ke et al., n.d.; de Kerviler et al., 2016; Kim, Mirusmonov, & Lee, 2010; Kim, Tao, Shin, & Kim (2010); Mimouni-Chaabane & Volle, 2010; Pal et al., 2021; Shaikh & Karjaluoto, 2015). Furthermore, practitioners may use designs to influence people's opinions with applying digital nudging methods.

Limitations of the study and suggestions:

This study has certain limitations and further studies can be conducted on this topic. While this study was conducted with 241 university students, it can be conducted with different age and income groups and people of different occupations. To understand the mobile payment perception of users, the whole population could be reflected in the sample. The number of participants is a limit to the study, it can be increased in further studies.

Various other positive and negative factors, as well as trust and security factors can be examined in order to understand the effects on the mobile payment systems usage for further analysis. Many other digital nudging techniques can be applied in further studies to understand their effects on the choices related to mobile payment systems. Default options as in the studies of Jesse, Jannach, and Gula (2021); Mallas et al. (2021) and using positive and negative photographs as in the study of Mallas et al. (2021) could also be applied in questionnaire format as digital nudging.

This study can be conducted for cryptocurrencies and digital currencies. Risk perception, trust and security factors and digital nudging techniques can be investigated for cryptocurrencies. Given the popularity of this topic, it has the potential to be a promising area for study.

APPENDIX A

SURVEY QUESTIONS (FIRST VERSION)

*Required

Part 1:

1. Please select the best option for yourself regarding your risk perception. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

1.1 In daily life, I am inclined to take risks. (Zhang, 2021)

1.2 In situations where I may get high returns, I am inclined to take high risks. (Fogel & Nehmad, 2009; Pan & Zinkhan, 2006)

1.3 Before I take risks in a specific topic, I can calculate its pros and cons. (Zhang, 2021)

1.4 After I calculate returns, I take risks if it is logical. (Fogel & Nehmad, 2009; Pan & Zinkhan, 2006; Zhang, 2021)

1.5 What do you think of first, when you think about the word "risk"? * (Zhang, 2021)

Select only one option.

( ) Loss

( ) Uncertain

( ) Neutral

( ) Opportunity

( ) Gain

2. Please select the best option for yourself regarding mobile payment systems usage. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

2.1 I regularly utilize mobile payment systems. (Kim, Tao, Shin, & Kim, 2010)

2.2 I will continue to regularly utilize mobile payment systems in the future. (Kim, Tao, Shin, & Kim, 2010)

2.3 In future, I expect mobile payment usage to increase more. (Kim, Tao, Shin, & Kim, 2010)

2.4 I regularly use digital wallet applications. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

3. Please select the best option for yourself regarding risk and trust perception in mobile payment systems. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

3.1 I find mobile payment systems secure. (Kim, Tao, Shin, & Kim, 2010)

3.2 I am aware of fraud and theft risks when I am using mobile payment systems. (Zhang, 2021)

3.3 I can calculate pros and cons before I am using mobile payment systems. (Zhang, 2021)

3.4 I believe that the information I provide for mobile payment systems is helpful for secure payments. (Kim, Tao, Shin, & Kim, 2010)

3.5 I am not worried about my personal data to be stolen in mobile payment systems. (Kim, Tao, Shin, & Kim, 2010)

3.6 I trust security mechanisms of the mobile payment system I use. (Kim, Tao, Shin, & Kim, 2010)

3.7 Personal information that I provide in mobile payments systems have not been stolen due to mobile payment usage. (Kim, Tao, Shin, & Kim, 2010)

3.8 I have not encountered any temporary or permanent technical problems when I use mobile payments. (Kim, Tao, Shin, & Kim, 2010)

3.9 I have enough information sources or contacts in case of questions or problems related to mobile payment usage. (Kim, Tao, Shin, & Kim, 2010)

4. Please select the best option for yourself regarding mobile payment usage objectives. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

4.1 The ability of using mobile payment systems anywhere and anytime is an important factor for my mobile payment usage. (Kim, Mirusmonov, & Lee, 2010)

4.2 The convenience and easiness of usage are important factors for my mobile payment usage. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers, Carr, Peck, & Carson, 2001; Kim, Mirusmonov, & Lee, 2010; Pal, Herath, De, & Rao, 2021; Shaikh & Karjaluoto, 2015)

4.3 Discounts and rewards in mobile payment systems are significant determinants for my usage. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Ke, Chung, Li, & Furgiuele, n.d.; de Kerviler, Demoulin, & Zidda, 2016; Mimouni-Chaabane & Volle, 2010)

4.4 Using mobile payment systems allows me to complete my transactions faster and save time. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al., 2001; Ke et al., n.d.)

4.5 The mobile payment usage of my acquaintances is an important factor for my mobile payment usage. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Ke et al., n.d.)

4.6 Mobile payments are risky, so I use these systems less. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal et al., 2021)

4.7 Having hardships with the use of technology makes me use mobile payments less. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

4.8 I do not find mobile payment systems convenient (difficult to understand/too time-consuming), so I use mobile payment systems less. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

4.9 Absence of face-to-face contact when I have problems related to mobile payments makes me use mobile payments less. (Kim, Tao, Shin, & Kim, 2010)

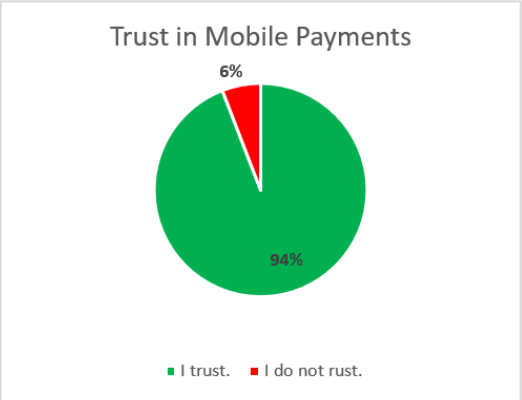
4.10 There are cases about stolen personal and financial information in various mobile payment systems, so I am using these systems less. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal, Herath, De, & Rao, 2021)

4.11 Risks of fraud and theft in mobile payments make me use mobile payments less. (Featherman & Pavlou, 2003; Pal et al., 2021; Zhang, 2021)

Part 2:

1. In an unpublished study in 2021 (Evcil, 2021), in Turkey 94% of people stated that they trust mobile payments on average and more than average. (1 represents the lowest score and 5 represents the highest score.) (Mallas, Xenos, & Karavasili, 2021)

Trust Scores	Number of People
1	7
2	5
3	58
4	104
5	31



Source: Evcil (2021)

Question: How much do you trust mobile payments? * (1 = I do not trust them at all., 2 = I do not trust them., 3 = I am indecisive., 4 = I trust them., 5 = I trust them very much.) (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

2. According to the 2021 Mobile Wallet Report (Boku Inc., 2021), at the end of 2025 global mobile wallet usage will increase by 74% compared to the end of year 2020 and more than half of the world population will be using mobile wallet by the end of 2025. (Mallas et al., 2021)

   What is your perception of digital wallet use in mobile payment systems? * (1 = Very negative, 2 = Negative, 3 = Neutral, 4 = Positive, 5 = Very positive) (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

3. There is an e-commerce mobile application used by many people. The users can gain many rewards and discounts from prestigious firms when they use the application. Recently, this firm was exposed to cyber-attack and these attackers leaked user information excluding their card information to the Internet. However, many people continue using this application due to big discounts,

rewards and service quality (speed, customer experience, etc.). (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al., 2001; Featherman & Pavlou, 2003; Ke et al., n.d.; de Kerviler et al., 2016; Kim, Tao, Shin, & Kim, 2010; Mallas et al., 2021; Mimouni-Chaabane & Volle, 2010; Pal et al., 2021)

I will continue using this application. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

4. You are using a mobile application in which you pay from digital wallet in the mobile application in your purchases related to groceries, electronics, clothing and meal. You can gain various promotions and incentives (free shipping, extra discount in specific products, etc.) regarding the purchases you make. You can make your payments from wherever you are, easily and quickly. When you use the digital wallet, you need to enter your name and credit card information. However, this mobile application provider does not make any necessary security updates. Would you continue shopping from this application? (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al., 2001; Featherman & Pavlou, 2003; Ke et al., n.d.; de Kerviler et al., 2016; Kim, Mirusmonov, & Lee, 2010; Kim, Tao, Shin, & Kim, 2010; Lim, Kim, Hur, & Park, 2018; Mallas et al., 2021; Mimouni-Chaabane & Volle, 2010; Pal et al., 2021) *

   Select only one option.

   ( ) I will continue using this application due to incentives and promotions. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Ke et al., n.d.; de Kerviler et al., 2016; Mimouni-Chaabane & Volle, 2010)

( ) I will continue using this application, because I can make payments easily and in a fast way. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al. 2001; Featherman & Pavlou, 2003; Ke et al., n.d.; Kim, Mirusmonov, & Lee, 2010; Pal et al., 2021; Shaikh & Karjaluoto, 2015)

( ) I am indecisive about using or not using this application.

( ) I will not continue using this application due to security breach.

(Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal et al., 2021)

APPENDIX B

SURVEY QUESTIONS (SECOND VERSION)

*Required

Part 1:

1. Please select the best option for yourself regarding your risk perception. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

1.1 In daily life, I am inclined to take risks. (Zhang, 2021)

1.2 In situations where I may get high returns, I am inclined to take high risks. (Fogel & Nehmad, 2009; Pan & Zinkhan, 2006)

1.3 Before I take risks in a specific topic, I can calculate its pros and cons. (Zhang, 2021)

1.4 After I calculate returns, I take risks if it is logical. (Fogel & Nehmad, 2009; Pan & Zinkhan, 2006; Zhang, 2021)

1.5 What do you think of first, when you think about the word "risk"? * (Zhang, 2021)

Select only one option.

( ) Loss

( ) Uncertain

( ) Neutral

( ) Opportunity

( ) Gain

2. Please select the best option for yourself regarding mobile payment systems usage. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

2.1 I regularly utilize mobile payment systems. (Kim, Tao, Shin, & Kim, 2010)

2.2 I will continue to regularly utilize mobile payment systems in the future. (Kim, Tao, Shin, & Kim, 2010)

2.3 In future, I expect mobile payment usage to increase more. (Kim, Tao, Shin, & Kim, 2010)

2.4 I regularly use digital wallet applications. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

3. Please select the best option for yourself regarding risk and trust perception in mobile payment systems. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

3.1 I find mobile payment systems secure. (Kim, Tao, Shin, & Kim, 2010)

3.2 I am aware of fraud and theft risks when I am using mobile payment systems. (Zhang, 2021)

3.3 I can calculate pros and cons before I am using mobile payment systems. (Zhang, 2021)

3.4 I believe that the information I provide for mobile payment systems are helpful for secure payments. (Kim, Tao, Shin, & Kim, 2010)

3.5 I am not worried about my personal data to be stolen in mobile payments systems. (Kim, Tao, Shin, & Kim, 2010)

3.6 I trust security mechanisms of the mobile payment system I use. (Kim, Tao, Shin, & Kim, 2010)

3.7 Personal information that I provide in mobile payments systems have not been stolen due to mobile payment usage. (Kim, Tao, Shin, & Kim, 2010)

3.8 I have not encountered any temporary or permanent technical problems when I use mobile payments. (Kim, Tao, Shin, & Kim, 2010)

3.9 I have enough information sources or contacts in case of questions or problems related to mobile payment usage. (Kim, Tao, Shin, & Kim, 2010)

4. Please select the best option for yourself regarding mobile payment usage objectives. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)

4.1 The ability of using mobile payment systems anywhere and anytime is an important factor for my mobile payment usage. (Kim, Mirusmonov, & Lee, 2010)

4.2 The convenience and easiness of usage are important factors for my mobile payment usage. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers, Carr, Peck, & Carson, 2001; Kim, Mirusmonov, & Lee, 2010; Pal, Herath, De, & Rao, 2021; Shaikh & Karjaluoto, 2015)

4.3 Discounts and rewards in mobile payment systems are significant determinants for my usage. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Ke, Chung, Li, & Furgiuele, n.d.; de Kerviler, Demoulin, & Zidda, 2016; Mimouni-Chaabane & Volle, 2010)

4.4 Using mobile payment systems allows me to complete my transactions faster and save time. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al., 2001; Ke et al., n.d.)

4.5 The mobile payment usage of my acquaintances is an important factor for my mobile payment usage. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Ke et al., n.d.)

4.6 Mobile payments are risky, so I use these systems less. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal et al., 2021)

4.7 Having hardships with the use of technology makes me use mobile payments less. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

4.8 I do not find mobile payment systems convenient (difficult to understand/too time-consuming), so I use mobile payment systems less. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

4.9 Absence of face-to-face contact when I have problems related to mobile payments makes me use mobile payments less. (Kim, Tao, Shin, & Kim, 2010)

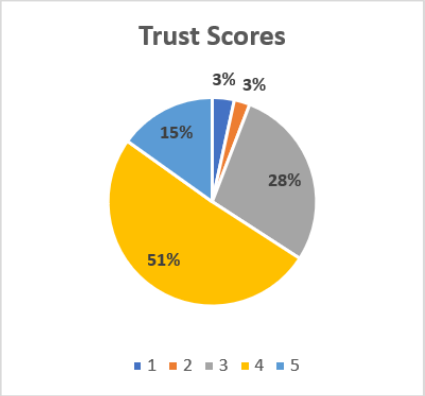
4.10 There are cases about stolen personal and financial information in various mobile payment systems, so I am using these systems less. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal, Herath, De, & Rao, 2021)

4.11 Risks of fraud and theft in mobile payments make me use mobile payments less. (Featherman & Pavlou, 2003; Pal et al., 2021; Zhang, 2021)

Part 2:

1. In an unpublished study in 2021 (Evcil, 2021), in Turkey respondents were requested to score their trust in mobile payments. You may find the results in the table below and in the pie chart. (1 represents the lowest score and 5 represents the highest score.) (Mallas, Xenos, & Karavasili, 2021)

Trust Scores	Number of People
1	7
2	5
3	58
4	104
5	31



Source: Evcil (2021)

Question: How much do you trust mobile payments? * (1 = I do not trust them at all., 2 = I do not trust them., 3 = I am indecisive., 4 = I trust them., 5 = I trust them very much.) (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)

2. What is your perception of digital wallet use in mobile payment systems? * (1 = Very negative, 2 = Negative, 3 = Neutral, 4 = Positive, 5 = Very positive) (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020)
3. There is an e-commerce mobile application used by many people, they are selling products to many people from their mobile application. Recently, this firm was exposed to cyber-attack and these attackers leaked user information excluding their card information to the Internet. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Mallas et al., 2021; Pal et al., 2021)

   I will continue using this application. * (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always)
4. You are using a mobile application in which you pay from digital wallet in the mobile application for your purchases related to groceries, electronics, clothing

and meals. You can gain various promotions and incentives (free shipping, extra discount in specific products, etc.) regarding the purchases you make. You can make your payments from wherever you are, easily and in a fast way. When you use the digital wallet, you need to enter your name and credit card information. However, this mobile application provider does not make any necessary security updates. Would you continue shopping from this application? (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Childers et al., 2001; Featherman & Pavlou, 2003; Ke et al., n.d.; de Kerviler et al., 2016; Kim, Mirusmonov, & Lee, 2010; Kim, Tao, Shin, & Kim, 2010; Lim, Kim, Hur, & Park, 2018; Mallas et al., 2021; Mimouni-Chaabane & Volle, 2010; Pal et al., 2021) *

Select only one option.

( ) I will not continue using this application due to security breach. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal et al., 2021)

( ) I will not continue using this application because my personal and financial information can be stolen. (Featherman & Pavlou, 2003; Kim, Tao, Shin, & Kim, 2010; Pal et al., 2021)

( ) I am indecisive about using or not using this application.

( ) I will continue using this application due to incentives and promotions. (CCL at Center for Advanced Hindsight at Duke University & CARF at Boğaziçi University, 2020; Ke et al., n.d.; de Kerviler et al., 2016; Mimouni-Chaabane & Volle, 2010)

APPENDIX C

ETHICS COMMITTEE APPROVAL FOR THE STUDY

Evrak Tarih ve Sayısı: 10.04.2022-61404

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME KOMİSYONU
TOPLANTI KARAR TUTANAĞI

Toplantı Sayısı : 30
Toplantı Tarihi : 07.04.2022
Toplantı Saati : 10:00
Toplantı Yeri : Zoom Sanal Toplantı
Bulunanlar : Prof. Dr. Ebru Kaya, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen
Bulunmayanlar :

Melike Evcil
İşletme

Sayın Araştırmacı,
"Üniversite Öğrencilerinin Mobil Ödeme Sistemleri Algısı ve Dijital Dürtmenin Etkisinin Ölçülmesi" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2022/31 sayılı başvuru komisyonumuz tarafından 7 Nisan 2022 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınamadığı için bu onay mektubu üye ve raportör olarak Yasemin Sohtorik İlkmen tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Dr. Öğr. Üyesi Yasemin
SOHTORİK İLKMEN
ÜYE

e-imzalıdır
Dr. Öğr. ÜyesiYasemin Sohtorik
İlkmen
Öğretim Üyesi
Raportör

SOBETİK 30 07.04.2022

Bu belge, güvenli elektronik imza ile imzalanmıştır.

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