HIGH SCHOOL EDITION
Journal of Student Research
Volume 13 Issue 3 (2024)

The Effects of Near Field Communications Mobile Payment on Los Angeles Teenagers' Perceptions of Spending

Anna Rosciszewski

Le Lycee Francais de Los Angeles, USA

ABSTRACT

Near Field Communications Mobile Payment, NFC M-pay, is a new form of mobile payment in the post-pandemic. Like other digital technologies, it has been found to be more easily accepted by Gen Z due to their technological saviness and technology oriented lifestyle, resulting in a higher perceived ease of use and conveninece for their age group. Teenagers, who are a part of Gen Z, make up 23.7% of Los Angeles County's population and thus are a significant group to investigate in the context of NFC M-pay. This study investigates the specific relationship between Los Angeles teenagers' use of NFC M-pay and perceptions of spending, specifically include pain of paying, pleasure of paying, volume of payment, transparency, consumer satisfaction, Overall Store Price Image, Willingness to pay, and abstraction of payment. Prior to this study, these perceptions of spending had neither been studied together nor measured in Los Angeles teenagers, albeit they yielded interesting results individually in other study groups. The study's method consisted of a questionnaire accompanied by a four-point linear scale and was inspired by Ming-Yeh Teoh, Wendy et al.'s study on consumer perceptions toward electronic payment systems. Each question was based on a hypothesis for clarity. Results were gathered from 49 respondents from a variety of ages and genders. Out of eleven hypotheses, eight were confirmed and one was partially confirmed from the primary data. This study adds valuable findings to the broader scholarly discussion concerning teenagers' perceptions of spending using NFC M-pay while pioneering research in Los Angeles.

Introduction

In the United States, the adoption and continued use of Mobile Payment (M-Payment) and Mobile Wallets (M-Wallet) has surged in the last 10 years as M-payment smartphone applications have become increasingly adopted by U.S consumers. Mobile wallets such as Apple Pay and Google Pay, the most used mobile wallets among U.S customers and merchants alike, come preinstalled on IPhones and most Android Devices. Furthermore, with the introduction of Point of Sale (POS) features like Near Field Communication (NFC) systems, which are currently the most commonly employed resources used to facilitate the payment process, have further boosted the usage of M-pay systems (CFPB Office of Competition & Innovation and Office of Markets). Since the Covid-19 Pandemic, NFC Mobile Payments have gained further popularity because of their mitigation of health risks resulting from the absence of physical contact during the payment process. The growth of mobile payment has been primarily driven by younger consumers as smartphones play a crucial role in their everyday lives, and it is thus easier for them to accept NFC M-pay into their lifestyles (Agardi, Irma). According to the most recently available data from 2021, Los Angeles County Census recorded a teenage population of 516,190, which accounted for 23.7% of the total population, making them a significant part of Los Angeles' consumer market (KidsData). Los Angeles tenagers are an important cohort to examine as they are a numerically significant and technology-oriented population. This study's purpose is to investigate NFC M-Pay's effects on the

spending perceptions of Los Angeles teenagers. The spending perceptions this study investigates are pain of paying, pleasure of paying, willingness to pay, volume of payment, satisfaction, ease of use, and overall store price image.

Literature Review

Gen Z

Gen Z is the only generation that grew up in a world of technology and are thus generally very savvy with smartphones. Studies have investigated the effects of M-pay in the case of Gen Z, as it has been found to be more prominent among the younger population (Meyll, Tobias, et al.). Since they usually carry their smartphones, Gen Z is an important age cohort to study in the context of paying with M-pay. In the United Kingdom, Priporas, Constantinos-Vasilios, et al. documented that Gen Z is a technology-oriented group in the context of retailing and frequently use their smartphones and other technologies for shopping (Priporas, Constantinos-Vasilios, et al.). Regarding in-store transactions, research conducted in Hungary has indicated that Gen Z perceived M-pay to fit better into their lifestyle and were less concerned about the risks associated with using digital devices compared to Gen X (Agardi, Irma, et al.). Furthermore, Cesarina Mason, Michela, et al. documented that for Gen Z in Italy, a smartphone addiction in a young consumer had a positive relationship with impulse buying behavior (Cesarina Mason, Michela, et al.) Teenagers today, born between 2006 to 2011, are part of Gen Z, and their attachment to technology has been extensively studied. However, the literature concerning the link between teenagers and their relationship to M-pay is scarce. This study aims to narrow down the current literature about Gen Z and M-pay to teenagers specifically.

Transparency and Pain of Paying

Perception is defined as “an idea, a belief, or an image you have as a result of how you see or understand something” (Oxford Dictionary). Perception of spending thus refers to a consumer’s mental impression of their individual spending activity and behavior. Studies have previously examined the varying effects of payment transparency of different payment mechanisms on perceptions of spending and spending behavior in stores, but the bulk of the research dates back from the past decade and is, accordingly, composed almost exclusively of the outcomes of cash and card (Soman, Dilip; Chen, Rong, et al.; Raghubir & Srivastava). According to Soman, transparency in the case of payment defines the relative abstraction of a payment mechanism compared to that of cash, which is the most salient form of payment because of its more evident and physical form (Soman, Dilip). Cash is, accordingly, the form of payment that is the most associated with transparency compared to credit card. Moreover, the pain of paying phenomenon is defined as the negative emotion experienced during the payment process and has been studied to have a lessened effect with forms of payment of lower transparency. (Prelec & Loewenstein; Zellermayer, Ofer). Raghubir & Srivastava found that people are more willing to pay (WTP) using a credit card than when using cash, due to a lower pain of paying (Raghubir & Srivastava). Comparably, Chen and Soman demonstrated that the lower transparency of card led to increased consumption because of the lowered pain associated with paying (Chen and Soman). These studies highlight the contrast of payment transparency between cash and card, concluding that card payment results in increased consumption and higher WTP as it is constructed more abstractly by the consumer and because it elicits a lower pain of paying.

NFC M-pay must be individually studied as it adds a new dimension to the existing card payment system: its direct connection to the smartphone. M-pay is a form of electronic payment (E-pay) limited to smartphones and thus applies to in-store transaction settings, albeit the terms are used interchangeably when

discussing in-store transactions. More recent literature has investigated the effects of E-pay methods on transparency, pain of paying, and pleasure of paying (Meyll, Tobias, et al.; Ma, Qingguo, et al.; Falk, Thomas, et al.; Manshad, Muhanad Shakir; Wang, Manlin, et al.). Similarly to the results found for credit card usage, Meyll, et al. documents that, in the United States, the use of smartphone in conducting M-pay transactions is strongly correlated with a consumer's likelihood to exhibit costly credit card behavior and less pain of paying (Meyll, Tobias, et al). Researching in China, Ma, et al. and Wang, et al. both came to the same conclusion through a neuroscience perspective, finding that participants paying with M-pay utilized less cognitive resources than those who paid with cash, indicating an abstract view of money using M-pay (Ma, Qingguo et al; Wang, Manlin et al.) Moreover, the unique transparency of M-pay also affects the way in which consumers view the Overall Store Price Image (OSPI), which is a measure of a consumer's perception of an individual store's prices. According to a study done by Falk, Thomas, et al., European consumers who used M-pay experienced lower OSPIs than those who paid with cash, as cash was associated with a higher pain of paying (Falk, Thomas, et al.). Therefore, the consumer's perception of a store's prices is affected by the lower pain of paying of M-pay.

Furthermore, certain digital features have been found to offset the lessened pain of paying and consequent increased spending using cashless payment systems. Haptic feedback (vibration) occurring in NFC M-pay systems during the payment process have been found to increase pain of paying and decrease WTP (Manshad, Muhanad Shakir). Similarly, the tracking of credit card payment on smartphones also increased the pain of paying by increasing salience, which decreased spending in Switzerland (Huebner, Johannes, et al.). Haptic feedback and smartphone history of M-pay present important implications to the research of NFC M-pay spending perceptions in the U.S since its most popular M-wallets (ApplePay, Google Pay, and Samsung Pay) have adopted these features. Thus, most consumers who use these M-pay in the U.S applications receive and are affected by these signals.

Hence, this study proposes the following hypotheses:

H1: LA teenage consumers construe payment NFC M-pay more abstractly than with cash or card.

H2: LA teenage consumers feel like they spend more money when using M-Pay than with cash or card.

H3: LA teenage consumers who use NFC M-Pay feel less pain of paying than with cash or card.

H4: LA teenage consumers who use NFC M-pay feel lower OSPI than with cash or card because of the lower pain of paying effect.

H5: Haptic vibration during NFC M-Pay increases the pain of paying and decreases WTP among LA teenage consumers, urging them to spend less.

H6: Smartphone payment accounting of NFC M-Pay increases the pain of paying and decreases WTP among LA teenage consumers, urging them to spend less.

Pleasure of Paying and Willingness to Pay

Inversely with a higher pain of paying, consumers were documented to also experience the pleasure of paying effect. The pleasure of paying is the level of pleasure that a consumer gets for paying, meaning "the psychological link between payment and pleasure" (Prelec & Loewenstein). Past studies have found that, in the context of M-pay, pleasure of paying is higher than traditional payment methods. Ma, et al. recorded that consumers who used M-pay to buy high-priced items felt a pleasure of paying that outweighed the pain of paying. Correspondingly, Wang, et al., found that M-pay resulted in a strong pleasure of paying, regardless of price. This study concluded that the strong pleasure of paying, along with the weak pain of paying, that are associated with M-pay jointly resulted in a more prominent purchase intention, otherwise referred to as WTP (Wang, Manlin, et al).

Willingness to Pay (WTP) is defined as "the maximum price a consumer is willing to pay for a product or service" (Harvard Business School). WTP in an M-pay environment refers to how much a consumer is willing to pay for a good or service. In Boden's study encompassing American, Japanese, and German respondents, M-pay was discovered to result in higher WTP than card through greater convenience than both card and cash (Boden, Joe, et al.). In accordance with Boden's findings, Wang, et al., found that M-pay increased consumers' WTP (Wang, Manlin, et al.). Similarly and likewise in China, Jiang, Yizhao concluded that consumers who used M-pay exhibited a higher WTP than those who did not, and thus ended up spending more on average (Jiang, Yizhao). Therefore, a connection between pleasure of paying and WTP exists in the context of M-pay.

Hence, this study hypothesizes that:

H7: LA teenage consumers who use NFC M-Pay feel more pleasure of paying using NFC M-Pay than with cash or card.

H8: LA teenage consumers who use NFC M-Pay exhibit a stronger WTP than with cash or card because of associated convenience.

Satisfaction and Ease of Use:

Numerous studies have explored consumer satisfaction of electronic interfaces in the context of e-commerce, which refers to the digital marketplace on the Internet. Results have shown that a website's design and visual appeal had a significant and positive impact on consumer satisfaction in the context of e-commerce in Malaysia and France (Lee, Yi, et al.; Bresolles and Durrieu). In the context of M-pay specifically, Hillman, Serena, et al. found that gamification, which describes app design and interactivity, played a significant role in attracting North American consumers to adopt it as a payment method (Hillman, Serena, et al.). In Jordan, Ajina, Ahmed S, et al. found that perceived M-wallet service quality, which is an assessment of how well a delivered service conforms to the client's expectations and thus can be interpreted as a service's visual and functional appeal to the consumer (Ramya, N, et al.), positively impacted satisfaction (Ajina, Ahmed S, et al). Likewise, Liebana-Cabanillas, Francisco, et al. documented that the perceived quality of NFC M-pay had a significant impact on satisfaction, notably for teenagers, in Spain (Liebana-Cabanillas, Francisco, et al.). These findings suggest that visual appeal and service quality of NFC M-pay has an effect on satisfaction, and importantly, that this effect is prominent for teenagers.

Bresolles and Durrieu also documented that ease of use increased satisfaction in the context of e-commerce (Bresolles and Durrieu). Like online transactions, ease of use plays an important role in in-store electronic transactions. Teoh, Wendy Ming-Yen, et al. found that ease of use positively affected consumers' perception of M-pay in China (Teoh, Wendy Ming-Yen, et al.). Contrastingly, Ajina, Ahmed S, et al. found that ease of use did not make an impact on satisfaction of M-pay (Ajina, Ahmed S, et al.). In agreement, Liebana-Cabanillas, Francisco, et al. concluded that ease of use did not significantly influence perceived usefulness nor behavioral intention of consumers toward M-pay, indicating that ease of use was not a concern to consumers (Liebana-Cabanillas, Francisco, et al.). Therefore, this study questions whether the perceived ease of use of NFC M-pay has an effect on satisfaction.

Multiple studies have demonstrated the ease associated with paying with M-pay. M-Pay was found to be a more time efficient system of paying, compared to traditional payment methods like cash or card for Polish consumers (Polasik, Michal, et al.). Speed of transaction was found to be an important factor of M-pay for Gen Z, and performing transactions more efficiently was found to attract Gen Z consumers into using M-pay in Indonesia (Lisana, Lisana). M-Pay was also documented to be a more convenient paying method for Finnish consumers and satisfactory when used for habitual purchases for North American consumers (Mallat, Niina; Hillman, Serena, et al.). An explanation for the contrasting findings on ease of use of NFC M-Pay is that certain consumers may not be used to using it and thus experience difficulty paying with it. Hillman, Serena, et al. recorded that existing North American users of M-pay perceived M-pay to be much quicker and convenient

than traditional payment methods. Inversely, this study also found that new users had a difficult time understanding M-pay, and thus perceived the process to be slow and stressful (Hillman, Serena, et al.). Therefore, it is important to acknowledge the differing ease of use perceptions between inexperienced and existing M-pay users. Hillman's study concludes by positing that Gen Z, since it is more technologically savvy than older generations, experiences more satisfaction due to a higher perceived ease of use and convenience using M-pay. This study hypothesizes that differences between the perceptions of these variables differ based on frequency and habitual use.

Hence this study hypothesizes that:

H9: Visual appeal and service quality of NFC M-Pay have a positive impact on LA teenage consumers' satisfaction.

H10: Perceived ease of use and convenience of NFC M-pay has a positive effect on consumer satisfaction for LA teenage consumers.

H11: Perceptions of spending among Los Angeles teenage consumers vary depending on frequency of use.

GAP

Perceptions of Spending

Previous studies have researched pain of paying, pleasure of paying, transparency, volume of payment, WTP, satisfaction, ease of use, and OSPI in the context of M-pay, and, more specifically, NFC M-pay. However, no study has investigated all of these dimensions together.

Teenagers

Though the body of research has focused on Gen Y and Gen Z consumers, no study has yet specifically researched teenagers' perceptions of spending using NFC M-pay.

Los Angeles

The literature concerning the dimensions of M-pay has been largely conducted outside of the U.S, and, within the U.S, no research has yet focused on Los Angeles teenagers' perceptions of spending using NFC M-pay.

Method

To achieve this study's goal, a questionnaire was employed as the means for data collection via Google Forms. This quantitative method was utilized because, according to Ahmed S. Ajina, "[the] quantitative approach is an efficient research method to reach the largest number of samples and collect primary data so that the phenomenon under study is explained". Therefore, using a quantitative method facilitates and clarifies the interpretation of the primary results obtained from the questionnaire, as well as acquiring a greater number of respondents. This study's research method is inspired by Ming-Yeh Teoh, Wendy, et al.'s study on perceptions of e-payment systems as this study likewise endeavors to measure consumer perceptions of a particular payment method. Like Ming- Yeh Teoh, Wendy, et al.'s study, this study is separated into two sections: the collection of demographic data in Section I and of reactions to statements based on the hypothesis in Section II. Due to the unscalable nature of the data required, Section I consisted of a multiple choice questionnaire. In Section II, a four point linear scale, ranging from strongly disagree (=1) to strongly agree (=4) as it eliminates social desirability bias (Garland, 1991 qtd. Ming-Yeh Teoh, Wendy, et al.) and pushes more respondents toward the definite ends of the scale (Worcester and Burns, 1975 qtd. Ming-Yeh Teoh, Wendy, et al.). The purpose of using this method was to effectively measure spending perceptions of NFC M-pay by using participants' varying reactions to

statements proposed by the study after separately taking note of differing demographic features. Additionally, to ensure that participants were familiar with NFC M-pay, data concerning prior use and frequency of use of NFC M-pay systems were also collected in Section I in order to study the link between habitual use and satisfaction (H9), along with other potential findings linked to demographic distinctions. (Appendix.11)

The survey was filled out by 53 students attending various Los Angeles highschools via text and social media because many teenagers have access to text and social media and also because it enables easy sharing of the survey, encouraging a wider range of teenagers to participate.

Method of Data Analysis

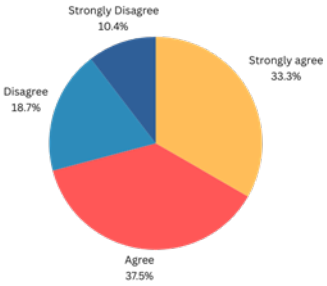
The data was split into 11 different groups: the results of all respondents, of all respondents based on the 3 genders surveyed, and of all respondents based on the 5 ages surveyed. The group of all respondents was the most significant to the analysis and thus served as a model for comparison for the 10 other groups to delineate differences stemming from demographic distinctions. The respondents who selected that they have never used NFC M-Pay before were removed from data collection for alignment to the purpose of the study, thus reducing the pool to 49 respondents. To test whether Hillman, Serena's findings on frequency of use were concurrent with Los Angeles teenagers, along with if frequency of use affected factors unique to this study, two subsequent groups were created: those who use NFC M-pay infrequently and of those who use NFC M-pay frequently (Q4).

Theoretical conclusions based on the quantitative data collected were drawn from the comparison of percentages for each question. The two categories of answers collected were whether the majority of respondents agreed with the statement or if they disagreed with it.

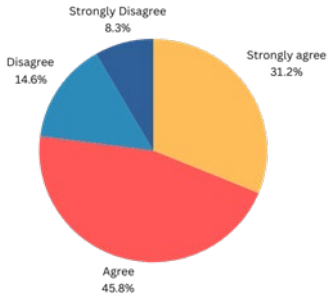
Results

Primary Data

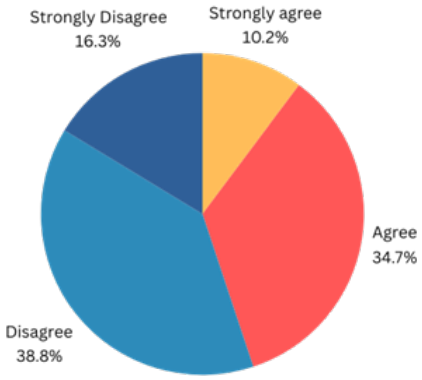
This study found that Los Angeles teenagers construed NFC M-pay more abstractly than cash or card (45.8% agreed and 31.2% strongly agreed), confirming Hypothesis 1. Los Angeles teenagers felt like they spent more money using NFC M-Pay compared to traditional methods of payment (25.0% agreed and 39.6% strongly agreed), confirming Hypothesis 2. They also felt with it a lessened pain of paying (37.5% agreed and 33.3% strongly agreed), confirming Hypothesis 3. Los Angeles teenagers were also found to experience a higher pleasure of paying (44.4% agreed and 29.6% strongly agreed), along with a higher WTP (41.6% agreed and 25% strongly agreed) using NFC M-pay because of increased convenience. These results confirmed Hypothesis 7 and 8, respectively. Surprisingly, Los Angeles teenagers were not observed to feel lower OSPI with NFC M-Pay compared to cash and card (47.9% disagreed and 22.9% strongly disagreed) and, thus, did not confirm Hypothesis 4. Moreover, they did not feel as if haptic vibration that occurs when paying with NFC M-pay increased their pain of paying (31.2% disagreed and 25.0% strongly disagreed) and did not feel that it decreased their WTP, disproving Hypothesis 5. Los Angeles teenagers felt that smartphone history of mobile payment increased their pain of paying (31.2% agreed and 25.0% strongly agreed), but not that it decreased their WTP (38.8% disagreed and 16.3% strongly disagreed). Therefore, Hypothesis 6 was only partially confirmed. Furthermore, Los Angeles teenagers felt that NFC M-pay visual appeal and service quality had a positive impact on their consumer satisfaction (39.6% agreed and 25.0% strongly agreed), confirming Hypothesis 9. They also felt that perceived ease of use and convenience of NFC M-pay positively affected consumer satisfaction (52.1% agreed and 25.0% strongly agreed), confirming Hypothesis 10. (Appendix.1)



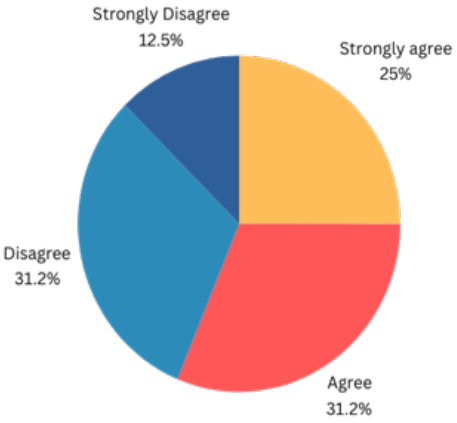
You feel less pain of paying using NFC Mobile Payment than cash or card.
Appendix.1



You perceive payment using NFC Mobile Payment more abstractly than with cash or card.
Appendix.1



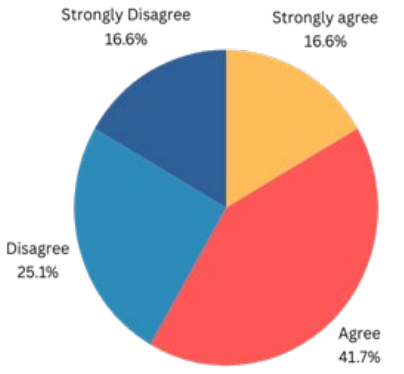
Smartphone history of NFC Mobile Payment decreases your willingness to spend.
Appendix.1



Smartphone history of NFC Mobile Payment increases your "pain of paying". Appendix.1

Demographic Distinctions

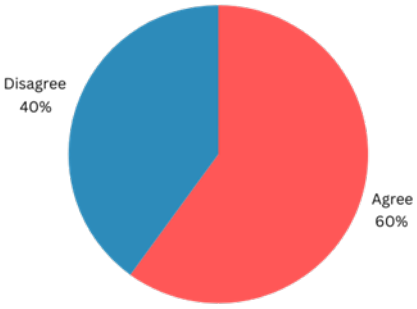
Although female respondents' results closely aligned with the primary data, for males, haptic vibration partially produced the hypothesized effect of hypothesis 5, increasing their pain of paying (41.6% agreed and 16.6% strongly agreed) but not decreasing their WTP (41.6% disagreed and 33.3% strongly disagreed) (Appendix.5). Furthermore, a heightened WTP because of convenience using NFC M-pay was not observed in males (33.3% disagreed and 16.6% strongly disagreed), not confirming Hypothesis 8. Moreover, for 15 and 16 year olds, smartphone history of mobile payment did not increase pain of paying (20% disagreed and 30% strongly disagreed among 15 year olds, while 43.75% disagreed and 25% strongly disagreed among 16 year olds) thus fully not confirming Hypothesis 6 for their both 15 and 16 year olds, whereas it was partially confirmed for all respondents (Appendix.8 and Appendix.9). Contrastingly, for 17 year olds, Hypothesis 6 was confirmed (33.3% agreed and 16.6% strongly agreed), meaning that smartphone history of mobile payment increased pain of paying and decreased WTP solely within their age group (Appendix.10).



Haptic vibration (vibration that your phone makes when you pay using tap) that occurs when paying with NFC Mobile Payment increases your "pain of paying" . Appendix.5

Frequency of Use

For Los Angeles teenagers who used NFC M-pay frequently, Hypotheses 1, 2, 3, 4, 7, 8, 9, and 10 were confirmed, while Hypotheses 4 and 5 were not confirmed, providing the same results as the primary data. Respondents who used NFC M-pay infrequently felt less pain of paying (20% agreed and 40% strongly agreed), lower OSPI (60% agreed), more pleasure of paying (100% agreed), and a higher WTP due to convenience (40% agreed and 20% strongly agreed) using NFC M-pay. Moreover, NFC M-pay positively affected their consumer satisfaction (40% agreed and 20% strongly agreed). However, they did not perceive NFC M-pay more abstractly than cash or card (20% disagreed and 40% strongly disagreed), did not feel as if they spent more money using NFC M-pay compared to cash or card (20% disagreed and 40% strongly disagreed), did not feel as though haptic vibration increased pain of paying (20% disagreed and 60% strongly disagreed) nor that it decreased WTP(20% disagreed and 60% strongly disagreed), did not feel as though smartphone history of NFC M-pay increased pain of paying (20% disagreed and 40% strongly disagreed) nor that it decreased WTP (60% disagreed and 40% strongly disagreed). They also did not feel that the visual appeal and service quality of NFC M-pay had a positive impact on consumer satisfaction (20% disagreed and 40% strongly disagreed) . Hypotheses 1, 2, 5, 6, and 9 were not confirmed and Hypotheses 3, 4, 7, 8, and 10 were confirmed for infrequent users of NFC M-pay. Based on the varying results between frequent and infrequent users of NFC M-pay, Hypothesis 11 was confirmed.



You feel that store prices are lower when you pay with NFC Mobile Payment rather than cash or card. .
Appendix.3

Analysis and Discussion

This study found that, compared to traditional payment methods like cash or card, Los Angeles teenagers view payment using NFC M-pay more abstractly. Their “pain of paying” is also decreased, meaning that the lack of physicality associated with tapping their phone to pay makes payment feel more abstract to Los Angeles teenagers, who are consequently less sensitive to the pain of departing with money during the payment process using NFC M-pay. Moreover, Los Angeles teenagers carry their phones with them often, which means that paying with NFC M-pay is more convenient to use as a means of payment, consequently eliciting a higher WTP to pay, aligning with Boden Joe et al.'s findings. Correlating with a lessened “pain of paying”, Los Angeles teenagers are also reported to feel a higher “pleasure of paying”.This study thus found that NFC M-pay feels more pleasurable, or “fun”, while also being more convenient to use than cash or card, enabling Los Angeles teenagers spend more money than they otherwise would have. A significant consequence of these causes was that they tend to spend more money using NFC M-pay compared to cash or card. However, these factors do not

influence how they view stores' prices, thus specifying that the relationship between consumer and spending perception using NFC M-pay is not significantly altered by store prices as was found by Falk, Thomas, et al.

Furthermore, the service quality and visual appeal of NFC M-pay, in order words, how "fun" it felt to use, as well as how easy it felt to use are both reported to have a positive impact on Los Angeles teenagers' consumer satisfactions. The high "pleasure of paying" effect, decreased "pain of paying" effect, and abstractness of payment that were observed in Los Angeles teenagers, demonstrating that, to them, NFC M-pay feels more easy, enjoyable, convenient, and less concrete to use compared to cash or card, which thus results in increased consumer satisfaction.

Haptic vibration that occurs during NFC M-pay does not have any effect on the Los Angeles teenage consumer, indicating that it is virtually ignored by them as a characteristic of NFC M-pay. However, male Los Angeles teenagers report that it increases their pain of paying, meaning that the vibration simulates the physicality of money for them. Furthermore, for the average Los Angeles teenage consumer, smartphone history of NFC Mobile Payments that occurs after the payment process increases the pain of paying effect, thus canceling out the decreased pain of paying that the payment process had on the consumer. When a user of NFC M-pay reflects on their completed purchase, they feel the pain of departing with their money which they had not felt while paying. Though they felt the pain of paying effect when reminded of their purchase, the history of NFC M-pay did not decrease WTP, indicating that it does not influence the willingness to spend money in Los Angeles teenagers. Thus, this study reports that the aforementioned heightened WTP to pay using NFC M-pay because of increased convenience is not offset by smartphone history of mobile payment.

Furthermore, the frequency of use of NFC M-pay was found to affect perceptions of spending among Los Angeles teenagers. The results for those who used it frequently aligned with the study's primary findings due to the fact that they made up 89.7% of respondents. Nonetheless, the responses of those who use NFC M-pay infrequently offered contrasting results to draw conclusions from. Infrequent users report lowered OSPIs, which align with the hypothesized effect that lowered pain of paying lowers store price perception, but meant that this phenomenon only occurs for those who do not routinely use NFC M-pay. Moreover, the findings that NFC M-pay is seen as abstract and does not incite more spending for infrequent users indicate that frequency plays a significant role in inspiring these perceptions of spending. The link between abstractness and increased spending can thus be observed as the result of frequent use of NFC M-pay. Moreover, for infrequent users, the findings that smartphone payment history and haptic vibration have no effect on "pain of paying" and WTP, as well as that visual appeal and app design has no effect on consumer satisfaction, demonstrate that these features do not influence users who do not use NFC M-pay often. However, perceived ease of use and convenience was found to boost satisfaction of infrequent users. In accordance with Hillman, Serena et al. 's findings about the effects of experience and frequency of use of NFC M-pay on satisfaction, this study found that frequency not only affected these factors and influenced other spending perceptions as well.

Implications and Future Directions

This study demonstrates how the use of Near Field Communications Mobile Payment affects the multi-faceted perceptions of spending of Los Angeles teenagers, which include pain of paying, pleasure of paying, volume of payment, transparency, consumer satisfaction, Overall Store Price Image, Willingness to pay, abstraction of payment. It also investigates the particular effects of frequency of use of NFC M-pay on these spending perceptions. It fills the GAP because it studies all these various factors together, while focusing on how they manifest in Los Angeles teenagers, both of which have not been researched before. This study's findings indicate positive correlations between the Los Angeles teenage consumer's perceptions of spending with M-pay and how it influences the way they spend and feel about their payment experience, as well as how experiences differ based on frequency of use of NFC M-pay. Businesses can look to this study to see how tailoring to the technological savviness of Gen Z teenagers can potentially increase profits. Parents and teenagers can also look at the

aforementioned findings to warn themselves of the potentially irresponsible spending behaviors using NFC M-pay. Future research could investigate how Los Angeles teenagers' spending perceptions are influenced by NFC M-pay in specific settings (shops, cafes, restaurants). Spending perceptions that this paper was not able to study like perceived enjoyment, perceived security, and trust should also be investigated.

Limitations

A significant limitation that this study encountered was a lack of age diversity: 89.7% of respondents were between the ages of 15 and 17. Therefore, considering that a negligible amount of 13 and 14 year olds filled out the survey, they are considered outliers (1 and 4, respectively), meaning that the slight differences between 13 and 14 year old groups and all respondents were not reported as separate findings. This phenomenon is probably due to the fact that not many 13 and 14 year olds in Los Angeles use NFC M-pay as it is a more advanced form of payment that requires a higher level of responsibility with money, and, thus, some parents may not trust their younger teenagers with using it. Another outlier group consisted of respondents who identified with "non-binary" as their group made up only 6% of all respondents, making them also insignificant numerically to draw conclusions from. Another limitation was the close geographic range of Los Angeles teenagers, which was mainly concentrated in West Los Angeles because of their relatively strong accessibility to the social circles that the survey was sent to. Moreover, 89.7% of respondents were frequent users of NFC M-pay, which skewed the primary results in their direction, so the conclusions may be biased toward trends aligned with frequent use. This was probably because most Los Angeles teenagers are habitual users of NFC M-pay, if they use it at all.

Acknowledgments

I would like to thank my advisor for the valuable insight provided to me on this topic.

References

Agardi, Irma, et al., "Do digital natives use mobile payment differently than digital immigrants? A comparative study between generation X and Z", *Electronic Commerce Research,* 19 April 2022. https://doi.org/10.1007/s10660-022-09537-9. Accessed September 30 2023.

Ajina, Ahmed S, et al., "The effect of mobile-wallet service dimensions on customer satisfaction and loyalty: An empirical study", *Cogent Business and Management,* July 9 2023. https://doi.org/10.1080/23311975.2023.2229544. Accessed September 19 2023.

Boden, Joe, et al., "The Effect of Credit Card Versus Mobile Payment on Convenience and Consumers' Willingness to Pay", Journal of Retailing and Consumer Services, February 19 2019. https://doi.org/10.1016/j.jretconser.2019.101910. Accessed October 1 2023.

Bressolles and Durrieu, "The impact of electronic service quality's dimensions on consumer satisfaction and buying impulse", *Journal of Consumer Behavior,* March 2007, https://www.researchgate.net/publication/233680737_The_impact_of_electronic_service_quality's_dimensions_on_customer_satisfaction_and_buying_impulse. Accessed December 13 2023.

Cesarina Mason, Michela, et al., "Glued to your phone? Generation Z's smartphone addiction and online compulsive buying", *Computers in Human Behavior,* March 2007,

https://www.sciencedirect.com/science/article/pii/S0747563222002266. Accessed December 23 2023.

Chen, Rong, et al., "Go Beyond Just Paying: Effects of Payment Method on the Level of Construal", *Journal of Consumer Psychology,* September 5 2016. https://doi.org/10.1016/j.jcps.2016.09.003. Accessed September 23 2023.

Dalimunte, Irfandy, et al., "Comparing Generation Z's Behavior Intention in Using Digital Wallet for Online and In-store Transaction: A Unified Theory of Acceptance and Use of Technology Approach", *Journal of Applied Economic Sciences,* October 2019. https://www.researchgate.net/publication/336496486 Accessed October 9 2023.

Falk, Thomas, et al., "How mobile payment influences the overall store price image", *Journal of Business Research,* July 2016. https://doi.org/10.1016/j.jbusres.2016.01.011. Accessed October 10 2023.

Hillman, Serena, et al., "User Challenges and Successes with Mobile Payment Services in North America", *MobileHCI '14: Proceedings of the 16th international conference on Human-computer interaction with mobile devices & services,* September, 2014. https://doi.org/10.1145/2628363.2628389. Accessed August 20 2023.

Huebner, Johannes, et al., "Assisting mental accounting using smartphones: Increasing the salience of credit card transactions helps consumers reduce their spending", *Computers in Human Behavior,* July 29 2020. https://doi.org/10.1016/j.chb.2020.106504. Accessed September 20 2023.

Jiang, Yizhao, "The Influence of Payment Method: Do Consumers Pay More with Mobile Payment?", 2022. https://doi.org/10.48550/arXiv.2210.14631. Accessed October 10 2023.

Lee, Yi, et al., "Impulse Buying's Antecedents and Consequences: Malaysian E-wallet Users Perceptions", *2021 5th International Conference on Software and e-Business,* December 5 2021. https://dl.acm.org/doi/10.1145/3507485.3507493. Accessed August 17 2023.

Liebana-Cabanillas, Francisco, et al.,"Examining the determinants of continuance intention to use and the moderating effect of the gender and age of users of NFC mobile payments: a multi-analytical approach", *Information Technology and Management,* April 20 2023. https://doi.org/10.1007/s10799-021-00328-6. Accessed September 18 2023.

Lisana, Lisana, "Understanding the key drivers in using mobile payment among Generation Z", *Journal of Science and Technology Policy Management,* August 2022, https://www.emerald.com/insight/content/doi/10.1108/JSTPM-08-2021-0118/full/html?skipTracking=true. Accessed December 2023.

Ma, Quingguo, et al., "Does mobile payment change consumers' perception during payment process? —An ERP study", *Neuroscience Letters,* November 23 2020. https://doi.org/10.1016/j.neulet.2021.136138. Accessed September 26 2023.

Mallat, Niina, "Exploring consumer adoption of mobile payments – A qualitative study", *The Journal of Strategic Information Systems,* December 2007, https://www.sciencedirect.com/science/article/abs/pii/S0963868707000480. Accessed December 10 2023.

Manshad, Muhanad Shakir, "Haptic Payment: Exploring Vibration Feedback as a Means of Reducing Overspending in Mobile Payment", *Journal of Business Research,* February 15 2020. https://doi.org/10.1016/j.jbusres.2020.08.049. Accessed October 12 2023.

Meyll, Tobias, et al. "Tapping and Waving to Debt: Mobile Payments and Credit Card Behavior", *Finance Research Letters,* May 30 2018, http://dx.doi.org/10.2139/ssrn.3145158. Accessed September 25 2023.

Meng-Yen Teoh, Wendy, "Factors affecting consumers' perception of electronic payment: an empirical analysis", *Internet Research,* 2013. https://doi.org/10.1108/IntR-09-2012-0199. Accessed August 20 2023.

Polasik, Michal, et al., "Time Efficiency of Point-of-Sale Payment Methods: Empirical Results for Cash, Cards and Mobile Payments", *Lecture Notes in Business Information Processing,* October 2013. Accessed November 13 2023.

Prelec & Loewenstein, "The Red and the Black: Mental Accounting of Savings and Debt", *Marketing Science,* 1998, https://www.cmu.edu/dietrich/sds/docs/loewenstein/redblack.pdf. Accessed December 24 2023.

Priporas, Constantinos-Vasilios, et al., "Generation Z consumers' expectations of interactions in smart retailing: A future agenda", *Computers in Human Behavior,* November 25 2016. https://doi.org/10.1016/j.chb.2017.01.058. Accessed September 19 2023.

Raghubir & Srivastava, "Monopoly Money: The Effect of Payment Coupling and Form on Spending Behavior", *Journal of Experimental Psychology: Applied,* 2008, https://www.apa.org/pubs/journals/releases/xap143213.pdf. Accessed November 24 2023.

Ramya, N, et al., "SERVICE QUALITY AND ITS DIMENSIONS", *EPRA International Journal of Research and Development*, February 2019, https://www.researchgate.net/publication/333058377_SERVICE_QUALITY_AND_ITS_DIMENSIONS. Accessed November 13 2013.

Soman, Dilip, "Effect of Payment Transparency on Consumption: Quasi-Experiments from the Field", *Marketing Letters,* 2003. https://www.researchgate.net/publication/226485295. Accessed October 12 2023.

Wang, Manlin, et al., "Pleasure of paying when using mobile payment: Evidence from EEG studies", *Frontiers Psychology,* October 25 2023. https://doi.org/10.3389/fpsyg.2022.1004068 Accessed October 13 2023.

Yu, Yining, et al., "The Impact of Mobile Payment on Hedonic Preference", *Journal of Interactive Marketing,* 2023. https://doi.org/10.1177/10949968221146997. Accessed October 12 2023.

Zellermayer, Ofer. "The pain of paying", *Department of Social and Decision Sciences, Carnegie Mellon University*, January 1996, https://www.researchgate.net/publication/280711796_The_Pain_of_Paying. Accessed December 13 2023.

"Big Tech's Role in Contactless Payments: Analysis of Mobile Device Operating Systems and Tap-to-Pay Practices", *CFPB Office of Competition & Innovation and Office of Markets,* September 7 2023, https://www.consumerfinance.gov/data-research/research-reports/big-techs-role-in-contactless-payments-analysis-of-mobile-device-operating-systems-and-tap-to-pay-practices/full-report/. Accessed September 23 2023.

"Summary: Los Angeles County", *KidsData,* Los Angeles County Summary - Kidsdata.org. Accessed August 24 2023.

Appendixes

Appendix 1. All respondents (49)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	8.33%	14.6%	45.8%	31.2%
Q2	12.5%	22.9%	25.0%	39.6%
Q3	10.4%	18.7%	37.5%	33.3%
Q4	7.41%	18.5%	44.4%	29.6%
Q5	22.9%	47.9%	16.6 %	12.5%
Q6	25.0%	31.2%	31.2%	12.5%
Q7	35.2%	29.2%	27.1%	8.33%
Q8	12.5%	31.2%	31.2%	25.0%
Q9	16.3%	38.8%	34.7%	10.2%
Q10	12.5%	20.8%	41.6%	25.0%
Q11	14.6%	20.8%	39.6%	25.0%
Q12	8.3%	14.6%	52.1%	25.0%

Appendix 2. Respondents who use NFC M-Pay often (44)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	0%	27.3%	45.4%	31.8%
Q2	6.8%	27.3%	25.0%	41%
Q3	4.5%	22.7%	41%	31.8
Q4	0%	28%	36%	36%
Q5	18.2%	60%	13.6%	9.09%
Q6	22.7%	36.4%	31.8%	6.82%
Q7	38.6%	36.4%	25%	0%
Q8	11.4%	29.5%	36.4%	18.2%
Q9	9.6%	36.4%	38.6%	15.4%
Q10	9.09%	27.4%	38.6%	25%
Q11	9.09%	25%	43.2%	22.7%
Q12	6.82%	18.2%	45.4%	25%

Appendix 3. Respondents who infrequently use NFC M-pay (5)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	40%	20%	40%	0%
Q2	40%	20%	40%	0%
Q3	20%	20%	20%	40%
Q4	0%	0%	100%	0%
Q5	0%	40%	60%	0%
Q6	60%	20%	20%	0%
Q7	60%	20%	20%	0%
Q8	40%	20%	20%	20%
Q9	40%	60%	0%	0%

Q10	20%	20%	40%	20%
Q11	40%	20%	20%	20%
Q12	20%	20%	40%	20%

Appendix 4. All female respondents (34)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	8.57%	14.3%	42.86%	34.3%
Q2	14.3%	25.7%	22.8%	37.1%
Q3	8.57%	20%	34.3%	37.1%
Q4	2.86%	2.86 %	25.7%	14.3%
Q5	22.5%	51.4%	14.3%	11.4%
Q6	25.7%	34.3%	31.4%	8.57%
Q7	37.14%	28.6%	25.7%	8.57%
Q8	8.57%	34.3%	28.6%	28.6%
Q9	17.2%	34.3%	34.3%	14.3%
Q10	14.3%	22.8%	37.1%	25.7%
Q11	14.3%	22.8%	42.8%	20%
Q12	5.17%	17.1%	45.7%	31.4%

Appendix 5. All male respondents (12)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	8.3%	25%	41.6%	25%
Q2	0%	8.3%	33.3%	58.3%
Q3	16.6%	25%	41.6%	16.6%
Q4	0%	20%	40%	40%
Q5	16.6%	50%	16.6%	16.6%

Q6	16.6%	25%	41.6%	16.6%
Q7	33.3%	41.6%	25%	0%
Q8	16.6%	33.3%	50%	0%
Q9	8.33%	41.6%	41.6%	8.33%
Q10	0%	25%	50%	25%
Q11	0%	25%	33.3%	41.6%
Q12	8.33%	25%	66.6%	0%

Appendix 6. All Non-Binary Respondents (3)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	0%	0%	100%	0%
Q2	0%	33.3%	33.3%	33.3%
Q3	0%	0%	66.6%	33.3%
Q4	0%	100%	0%	0%
Q5	33.3%	66.6%	0%	0%
Q6	33.3%	33.3%	33.3%	0%
Q7	33.3%	33.3%	33.3%	0%
Q8	33.3%	0%	33.3%	33.3%
Q9	0%	33.3%	33.3%	33.3%
Q10	0%	33.3%	33.3%	33.3%
Q11	33.3%	33.3%	33.3%	0%
Q12	33.3%	0%	66.6%	0%

Appendix 7. 13 year old respondents (1)

	Strongly Disagree	Disagree	Agree	Strongly Agree

Q1	0%	100%	0%	0%
Q2	100%	0%	0%	0%
Q3	0%	0%	100%	0%
Q4	0%	0%	100%	0%
Q5	0%	100%	0%	0%
Q6	0%	0%	100%	0%
Q7	0%	0%	100%	0%
Q8	0%	100%	0%	0%
Q9	0%	0%	100%	0%
Q10	0%	100%	0%	0%
Q11	0%	100%	0%	0%
Q12	0%	0%	0%	100%

Appendix 8. 14 year old respondents (4)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	0%	50%	25%	25%
Q2	0%	50%	0%	50%
Q3	0%	50%	25%	25%
Q4	0%	25%	50%	25%
Q5	0%	50%	25%	25%
Q6	25%	50%	0%	25%
Q7	50%	0%	50%	0%
Q8	0%	50%	50%	0%
Q9	0%	25%	75%	0%
Q10	0%	50%	50%	0%
Q11	0%	0%	75%	25%

Q12	0%	25%	50%	25%

Appendix 9. 15 year old respondents (10)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	20%	10%	30%	40%
Q2	10%	30%	30%	30%
Q3	0%	20%	40%	40%
Q4	0%	30%	20%	50%
Q5	10%	60%	10%	20%
Q6	40%	20%	30%	10%
Q7	50%	30%	20%	0%
Q8	30%	20%	40%	10%
Q9	30%	20%	30%	20%
Q10	10%	30%	20%	40%
Q11	10%	20%	40%	30%
Q12	20%	30%	10%	40%

Appendix 10. 16 year old respondents (16)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	6.25%	18.75%	43.75%	31.25%
Q2	6.25%	31.25%	25%	31.25%
Q3	6.25%	12.5%	62.5%	18.75%
Q4	0%	14.3%	57.1%	28.5%
Q5	25%	62.5%	12.5%	0%
Q6	31.25%	37.5%	25%	6.25%
Q7	31.25%	43.75%	25%	0%

Q8	25%	43.75%	25%	6.25%
Q9	18.75%	56.25%	25%	0%
Q10	12.5%	31.25%	37.5%	12.5%
Q11	18.75%	25%	31.25%	25%
Q12	6.25%	12.5%	68.75%	6.25%

Appendix 11. 17 year old respondents (18)

	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	5.55%	5.55%	61.1%	27.7%
Q2	11.1%	16.6%	27.7%	44.4%
Q3	11.1%	27.7%	16.6%	44.4%
Q4	0%	28.5%	57.1%	14.3%
Q5	27.7%	50%	11.1%	5.55%
Q6	22.2%	38.8%	38.5%	0%
Q7	44.4%	38.8%	16.6%	0%
Q8	0%	22.2%	38.8%	38.8%
Q9	11.1%	38.8%	33.3%	16.6%
Q10	11.1%	11.1%	44.4%	33.3%
Q11	11.1%	27.7%	44.4%	16.6%
Q12	5.55%	11.1%	55.5%	27.7%

Appendix 11. Survey Questions

How old are you? 13 14 15 16 17
What is your gender? Male Female Non Binary
Have you ever used Near Field Communication Mobile Payment? (at least 1 time) Yes No
Do you use Near Field Communication Mobile Payment often? Yes No
You perceive payment using NFC Mobile Payment more abstractly than with cash or card. Strongly Disagree 1 2 3 4 Strongly Agree
You feel like you spend more money using NFC Mobile Payment than with cash or card. Strongly Disagree 1 2 3 4 Strongly Agree

You feel less pain of paying using NFC Mobile Payment than cash or card. Strongly Disagree 1 2 3 4 Strongly Agree

You feel more pleasure of paying using NFC Mobile Payment than cash or card. Strongly Disagree 1 2 3 4 Strongly Agree

You feel that store prices are lower when you pay with NFC Mobile Payment rather than cash or card. Strongly Disagree 1 2 3 4 Strongly Agree

Haptic vibration (vibration that your phone makes when you pay using tap) that occurs when paying with NFC Mobile Payment increases your "pain of paying" . Strongly Disagree 1 2 3 4 Strongly Agree

Haptic vibration that occurs when paying with NFC Mobile Payment decreases your willingness to spend. Strongly Disagree 1 2 3 4 Strongly Agree

Smartphone history of NFC Mobile Payment increases your "pain of paying". Strongly Disagree 1 2 3 4 Strongly Agree

Smartphone history of NFC Mobile Payment decreases your willingness to spend. Strongly Disagree 1 2 3 4 Strongly Agree

You are willing to spend more using NFC Mobile Payment compared to cash or card because of its associated convenience. Strongly Disagree 1 2 3 4 Strongly Agree

Your NFC Mobile Payment app design/ visual appeal and service quality has a positive impact on your consumer satisfaction. Strongly Disagree 1 2 3 4 Strongly Agree

Perceived ease of use and convenience of NFC M-pay has a positive impact on your consumer satisfaction. Strongly Disagree 1 2 3 4 Strongly Agree