The Influence of Payment Method:
Do Consumers Pay More with Mobile Payment?

By

Yizhao Jiang

Claremont Graduate University
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Abstract

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The introduction of new payment methods has resulted in one of the most significant changes in the way we consume goods and services. In this paper, I present results of a field and a laboratory experiment designed to determine the effect of payment method (cash vs. mobile payment) on spending, and a meta-analysis of previous literature about payment method effect. In the field experiment, I collected cashier receipts from Chinese supermarkets. Compared to cash payment, mobile payments significantly increased the amount purchased and the average amount spent on each item. This effect was found to be particularly large for high price elasticity goods. In the laboratory experiment, participants were randomly assigned to one of four groups that varied with respect to the kind of payment and the kind of incentives, eliminating the potential endogeneity problem from the field experiment. I found that compared to cash, mobile payments lead to a significantly higher willingness to pay (WTP) for consumption. In contrast to others, I found that “pain of paying” does not moderate the payment method effect; however, other psychological factors were found to work as potential mechanisms for affecting WTP.

This paper has the following innovations: First, previous experimental studies on payment methods focused on credit cards or debit cards, which are not the primary payment methods in China. This paper uses both the lab experiment and the field experiment to confirm that the payment representation form would influence consumption. Second, the previous experiments failed to test the influence of monetary forms of the incentives due to the cash in-pocket constraint. This study uses the two-by-two groups design to avoid the problem and found the different incentives form led to a strong earmarking effect. That is, the WTP would be significantly higher if the incentives were in the same payment form as paying. Third, this paper discusses the psychological factors that may mediate the payment method effect, including the pain of paying, the BIS/BAS system, and the attitude toward mobile payment. The mechanism discussion poses important implications for both consumers, merchants, and policymakers.

Keywords: payment methods; mobile payment; consumption; pain of paying; experiment
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1. Introduction

After cash dominate payment for recent centuries, mobile payment is becoming more popular and starting to take over the dominant. In China, 347.11 trillion yuan (55 trillion dollars) banking transactions are based on mobile payment in 2019. Moreover, the third-party mobile transaction (Alipay and WeChat pay) are 249.88 trillion yuan (39 trillion dollars) in 2019. The non-cash situations dominate the most consumption situations, including convenience stores, supermarkets, restaurants, malls, even stalls, and farmers’ markets. Most previous related research is focused on the acceptance of mobile payment technology or its spreading. However, there is little research about how this change would influence the consumers’ behaviors. Does electronic pay increase consumers’ marginal propensity to consume? Due to their widespread use in daily life, mobile payments may increase domestic demand a lot.

While the classical theory concerns the amount of money, regards it as the budget constraint, the forms of money may also play an important role when consumers buy goods. Credit cards are widely considered an efficient way to stimulate consumption. According to the literatures (Thaler 1985, 1999; Prelec and Loewenstein 1998), credit cards would delay payment, separating the paying and purchasing time. This decoupling effect makes people more likely to spend. After considering the monetary costs, time costs, and other transaction costs, it may be rational not to use it (Zinman 2007). On the other hand, despite the time difference and payment cost of credit card would certainly influence the consumption behavior, lots of research found the form of the credit card may also contribute to the spending stimulus. Feinberg (1986) found the credit card would facilitate spending significantly only with their logo appearing. He concluded that it may come from the "weapons effect". This concept comes from psychology, which means that the presence of a
weapon would make subjects think more about the violent behavior and elicit subject's more aggressive responses (Berkowitz & Lepage, 1967), even the word or picture of a weapon would increase aggression-related thoughts (Anderson, Benjamin, & Bartholow, 1998). Similarly, the presence of credit cards may arouse people consuming-related behavior.

Prelec and Simester (2001) tested the results by asking willingness to pay for sports tickets. The cash salience group significantly pays less than the credit card salience group, but the difference disappears in another experiment with fixed-value goods. Raghubir and Srivastava (2008) found similar weapon effect results in an experiment that asked subjects fill out willingness to pay for a restaurant dinner. They also compared cash and gift cards and found that subjects would like to buy cheaper goods in cash, and the difference would be influenced by the transparency of the money. Soman (2003) using field experiments, tests how the different transparency of payment methods influence consumption. People using cash significantly pay less than those using cards. They conclude the effect comes from the different salience of payment methods. Reinstein and Reiner (2009) ran a lab experiment on charity giving. They found that people donated significantly less when they were paid in cash than when their allocation was only shown on the computer. Soetevent (2011) also tested the difference between cash and debit cards in the field experiment. The debit card group has a lower donation rate but a higher average donation. In empirical, Eschelbach (2017) used German consumer diary data and found that cash consumption is less likely to be regarded as unnecessary consumption after purchasing.

Several possible channels may cause the difference performance between the payment methods. Liquid constraints may prevent people from paying cash from their empty pockets. Most lab experiments would give people a financial incentive so they could use it in the experiment. In this case, earmarking effects may be at work; that is, subjects may believe the experiment incentive is earmarked for purchase in the experiment. Runnermark, Hedman, and
Xiao (2015) construct a 3-group experiment that distinguishes the money forms subjects receive and pay. They found the average bids paid with a debit card are higher than cash, and bids are lower when receiving money from their account than when receiving cash. While they considered the earmarking effect, they didn’t set up the groups that received money in an account but paid with cash due to the pocket constraint. In my experiment, I set up all four conditions to test the effect completely. Aside from the explanations provided by the reality constraint or experiment design, one widely accepted psychological mechanism is that transparency varies between different types of money. People suffered from a ‘pain of payment’ when spending money (Prelec and Loewenstein 1998,) Different forms of payment may cause varying levels of pain from payment (Zellermayer 1997), and the salience of the payment form, i.e., transparency, may influence people's willingness to pay (Soman 2003). Using a credit card would more likely focus attention on the benefit of the goods compared to cash (Chatterjee and Rose 2012). People are more likely to make impulse purchases when using credit cards (Thomas, Seenivasan, and Desai 2010). Xu, Ghose, and Xiao (2018) used bank data and found that the transaction amount increased by 2.4% after Alipay adoption.

Most of the previous literature is focused on the difference between credit cards or debit cards and cash. Would the mobile have a similar effect to cards? Falk, Kunz, Schepers, and Mrozek (2016) compared the OSPI (overall price image of retail stores) and found that mobile payments have a lower OSPI compared to cash and credit. Xun et.al. (2020) used China Family Panel Studies to find that digital finance significantly increases household consumption on a geography scale.

This paper includes a field quasi-experiment and a lab experiment. In the field part, I test the difference between cash consumption and mobile payment consumption in grocery stores and supermarkets, following Soman’s (2003) design. However, such a difference may come from the self-selection of different technology acceptance or consuming styles. Therefore, I
used a lab experiment to control the endogenous factor in this part. To eliminate the earmarking effects, I divided subjects into 2 by 2 groups that received cash/mobile transfer and paid with cash/mobile transfer. Since Prelec and Simester (2001) have different results for fixed-price goods and unknown price goods, I use two different items to separate the possible anchoring effects. Also, I test whether transparency has the same effect among people who have a different feeling of pain of paying (Rick, Cryder, and Lowenstein 2008).

2. Background and Hypothesis

2.1. Mobile Payment App

WeChat Pay and Alipay are the two dominant mobile payments in China. Alipay is a payment system owned by Alibaba, the e-commerce behemoth, that first appeared in China's mobile payment market in 2008. Alipay had a huge market share at the time since mobile payment solutions were still a new idea. WeChat Pay debuted in 2013, and it differs from Alipay in that it is a feature within WeChat, China's most popular social networking and instant messaging app. This means that users don't have to leave the app when moving from chatting with friends and posting on their timelines to purchasing online or making appointments.

Alipay and WeChat Pay have taken more than 90% of the market in recent years, with Alipay having a slightly higher share due to its early development. According to the self-reported data, 92% of people in China’s largest cities use WeChat Pay or Alipay as their main method of payment in 2020. In the first study field experiment in this paper, 89% of receipts from supermarkets were paid with WeChat Pay/Alipay.

I use WeChat Pay as the mobile payment method in the lab experiment. It provides an easy way for the experimenter to send incentives and collect payment in a face-to-face situation. In the recruiting process, all subjects confirmed that they already used WeChat Pay
before the experiment. In the questionnaire, no subjects choose “never use” WeChat Pay, and 94.87% of subjects choose “usually use” or “always use” WeChat Pay in their dairy consumption.

2.2. Simulated Trading

Simulated trading is widely used in previous studies that compared payment methods (Prelec 2000, Raghubir 2008, Bearden 2012, Runnemark 2016, Falk 2016, Boden 2020). There are two kinds of simulated trading. Some studies use questionnaires that ask the subjects to fill out their willingness to pay (WTP) for the goods. It can reduce the cost and is convenient to use on Internet surveys like Mturk or Qualtrics. The shortcoming is that the trade is virtual, and subjects may not have the incentive to report their true consumption willingness. In this study, like recent lab experiment studies, I used real goods in the simulated trading. Subjects would report their willingness to pay for the goods, and the purchase is based on the Becker-DeGroot-Marschak Mechanism. Hence, the subjects would deliberate and have the incentive to report their true value.

The Becker-DeGroot-Marschak (BDM) Mechanism comes from the Becker et al. 1964 paper. In the paper, they construct this incentive-compatible mechanism to encourage subjects to report their true estimation of the goods. The BDM mechanism is the most common way to measure the willingness to pay. In the experiment, the subjects would report their willingness to pay for the goods. However, the actual good price is determined by a random number generator. If the subject’s WTP is higher than the randomly generated price, he/she would buy the goods at that price. If the subject’s WTP is lower than the randomly generated price, he/she wouldn’t buy anything. It’s easy to prove that it’s optimal for subjects to report their true willingness to pay in such mechanisms.

2.3. Possible Mechanism
In the extensive research investigating the relationship between payment methods and consumption (Table 1), the pain of paying is considered to be the primary mechanism. Zellermayer (1996), Prelec and Loewenstein (1998) first used this term to describe the emotion that consumers experience in parting with their money. Soman (2003) used the term ‘transparency’ to conclude the different salience and timing of payment methods, and it led to different levels of pain of paying. Raghubir and Srivastava (2008), Thomas et al., (2010), Bearden & Haws (2012), Runnemark et al., (2016), Park, Lee & Thomas (2019), Boden et al., (2020), analyzed the difference between payment methods due to the pain of paying. Rick, Cryder, and Loewenstein (2008) developed a questionnaire that measures people’s consumption attitudes—whether they are spendthrifts or tightwads, which have different levels of pain of paying.

Another possible mechanism is the different level of pain of payment come from the different level of negative arousal. The BIS/BAS theory is based on Gray's (1987) reinforcement sensitivity theory of personality, which examines how people react to reward vs punishment signals. Perceiving a signal of an actual or possible threat, punishment, or loss might enhance anxiety levels in some people. An endeavor to avoid the prospective threat can result from this fear (escape). When a possible threat is sensed, the BIS system is activated, which can then activate the fight-or-flight system, according to Gray's theory (Gray, 1990; Gray & McNaughton, 2000). The BAS system may be triggered when a signal of prospective reward or gain is received, resulting to reward-based approach behaviors. The BIS and BAS collaborate to provide reward-approach and punishment-escape behaviors (Franken & Muris, 2006; Gray, 1990, 2000).
Table 1 Research on payment forms and related constructs

| Paper                        | Payment method                        | Dependent variable                                      | Mechanism                             | Experiment                      |
|------------------------------|---------------------------------------|----------------------------------------------------------|---------------------------------------|---------------------------------|
| Hirschman (1979)             | Credit card vs store-issued card       | Purchasing rate in the stores                            |                                       | 4049 surveys in the cities      |
| Feinberg (1986)              | Credit Card vs Cash                    | Tips percentage                                          | “Weapon effect”                       | 135 field surveys in restaurant |
|                              | Credit Card present stimuli vs no stimuli | Willing to spend of 7 items                           |                                       | Experiment 60 students          |
|                              |                                       | Willing to spend, decision time and motivation to spend. |                                       | Experiment 24 female students   |
|                              |                                       | How much subjects would be willing to donate            |                                       |                                 |
|                              |                                       | Actual donation                                          |                                       | 40 students experiment          |
| Prelec & Simester (2000)     | Cash vs Credit Card. Exposure to credit logos | WTP of sports ticket in the auction                      |                                       | Lab experiment 64 students      |
|                              |                                       | WTP of a $175 certificate BDM                           |                                       |                                 |
| Soman (2001)                 | Credit vs Check                        | Purchase Intention                                      | Rehearsal effect                      | Survey (Lab) 160 university students In U.S |
|                              |                                       |                                                          | Immediacy depletion                  |                                 |
| Soman (2003)                 | Photocopy Cards vs Dimes               | Photocopy pages                                          | Payment transparency; perceived pain of payment | Lab experiment 24 students      |
|                              | Prepaid laundry Cards vs Cash          | Separate white and colored clothes                      |                                       | Field experiment 232 observations |
|                              |                                       |                                                          |                                       |                                 |
| Study | Design & Condition | Dependent Variable | Research Question | Sample Size |
|-------|-------------------|-------------------|-------------------|-------------|
| Raghubir and Srivastava (2008) | Credit Card logo present vs absent | WTP | Transparency led to pain of paying | Survey 114 students from class |
| | Cash vs Credit | Estimate food cost | Field | Survey 57 students from class |
| | Gift card vs Cash | Money spent | Experiment | 28 students |
| | Gift card vs Cash | Percentage of spending the 1 dollar | 130 students experiment in class |
| Reinstein & Riener (2009) | Cash vs Account | Donation Rate to charity | Tangibility effect: Money endowment effect; More consider their sacrificing; non-remunerated tasks experiment effect. | Lab experiment 190 subjects. |
| Soetevent (2009) | Cash vs Cash-or-Debit vs Debit | Door-to-Door donation | Field experiment in Netherland. |
| Thomas et.al. (2010) | Cash vs Credit Card vs Debit Card | Unhealthy and impulsive food | Pain of paying. Deliberative evaluations. | 1000 household shopping data |
| Chatterjee & Rose (2011) | Word “Credit” vs “Cash” absent in task | Reservation price | Credit concepts prime attention to benefit, Cash concepts prime attention to cost. Immediate vs delayed | 59 students experiment in class |
| | Word “Credit” vs “Cash” absent in task | Reservation price & Recognizing flashing words | 104 students experiment in class |
| | Word “Credit” vs “Cash” absent in task | Classify flashing words to cost or benefit | 134 students experiment in class |
| | Decoy benefit and cost | Choice between two iPod and Zune | 250 students experiment in class |
| Bearden & Haws (2012) | Cash vs Existing Credit Card vs New Credit Card | CSSC (consumer spending self-control). | Pain of paying, decoupling of payment and | Survey,202 students |
| Study                          | Treatment                                | WTP                | Consumption of Credit Card                          | Survey Details                                      |
|-------------------------------|------------------------------------------|--------------------|-----------------------------------------------------|----------------------------------------------------|
| Kamleitner (2013)             | Cash vs Debit vs Credit                  | Psychological ownership, Pain of Paying | Pain of payment & the acquired of good item         | Survey, 208 subjects upon leaving stores in UK     |
| Runnemark et al. (2016)       | Cash/Card vs Cash/Card vs Card/Account  | WTP                | Pain of paying, Earmarking effect                   | Lab experiment, 82 students in Denmark             |
| Falk et al. (2016)            | Cash vs Credit Card                      | OSPI (belief that consumers hold about the overall price image of a store) | Transparency                                        | Virtual shopping, 57 graduate students             |
|                               | Mobile payment vs Cash vs Credit Card    | OSPI, WTP          |                                                     | Lab experiment, 200 subjects                       |
| Eschelbach (2017)             | Cash vs Electronic Payment               | Self-reported unnecessary transactions | Cash restrict the budget, strong signal of price.   | Bundesbanks data, 1545 diaries transactions in Germany |
| Gafeeva et al. (2017)         | Cash vs Cafeteria Card vs Multifunctional Card | Recall Accuracy | Transparency, decoupling                            | Field Interview, 496 Germany students              |
| Park, Lee & Thomas (2019)     | Cash vs Cashless (Credit and Debit Card) | Perceived health risk on purchase intentions. Electrodermal activity (EDA) in simulated shopping task. | Pain of paying, different payment methods elicit different levels of negative arousal. | Lab experiment, 104 students.                      |
| Boden et al. (2020)           | Credit vs Mobile, Cash vs Credit         | WTP                | Convenience & Pain of paying                       | Survey (Mturk)                                     |
2.4. Hypothesis

The first assertion is that the payment method would influence the willingness to pay. According to previous literature, mobile payment has lower transparency compared to cash. Hence, it induces consumers to pay more when using mobile payment.

**H1. People have a higher WTP when they paid with mobile payment.**

Earmarking effects may also play an important role in the experiment. Earmarking means people labeling money for a particular use (Soman & Cheema, 2011). In the experiment, subjects may believe the experiment incentive is earmarked for purchase in the experiment. Runnermark, Hedman, and Xiao (2015) construct a 3-group experiment that distinguishes the money forms subjects receive and pay. To develop their design, I used a 2 x 2 group design in the experiment to better separate the earmarking effect.

**H2. People have a higher WTP when they paid with the same form as they received.**

Furthermore, the type of goods may influence mobile payment (Prelec & Simester, 2000). Subjects behave differently towards goods with or without the face value. A possible mechanism is the anchoring effect, that the face value anchors a reference price of the good’s value. In the experiment, I used two goods to test the payment method effect.

**H3. The difference between the WTP of mobile payment and cash payment would be higher for goods without a face value compared to goods with a face value.**
Also, the mechanism of the payment effect is very important. In the lab experiment, the mobile payment is exogenous. The moderation of mobile payments may be the possible channels causing the effect.

**H4.** The difference between mobile vs cash WTP is influenced by subjects’ attitudes toward payment methods and psychological factors. Subjects who are more familiar with mobile payment, or less sensitive to the pain of paying would have a lower payment methods effect.

### 3. Empirical Studies

#### 3.1. Chapter 1: The Field Study of Mobile Payment in Supermarket

The goal of this study was to check whether previous literature finds work in a similar way in real consumption in China.

**3.1.1. Procedure, Data, and Design**

This study collected 2531 receipts from six supermarkets and groceries in Beijing, China. The research asked the cashier to collect the receipts that consumers don’t mind leaving in the stores, which is the most common situation. The data was collected during April and May 2018, and the six stores included four supermarkets and two local convenience stores. The receipts contain information about the store name, goods name, goods amount, price per good, total spending, purchasing time, payment method, and POS information. The receipts do not contain any private information that could identify the consumers.

The 2531 purchases were all made with cash or mobile payments (Wechat Pay and Alipay). Besides the 2531 receipts, there are about three hundred receipts that are paid with non-primary mechanisms, including debit cards, credit cards, or store-value cards. In the
following analysis, I exclude these parts since they are not the principal consumption methods in China, and there is plenty of literature already focusing on them.

The range of consumption is from ¥0.2 to ¥804.27. The mean of receipts is ¥24.32, and the median is ¥13.39. I also use the 5%-95% quantile in robustness check in case the outliers’ influence on the consumption. The receipts also include the store information and shopping time. Considering the place and time of shopping may come from different types of consumers, for example, the older may more likely go shopping in the morning and the students may prefer to go shopping after class time. Although there is certainly endogeneity that consumers paying with cash may have different consuming habits compared to paying with mobile. Using the time and location as control variables may reduce it a little bit.

I categorize all consumer goods into 13 categories: meat, vegetables, fruit, staple food, spices, leisure food, milk and dairy, drinks, cigarette and liquor, frozen food and prepared food, house goods, eggs, and others. Andreyeva, Long, and Brownell (2019) conducted a systematic review on the price elasticity of food demand. According to the elasticity coefficient in the paper and some local adjustments, I divided the goods into two groups. Meat, fruit, snack foods, milk and dairy products, cigarettes and liquor, and beverages are all part of the elastic group. On the other hand, vegetables, staple foods, spices, and egg types are marked as the inelastic group. The remaining types, including frozen and prepared foods, house goods, and others, don’t count in either group because there is huge heterogeneity in these types.

3.1.2. Results and Discussion

The descriptive data is shown in table 2. The mobile payment account for 65% of total consumption. The average purchasing amount is 3.06 items in one consumption, and the average spending is 24.32.
The figure 1 clearly shows the difference between paying with cash and paying with mobile. The cash payment has a low average spending ($M_{\text{cash}}=20.97$), consuming significantly lower (24.7%, $t=3.36$, $p=0.0004$) than mobile payment ($M_{\text{mobile}}=26.15$). The difference may come from two parts. First, when paying with cash consumers may have lower consumption desire that cause they buy less goods, especially the unnecessities. It reflects on the cash payment has fewer average purchasing goods ($N_{\text{cash}}=2.90$), 8.7% (t=1.59, $p=0.565$) lower comparing to the mobile payment ($N_{\text{mobile}}=3.15$). Second, because of paying with cash primes a higher cost attention and pain of paying, consumers would choose goods with lower price. The average spending per items in cash payment ($A_{\text{cash}}=7.99$) is 24.9% ($t=4.48$, $p=0.000$) lower comparing to mobile payment ($A_{\text{mobile}}=9.98$).
Table 3 show the OLS regression outcome. Considering the store location and the shopping time may influence the purchasing goods, I put it as the control variable in column 3-6. After controlling the time and location, consumers paying with mobile still spend 2.688 yuan more money and buy 0.341 more items than paying with cash.

Table 3: Receipts Results

|       | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|-------|-----|-----|-----|-----|-----|-----|-----|
| mobile| 5.180*** | 3.829*** | 2.688**  | 0.197*** | 0.341**  | 0.114*** | 0.311*** |
|       | (1.540) | (1.284) | (1.359)  | (0.038)  | (0.164)  | (0.033)  | (0.045)  |
| num   | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
| time  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
From the distribution graph (Appendix) we can see the highest spending are most paid by mobile. It may be due to the liquid constraint that consumers didn’t bring enough cash in the wallet. One concerning of the robustness is that these extremely values may significantly influence the general result. In column 4 and 6, I use the log form of the total spending and purchasing amount and found it doesn’t influence the result. On the other hand, I dropped the top 50 and bottom 50 spending as outliers in table 4, the payment method effect is robust.

Table 4 Elastic and Inelastic Spending

| Payment method                  | Cash   | Mobile  |
|--------------------------------|--------|---------|
| Number of receipts (N)         | 892    | 1639    |
| Average spending (Yuan)        | 20.97  | 26.15   |
| Average purchasing amount (N)  | 2.897  | 3.148   |
| Average elastic goods spending (Yuan) | 12.17  | 16.79   |
| Average inelastic goods spending (Yuan) | 6.44    | 5.59    |

Previous study (Soman 2003) has found that comparing to paying by cash, paying by credit card would buy more flexible items but not inflexible items in receipts. In this paper I
use a ten more larger dataset and the classify the group based on systemic review of the price elasticity. There are also some studies (Thomas et al., 2010, Eschelbach et al., 2017) found similar effect that card or mobile would induce more spending on unhealthy food, unnecessary goods. One possible mechanism is different payment methods elicit different levels of negative arousal (Park, Lee & Thomas). When consumers buy elasticity or flexible goods in cash, they would think more about the costs or risks and buy less goods. However, for the inelastic or inflexible goods, the necessary instead of cost may be the prime consideration during the consumption. In that case, the consuming due to difference payment methods would be much less.

3.2. Chapter 2: The Lab Study of Simulated Good Trade

Although in the receipt experiment the time and location have been controlled, there are some endogeneity problems that can’t be solved. The payment method is self-selected, and there may be some features are correlated with purchasing decision and whether use mobile payment. For example, the children or elder comparing to the students and youngers, may prefer cash more than the mobile payment. The frequency of mobile usage may both influence the consumption amount and mobile payment attitude. In the study 2, these endogeneity problems could be eliminated by randomizing the payment method in the lab experiment.

3.2.1. Procedure, Data and Design

263 subjects were recruited from the North China Electric Power University and China University of Petroleum in Dec 2018 and June 2019. Among them, 122 are females (3 subjects leave the gender question blank). All subjects are randomly divided four groups based on the last 2 digits of their student ID number.
Subjects are asked to bring 20 yuan in cash and in their mobile app to pay for the real goods. For incentive, they would get 30 yuan for participation, but it may be not the form they paid. In Runnemark et.al (2016) paper, they didn’t set the group paying in cash and get incentive in other forms (credit card in their study) in the simulating trade. It due to subjects may not carry enough cash. In this study, the subjects are asked to bring 20 yuan to the lab in advance. Therefore, this study can eliminate the budget constraint problem and separate the paying effect and receiving effect.

The four groups are 2 by 2 design: receiving cash/mobile payment as the participation incentive, paying with cash/mobile payment to purchase the good. In each group, subjects fill out their WTP of two different goods.

In the Cash/Cash group, the subjects get 30 Yuan cash as incentive after the experiment, and they need to pay cash to purchase the goods. In the Cash/Mobile group, the subjects get cash as incentive and pay with mobile paying app (WeChat Pay). Similarly, in the Mobile/Mobile group, subjects get mobile transfer as the incentive and pay with mobile app. In the Mobile/Cash group, subjects get mobile transfer as the incentive and pay in cash.

Subjects are asked to fill out the Willing to Pay (WTP) of two goods in the simulated trade. After collecting the subjects’ WTP, the price is determined by BDM mechanism. Then, subjects fill out the questionnaire including psychology questions, their attitudes about mobile payment and demography questions. In this study, I introduce the BDM mechanism to subjects after the introduction part. To make sure subjects could understand the mechanism, I set up an example and exercise run before the formal purchasing. 91% subjects answer the example question correctly. In experiment, subjects are asked to fill out their WTP at first, then I use an online random number generator to determine the price.

To test whether the cash forms are consistent in different types of goods, the subjects are asked to fill the WTP of both goods, then only one type would be randomly chosen as their
purchasing good. The two types of goods are a 20-yuan McDonald gift card, which has a fix
cash value, and a 20-yuan valued mug, which the subjects do not know the exact price. The
goods are shown to subjects after introduction part.

3.2.2. Results

Table 5(Appendix) shows the descriptive data of study 2. The BIS-BAS study is only
tested in China University of Petroleum.

The average WTP of subjects is listed in Graph 2. The average WTP is 8.9% and 10.5%
higher in mobile payment groups than in cash groups for mugs and McDonald's gift cards.
The distribution graph (Graph 3A, Appendix) shows the difference does not come from
corner bidding like 0 or 20, but from the whole bidding range. The Calmative Distribution
Function (CDF) graph (Graph 3B, Appendix) shows that the bidding from the mobile
payment group is First Order Stochastic Dominance (FOSD) to the cash group bidding, that
is, mobile payment bidding has a lower CDF than the cash group in any quantile. Besides,
from the distribution graph, we can know that the subjects have an integer preference.
Similiar to Whipple preference in demographer, subjects are more likely to choose WTP
ending with digit 0 or 5.
To control other factors that may affect WTP, I list the OLS regression result in Table 6. Column 1 shows the WTP with mobile payment is significantly higher than cash mobile payment (p<0.05). Column 2 takes consideration of the earmarking effect, that is subjects are more likely to spend money when they get incentive with same form as the paying. This effect is significant positive. A possible explanation is when subjects get money in cash but pay with mobile (or in opposite, get money with mobile but pay in cash), they may think the money is categorized to two different mental accounting. Therefore, the spending may incur the loss aversion and have a lower WTP. For the subjects in Cash/Cash group or Mobile/Mobile group, they have a positive gain of money in only one form. So, they would have a higher WTP comparing to the other two groups.

The column 3 to 6 take control of other experiment factors and some demography factors. The mobile payment effect is significant and robust after considering these factors. Beside the mobile payment effect and the earmarking effect that already found significant in previous columns, the good types and gender is significant. Female report lower WTP than male.
Subjects have different WTP of the two goods, but the interaction term of good types and mobile payment effect is close to zero, indicates the good types that whether the goods have the fixed face-value may not influence the mobile payment effect.

| Good Type (McDonald) | (1)  | (2)  | (3)  | (4)  | (5)  | (6)  |
|----------------------|------|------|------|------|------|------|
| Mobile               | 0.859** | 0.822** | 1.015** | 1.074* | 0.123** | 0.139*** |
|                      | (0.405) | (0.400) | (0.397) | (0.561) | (0.049) | (0.069) |
| Incentive            | 1.479*** | 1.618*** | 1.618*** | 0.179*** | 0.179*** |
|                      | (0.399) | (0.394) | (0.394) | (0.049) | (0.049) |
| Location             | -0.024 | -0.024 | -0.006 | -0.006 |
|                      | (0.397) | (0.398) | (0.049) | (0.049) |
| Good Type            | -2.143*** | -2.090*** | 0.274*** | 0.260*** |
|                      | (0.392) | (0.533) | (0.048) | (0.066) |
| Female               | -0.962** | -0.962** | -0.124** | -0.124** |
|                      | (0.400) | (0.400) | (0.049) | (0.049) |
| Income               | -0.039 | -0.040 | -0.005 | -0.005 |
|                      | (0.119) | (0.119) | (0.015) | (0.015) |
| c.Mobile#c.Good      | -0.116 | -0.31 | -0.031 |
|                      | (0.787) | (0.097) |             |
| _cons                | 9.124*** | 8.381*** | 10.901*** | 10.875*** | 2.333*** | 2.327*** |
|                      | (0.275) | (0.338) | (0.853) | (0.872) | (0.106) | (0.108) |
| N                    | 526 | 526 | 518 | 518 | 506 | 506 |
| r2                   | 0.009 | 0.034 | 0.098 | 0.098 | 0.098 | 0.098 |
| r2_a                 | 0.01 | 0.03 | 0.09 | 0.09 | 0.09 | 0.09 |

3.2.3. Mechanism Analysis

What is the mechanism that causes the difference between the payment methods? Most of the previous literature argues that the pain of paying may be the import channel. The transparency of different payment methods is varied, so consumers experience distinct levels of cost salience.

To test the channel of pain of paying, I used the ST-TW scales (Lowenstein 2008) to measure the individual difference in pain of paying. The subjects with a high ST-TW score, the spendthrifts, anticipate little pain of paying than ideally. The tightwads, by contrast, have
a low ST-TW score and more anticipatory pain of paying. If the pain of paying plays a significant role, we should expect the tightwad type to be more sensitive to payment transparency. However, as shown in Table 7 (Appendix), neither the ST-TW scores nor types significantly influence the WTP, and the interaction with the payment method is not significant. The pain of paying may not be the crucial reason for the mobile payment difference.

Another possible channel is the approach and avoidance motivational systems of consumption behavior, based on Gray’s reinforcement sensitivity theory (Gray 1970, 1982, 1987). I use the BAS/BIS scale to measure the subjects’ motivation and inhibition personality. The Behavioral Inhibition System (BIS) corresponds to motivation to avoid aversive outcomes, which is the cost of paying for consumption. The behavioral activation systems (BAS) include BAS Drive, measuring the motivation to follow one’s goals; BAS Reward Responsiveness, measuring the sensitivity to pleasant reinforcers in the environment; and BAS Fun Seeking, measuring the motivation to find novel rewards spontaneously. Table 8 shows the result of the model with BIS/BAS scores. There is a significant negative interaction between the BAS Drive score, the BAS Reward Responsiveness scores and the mobile payment ($\beta = -0.058, p < 0.05; \beta = -0.070, p < 0.05$). This result indicates the behavioral activation system mitigates the mobile payment method. The behavioral inhibition system, similar to the pain of paying, doesn’t interact with the payment method or influence the WTP.

The third possible channel is the attitude and familiarity of mobile payment. Trust, perceived security, and payment culture are varied among consumers. One favor of mobile payment and frequent use of it may underestimate the mobile payment effect. In contrast, those who believe mobile payment causes the overspending problem, may intentionally reduce their consumption when using mobile. In the experiment, the questionnaire collected
five questions about the frequency of payment methods, two questions about the comparison of mobile payment and cash payment, eight questions about the subjects’ attitude towards mobile payment and cash. For convenience's sake, the eight attitude questions could be categorized into two aspects. I set two score variables: stdA, which represents the attitude of whether the mobile payment is good (convenient/safer), and stdP, which represents the attitude of whether the mobile payment led to overspending.

Table 9 shows that attitude doesn’t significantly influence the difference between mobile paying and cash paying. The acceptance or favor of mobile payment may not moderate the mobile payment effect, which indicates the taste of mobile payment is not the channel that causes the difference in WTP.

Are there any other factors that may be involved in the mechanism? Graphs 4–7(Appendix) show the results from the Principal Component Analysis (PCA) method. The PCA method reduces the question dimensions to four factors. Factor 1 represents the frequency and attitude towards mobile payments and cash. Factor 2 represents the belief that mobile payments contributed to the overspending problem. Factor 3 represents the attitude toward whether mobile payment improves one's life or reduces the pain of paying. Factor 4 represents the frequency of using debit/credit cards in their daily life. Table 10(Appendix) shows the regression including these factors. Only the first factor is significant. That is, the subjects' favoring mobile payment would have a higher WTP. However, no interaction terms are significant. The results show the mobile payment effect is stable (about 10%–11%) when each factor is considered.

3.3. Chapter 3: A meta-analysis of the payment method effect

I conducted a meta-analysis on payment method studies to compare the experiment results with the literature. Since mobile payment is a relevant new method and I don’t have enough
paper about it, I also investigated the paper about credit cards, debit cards, and scrips, which allowed me to have an overview of the effect size.

3.3.1. Searching Strategy

A search of the economics literature for results of payment method experiments using Elsevier, Google Scholar, and references cited in Feinberg's (1986) payment method paper.

The searching keywords are:

“Payment method” Or “Cash” Or “Card” Or “Mobile” Or “Pain of Paying”

And “WTP” Or “Willingness to pay” Or “Consumption” Or "Consumer Behavior"

3.3.2. Selection

The criteria for including the candidate studies from the bibliographic sources are:

- Comparing the behavior results from using different payment methods
- Using the survey or experiment method and reported group-level results for the outcomes
- The outcome is based on the payment, including the WTP, or estimated consumption, or actual expense, or reservation price.

After the selection, 44 studies (17 papers) remained in the analysis, including the previous 2 studies in this paper. The outcome other than the amount of pay is excluded from the study to make it comparable, such as the pain of paying, recall error, or reaction time. For the effect size measure, I chose the standardized mean difference to estimate the effect.

3.3.3. Literature Descriptive and Moderator
I abstracted bibliographic details and summarized them in Table 11. The effect size is calculated by the mean, sd, and N, or the F test result. For studies using more than one type of good, I use the sample mean and standard error of effect size as the study effect size.

Table 11: Selected parameters for experiments included in the meta-analysis

| Author                        | Year  | Study | Dependent Variable | Realize | Stude nt | Group           | U S | COHEN'S D | SD   |
|-------------------------------|-------|-------|--------------------|---------|----------|-----------------|-----|-----------|------|
| Feinberg                      | 1986  | 1     | WTP                | 0       | 1        | credit absent/present | 1   | 1.09      | 0.28 |
| Feinberg                      | 1986  | 2     | WTP                | 0       | 1        | credit absent/present | 1   | 0.98      | 0.43 |
| Feinberg                      | 1986  | 3     | Estimate Donation  | 0       | 1        | credit absent/present | 1   | 0.65      | 0.32 |
| Feinberg                      | 1986  | 4     | Actual Donation    | 1       | 1        | credit absent/present | 1   | 1.31      | 0.40 |
| McCall&Bellmont               | 1996  | 1     | Tips               | 1       | 0        | credit vs cash      | 1   | 0.84      | 0.30 |
| McCall&Bellmont               | 1996  | 2     | Tips               | 1       | 0        | credit insignia vs blank | 1   | 0.85      | 0.40 |
| Monger, Jodie, Feinberg, and Richard | 1997  | 1     | Reservation price  | 0       | 1        | credit vs check/cash /non specific | 1   | 0.50      | 0.18 |
| Shimp&Moody                   | 2000  | 1     | WTP                | 0       | 1        | credit absent/present | 1   | 0.30      | 0.29 |
| Shimp&Moody                   | 2000  | 2     | WTP                | 0       | 1        | credit absent/present at goods | 1   | -0.14     | 0.30 |
| Shimp&Moody                   | 2000  | 2     | WTP                | 0       | 1        | credit absent/present | 1   | -0.04     | 0.29 |
| Prelec&Simester               | 2001  | 1     | WTP                | 1       | 1        | credit vs cash      | 1   | 2.81      | 0.37 |
| Prelec&Simester               | 2001  | 2     | WTP                | 1       | 1        | credit vs cash      | 1   | -1.72     | 0.25 |
| Prelec&Simester               | 2001  | 2     | WTP                | 1       | 1        | credit vs cash (with) | 1   | 3.68      | 0.37 |
|                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Soman          | 200 3          | 1              | Photocopy pages| 1              | 1              | photocopy card vs cash | 1              | 0.31           | 0.15           |
| Soman          | 200 3          | 3              | Supermarket Expenses of Flexible Items | 1              | 0              | credit vs cash | 1              | 0.76           | 0.19           |
| Soman          | 200 3          | 3              | Supermarket Expenses of Flexible Items | 1              | 0              | credit vs check | 1              | 0.39           | 0.19           |
| Raghubir&Srivastava | 200 8        | 1              | WTP            | 0              | 1              | credit absent/present | 1              | 0.38           | 0.19           |
| Raghubir&Srivastava | 200 8        | 2              | Estimate Cost(host ilic) | 0              | 1              | credit vs cash | 1              | 0.79           | 0.40           |
| Raghubir&Srivastava | 200 8        | 3              | Average amount spent per item | 0              | 1              | scrip vs cash | 1              | 0.12           | 0.05           |
| Thomas, Desai, and Seenivasan | 201 1    | 2              | Vice Food Planning Consumption | 0              | 1              | credit vs cash | 1              | 0.44           | 0.18           |
| Thomas, Desai, and Seenivasan | 201 1    | 3              | Vice Food Planning Consumption | 0              | 1              | credit vs cash | 1              | 0.52           | 0.26           |
| Moore&Taylor   | 201 1          | 1              | WTP            | 0              | 1              | debit card logo vs cash | 1              | 0.51           | 0.27           |
| Chatterjee&Rose | 201 2         | 1              | Reservation price | 0              | 1              | credit vs cash | 1              | 0.51           | 0.26           |
| Chatterjee&Rose | 201 2         | 2              | Reservation price | 0              | 1              | credit vs cash | 1              | 0.45           | 0.20           |
| Chatterjee&Rose | 201 2         | 3              | Reservation price | 0              | 1              | credit vs cash | 1              | 0.61           | 0.18           |
| Nakajima&Izumida | 201 4         | 1              | WTP            | 0              | 1              | credit absent/present | 0              | 0.33           | 0.21           |
| Author(s)                        | Year | Study Type | Treatment 1 | Treatment 2 | Comparison | WTP 1 | WTP 2 | WTP 3 |
|---------------------------------|------|------------|-------------|-------------|-----------|-------|-------|-------|
| Falk, Kunz, Scheipers, and Mrozek | 2016 | WTP        | 0           | 0           | credit vs cash | 0   | 0.27  | 0.19  |
| Falk, Kunz, Scheipers, and Mrozek | 2016 | WTP        | 0           | 0           | mobile vs cash | 0   | 0.41  | 0.20  |
| Runnemark, Hedman, and Xiao     | 2016 | WTP        | 1           | 1           | debit card vs cash | 0   | 0.50  | 0.28  |
| Boden                           | 2020 | WTP        | 0           | 0           | credit vs cash | 1   | -0.19 | 0.43  |
| Boden                           | 2020 | WTP        | 0           | 1           | credit vs cash | 0   | 0.10  | 0.44  |
| Boden                           | 2020 | WTP        | 0           | 0           | credit vs cash | 1   | 0.22  | 0.14  |
| Liu, Luo, and Zhang             | 2020 | WTP        | 0           | 1           | mobile vs cash | 0   | 0.60  | 0.21  |
| Liu, Luo, and Zhang             | 2020 | WTP        | 0           | 1           | mobile vs cash | 0   | -0.20 | 0.40  |
| Liu, Luo, and Zhang             | 2020 | WTB        | 0           | 1           | mobile vs cash | 0   | 0.21  | 0.21  |
| Liu & Dewitte                   | 2021 | WTP        | 0           | 0           | credit vs cash | 1   | 0.03  | 0.18  |
| Liu & Dewitte                   | 2021 | WTP        | 0           | 0           | debit vs cash | 1   | -0.02 | 0.17  |
| Liu & Dewitte                   | 2021 | WTP        | 0           | 0           | credit vs cash | 0   | 0.12  | 0.23  |
| Liu & Dewitte                   | 2021 | WTP        | 0           | 0           | credit vs cash | 0   | -0.01 | 0.18  |
| Liu & Dewitte                   | 2021 | Basket Value| 0           | 0           | credit vs cash | 1   | -0.04 | 0.17  |
| Liu & Dewitte                   | 2021 | Basket Value| 0           | 0           | credit vs cash | 0   | 0.53  | 0.23  |
| Liu & Dewitte                   | 2021 | Basket Value| 0           | 0           | credit vs cash | 0   | 0.13  | 0.18  |
| Yizhao                          | 2022 | Consumption| 1           | 0           | mobile vs cash | 0   | 0.14  | 0.04  |
| Yizhao                          | 2022 | WTP        | 1           | 1           | mobile vs cash | 0   | 0.19  | 0.09  |

### 3.3.4. Results

The heterogeneity (Q value) is significant ($Q = 93.085, p 0.001$), which indicates the studies are not from the same population. So, I chose the random effect to estimate the effect size. Graph 9 shows the forest plot of the payment method. The average effect is...
0.388(0.067). According to Cohen's critique, it's a small effect and significant. Graph 10 shows the cumulative forest plot, which indicates the payment method effect has weakened over time. One possible explanation is that consumers are more familiar with the new payment methods such as cards or mobile payments, so they would be aware of the overspending problem. The new technology such as real-time spending notifications or expense patterns reports would remind you more about your consumption. Also, with the increasing use of new payment methods and technology, the "new" payment method is more familiar to consumers and has been one of the benchmarks of consumption.

Graph 9: The Forest Plot of the payment method effect
Graph 10: The Cumulative Forest Plot of the payment method effect
3.3.5. Sensitive Analysis and Publication Bias

Graph 11 shows the result of the one-study-removed procedure. The payment method is not influenced by the outlier studies. Another concern is publication bias: researchers favor positive results and report them asymmetrically. Graph 12 uses the funnel plot to test the effect. The graph shows most studies are in the range of the funnel, and there is a small asymmetric that more studies are on the positive side rather than the negative. After considering the publication, the average effect is around 0.2, a relatively small effect but still
significant. Compared to the effect size of my previous two studies, which effect sizes are 0.14 and 0.19, there is no big difference between the experiment and literature.

Graph 12: Funnel Plot of the payment method effect

3.3.6. Meta-Regression

Table 11 shows the result of the meta-regression. The possible moderators include: the location: whether the experiment is conducted in the US; the type of experiment: lab experiment or field experiment; the subjects: whether the subjects are college students; And the incentives: whether the purchase is realized. The table shows that the location is marginally significant. The payment effect in the US is higher than in other countries, which may come from the different consumption habits. The incentive is significant, which is not surprising that the effect is stronger when actual purchasing happens.

Table 11: Meta-Regression Results

| Variable | (1)   | (2)   | (3)    |
|----------|-------|-------|--------|
| US       | 0.1415| 0.1581| 0.1642 |
|          | (0.0895)| (0.094) | (0.0995) |
| Field    | -0.0634| -0.0857|        |
|          | (0.1025) |       | (0.1192) |
In general, the meta-analysis suggests there is a small and significant effect of the payment method influence, and the effect size is similar to my previous two studies. Moreover, there are some factors that may influence the effect, like the location or incentive. The specific payment method may also be a moderator, but there are not enough studies yet to test it.

4. Conclusion

4.1. Research contributions

Payment methods significantly influence consumption behaviors. Following the literature analyzing credit cards (Feinberg, 1986; Prelec & Simester, 2001; Hafalir & Loewenstein, 2009; Chatterjee & Rose, 2011), debit cards (Thomas et.al. 2010, Ruunemark 2015, Park et.al. 2019), account (Reinstein & Riener, 2009), gift certificates (Raghubir & Srivastava, 2008), pre-paid cards (Soman, 2003), and cash denominations (Raghubir & Srivastava, 2009), this paper focuses on mobile payment, which is burgeoning and prevalent in China. This article adds to the research on payment methods, provides added validity by using both the field experiment, and the lab experiment with actual goods. Compared to questionnaires collected from online platforms like Amazon Turk, the subjects would take the simulating trade more seriously since they eventually pay the money and get the goods.
This article also overcomes the problem of earmarking effect. Due to the limitation that subjects may not bring enough cash to the experiment, most previous studies either ignore the payment modes of incentive or just mention it in the discussion. In our experiment, the four groups (Cash/Cash, Cash/Mobile, Mobile/Cash, Mobile/Mobile) separated the mobile payment effect and the earmarking effect, show that both these effects significantly increase the willingness to pay of consumers.

The meta-analysis confirms the payment method had a significant impact. It’s not sensitive to the outlier study result. The publication bias exists but is not strong enough to influence the direction of effect size. However, the effect size has weakened over time. The location of studies and whether the subjects get the real goods would be the moderators that influence the effect size.

Moreover, this paper also builds a bridge between the psychological factors and the payment effects. In contrast to previous ideas that the pain of paying is the primary mechanism of the payment method difference, the different levels of pain of paying don’t significantly influence the WTP in this experiment. Instead, the BAS system significantly interacts with mobile payments. Also, the attitude of mobile payment and the frequency of relevant payment methods don’t moderate the mobile payment effect. This result may come from two possible explanations: First, the different payment progress involves deeper psychological mechanisms that work similarly for all subjects, even if they may have different consumption attitudes. Second, the lab experiment subjects’ pool is all from undergraduate students in China. They are all familiar with the mobile payment and have similar lifestyles on campus, the heterogeneity of consumption behaviors and attitudes may not be large enough. However, as the representative of youth generation consumers, these subjects signal the primary consumer’s behavior in the close future.

4.2. Managerial implications
There are implications both for consumers, merchants, and policymakers. For consumers, if they worry about the overspending problem, switching the payment method to cash may significantly reduce their elastic consumption. For merchants, encouraging mobile payment is profitable. It can increase both purchasing amount and average spending of consumers. For the policymakers, the new technology development is beneficial for stimulating domestic demand. It also can be used as a nudge to foster public services. For the countries which the mobile payment is not so popular at now, the adoption of mobile payment is a potential economic engine. On the hand, it should be careful of the goods that are addictive or correlated to the overspending problem, the regulations of payment may be needed to increase consumers’ financial awareness. It may also increase the velocity of money, causing the worry of inflation problems.

4.3. Limitations and future research

This research has two limitations. First, this study was conducted in China and focuses on undergraduate students. They are very familiar with mobile payment and are in favor of the new technology. The external validity needs to be tested in further studies that replicate in other countries and with older generations.

Second, the endogeneity problem couldn’t be excluded due to the data limitation in the field experiment part. If there was tracking data on consumer spending, the DID method would be a better tool for analyzing the effect. I would recommend researchers and relevant merchants could cooperate directly and test the payment effect more accurately with the actual consumption data.
## Appendix.1 Tables and Graphs

### Table 2: Descriptive statistics

| VarName           | Describe                                      | Obs  | Mean | SD     | Min  | Median | Max  |
|-------------------|-----------------------------------------------|------|------|--------|------|--------|------|
| mobile            | Payment Method (Cash=0, Mobile=1)             | 2531 | 0.65 | 0.478  | 0    | 1      | 1    |
| num               | Purchasing amount                             | 2531 | 3.06 | 3.812  | 1    | 2      | 64   |
| spending          | Total Spending (Yuan)                         | 2531 | 24.32| 37.096 | .2   | 13.39  | 804.27|
| meat              | Meat Consumption (Yuan)                       | 148  | 41.58| 53.206 | 2    | 23.735 | 388.15|
| veg               | Vegetable Consumption (Yuan)                  | 935  | 7.84 | 9.083  | .6   | 5.4    | 159.05|
| fruit             | Fruit Consumption (Yuan)                      | 837  | 20.81| 18.996 | 1    | 15.2   | 201.1 |
| staplefood        | Staple Food Consumption (Yuan)                | 342  | 11.02| 10.271 | 1    | 8      | 91.7  |
| spices            | Spice Consumption (Yuan)                      | 196  | 14.05| 24.676 | 1.1  | 8.5    | 238.4 |
| leisurefood       | Leisure Food Consumption (Yuan)               | 254  | 18.71| 26.472 | 1    | 10.035 | 230.2 |
| dairy             | Dairy Consumption (Yuan)                      | 300  | 14.64| 15.353 | 1.8  | 9.9    | 104.9 |
| drink             | Drink Consumption (Yuan)                      | 346  | 8.40 | 14.375 | 1    | 5      | 196.6 |
| cigandliquor      | Cigarette and liquor Consumption (Yuan)       | 120  | 22.96| 46.803 | 2    | 15     | 500   |
| frozenfood        | Forzen Food Consumption (Yuan)                | 161  | 16.97| 16.688 | 2    | 12.6   | 103.6 |
| housegoods        | House Good Consumption (Yuan)                 | 161  | 29.15| 30.117 | 2    | 20.8   | 256.5 |
|          | Egg Consumption (Yuan) | 94  | 11.18 | 5.965 | 1.5  | 10.55 | 32  |
|----------|------------------------|-----|-------|-------|------|-------|-----|
| other    | Other Consumption (Yuan) | 51  | 9.11  | 12.753 | 1 | 5 | 78.6 |
| store    | Store ID               | 2531 | 2.40  | 1.216 | 1 | 2 | 5  |
| time     | Purchasing time (24 hour) | 2528 | 14.85 | 3.609 | 0 | 16 | 29 |
| elast    | Elasticity Good (Yuan)  | 2531 | 15.16 | 30.718 | 0 | 7 | 804.25 |
| inelast  | Inelasticity Good (Yuan) | 2531 | 5.89  | 13.037 | 0 | 0.6 | 304.25 |

Graph 3A: Cash Distribution

Graph 3B: CDF Graph (Cash: Black Line vs Mobile: Gray Line)
Table 5: Descriptive statistics

| VarName       | Describe                                                                 | Obs | Mean  | SD    | Min | Median | Max  |
|---------------|---------------------------------------------------------------------------|-----|-------|-------|-----|--------|------|
| WTP           | Willing to pay of the Good (Yuan)                                         | 526 | 9.52  | 4.648 | 0   | 10     | 20   |
| Received      | Payment method that subjects receiving inventiveness                      | 526 | 0.51  | 0.500 | 0   | 1      | 1    |
| Mobile        | Payment method that subjects pay for the goods                             | 526 | 0.46  | 0.499 | 0   | 0      | 1    |
| Same          | Whether the receiving and payment are same form                           | 526 | 0.51  | 0.500 | 0   | 1      | 1    |
| Good          | The selling goods                                                          | 526 | 0.50  | 0.500 | 0   | 1      | 1    |
| Exp           | The first experiment or second experiment                                  | 526 | 0.45  | 0.498 | 0   | 0      | 1    |
| Q2TSform      | Self-report of tightwad or spendthrift.                                   | 511 | 0.79  | 1.755 | -5  | 1      | 5    |
| Q3Aspending   | Spendthrift question.                                                      | 519 | 2.87  | 0.853 | 1   | 3      | 5    |
| Q3BNspending  | Tightwad Question.                                                         | 514 | 2.42  | 0.820 | 1   | 2      | 4    |
| Q4MrAorB      | Tightwad or Spendthrift question based on scenario.                        | 525 | 2.83  | 0.987 | 1   | 3      | 5    |
| Question | Description | Min | Max | Mean | SD | Median | Mode |
|----------|-------------|-----|-----|------|----|--------|------|
| Q5freqCash | Self-report consumption frequency of cash. Min 1 Never use, Max 5 Always use. | 526 | 2.04 | 0.476 | 1 | 2 | 4 |
| Q5freqDebit | Self-report consumption frequency of debit card | 524 | 2.15 | 1.141 | 1 | 2 | 5 |
| Q5freqCred | Self-report consumption frequency of credit card | 522 | 1.26 | 0.642 | 1 | 1 | 4 |
| Q5freqAli | Self-report consumption frequency of mobile payment (Alipay) | 524 | 4.05 | 1.022 | 1 | 4 | 5 |
| Q5freqWechat | Self-report consumption frequency of mobile payment (WeChat Pay) | 526 | 4.55 | 0.624 | 2 | 5 | 5 |
| Q6favorofpayment | Self-report favor of payment method. Min -5 favor of cash, Max 5 favor of mobile payment | 525 | 3.73 | 1.556 | -4 | 4 | 5 |
| Q7frequency | Self-report consumption frequency of mobile payment vs cash. Min -5 using cash, Max 5 using mobile payment. | 523 | 4.00 | 1.007 | -4 | 4 | 5 |
| Q8Aattitude | Self-report attitude about mobile payment. Mobile payments are more convenient. Min -5 totally disagree, Max 5 totally agree. | 526 | 4.35 | 1.099 | -5 | 5 | 5 |
| Q8B | Mobile payments lead to overspending | 525 | 2.88 | 2.530 | -5 | 4 | 5 |
| Q8C | Mobile payments are safer | 526 | 3.18 | 1.985 | -5 | 3 | 5 |
| Q8D | Mobile payments bring a better lifestyle | 524 | 1.44 | 2.607 | -5 | 2 | 5 |
| Q8E | Mobile payment has less pain of paying | 526 | 3.39 | 1.588 | -3 | 4 | 5 |
| Q8F | I consider less about price when I use mobile payments | 524 | -0.60 | 3.172 | -5 | -1 | 5 |
| Q8G       | I can control my spending better when I use cash | 524 | 1.18 | 2.980 | -5 | 2 | 5 |
|-----------|-------------------------------------------------|-----|------|-------|----|---|---|
| Q8H       | I feel the cash is a more convenient payment method | 524 | -3.01 | 2.056 | -5 | -3 | 5 |
| Female    | Sex of subjects. Dummy variable, male=1, female=2 | 520 | 1.47 | 0.499 | 1 | 1 | 2 |
| Q12averageusingtime | Daily ceiling using time. 1: Below half hour. 2: Half hour to one hour. 3: One to three hours. 4: Three to five hours. 5: Five to eight hours. 6: More than eight hours. | 520 | 4.29 | 0.790 | 3 | 4 | 6 |
| Income    | All sources personal income. 1: Below 500 Yuan. 2: 500 to 1000 Yuan. 3: 1000 to 1500 Yuan. 4: 1500 to 2000 Yuan. 5: 2000 to 3000 Yuan. 6: 3000 to 5000 Yuan. 7: More than 5000 Yuan. 8: Confidential (Not including in the form) | 518 | 4.04 | 1.664 | 1 | 4 | 8 |
| Exam      | 1: Pass the BDM test question. 2: fail in test | 431 | 1.09 | 0.280 | 1 | 1 | 2 |
| BASDR     | BAS Drive | 237 | 11.87 | 2.043 | 5 | 12 | 16 |
| BASF      | BAS Fun Seeking | 237 | 12.51 | 1.865 | 8 | 13 | 16 |
| BASRR     | BAS Reward Responsiveness | 237 | 17.06 | 2.125 | 9 | 17 | 20 |
| BISA      | BIS | 237 | 20.24 | 3.211 | 12 | 20 | 28 |
Table 7: ST-TW Results

|      | (1)                    | (2)                    | (3)                    | (4)                    |
|------|------------------------|------------------------|------------------------|------------------------|
|      | logWTP                 | logWTP                 | logWTP                 | logWTP                 |
| Pay  | 0.136***               | 0.124**                | 0.136***               | 0.146                  |
|      | (0.051)                | (0.049)                | (0.051)                | (0.163)                |
| same | 0.193***               | 0.178***               | 0.195***               | 0.181***               |
|      | (0.050)                | (0.049)                | (0.051)                | (0.049)                |
| Exp  | 0.014                  | -0.007                 | 0.016                  | -0.008                 |
|      | (0.051)                | (0.050)                | (0.051)                | (0.050)                |
| Good | -0.259***              | -0.274***              | -0.259***              | -0.273***              |
|      | (0.050)                | (0.049)                | (0.050)                | (0.049)                |
| Q11gendermale1 | -0.154***              | -0.124**               | -0.152***              | -0.124**               |
|      | (0.052)                | (0.050)                | (0.052)                | (0.050)                |
| Q13income | -0.006                 | -0.005                 | -0.005                 | -0.005                 |
|      | (0.016)                | (0.015)                | (0.016)                | (0.015)                |
| STTWm| 0.013                  | 0.017                  |                        |                        |
|      | (0.009)                | (0.012)                |                        |                        |
| 0b.STtype | 0.000                 |                        | 0.000                  |                        |
|      | (0.000)                |                        | (0.000)                |                        |
| 1.STtype | 0.021                 |                        | 0.012                  |                        |
|      | (0.086)                |                        | (0.111)                |                        |
| 2.STtype | 0.011                 |                        | 0.103                  |                        |
|      | (0.099)                |                        | (0.133)                |                        |
| c.Pay#c.STTWm |                        | -0.007                 |                        |                        |
|      |                        | (0.017)                |                        |                        |
| 0b.STtype#co.Pay |                       |                        | 0.000                  |                        |
|      |                        |                        | (0.000)                |                        |
| 1.STtype#c.Pay |                       |                        | 0.020                  |                        |
|      |                        |                        | (0.173)                |                        |
| 2.STtype#c.Pay |                       |                        | -0.174                 |                        |
|      |                        |                        | (0.195)                |                        |
|          | (1)          | (2)          | (3)          | (4)          | (5)          |
|----------|--------------|--------------|--------------|--------------|--------------|
| _cons   | 2.363***     | 2.318***     | 2.358***     | 2.310***     |              |
|          | (0.110)      | (0.124)      | (0.111)      | (0.141)      |              |
| N        | 476          | 506          | 476          | 506          |              |
| r2       | 0.103        | 0.098        | 0.103        | 0.103        |              |
| r2_a     | 0.09         | 0.08         | 0.09         | 0.08         |              |

Table 8: BIS/BAS Results

|          | logWTP       | logWTP       | logWTP       | logWTP       | logWTP       |
|----------|--------------|--------------|--------------|--------------|--------------|
| Pay      | 0.276***     | 0.273***     | 0.264***     | 0.260***     | 0.297***     |
|          | (0.071)      | (0.072)      | (0.072)      | (0.072)      | (0.071)      |
| same     | 0.186***     | 0.218***     | 0.221***     | 0.206***     | 0.216***     |
|          | (0.071)      | (0.072)      | (0.072)      | (0.072)      | (0.074)      |
| Good     | -0.274***    | -0.273***    | -0.272***    | -0.272***    | -0.274***    |
|          | (0.070)      | (0.071)      | (0.070)      | (0.071)      | (0.069)      |
| Q11gender| -0.110       | -0.102       | -0.079       | -0.096       | -0.111       |
|          | (0.072)      | (0.073)      | (0.073)      | (0.073)      | (0.073)      |
| Q13income| 0.017        | 0.007        | 0.008        | 0.010        | 0.010        |
|          | (0.021)      | (0.021)      | (0.021)      | (0.021)      | (0.021)      |
| BASDRm   | -0.009       |              |              | -0.032       |              |
|          | (0.023)      |              |              | (0.028)      |              |
| c.Pay#c.BASDRm | -0.058*    |              |              | -0.064       |              |
|          | (0.035)      |              |              | (0.042)      |              |
| BASFm    | 0.019        |              |              | 0.024        |              |
|          | (0.025)      |              |              | (0.029)      |              |
| c.Pay#c.BASFm | 0.023       |              |              | 0.080*       |              |
|          | (0.040)      |              |              | (0.046)      |              |
|                  | (1)   | (2)   | (3)   | (4)   | (5)   | (6)   |
|------------------|-------|-------|-------|-------|-------|-------|
|                  | logWTP | logWTP | logWTP | logWTP | logWTP | logWTP |
| **Mobile**       | 0.120** | 0.118** | 0.115** | 0.120** | 0.116** | 0.113** |
|                  | (0.049) | (0.049) | (0.049) | (0.049) | (0.049) | (0.049) |
| **same**         | 0.184*** | 0.184*** | 0.189*** | 0.184*** | 0.182*** | 0.374 |
|                  | (0.049) | (0.049) | (0.049) | (0.049) | (0.049) | (0.098) |
| **Exp**          | -0.011 | -0.011 | -0.014 | -0.010 | -0.010 | -0.012 |
|                  | (0.049) | (0.049) | (0.050) | (0.049) | (0.049) | (0.050) |
| **McDonald**     | -0.272*** | -0.274*** | -0.275*** | -0.272*** | -0.275*** | -0.276*** |
|                  | (0.049) | (0.049) | (0.049) | (0.049) | (0.049) | (0.049) |
| **Female**       | -0.120** | -0.114** | -0.110** | -0.120** | -0.117*** | -0.115** |
|                  | (0.050) | (0.050) | (0.050) | (0.050) | (0.050) | (0.050) |
| **Income**       | -0.003 | -0.005 | -0.005 | -0.003 | -0.004 | -0.004 |
|                  | (0.015) | (0.015) | (0.015) | (0.015) | (0.015) | (0.015) |
|        | stdA       |      |      |      |      |
|--------|------------|------|------|------|------|
|        |            |      |      |      |      |
|        | (0.035)    |      |      |      |      |
|        | (0.036)    |      |      |      |      |
|        | (0.039)    |      |      |      |      |
|        | (0.041)    |      |      |      |      |
| c.Mobile#c.stdA | -0.001      | 0.009 |      |      |      |
|        | (0.050)    |      |      |      |      |
| stdP   | 0.036      | 0.032 |      | 0.004 | -0.006 |
|        | (0.035)    |      |      |      |      |
|        | (0.035)    |      |      |      |      |
|        | (0.034)    |      |      |      |      |
|        | (0.035)    |      |      |      |      |
| c.Mobile#c.stdP | -0.034     | -0.045 |      |      |      |
|        | (0.049)    |      |      |      |      |
|        | (0.052)    |      |      |      |      |
| c.same#c.stdA | -0.005     | -0.014 |      |      |      |
|        | (0.051)    |      |      |      |      |
|        | (0.053)    |      |      |      |      |
| c.same#c.stdP | 0.034      | 0.036 |      |      |      |
|        | (0.049)    |      |      |      |      |
|        | (0.051)    |      |      |      |      |
| _cons  | 2.321***   | 2.321*** | 2.315*** | 2.322*** | 2.323*** | 2.318*** |
|        | (0.107)    |      |      |      |      |      |
|        | (0.107)    |      |      |      |      |      |
|        | (0.107)    |      |      |      |      |      |
|        | (0.107)    |      |      |      |      |      |
|        | (0.107)    |      |      |      |      |      |
| N      | 504        | 503  | 503  | 504  | 503  | 503  |
| r2     | 0.101      | 0.100 | 0.104 | 0.101 | 0.100 | 0.103 |
| r2_a   | 0.09       | 0.09  | 0.09  | 0.09  | 0.09  | 0.08  |

Graph 4: Eigenvalue

| Factor | Variance | Difference | Proportion | Cumulative |
|--------|----------|------------|------------|------------|
| Factor1 | 2.61552 | 0.60577 | 0.2012 | 0.2012 |
| Factor2 | 2.00975 | 0.49826 | 0.1546 | 0.3558 |
| Factor3 | 1.51149 | 0.20203 | 0.1163 | 0.4721 |
| Factor4 | 1.30946 | .      | 0.1007 | 0.5728 |

LR test: independent vs. saturated: chi2(78) = 1283.39 Prob>chi2 = 0.0000
Graph 5: Screeplot

Scree plot of eigenvalues after factor

Graph 6: Factor loadings

Rotated factor loadings (pattern matrix) and unique variances

| Variable | Factor1 | Factor2 | Factor3 | Factor4 | Uniqueness |
|----------|---------|---------|---------|---------|------------|
| Q6favorofpat | 0.6970  |         |         |         | 0.3957     |
| Q7frequency | 0.6699  |         |         |         | 0.5332     |
| Q8attitude  | 0.7476  |         |         |         | 0.4196     |
| Q9s         |         | 0.6953  |         |         | 0.4114     |
| Q10c         |         | 0.7731  |         |         | 0.3853     |
| Q11d         | 0.5289  |         | 0.8316  |         | 0.2914     |
| Q12e         |         | 0.6891  |         | 0.5857  | 0.3751     |
| Q13f         |         | 0.6063  |         |         | 0.4397     |
| Q14g         | -0.7075 |         |         |         | 0.5210     |
| Q15h         | -0.4475 |         |         |         | 0.4169     |
| Q5freqCash   |         |         | 0.7919  |         | 0.7452     |
| Q6freqdebit  |         |         | 0.7423  |         | 0.2839     |
| Q7freqcred   |         |         |         |         | 0.3355     |

(blanks represent abs(loadings)<.3)

Graph 7: Factor Matrix

Factor rotation matrix

|       | Factor1 | Factor2 | Factor3 | Factor4 |
|-------|---------|---------|---------|---------|
| Factor1 | 0.8972  | 0.1042  | 0.4242  | -0.0647 |
| Factor2 | -0.1816 | 0.9672  | 0.1587  | 0.0798  |
| Factor3 | -0.0415 | -0.1301 | 0.2654  | 0.9544  |
| Factor4 | 0.4004  | 0.1918  | -0.8511 | 0.2802  |
Table 10: PCA Results

|                  | (1) logWTP | (2) logWTP | (3) logWTP | (4) logWTP | (5) logWTP | (6) logWTP |
|------------------|------------|------------|------------|------------|------------|------------|
| Mobile           | 0.104**    | 0.099**    | 0.110**    | 0.113**    | 0.114**    | 0.418      |
|                  | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.20)     |
| Same             | 0.207****  | 0.202***   | 0.185***   | 0.184***   | 0.192***   | 0.211***   |
|                  | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     |
| Exp              | -0.004     | -0.017     | -0.013     | -0.005     | -0.003     | -0.009     |
|                  | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     |
| McDonald         | -0.280***  | -0.280***  | -0.280***  | -0.279***  | -0.279***  | -0.280***  |
|                  | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     |
| Female           | -0.130**   | -0.128**   | -0.129**   | -0.138***  | -0.126**   | -0.122**   |
|                  | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     | (0.05)     |
| Income           | -0.010     | -0.008     | -0.005     | -0.006     | -0.007     | -0.010     |
|                  | (0.01)     | (0.01)     | (0.01)     | (0.01)     | (0.01)     | (0.02)     |
| f1               | 0.074***   | 0.093***   |            |            |            | 0.095***   |
|                  | (0.02)     | (0.03)     |            |            |            | (0.03)     |
| f2               | 0.009      | 0.017      |            |            |            | 0.018      |
|                  | (0.02)     | (0.03)     |            |            |            | (0.03)     |
| f3               | -0.011     | -0.004     |            |            |            | -0.000     |
|                  | (0.02)     | (0.03)     |            |            |            | (0.03)     |
| f4               | -0.028     | -0.013     | -0.023     |            |            |            |
|                  | (0.03)     | (0.03)     | (0.03)     |            |            | (0.03)     |
| c.Mobile#c.f1    | -0.044     |            | -0.051     |            |            |            |
|                  | (0.05)     |            | (0.05)     |            |            | (0.05)     |
| c.Mobile#c.f2    |            | -0.016     | -0.012     |            |            |            |
|                  |            | (0.05)     | (0.05)     |            |            | (0.05)     |
| c.Mobile#c.f3    |            | -0.023     | -0.023     |            |            |            |
|                  |            | (0.05)     | (0.05)     |            |            | (0.05)     |
| c.Mobile#c.f4    |            |            | -0.031     | -0.018     |            |            |
|                  |            |            | (0.05)     | (0.05)     |            | (0.05)     |
|        | 2.358*** | 2.358*** | 2.347*** | 2.361*** | 2.342*** | 2.347*** |
|--------|----------|----------|----------|----------|----------|----------|
| _cons  | (0.11)   | (0.11)   | (0.11)   | (0.11)   | (0.11)   | (0.11)   |
| N      | 497      | 497      | 497      | 497      | 497      | 497      |
| r2     | 0.120    | 0.119    | 0.101    | 0.102    | 0.104    | 0.123    |
| r2_a   | 0.10     | 0.10     | 0.09     | 0.09     | 0.09     | 0.10     |
Appendix.2 Receipts and Goods example

Graph 8: Examples (Left: Receipts, Upper right: McDonald’s gift card, Lower right: Mugs)
Appendix.3 Questionnaire

Information about the study

You are being asked to take part in a research project that is led by Yizhao Jiang, a doctoral student at Claremont Graduate University who is being supervised by professor of economics Monica Capra.

PURPOSE. The purpose of this study is to learn more about consumption behavior.

PARTICIPATION. During the study, you will be asked to fill out a questionnaire, and participate a simulating purchasing based on your questionnaire answer. This questionnaire consists two parts and need about 40 minutes to finish all the parts.

RISKS OF PARTICPATION. I don’t believe there are any risks from participating in this research.

BENEFITS OF PARTICPATION. You have the opportunity to buy the actual goods in simulating purchasing part, and the price would be lower than market price.

COMPENSATION. For the participation, you will get 30 yuan in cash (mobile transfer) as participation fee at the beginning of the study.

VOLUNTARY PARTICIPATION. Taking part in this study is completely voluntary. You may stop or withdraw from the study at any time without it being held against you. Your decision whether or not to participate will have no affect on your current or future connection with any one at China University of Petroleum.

CONFIDENTIALITY. Your individual privacy will be protected in all papers, books, talks, posts, or stories resulting from this study. In order to protect the confidentiality of your responses, I will not collect your name or any information that could directly identify you.

FURTHER INFORMATION. The researcher would be glad to answer your questions or concerns. If you have questions later, you may contact Yizhao Jiang at yizhao.jiang@cgu.edu or at 133-6693-4537. If you have any questions or concerns regarding your rights as a subject in this study, you may access the Institutional Review Board (IRB) at +1(909)607-9406 or visit the website at https://mycampus.cgu.edu/web/sponsored-research-and-programs/irb. A copy of this form will be given to you if you wish to keep it.

CONSENT

☐ Check here indicate: I understand what the study is about and my questions so far have been answered. I agree to take part in this study.

Note: you can change your mind and stop at any time. If you decide to withdraw before this study is completed, please raise your hand and tell the researcher.
Part I

Instruction

Please remain salience during the study. If you found anything confusing or hard to understand, please raise your hand and the researcher would help you.

In this part, the researcher would briefly introduce how the purchasing works. The process is also described in below. Please listen and read it carefully, then try to fill out the example question first.

Process:
For each item, A, and B, you have an opportunity to purchase it. To select the price of the item we will collect all participants’ willing to pay and we will use the following procedure:
Step 1: All participants would be randomly selected A item or B item group (with equal probability, based on the ID number in the questionnaire).
Step 2: For each item group, we randomly draw a sale price for the item between 0 and 20 (all numbers are equally probable).
Step 3: We would compare all participants’ WTP with the sale price from Step 2.
  • If the participant’s WTP is the same or higher than the sale price, the participant purchases the item at the sale price with cash (Alipay or Wechat Pay).
  • If the participant’s WTP is lower than the sale price, there is no purchase for this participant.

The WTP price is required to be an integer from 0 to 20.

Example

One analogy of the mechanism: Imagine you asking your friend for favor that buy something from a store, but you don’t know the exact price. So you tell him that if price is below or equal to XX Yuan(your WTP) then you would buy it, otherwise you won’t. Therefore, the trading price is not correlated to your willing to pay, the WTP would only depend whether you buy it or not.

In this experiment:
Suppose you fill out the WTP for item A is 12 (yuan) and for item B is 8 (yuan). The randomization result is you are in A item group, and the price is 9 for A. Then you would buy item A with price 9 Yuan.
Suppose you fill out the WTP for item A is 6(yuan) and for item B is 17 (yuan). The randomization result is you are in A item group, and the price is 14 for A. Then you won’t buy anything.

Example question
Suppose you fill out the WTP for item A is 4(yuan) and for item B is 11 (yuan). The randomization result is you are in B item group, and the price is 5 for B.

Would you purchase the item successfully?
Yes / No
If yes, which item you would buy and what’s the price?
Item ______, price ________.

If you have any doubts about the answer of the example question, please not hesitated to raise hand and ask the researcher for help.

Your ID number is XXX
**Question**

Please write down your willing to pay for follow items:

For the mugs, my willing to pay is __ Yuan

For the gift card, my willing to pay is __ Yuan

After you finish the first part, please hand out the first part and waiting for the researcher to draw a random price and check the purchasing results. It takes several minutes for researcher to finish the purchasing, you can go forward to fill out the part II.
Part II

Instruction

In this part, you need to fill out some consumption attitude and demography questions. There are not right or wrong answer of it. Therefore, please answer your true attitude. We won’t record your name or other personal privacy, and all the results would be used for academia only.

If you have question, please contact the researcher.

Your ID number is XXX

Question

1. Which of the following descriptions about consumption attitude fits you better? (Please click the number in below)
   
   -5 -4 -3 -2 -1 0 1 2 3 4 5

   Tightwad Spendthrift

   I have difficult in spending money     About the same or neither     I have difficult in control spending

2. Some people have trouble limiting their spending: they often spend money-for example on clothes, meals, vacations, phone calls- when they would do better not to. Other people have trouble spending money. Perhaps because spending money makes them anxious, they often don’t spend money on things they should spend it on.
   
   a. How well does the first description fit you? That is, do you have trouble limiting your spending?

   1   2   3   4   5

   Never Rarely Sometimes Often Always

   b. How well does the second description fit you? That is, do you have trouble spending money?

   1   2   3   4   5

   Never Rarely Sometimes Often Always

3. Following is a scenario describing the behavior of two shoppers. After reading about each shopper, please answer the question that follows.
   Mr.A is accompanying a good friend who is on a shopping spree at a local mall. When they enter a large department store, Mr. A see that the store has a “one-day-only-sale” where everything is priced 10-60% off. He realizes he doesn’t need anything, yet can’t resist and ends up spending almost 500 Yuan on stuff.

   Mr.B is accompanying a good friend who is on a shopping spree at a local mall. When they enter a large department store, Mr. A see that the store has a “one-day-only-sale” where everything is priced 10-60% off. He figures he can get great deals on many items that he needs, yet the thought of spending the money keeps him from buying the stuff.
In terms of your own behavior, who are you more similar to, Mr. A or Mr. B?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Mr. A | About the same or neither | Mr. B |

4. There are some statements about consumption that you may either agree with or disagree with. For each statement, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. (Left side: Disagree. Right side: Agree)

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| **1.** I closely monitor my spending behavior. | -3 | -2 | -1 | 0 | 1 | 2 |
| **2.** I am able to work effectively toward long term financial goals. | -3 | -2 | -1 | 0 | 1 | 2 |
| **3.** I carefully consider my needs before making purchases. | -3 | -2 | -1 | 0 | 1 | 2 |
| **4.** I often delay taking action until I have carefully considered the consequences of my purchase decisions. | -3 | -2 | -1 | 0 | 1 | 2 |
| **5.** When I go out with friends, I keep track of what I am spending. | -3 | -2 | -1 | 0 | 1 | 2 |
| **6.** I am able to resist temptation in order to achieve my budget goals. | -3 | -2 | -1 | 0 | 1 | 2 |
| **7.** I know my limits regarding how much I spend. | -3 | -2 | -1 | 0 | 1 | 2 |
| **8.** In social situations, I am generally aware of what I am spending. | -3 | -2 | -1 | 0 | 1 | 2 |
9. Having objectives related to spending is important to me.

10. I am responsible when it comes to how much I spend.

5. There are 24 statements that you may either agree with or disagree with. For each statement, indicate how much you agree or disagree with what the item says. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Please do not leave any blank. (Left side: Disagree. Right side: Agree)

| Statement                                                                 | very false for me | somewhat false for me | somewhat true for me | very true for me |
|---------------------------------------------------------------------------|-------------------|-----------------------|----------------------|-----------------|
| 1. A person's family is the most important thing in life.                 |                   |                       |                      |                 |
| 2. Even if something bad is about to happen to me, I rarely experience fear or nervousness. |                   |                       |                      |                 |
| 3. I go out of my way to get things I want.                               |                   |                       |                      |                 |
| 4. When I'm doing well at something I love to keep at it.                 |                   |                       |                      |                 |
| 5. I'm always willing to try something new if I think it will be fun.     |                   |                       |                      |                 |
| 6. How I dress is important to me.                                       |                   |                       |                      |                 |
7. When I get something I want, I feel excited and energized.

8. Criticism or scolding hurts me quite a bit.

9. When I want something I usually go all-out to get it.

10. I will often do things for no other reason than that they might be fun.

11. It's hard for me to find the time to do things such as get a haircut.

12. If I see a chance to get something I want I move on it right away.

13. I feel pretty worried or upset when I think or know somebody is angry at me.

14. When I see an opportunity for something I like I get excited right away.

15. I often act on the spur of the moment.

16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.

18. When good things happen to me, it affects me strongly.

19. I feel worried when I think I have done poorly at something important.

20. I crave excitement and new sensations.

21. When I go after something I use a "no holds barred" approach.

22. I have very few fears compared to my friends.

23. It would excite me to win a contest.

24. I worry about making mistakes.

6. During the past year, how often these payment methods you use in diary consumption? (Please click the table in each row)

| Never | Seldom | Often | Usually | Almost/Always |
|-------|--------|-------|---------|--------------|
|       |        |       |         |              |
| Cash  |        |       |         |              |
| Debit Card |    |       |         |              |
7. Which of the following descriptions fits your consumption attitude on payment methods better? (Left side: in favor of cash. Right side: in favor of mobile payment)

|            | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
|------------|----|----|----|----|----|---|---|---|---|---|---|
| More in favor of cash | About same or neither | More in favor of mobile payment |

8. What is the relative frequency of using mobile payment and cash in your dairy consumption? (Left side: using cash more. Right side: using mobile payment more)

|            | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
|------------|----|----|----|----|----|---|---|---|---|---|---|
| Almost cash | About same or neither | Almost mobile payment |

9. For the following description about cash and mobile payment, what’s your attitude? (Left side: Disagree. Right side: Agree)

| Description                                      | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
|-------------------------------------------------|----|----|----|----|----|---|---|---|---|---|---|
| Mobile payments are more convenient             | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| Mobile payments lead to overspending            | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| Mobile payments are safer                       | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| Mobile payments bring a better lifestyle        | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| Mobile payment has a less pain of paying        | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
10. Suppose you can buy the given items with your WTP price and the quantity is not limited. How many goods would you buy? For the mugs, I would like to buy _________ (please fill out the amount you want to buy). For the gift cards, I would like to buy _________ (please fill out the amount you want to buy).

11. Did you purchase the item successful during the experiment? Y or N
   If yes, suppose we want to buy the item back from you, what’s the price you are willing to accept? (by the same mechanism)
   ______ Yuan

12. *Have you link credit card or debit card to your mobile payment? Y or N
   Did you using account balance or debit card to pay in the experiment?
   • Debit card
   • Balance
   • Credit card
   • Others _________ (please specific)

13. What is your sex?
   • Male
   • Female

14. In past a year, what is your average time of using cellphone in a day?
   • Below half hour
   • Half hour to one hour
   • One to three hours
   • Three to five hours
   • Five to eight hours
   • More than eight hours
15. What is your average personal income by month? (All sources, including allowance)

- Below 500 Yuan
- 500 to 1000 Yuan
- 1000 to 1500 Yuan
- 1500 to 2000 Yuan
- 2000 to 3000 Yuan
- 3000 to 5000 Yuan
- More than 5000 Yuan
- Confidential

You have completed all parts of the questionnaire! If you have any questions or concerns about this study, you can come to talk with the researcher. I’m glad to have the chance to communicate with you!

Thanks for your participating!
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