

**THE EFFECT OF PAYMENT FORMAT ON CONSUMER AFFECT AND  
BEHAVIOR**

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The Academic Faculty

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**THE EFFECT OF PAYMENT FORMAT ON CONSUMER AFFECT AND  
BEHAVIOR**

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## SUMMARY

All else equal, consumer evaluation of a purchase should not logically depend on the form of payment that is used. However, voluminous research on the “pain of payment” phenomenon has shown that payment format impacts transaction-based affect, cognition, and behavior (Prelec and Loewenstein, 1998; Soman, 2003; Raghurir and Srivastava, 2008). As introduced by Zellermyer (1996), “pain of payment” captures the notion that the physical act of paying for a product or service induces a negative emotional response. This response takes the form of “hedonic vexation” that is related to but distinct from physical pain, stress, or the fear that spending money will diminish future buying power.

Given the introduction in recent years of entirely new payment formats, including many consumer-to-consumer payment platforms (e.g. Venmo, PayPal), it is more important than ever to understand how consumers feel and behave when making payments or receiving money. In chapter 1, I focus on the receiving end of the transaction by exploring how consumers react to being paid in cash versus other monetary formats. To address the question, I define “joy of receipt” (JOR) as a positive affective reaction that consumers experience when receiving money. I consider the extent to which different monetary formats produce different JOR, as well as the ramifications for subsequent spending behavior. Three studies show that consumers feel momentarily wealthier when they are paid in cash (an especially salient monetary format) than credit or mobile payments. These feelings of wealth lead to greater joy of receipt and a greater likelihood of spending.

Chapter 2 focuses on the relationship between payment format and pain of payment. Previous work has identified temporality and transparency as important drivers of the pain of payment phenomenon. However, that work has largely ignored the wide variety of payment formats that have emerged in recent years. I argue that novel forms of payment lead to consumer excitement (a positive emotion), and thereby lower pain of payment. In a series of studies, I demonstrate that consumers experience less pain of payment when

paying with a mobile phone than with a credit card or cash. Additionally, I argue that novelty in a payment format need not depend on technological innovation. As evidence, I demonstrate that the design and denomination of currency can also be used to create perceived novelty.

# CHAPTER 1

## THE JOY OF RECEIPT

### 1.1 Introduction

All else equal, consumer evaluation of a purchase should not logically depend on the form of payment that is used. However, voluminous research on the “pain of payment” phenomenon has shown that payment format impacts transaction-based affect, cognition, and behavior (Prelec and Loewenstein, 1998[1]; Soman, 2003[2]; Raghurir and Srivastava, 2008)[3]. Widely agreed upon are two broad reasons for the phenomenon. The first reason is temporality: payment formats that separate actual monetary transfer from the purchase decision (e.g., a credit card vs. cash) create a psychological “decoupling” that can limit the perception of loss and increase spending likelihood. The second reason is transparency: payment formats that are tangible and visible (cash, physical check, etc.) increase the salience of monetary outflow and resulting sense of loss. As “legal tender,” cash is especially salient in both its physical form and quantity.

The present research considers the opposite side of the transaction: specifically, I consider the act of receiving money in exchange for the provision of goods or services. I argue that the psychological consequences of monetary receipt depend systematically on the format in which it is received. As developed below, I introduce “joy of receipt” (JOR) as the positive affective reaction that consumers experience when receiving money, and I consider the extent to which different monetary formats produce differences in JOR, differences in perceived wealth, and differences in short-term spending behavior. Although monetary receipt has been explored in consumer research on gift-giving (Gino and Flynn (2011)[4], Webley, Lea, and Portalska (1983)[5]), this work is among the first to explore receipt in a transaction context, or to consider the impact of monetary format on receipt outcomes.

To the extent that “paying” and “receiving payment” are symmetric in their affective implications, the act of receiving should be expected to induce pleasure, and this effect should be strongest when payment is received in a format that is immediate and transparent (cash). I argue that this logic is reasonable but also incomplete, due to differences in the underlying processes and the consequences of loss aversion and the endowment effect (Tversky and Kahneman, 1991)[6].

The past decade has seen an unprecedented proliferation in electronic and mobile payment formats. The increase is due in part to the expanded capability of mobile devices, as well as the desire of consumers to make more (and more immediate) transactions in an ever faster and more connected world. Consumers now send and receive money by clicking a mouse, touching a screen, or utilizing state-of-the-art applications involving voice, fingerprint or facial recognition. In a 2019 Federal Reserve study[7], consumers used cash in 26 percent of transactions, down from 30 percent in 2017. Given the continuing trend towards mobile transactions, it is more important than ever to understand their psychological consequences. In the experimental studies presented below, I compare the perceptual and behavioral consequences of receiving payment in cash to the consequences of receiving the same payment via different mobile formats.

By emphasizing the receiver side of a monetary transaction, my work supplements existing research on pain of payment, transaction utility, and money perceptions. Moreover, my research bears important practical and managerial implications (addressed in the general discussion): if consumers respond differently to the same monetary receipt depending on the format, then better understanding of the phenomenon stands to benefit retailers, financial intermediaries, and consumers themselves.

## 1.2 Literature Review

### 1.2.1 Pain of Payment

As introduced by Zellermayer (1996)[8], “pain of paying” captures the notion that the physical act of paying for a product or service induces a negative emotional response. This response takes the form of “hedonic vexation” that is related to but distinct from physical pain, stress, or the fear that spending money will diminish future buying power. Typically, pain of payment is measured by self-report: e.g. Zellermayer (1996)[8]. However, Mazar et al. (2017)[9] present more direct empirical evidence for pain of payment as a literal pain experience. Utilizing fMRI measures, they show that paying recruits brain pathways involved in the affective aspects of pain processing, but not in its somatosensory aspects; hence they categorize the displeasure as a form of “affective pain.” However, they also suggest that very high levels of pain of payment may “spread” to somatosensory pathways as well.

Explanations for pain of payment tend to be adaptive in nature, emphasizing loss aversion and the utility of money as a tangible resource. Zellermayer (1996)[8] suggested that pain of payment provides consumers with an “instant emotional signal” about the potential negative ramifications of spending, which can in turn impede overindulgence. Zhou and colleagues (Zhou and Gao 2008 [10]; Xu et al 2015 [11]) argue that monetary wealth is among various psychosocial protection mechanisms, and that giving up money (even in exchange for something of value) is painful due to the weakening of its ability to protect. In support of this argument, Xu et al. (2015)[11] demonstrated that social support (either real or recalled) reduces the pain associated with spending, particularly among those who perceive money as an important form of self-protection.

### 1.2.2 Antecedents of Pain of Payment

Antecedents of pain of payment have been examined extensively. At the contextual level, Zellermayer (1996)[8] demonstrated that the following characteristics of a purchase transaction reduce associated pain of payment: perceived fairness, perception of the purchase as an investment, payment that is one-time-only rather than drawn out, purchasing for another (vs. for oneself), perception of the purchase as volitional, and payment occurring before consumption (vs. after consumption). Rick, Cryder and Loewenstein (2008)[12] provide evidence that hedonic purchases are more painful than utilitarian purchases. In one experiment, participants were more willing to purchase an otherwise identical massage treatment when the stated motivation was relieving back pain (utilitarian) than receiving a pleasurable experience (hedonic). Building on Prelec and Loewenstein (1998, see below)[1], Rick et al. (2008)[12] argue that the difference is driven by the fact that utilitarian purchases tend to provide a greater magnitude and length of anticipated benefits. Applied to the current research, it is important to note that some but not all of these transactional characteristics clearly apply to the receipt side of a transaction: e.g., sellers are likely to react differently to immediate vs. delayed payments and to one-time-only vs. drawn out payments, but they are unlikely to care whether the transaction is perceived as an investment, a gift, etc.

Individual differences also play a role in pain of payment, though research in this area is only beginning. In a well-known example, Rick et al. (2008)[12] present a “tightwad-spendthrift scale” that predicts pain of payment; items include whether respondents have trouble limiting their spending and whether spending money makes them anxious. In addition to validating the scale, they demonstrate that it predicts spending behavior, such that “tightwads” (vs. “spendthrifts”) tend to spend less (vs. more) than they would “ideally like to spend,” and that the difference is largest in situations that amplify pain of payment. The authors attribute these results to group differences in anticipated pain of payment that are consistent with the differences in actual experience.

### 1.2.3 Payment Format and Pain of Payment

Research consistently shows that payment format can have a profound influence on the affect and behavior of potential spenders. Generally agreed upon are two reasons: temporality and transparency. Regarding the former, Prelec and Loewenstein (1998)[1] argue that from the perspective of spenders, the affectively ideal transaction situation is one in which payment is tightly coupled to consumption (so that spending evokes thoughts about the benefits attained), but consumption is decoupled from payment (so that the experience of benefits does not evoke reminders of spending). Their logic is consistent with the prospect theory principles of the value function and loss aversion, which predict that utility is greater for a gain and loss experienced together than separately. Paying with a credit card or physical check creates temporal separation between the purchase decision and actual payment, whereas paying by cash creates no temporal separation. For example, consumers who pay in cash balance the pain of paying with the immediate gratification of purchase, and do not have to think about future payments while consuming the product. Raghurir and Srivastava (2008)[3] argue that another essential determinant is the physical nature of the payment format. In particular, formats in which the outflow of money is more transparent (or vivid) are perceived as more painful and aversive. In one demonstration, participants judged the act of spending \$50 in cash to be more painful than that of spending \$50 stored on a gift card. Cash is generally considered the most transparent monetary format, due to its salience in physical form and amount, as well as its status as legal tender (Soman 2003)[2]. In fact, Raghurir and Srivastava (2008)[3] demonstrate that payment formats lacking transparency are sometimes viewed by consumers in a token-like manner (“play money,” “monopoly money”), reducing the psychological barrier to spending.

### 1.2.4 Behavioral Effects of Pain of Payment

Rick et al. (2008)[12] highlight the distinction between “immediate” emotions, which are experienced as a response to the current environment, and “expected” emotions, which



are experienced as a response to a projected future environment. They argue that unless opportunity costs are explicitly represented, pain of payment during the decision process is "expected" rather than "immediate." This expected pain of payment is an important influence on pre-purchase deliberation and decision making. In contrast, immediate pain of payment is an important influence on post-transaction evaluation.

Utilizing less painful monetary formats reduces barriers to spending by diminishing both expected and immediate negative emotions. In one prominent demonstration (Prelec and Simester (2001)[13], auction participants bid nearly twice as much for the same item when using a credit card vs. cash. In another demonstration (Soman 2001)[14], consumers who had paid for a prior purchase with a (lower-pain) credit card were more likely than those who had paid with a (higher-pain) physical check to purchase make an additional, discretionary purchase, and they were less likely to recall the prior payment. Other research reveals that simply thinking about less painful formats can have similar effects. For example, seeing a credit card logo during a purchase decision can increase the probability of purchase, decision speed, and spending amount (Feinberg 1986)[15]. Priming the concept of cash immediately prior to product evaluation leads to a focus on costs and negative attributes, while priming the concept of credit cards leads to a focus on benefits and positive attributes. (Chatterjee and Rose 2012)[16].

As illustrated by these examples, pain of payment research has tended to focus on variables directly involved in a transaction and has tended to identify negative affective consequences. In a noteworthy exception, Shah (2014)[17] observed that paying with a more painful monetary format leads to increased attachment and commitment to the chosen alternative, decreased commitment to non-chosen alternatives, and greater likelihood of a repeat transaction.

## 1.3 Theory

### 1.3.1 Consequences of Receipt

Having reviewed psychological and behavioral consequences of spending, I present a complementary question: How does the act of receiving money affect the recipient? Consistent with the majority of pain of payment literature, my research focuses on situations in which money is received as part of a transaction (rather than, for example, a gift). In the following paragraphs, I develop a framework by which receipt of the same underlying monetary amount in different formats leads to distinct perceptual, affective, and behavioral responses, and I identify fundamental drivers of the distinction. My framework borrows heavily from the pain of payment literature but also incorporates variables unique to the receipt context, leading to predictions that are distinct and, in some cases, asymmetric. This model is presented in Figure 1.1.

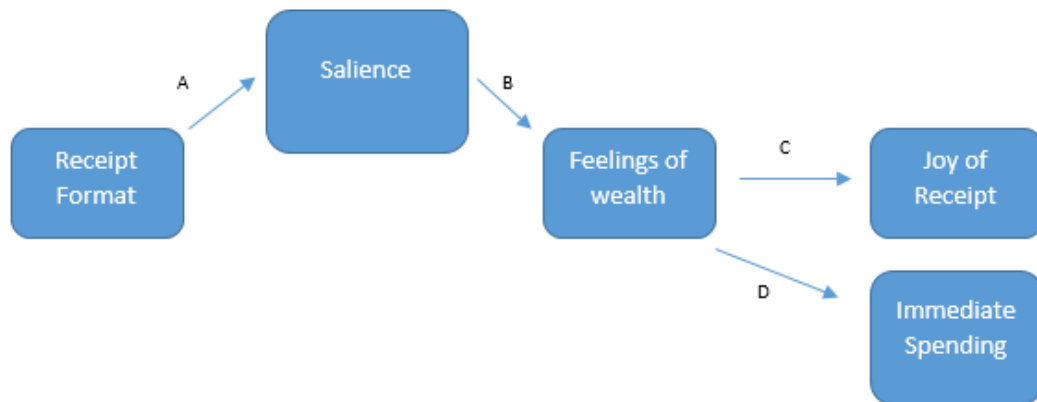


Figure 1.1: Theoretical Model

### 1.3.2 Perceptions of Wealth

The first argument is that the effects of monetary format on recipient reactions are driven largely by differences in saliency. As noted above, research in payment contexts has shown that cash is extremely salient in both physical form and amount, while monetary formats

other than cash are less salient and sometimes viewed as tokens or “monopoly money” (Raghubir and Srivastava 2008)[3]. Building on prior work (Zellermayer 1996)[8], salience is captured in a receipt context by three underlying dimensions: transparency (e.g., “this object is clearly money”), physicality (e.g., “I have the money in my hand”), and immediacy (e.g., “I have just received the money”). Because cash is equal or superior to other formats on all three dimensions, recipients of cash will perceive the money they have received to be especially salient, enhancing the realism and vividness of the receipt experience.

The second argument is that receipt of money in a highly salient format induces momentary feelings of wealth. To the extent that newly received money is transparent, physical, and immediate, consumers will not only be more likely to perceive that they have “real money” in their possession, but also more likely to recognize that their overall financial resources have been incremented as a result of the transaction. For example, Peck and Shu (2009)[18] find that being able to physically touch an item can increase both ownership and valuation of that item. Construal level theory (Trope and Liberman, 2003)[19] specifically proposes that individuals use more abstract mental models (higher-level construals) to represent information about distant future events than information about near-future events. Therefore, monetary receipt that has greater temporal or physical distance will have less impact on the immediate feelings of the consumer. Note that it is not necessary that such feelings of wealth be objectively “accurate,” nor that they be intense and long-lasting (see the general discussion), as long as they are sufficient to impact short-term affect and evaluation. Stated formally:

H1. Receipt of money in the form of cash (vs. other monetary formats) leads to greater feelings of wealth.

H2. The effects of monetary format on feelings of wealth are driven by salience (transparency, physicality and temporality).

### 1.3.3 Joy of Receipt and Subsequent Spending

Of the diverse effects likely to result from momentary feelings of wealth, two are especially relevant in a consumer transaction context. First, momentary feelings of wealth will induce positive affect. "Joy of receipt" is defined as the positive affective reaction that consumers experience when receiving money as part of a transaction. Despite weak empirical support for an objective association between wealth and subjective well-being (see Diener and Biswas-Diener, 2002 for a review)[20], the lay belief that "money = happiness" is widely held. In one well-known demonstration, Kahneman et al. (2006)[21], survey respondents predicted that low-income (vs. high-income) wage earners would spend a greater proportion of their day in bad moods, even though actual affective reports (using an event-diary methodology) were remarkably similar across conditions. In another demonstration, Aknin, Norton and Dunn (2009)[22] found that survey respondents with higher incomes did report being happier than those with lower incomes, but that they also predicted a much more dramatic relationship than that actually obtained. Such findings can be explained in part by focalism and durability biases (Gilbert, Pinel, Wilson, Blumberg, and Wheatley, 1998)[23], by which individuals correctly assume that a positive event will bring immediate pleasure, but overestimate its long-term impact relative to other influences. Such overestimation is consistent with Schwarz and Clore (1983)[24], who posit that people use their momentary affective states as information when making judgments of general happiness and life satisfaction. Though consumers may assume lingering happiness from monetary receipt, my framework argues only for a strong link between increased wealth and happiness in the period immediately after a transaction (the framework is agnostic regarding the longer term). As a result, the positive affect experienced by monetary recipients will be greatest for transactions involving a salient monetary format, due to greater feelings of wealth.

Second, momentary feelings of wealth will produce a short-term, behavioral consequence in which recipients are more willing to spend in the immediate future. This sugges-

tion is consistent with the intuition that perceived wealth reduces barriers to spending and lowers price sensitivity, as well as prior evidence that wealthier consumers experience less pain of payment (Zellermayer, 1996)[8]. It is also consistent with principles from mental accounting theory, in particular: 1) individuals tend to ignore the substitutability of money across vehicles, and 2) individuals who perceive that they have received “found money” are more willing to make discretionary purchases (Thaler, 1999)[25]. Stated formally:

H3a-b. Receipt of money in a more salient format leads to: a) greater positive affect and b) greater likelihood of immediate spending.

H4a-b. The effects of monetary format on affect and subsequent spending are driven by increased perceptions of wealth.

## **1.4 Pretest:Recall**

The purpose of the pretest was to gather real-world evidence regarding the joy of receipt invoked by cash versus other monetary formats.

### 1.4.1 Method

185 participants on Cloud Research participated in the study and were compensated for their time (Age  $X = 39.35$ ,  $SD = 12.71$ ,  $N_{male} = 76$ ,  $N_{female} = 82$ ). The study asked participants to recall a situation in which they were repaid by someone for an amount previously owed, which was under 100 dollars. The description was broad in order to maximize the likelihood of participants being able to recall an applicable situation. The instructions provided examples of repayment (for a meal purchased for a friend, for part of a utility bill, for a store return). Participants were asked to make sure this monetary receipt was part of a transaction, not a gift. The study had two between-subjects conditions: in one condition, participants were asked to recall a time they were paid back in cash (in US dollar bills), and in the other condition, participants were asked to recall a time they were paid

back on a digital platform. Participants were given examples of digital platforms (Venmo, PayPal, direct bank transfer, credit card transfer).

Participants then wrote a few sentences describing the transaction, and answered questions about how they felt after receiving the payment. Joy of receipt was measured with three verbal items: “How much [joy/happiness/pleasure] did you feel when you received the digital payment/cash?” on a scale from 1 (“not much”) to 7 (“a great deal”). Next, participants answered a series of questions about both cash and digital payments in general. They rated each format on its physicality, immediacy, ease, convenience, and safety, all on a scale from 1 to 7. Participants then indicated whether they felt like they had “more money than before,” “extra money” and “money they could immediately spend” after receiving the repayment, on a scale from 1 (“strongly disagree”) to 7 (“strongly agree”). Finally, participants responded to questions about the nature of the payment to inform potential control variables: examples include “was this payment expected?” and “how close are you with the person who gave you this payment?”

#### 1.4.2 Results

Mean comparisons across the two conditions revealed that compared to a digital format, cash was seen as more transparent (M<sub>cash</sub>=5.87, M<sub>digital</sub>=5.70), more physical (M<sub>cash</sub>=6.42, M<sub>digital</sub>=3.34), and more immediate (M<sub>cash</sub>=6.24, M<sub>digital</sub>=5.58). Averaging these three items to form a composite salience measure revealed substantially greater salience for cash (M<sub>cash</sub>=6.18, M<sub>digital</sub>=4.87). On the other hand, participants also perceived cash to be less safe (M<sub>cash</sub>=5.17, M<sub>digital</sub>=5.59), less convenient (M<sub>cash</sub>=5.13, M<sub>digital</sub>=6.49), and less easy (M<sub>cash</sub>=5.58, M<sub>digital</sub>=6.18). A joy of receipt measure was created by averaging the means for “happiness” “pleasure” and “joy”. Joy of receipt did not significantly differ across the two conditions (M<sub>cash</sub> = 4.57, M<sub>credit</sub>= 4.66,  $F = .107$ ,  $p=.743$ ).

An exploratory mediation analysis was performed to examine for pathways outlined in the theory section above. A measure labeled “more money” was created by averaging

responses to three items: "I felt like I had more money than before," "I felt like I had money I could immediately spend," and "I feel like I had EXTRA spending money." Using the PROCESS Macro in SPSS (Hayes, 2013, Model 6)[26], with 5,000 bootstrapped samples, the results indicated that the more salient the form of money, the more money the participant felt they received ( $\beta = .317$ , 95% CI (.01, .62)). "More money" was measured by averaging responses to the three statements "I felt like I had more money than before," "I felt like I had money I could immediately spend," and "I feel like I had EXTRA spending money." Additionally, the more money the participant felt they received, the more joy they felt ( $\beta = .5366$ , 95% CI (.41, .66)). The indirect pathway from monetary format through salience, feelings of wealth, to joy, was significant ( $\beta = -.222$ , 95% CI (-.48, -.01)).

### 1.4.3 Discussion

The pretest findings suggest that the proposed theoretical pathway from monetary format to joy of receipt is viable: cash was deemed more salient than digital platforms, salience led to feelings of wealth, and feelings of wealth led to joy of receipt. Though attempts were made to account for potential confounds, the recall methodology could have produced vast differences in the real-world scenarios being evaluated (reason for repayment, time, etc.). To remove the influence of such external factors, all the studies that follow ask participants to imagine themselves in a detailed scenario, and the manipulation for monetary format is embedded in that scenario.

## **1.5 Study 1: Selling a Television**

Study 1 is a scenario-based, experimental study in which participants imagined themselves either buying or selling a television, and using either cash or PayPal for the transaction.

### 1.5.1 Method

Participants were 266 workers on Mechanical Turk who were compensated for their time (Age  $X = 36.26$ ,  $SD = 11.50$ ,  $N_{\text{male}} = 152$ ,  $N_{\text{female}} = 114$ ). Materials for the study are provided in Appendix A. The study incorporated a 2 (format: cash vs. mobile) x 2 (party: seller vs. buyer), between-subjects design. Participants read a detailed scenario involving the purchase of a used TV in exchange for \$100. Depending on condition, participants read from the perspective of either the seller or the buyer. The buyer conditions were intended as a replication of previous pain of payment findings. Participants in the buyer conditions were told that they were moving to a new apartment soon, and wanted to upgrade their television to fit in their new space. After searching on Craigslist, they had identified a used television being sold for \$100, gone to inspect the television, and agreed to purchase it for \$100.

Participants in the receipt condition were given a similar scenario. They were told that they would be moving to a new apartment soon and wanted to buy a new television for their new apartment; therefore, they had decided to sell their current television on Craigslist for \$100. A potential buyer had seen the Craigslist post, come to inspect the television in person, and offered them the requested \$100.

Depending on condition, the transaction was conducted either in cash (five twenty-dollar bills) or mobile payment format (via the PayPal platform). Alongside the scenario text were images portraying the transaction format. After reading the scenario, participants reported their pain of payment (buyer condition) or joy of receipt (seller condition). Pain of payment was measured with two items: a verbal scale “How much pain did you feel when you handed over the \$100/used PayPal to send \$100? (1- “not much pain” to 7- “a great deal of pain,”) and the Wong-Baker (1988)[27] FACES Pain Rating Scale, in which respondents choose from a variety of facial expressions to indicate the amount of pain they are experiencing. Joy of receipt was measured with three verbal items (“joy,” “happiness,” and “pleasure”). Participants answered the questions “How much joy/happiness/pleasure



did you feel when you received the PayPal notification/cash?” on a scale from 1-“not much” to 7- “a great deal”. Additionally, participants in the receipt condition responded to a “face-joy” scale, created by the author as a positive analogue to the FACES scale.

In both the buyer and receipt conditions, participants responded to questions about their impressions of the transaction and their opinion of different receipt formats. In the receipt conditions, participants responded to two verbal items to capture feelings of wealth: “I feel like I have more money” and “I feel like I have extra money” (1- strongly disagree to 7-strongly agree). Next, they completed exploratory measures assessing their ability to remember the transaction and their likelihood of spending the money immediately. Participants were also asked to rate the form of payment that they received on six different aspects: transparency, physicality, immediacy, convenience, ease of use, and safety (1-“I strongly disagree that the form of payment I used was physical/safe/immediate/easy/transparent/convenient,” to 7- “I strongly agree that. . . ”). Participants in the buyer condition were asked rated their feelings of wealth with the statement “I feel like I have less money” (1- strongly disagree to 7- strongly agree). Additionally, all participants were asked whether they generally prefer to conduct transactions in cash or PayPal (1- “I strongly prefer cash to PayPal to 7- “I strongly prefer PayPal to cash). Finally, all participants completed a demographic questionnaire.

### 1.5.2 Results

Initial analyses explored the buyer conditions, to investigate the evidence for pain of payment and the extent to which it was influenced by payment format. The two measures of pain of payment were highly correlated ( $r=.705$ ). To be consistent with previous pain of payment research, only the verbal measure (“How much pain did you feel when you handed over the money?”) was used going forward. Analysis via ANOVA revealed that consistent with prior findings, reported pain differed by payment format, such that paying with cash was perceived as more painful than paying with PayPal ( $M_{\text{cash}}= 3.96$ ,  $M_{\text{PayPal}} = 2.70$ ,  $F$

= 16.00,  $p < .001$ ,  $r^2 = .11$ ). In addition, participants who paid in cash perceived having significantly less money after the transaction than those who paid using PayPal ( $M_{\text{cash}} = 5.59$ ,  $M_{\text{PayPal}} = 5.10$ ,  $F = 4.085$ ,  $p = .045$ ,  $r^2 = .03$ ). Analysis of the format preference measure revealed that participants in the buyer conditions generally preferred paying with PayPal rather than cash (1 = “Strongly prefer Cash”, 7 = “Strongly prefer PayPal”,  $M = 4.72$ ,  $t = 4.794$ ,  $p < .001$ ). Supporting previous theorizing in the pain of payment literature, payment in the cash condition was perceived as more physical and immediate than payment in the PayPal condition (physicality:  $F = 158.89$ ,  $p < .001$ ); immediacy: ( $F = 17.01$ ,  $p < .001$ ). Interestingly, cash was also perceived as significantly less safe ( $F = 6.174$ ,  $p = .014$ ).

Table 1.1: Means of Format Attributes (Study 1)

	<b>Payment: Cash</b>	<b>Payment: PayPal</b>	<b>Receipt: Cash</b>	<b>Receipt: PayPal</b>
<b>Transparent</b>	5.70 (1.15)	5.86 (1.27)	5.92 (1.16)	5.58 (1.22)
<b>Physical</b>	6.21 (.93)**	3.01 (1.91)	6.27 (1.15)**	2.76 (1.96)
<b>Safe</b>	4.96 (1.72)**	5.61 (1.35)	5.92 (1.01)	5.68 (1.06)
<b>Immediate</b>	6.43 (.77)**	5.83 (.939)	6.39 (.82)**	4.74 (1.67)
<b>Easy</b>	6.07 (1.12)	5.87 (1.10)	6.32 (.92)**	5.98 (1.00)
<b>Convenient</b>	5.81 (1.22)	5.58 (1.36)	6.26 (.94)	6.03 (.98)

\*\*  $p < .05$

The primary analyses explored the receipt conditions for evidence regarding hypotheses 1-4. First, the psychological outcomes across the two receipt formats were compared. Table 1.2 presents means by condition. The two items measuring feelings of wealth were averaged to form a single measure ( $r = .252$ ,  $p = .001$ ). Consistent with H1, analyses revealed that feelings of wealth were greater after receiving payment via cash than PayPal ( $M_{\text{cash}} = 5.15$ ,  $M_{\text{PayPal}} = 4.74$ ,  $F = 3.41$ ,  $p = .067$ ,  $r^2 = .03$ ). The three verbal items measuring

joy of receipt were averaged to form a single measure (Cronbach's  $\alpha = .955$ ). Consistent with H3a, analysis revealed that joy of receipt was greater after receiving payment via cash than PayPal (M<sub>cash</sub> = 5.51, M<sub>PayPal</sub> = 4.93,  $F = 5.379$ ,  $p = .022$ ,  $\eta^2 = .04$ ). Analysis of the likelihood to spend immediately measure revealed no difference across conditions (M<sub>cash</sub> = 4.61, M<sub>PayPal</sub> = 4.39,  $F = .588$ ,  $p = .445$ ), failing to support H3b. Analyses using the "face-joy" measure produced similar results; to simplify, only the three verbal measures will be discussed in this and subsequent studies.

Table 1.2: Psychological Outcomes by Receipt Format (Study 1)

	<b>Cash</b>	<b>PayPal</b>
<b>Feelings of wealth</b>	5.15 (1.30)*	4.74 (1.16)
<b>Joy (verbal)</b>	5.51(1.12)**	4.93 (1.64)
<b>Likelihood to Spend Immediately</b>	4.47 (1.74)	4.39 (1.84)
<b>Salience</b>	6.19 (.88)**	4.35 (1.14)

\*\* $p < .05$ , \* $p < .01$

Next, perceptions of the two monetary formats on each of the six aspect measures were compared. Results indicated that compared to participants in the PayPal condition, participants in the cash condition rated their format significantly higher in physicality ( $F = 150.74$ ,  $p < .001$ ), immediacy ( $F = 49.29$ ,  $p < .001$ ), and ease of use ( $F = 3.94$ ,  $p = .049$ ), and marginally higher in transparency ( $F = 2.66$ ,  $p = .105$ ). Means for these items can be found in Table 1.1. The transparency, physicality and immediacy measures were averaged to form an overall salience measure (Cronbach's  $\alpha = .651$ ). Consistent with predictions, perceived salience was greater for cash than PayPal (M<sub>cash</sub> = 6.19, M<sub>PayPal</sub> = 4.36,  $F = 67.03$ ,  $p < .001$ ).

Mediation analyses using the PROCESS macro (Hayes, 2013, Models 4,6)[26] were run with 5000 bootstrapped samples, and results are summarized in Figure 1.2. The direct effect of receipt format on salience was significant and positive ( $\beta = 1.84$ ,  $t = 10.17$ ,  $p < .001$ ), indicating greater salience for cash than PayPal. The direct effect of salience on feelings of wealth was significant and positive ( $\beta = .3384$ ,  $t = 3.26$ ,  $p = .001$ ), indicating greater feelings of wealth when salience was higher. Consistent with H2, the indirect effect of

receipt format on feelings of wealth through salience was significant ( $\beta = .6209$ , 95% CI (.2608, 1.0475)), and inclusion of salience in the model rendered the direct effect of receipt format on feelings of wealth insignificant ( $\beta = -.2182$ ,  $t = -.7686$ ,  $p = .4436$ ), suggestive of full mediation. Finally, adding joy of receipt as a downstream variable yielded support for the serial mediation predicted by Path ABC of my model: the direct effect of feelings of wealth on joy of receipt was positive and significant ( $\beta = .5837$ ,  $t = 7.34$ ,  $p < .001$ ), and the overall indirect effect was also significant ( $\beta = .3624$ , 95% CI = (.1323, .7124)).

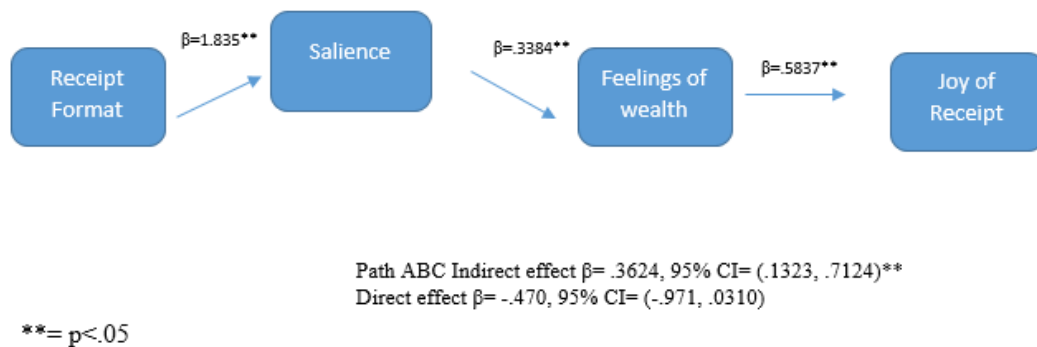


Figure 1.2: Mediation Estimation Model (Study 1)

### 1.5.3 Discussion

Using a realistic transaction scenario in which the format of payment was varied, Study 1 provided initial support for my theoretical model. Consistent with Pathway ABC of the model, participants perceived cash to be more salient than PayPal, leading to greater feelings of wealth after the transaction, and these feelings of wealth in turn led to greater joy of receipt. However, results failed to support Pathway ABD of the model, as receipt of cash rather than PayPal did not induce greater likelihood of spending. One possible explanation is the wording of the scenario itself: having being told that they simply “head back into their apartment” after making the transaction, participants may have had difficulty envisioning “spending the money immediately.” The next studies investigate this possibility,

while extending the setting to other receipt scenarios.

## **1.6 Study 2: Store Return**

The second study uses a common business-to-consumer setting: in-store returns. Expanding on study 1, the new setting enabled a test of our proposals using a different transaction, a different payment format, and a different environment, where “immediate” spending was possible. As an exploratory variable, both hedonic and utilitarian purchase decisions were examined. Previous research shows that the different sources of money are linked to each type of purchase. For example, salaries are seen as more “serious” and less likely to be spent on luxury items, while other income, such as a tax refund, or “windfalls” of any sort, are seen as more frivolous and more likely to be spent on luxury items (Thaler and Shefrin, 1981)[28]. Helion and Gilovich (2014)[29] found that people are more likely to buy hedonic products when shopping with a gift card than with cash, due to its categorization as a gift. This may suggest that consumers will spend more on hedonic items when they are shopping with credit cards as opposed to cash. However, it is possible that because receiving cash (as opposed to credit) makes consumers feel wealthier, they will perceive more immediate discretionary income and be more willing to spend on hedonic items.

### 1.6.1 Method

Participants were 183 Mechanical Turk workers (Age  $X = 35.21$ ,  $SD = 10.62$ ,  $N_{\text{male}} = 104$ ,  $N_{\text{female}} = 79$ ) who were compensated for their time. The study utilized a 2x2, between-subjects design that crossed receipt format (cash vs. credit card) and type of purchase (utilitarian vs. hedonic) as independent variables. Participants read a detailed scenario which first explained that they had purchased a sweater for \$40 from a local Target store, one week previously. The scenario then explained that they had decided not to keep the sweater, and had gone back to the store to return it at the customer service desk. Depending on condition, a store refund was provided either in cash (two \$20 bills), or by reimbursement to the

participant's credit card. Images were presented alongside the text to reinforce the format manipulation. At the conclusion of this section, participants were asked to report their joy of receipt, feelings of wealth, and general spending intentions, using measures similar to those in study 1.

The next section of the scenario captured downstream spending intentions. Participants were told that they reentered the shopping area after leaving the customer service desk, and they encountered a sale display of wireless phone cases. In the hedonic condition, participants were told that they "already have a phone case that works, but have been thinking about buying one that better fits their style." In the utilitarian condition, participants were told that they "just bought a new phone, and are really worried about cracking it." They were asked to provide their willingness to pay for a new phone case, using a "slider" scale ranging from 0 to 50.

Similar to Study 1, participants were then asked to rate their perception of the receipt format on six aspects: transparency (worded this time as "seems like real money"), physicality, immediacy, safety, ease, and convenience. Finally, they completed two attention checks ("Which item did you return?" and "How much did the item cost?") and demographic measures, and the study concluded.

### 1.6.2 Results

After filtering out 65 students who missed one or both attention checks, the usable sample size was 183. Analysis was conducted using separate univariate ANOVA. As in study 1, the two feelings of wealth items were averaged to form a single measure ( $r=.658$ ,  $p<.001$ ), and the three joy of receipt items were averaged to form a single measure (Cronbach's  $\alpha = .955$ .) Means are provided in Table 1.3. Consistent with H2 and the results of study 1, participants who received their refund in cash reported feeling greater levels of wealth

than those who received their refund in credit (Mcash = 4.20, Mcredit = 3.69,  $F = 4.62$ ,  $p = .006$ ,  $\eta^2 = .04$ ). Consistent with H3a and the results of study 1, participants in the cash condition reported greater joy of receipt (Mcash = 5.56, Mcredit = 5.04,  $F = 4.85$ ,  $p = .029$ ). In contrast to study 1 and supporting H3b, participants in the cash condition also reported more willingness to spend the money immediately (Mcash = 4.90, Mcredit = 4.20,  $F = 6.29$ ,  $p = .013$ ).

Table 1.3: Psychological Outcomes by Receipt Format (Study 2)

	Cash	Credit
<b>Feelings of wealth</b>	4.73 (1.77)**	4.02 (1.73)
<b>Joy of Receipt</b>	5.56 (1.42)**	5.04 (1.75)
<b>Immediate Spending</b>	4.90 (1.93)**	4.20 (1.86)
<b>WTP</b>	15.72 (10.37)	15.14 (11.51)
<b>Salience</b>	6.31 (.914)**	4.37 (1.23)

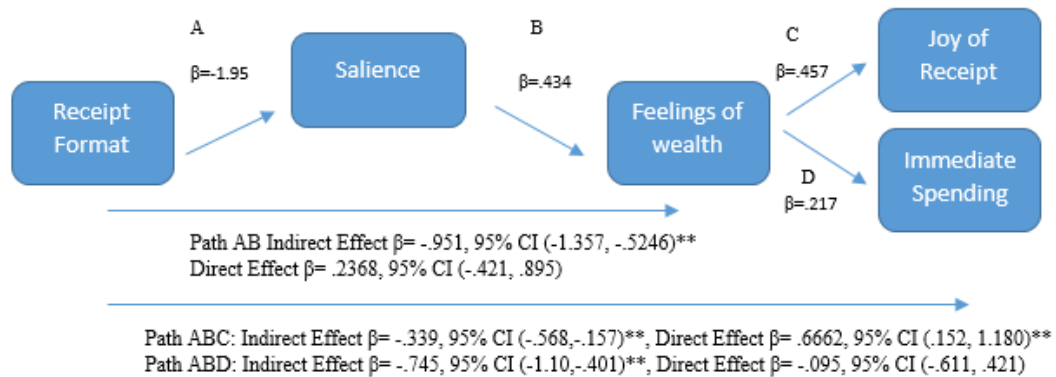
\*\* $p < .05$

Analysis of the willingness-to-pay (WTP) variable revealed no significant main effect of receipt format (Mcash=15.72, Mcredit=15.14,  $F = .127$ ,  $p = .722$ ), failing to support H3b. However, analysis also revealed a receipt format by product type interaction ( $F = 6.08$ ,  $p = .015$ ). Follow-up comparisons revealed that WTP was greater for cash recipients than for credit recipients in the hedonic condition ( $F = 4.08$ ,  $p = .045$ ), but not in the utilitarian condition ( $F = 2.71$ ,  $p = .101$ ).

Independent ANOVA tests revealed that compared to those in the credit condition, those in the cash condition rated their format significantly higher in physicality (Mcash = 6.31, Mcredit= 2.82,  $F = 245.21$ ,  $p < .001$ ) immediacy (Mcash = 6.36, Mcredit = 5.27,  $F = 29.10$ ,  $p < .001$ ), and transparency (Mcash = 6.29, Mcredit = 5.02,  $F = 36.26$ ,  $p < .001$ ). As before, the three items were averaged to create a salience measure ( $\alpha = .723$ ). As predicted, salience was greater for the cash refund than the credit refund (Mcash = 6.31, Mcredit= 4.37,  $F = 147.91$ ,  $p < .001$ ).

Mediation analyses were conducted using the PROCESS Macro in SPSS (Hayes, 2013,

Models 4,6)[26], with 5,000 bootstrapped samples. The results are summarized in Figure 1.3. Results revealed a direct effect of receipt format on salience ( $\beta = -1.95$ ,  $t = -12.16$ ,  $p < .001$ ) and a direct effect of salience on feelings of wealth ( $\beta = .434$ ,  $t=5.10$ ,  $p < .001$ ). Consistent with H2, results also revealed a significant indirect effect of receipt format on feelings of wealth through salience ( $\beta=-.9513$ , 95% CI (-1.37,-.528)). Finally, the separate serial mediation predicted by Path ABC and Path ABD of our model was tested. Results for Path ABC revealed that the direct effect of feelings of wealth on joy of receipt was positive and significant ( $\beta = .457$   $t=7.89$ ,  $p < .001$ ), and the overall indirect effect for the pathway was also significant ( $\beta = -.339$ , 95% CI (-.573, -.148)). Results for Path ABD revealed that the direct effect of feelings of wealth on immediate spending was positive and significant ( $\beta = .795$ ,  $t=14.66$ ,  $p < .001$ ) and the overall indirect effect for the pathway was also significant ( $\beta = -.745$ , 95% CI (-1.11, -.399)).



\*\*= $p < .05$

Figure 1.3: Mediation Estimation Model (Study 2)



### 1.6.3 Discussion

Expanding the investigation of study 1 to a different transaction context, study 2 again demonstrated that receipt of cash versus other monetary formats produces a more positive emotional response, driven by greater feelings of wealth. In addition, results provided initial evidence that cash receipts are may be more likely to be spent immediately. In situations where consumers have received money immediately before considering a purchase, anticipated pain of payment is offset by momentary feelings of wealth, which are strongest when the format of receipt is cash. This result is seemingly contrary to a consistent finding from the pain of payment literature, that shoppers spend less when shopping with cash, due to higher anticipated pain of payment (Feinberg, 1986)[15]. However, the contradiction only holds if it is assumed that consumers planning to pay for any purchases with the same form of money they have received. By this logic, a critical variable is the time delay between receipt and purchase transactions: as the delay increases, feelings of wealth will become less salient, and consumers will again anticipate greater of pain of payment with cash.

## **1.7 Study 3: Found Money**

Study 3 was conducted to test hypothesis 3b in a more detailed and realistic purchase scenario, with additional dependent measures that better capture immediate spending.

### 1.7.1 Method

Participants were 175 Mechanical Turk workers (Age  $X = 36.47$ ,  $SD = 11.51$ ,  $N_{male} = 92$ ,  $N_{female} = 83$ ) from the United States who were compensated for their time. The study incorporated a 2-cell (format: cash vs. PayPal), between-subjects design. Participants read a detailed scenario which asked them to imagine that while walking through a local Target store, they discovered \$40 that they had forgotten about. In the cash condition, participants reached into their pocket and pulled out \$40 (two \$20 bills). In the PayPal condition, they

looked at their phone and noticed they had \$40 available in their PayPal app. Participants in both conditions were told that they were unsure where the money came from, but that it might be a repayment from a friend. This explanation was added for realism, and to avoid connoting that the money was either a gift or did not belong to them. After reading and envisioning this portion of the scenario, participants were asked to report their joy of receipt and feelings of wealth, using the same measures as studies 1-2.

The scenario continued with the participant walking through the store and encountering a sale display of phone cases. Based on findings of study 2, participants were given a hedonic motivation for purchase: they were told that they disliked the look of their current phone case, and that they “really loved” one of the cases on display. The primary dependent measure was likelihood of purchase: participants were told that the phone case cost \$15 and asked how likely they were to purchase it (1- definitely will not purchase to 7- definitely will purchase). As a secondary measure, participants were asked to assume that the price was unknown and provide their willingness-to-pay on a scale from \$0 to \$40. The scale was based on results from Study 2 (in which 98.4% of participants chose a value between \$0 and \$40.)

### 1.7.2 Results

As in the prior studies, the two feelings of wealth items were averaged to form a single measure ( $r=.340$ ), and the three joy of receipt items were averaged to form a single measure (Cronbach's  $\alpha = .926$ ). Means for these measures are provided in Table 1.4. Analysis was conducted using univariate ANOVA. Results revealed that consistent with H1, participants in the cash condition reported feeling greater levels of wealth than those in the PayPal condition ( $M_{\text{cash}}= 5.75$ ,  $M_{\text{Paypal}} = 5.36$ ,  $F = 6.07$ ,  $p = .015$ ). Consistent with H3a, participants in the cash condition also reported feeling more joy of receipt ( $M_{\text{cash}} = 6.22$ ,  $M_{\text{PayPal}} = 5.89$ ,  $F = 4.58$ ,  $p = .034$ ). Consistent with H3b, participants in the cash condition were more likely to purchase the phone case than participants in the PayPal condition ( $M_{\text{cash}}=4.33$ ,

M PayPal=3.84, F=4.09, p=.045). Willingness to pay did not differ significantly between the two conditions (M cash=16.39, M PayPal=15.45, F=.583, p=.446). However, it is possible that responses to this item were anchored on the \$15 price given in the prior, purchase likelihood question (and the observed means reinforce this interpretation).

Table 1.4: Psychological Outcomes by Receipt Format (Study 3)

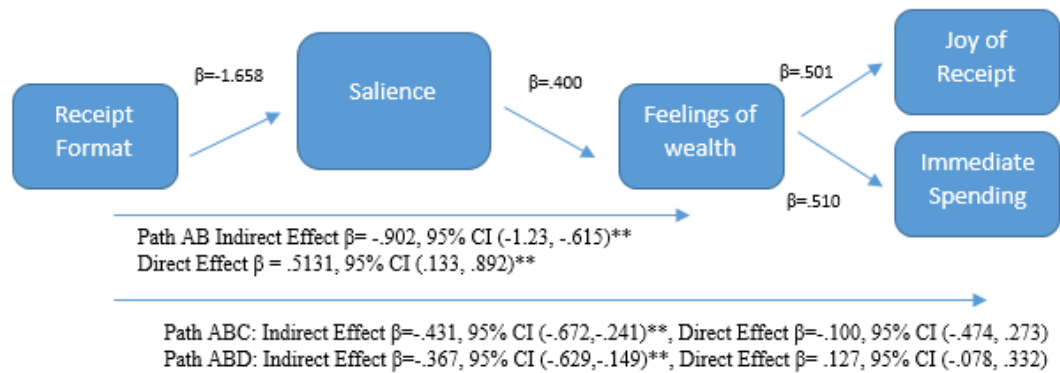
	Cash	PayPal
<b>Feelings of wealth</b>	5.75 (1.02)*	5.36 (1.07)
<b>Joy</b>	6.22 (.924)*	5.89 (1.12)
<b>Likelihood of Purchase</b>	4.33 (1.54)*	3.84 (1.68)
<b>Salience</b>	6.23 (.816)*	4.57 (.958)

\*p<.05

Examination of the aspect measures revealed that consistent with studies 1-2, participants in the cash condition rated the money higher in physicality (M cash = 6.32, M PayPal = 2.86, F = 279.92, p <.001), immediacy (M cash = 6.18, M PayPal = 5.33, F = 23.76, p <.001), and transparency (M cash = 6.17, M PayPal = 5.51, F = 12.14, p = .001). The three measures were again averaged to create a salience variable (a = .591). As predicted, salience was significantly greater for cash than Paypal (M cash = 6.23, M PayPal = 4.57, F = 151.80, p <.001).

Mediation analyses were conducted using the PROCESS Macro in SPSS (Hayes, 2013, Models 4,6)[26], with 5,000 bootstrapped samples. The results are summarized in Figure 1.4. Results revealed a direct effect of receipt format on salience ( $\beta = -1.66$ ,  $t = -12.32$ ,  $p <.001$ ) and a direct effect of salience on feelings of wealth ( $\beta = .400$ ,  $t = 6.78$ ,  $p <.001$ ). Consistent with H2, results also revealed a significant indirect effect of receipt format on feelings of wealth through salience ( $\beta = -.902$ , 95% CI (-1.24,-.612)). The remaining direct effect of receipt format on feelings of wealth was significant ( $\beta = .5131$ , 95% CI (.133, .892)), suggesting partial mediation. Supporting Path ABC of the model, serial mediation analysis revealed that the direct effect of feelings of wealth on joy of receipt was positive

and significant ( $\beta = .501, p < .001$ ), and the overall indirect effect for the pathway was also significant ( $\beta = -.431, 95\% \text{ CI } (-.672, -.241)$ ). Supporting Path ABD of the model, the direct effect of feelings of wealth on immediate spending were positive and significant ( $\beta = .510, p < .001$ ), and the overall indirect effect for the pathway was also significant ( $\beta = -.367, 95\% \text{ CI } (-.629, -.149)$ ).



\*\*= $p < .05$

Figure 1.4: Mediation Estimation Model (Study 3)

## 1.8 General Discussion and Conclusion

As consumer to consumer payments increase, the use of cash decreases, and new forms of payment emerge, it is essential to understand how the proliferation of payment methods affects consumers, their emotions, and their behavior. This research was conducted to investigate how the format in which money is received affects immediate affect and behavior. My theorizing argues that receipt format affects how salient the money seems, leading consumers to feel wealthier when they are paid in formats that are more salient. Those feelings of wealth have both affective (higher joy) and behavioral (immediate spending) consequences. In the context of a consumer-to-consumer transaction, Study 1 provided evidence that cash, as a more salient form than PayPal, leads consumers to report higher

feelings of wealth and more happiness. In the context of a customer return, Study 2 showed that receiving cash (as opposed to credit) leads consumers to make more immediate purchases, although this was only the case in a hedonic scenario. In a “found money” context comparing cash to PayPal, Study 3 provided additional evidence for the effect of monetary format on immediate purchase.

This research has helped to fill a gap in the literature on consumer monetary transactions. Every transaction has two sides, a buyer and a seller, and the monetary format in which the transaction occurs has implications for both sides. However, prior research has focused almost exclusively on the buyer side of the transaction, in the form of pain of payment. My hope is that this research inspires further investigation into the receipt side of the transaction. For retailers, my findings inform understanding regarding customer attitudes and behavior after receiving a refund. Additionally, the experience of joy of receipt may lead customers to form positive associations with a store, induce word-of-mouth marketing, and strengthen store-consumer relationships. For all these reasons, retailers may want to consider crediting consumers in cash rather than credit, using “cash-like” promotions. More broadly, employers and financial institutions may be interested in the positive ramifications of paying their employees and customers in cash, to the extent that doing so is feasible and practical.

For consumers, it is important to be aware that a chosen method of payment may have implications and consequences for the seller. For example, if a buyer is forced to pay in cash, they may feel greater pain of payment, leading to negative consequences on the seller’s relationship with the buyer, as well as the seller’s future transactions with other buyers.

Future research should investigate the link between joy of receipt and subsequent spending. In my framework, these two variables are considered independent consequences of feelings of wealth. However, it is possible that joy of receipt and likelihood to spend have a separate, causal relationship that needs to be explored. In addition, it would be interesting

and worthwhile to investigate generational differences among consumers in their preferences for (and reaction to) receiving cash versus other forms of payment. In particular, age may moderate the effect of receipt format on feelings of wealth, impacting subsequent behaviors and emotions.

It is important to emphasize that the feelings of wealth and joy of receipt identified in my research are inherently transient states. Results of the pretest suggest that when asked two weeks after the fact, consumers who have received cash may not feel wealthier than those who have received electronic payment. It would be worthwhile for future research to investigate the duration of feelings of wealth across different settings.

This research suggests a possible boundary condition to pain of payment findings on spending. I show that when a consumer has received money recently and is presented with a spending opportunity, perceptions of the money received (feelings of wealth) act as a buffer against perceptions of the money they may spend (pain of payment), and the strength of the buffer depends on monetary format. The most interesting situations are those in which the format of receipt and subsequent purchase are aligned. For example, one shopper may receive a cash reimbursement and then shop with cash, while another shopper may receive a credit card reimbursement and then shop with credit. Which of the two shoppers will be more willing to spend? This question offers a clear opportunity for future research.

This research represents an initial exploration of an important but neglected topic. Given the myriad contexts and formats in which modern consumers receive monetary payments, the “joy of receipt” has broad ramifications for their affect, cognition, and behavior. Through a better understanding of the phenomenon, scholars will gain unique insights into the psychology of consumer transactions.

## CHAPTER 2

### HOW ARE INNOVATIONS IN PAYMENT TECHNOLOGY AFFECTING PAIN OF PAYMENT? A FOCUS ON “NOVELTY”

#### 2.1 Introduction

While my first essay focused on the receiving end of a transaction, my second essay will take a more traditional approach to pain of payment, by focusing on the payment itself. In the United States, an estimated 1.2 billion consumer transactions occur daily. These transactions range from small, low-involvement purchases (buying a soda in the checkout line), to large, high-involvement purchases (buying a new car). Consumer emotional responses to these purchases vary widely, involving feelings ranging from delight (Oliver, Rust and Varki 1997)[30] to regret (Yi and Baumgartner 2004)[31]. Regardless of other emotions involved, however, almost all of these transactions involve payment, and they therefore have the potential to generate pain (Zellermayer 1996)[8]. As discussed in my first essay, the term “pain of payment” captures the negative emotional reaction of consumers to making a payment. Payment format has major implications not only for a consumer’s emotional state, but also for their subsequent behavior. Previous work has identified temporality and transparency of the payment as influential drivers of this phenomenon. However, pain of payment research has largely ignored the growing variety of payment formats that have emerged in recent years. This essay will examine a wide variety of novel forms of payment, including mobile payments, biometric credit cards, and redesigned cash.

Mobile payments are considered a new frontier in commerce. Mobile devices assume a crucial role in daily activities, and their versatility and capacity for growth in functionality seems limitless. In 2018, 55 million people in the U.S. used their smart phone to make a payment at a physical point of sale, whether by a closed-loop

mobile app (like the Starbucks app), or an open-loop wallet, (like Apple Pay). Other countries have adopted mobile payments at a faster rate than the United States. According to eMarketer's Global Mobile Payment Users Report (2019)[32], only 25% of Americans made a mobile payment in 2018, while 81% of people in China did so in a six-month period. Countries such as India, Denmark, South Korea, and Sweden have been quick to adopt mobile payment methods, while countries such as Brazil, Germany and Mexico have shown slower growth, with adoption rates under 15%. The United States is at an important stage in the adoption process, as a growing number of consumers are exploring mobile payments. Given this evolution alongside the potential for mobile transactions to be easier, more convenient, and (arguably) safer than traditional formats, it is important to understand their psychological consequences.

Mobile payments introduce a new set of variables into an analysis of pain of payment, which were not very relevant to traditional formats (cash, credit/debit, checks, etc.). When evaluating a mobile device as a payment mechanism, new factors to consider include: rewards, coupons, payment history, geolocation, and social interactions. These factors can make paying with a phone an entirely different experience than paying with cash or a card. Hence, paying with a mobile device is in itself a novel experience.

Novelty can lead to many outcomes and emotions relevant to the consumer transaction experience, one of which is excitement. In this research, I explore how novel payment formats can affect consumers' pain of payment. While it may be expected that mobile payments are less painful than cash payments due to transparency and temporality, these variables cannot fully explain why there may be a difference between mobile payments and card payments. Across seven studies, I explore the effects of payment format on pain of payment. I find that the perceived novelty of a payment format induces excitement, leading to lower pain of payment.



## **2.2 Literature Review**

### 2.2.1 Pain of Payment

As written in Chapter 1, the term “pain of paying” was first introduced by Zellermayer (1996)[8], and refers to the notion that a consumer who pays for a product or service experiences negative emotions associated with the act of paying. The pain of paying is different from the fear that spending money would result in lower future buying power; it is the hedonic vexation connected with spending money. Zellermayer also posits that the pain of paying plays an adaptive role: it provides the consumer with an “instant emotional signal” about the potential negative ramifications of the purchase, which can impede overindulgence. Pain of payment is relatively hard to measure, because individuals are not always able to report their emotional states. Thus, pain of payment is typically measured by self-report: e.g. Zellermayer (1996)[8]. However, Mazar et al. (2017)[9] present direct empirical evidence for pain of payment as a literal pain experience. Using fMRI measurement, they find direct evidence for the existence of a negatively hedonic experience of paying and qualify the displeasure as an affective pain. In addition, they find that paying recruits pain-processing brain regions, but that recruitment is limited to pathways involved in affective aspects of pain processing, not somatosensory aspects. On the other hand, they observe that processing of especially intense psychological pain can spread to brain areas involved in somatosensory pain processing. This could occur when the pain of payment is particularly high.

### 2.2.2 Behavioral Effects of Pain of Payment

Both pain of payment and anticipated pain of payment have been found to produce a variety of psychological and behavioral consequences for consumers. Anticipated pain of payment plays an important role as the consumer weighs the benefits and costs of a purchase, confirming that pain of payment is considered prior to the actual payment transaction. Rick,

Cryder and Loewenstein (2008)[12] state that there is a distinction between “expected” emotions and “immediate” emotions. Expected emotions are those that are anticipated to occur as a result of a decision. Immediate emotions can also arise from thinking about the future consequences of one’s decision, but unlike expected emotions, immediate emotions are also experienced at the moment of choice. Rick et al. (2008)[12] finds that unless opportunity costs are explicitly represented, consumers presented with a decision feel an anticipatory pain of payment rather than an immediate pain of payment. Expected pain of payment is therefore relevant to differences in deliberation/purchase behavior, while immediate pain of payment is more relevant to differences in post-purchase behavior.

Research has shown that using less transparent (and therefore less painful) forms of money reduces barriers to spending. For example, Chatterjee and Rose (2012)[16] demonstrated that simply priming the notion of cash prior to a product evaluation will influence people to focus on the costs and negative attributes of a product, whereas priming credit cards lead people to focus on the benefits and positive attributes of a product. Feinberg (1986)[15] found that merely having a credit card logo present while making a purchase decision increased the probability of making a purchase from a consideration set, the decision speed and the amount spent while making a purchase. Soman (2001)[14] showed that consumers who paid for a past expense using a relatively low-pain credit card were more likely to purchase an additional discretionary product (e.g., a boxed set of CDs from an artist that they liked) than those who paid for the same past expense using a relatively higher-pain check. This is because purchases made by credit card are less painful and therefore harder to recall than those made with cash. In an auction setting, Prelec and Simester (2001)[13] found that individuals would bid nearly twice as much money for the same item when using a credit card than when using cash.

Most prior work suggests that experiencing lower pain of payment is associated with positive outcomes during consumer deliberation and purchase (e.g., increased willingness to purchase a product, higher willingness to pay for an item, greater point-of-purchase

satisfaction). When looking at post transaction effects, however, greater pain of payment can produce positive effects on the consumer. Shah, Eisenkraft, Bettman and Chartrand (2016)[17] found that individuals who use more painful forms of payment increase their emotional attachment to a product, decrease their commitment to non-chosen alternatives, are more likely to publicly signal their commitment to an organization, and are more likely to make a repeat transaction.

### 2.2.3 Perceived Novelty and Emerging Payment Formats

From previous research on payment format and pain of payment, it is known that temporality and physicality drive differences in pain of payment between cash and credit cards. In the past decade, however, payments have shifted to new electronic formats that introduce novelty as an emerging factor to incorporate.

The evolution of payment formats is nothing new, but the recent growth in payment options has been unprecedented. The origin of money is not entirely clear, but historians believe metal objects were first used as money as early as 5,000 B.C. Paper money in the United States dates back to 1690, and represented bills of credit or IOUs. 300 years later, the modern credit card was created in 1950 by Ralph Schneider and Frank McNamara, who founded Diners Club. While credit cards were introduced more recently than cash, most people alive today were born after the introduction of credit cards. Many people grew up observing their parents using credit cards, signed up for credit cards as young adults, and are as familiar with using a credit card as they are with using cash.

In contrast, mobile payments only gained widespread viability after the introduction of the smart phone. For purposes of this paper, mobile payments are defined as any electronic payment using a smart phone made in the presence of the recipient- paying electronically in a moment where cash could be a viable substitute. This definition includes scenarios such as using Apple Pay to pay for groceries while standing at a checkout counter, as well as using Venmo to send money to a friend standing nearby. This definition does not include

what is typically termed “online shopping,” e.g. buying an item using the Amazon app or Target website. While online shopping has been possible on a mobile device since the early 2000s, the first widespread “mobile payment app” is generally considered to be Google Pay, introduced in 2011.

Mobile payments accelerated with the release of Apple Pay (2014), Samsung Pay (2015), and Android Pay (now merged with Google Pay) in 2015. To be able to use these apps, a customer must upload credit or debit card information, which is then stored for instant use. The apps can be used for on- line shopping as well as for mobile payments, as defined above. In a retail environment, mobile payment apps typically utilize near-field communication (NFC) chips embedded in a device and activated by holding the device near a chip reader reader, similar to the operation of a contactless debit card. Depending on the type of device, a fingerprint or face scan is required to approve the purchase. Other apps, such as Venmo and PayPal, can be used for consumer-to-consumer transactions that do not require an NFC reader, and can be used to transfer money online. While PayPal first appeared on home computers in the late 1990s and was alter adapted to mobile phones, Venmo was introduced in 2009 solely for mobile payments.

In the United States, mobile payments have only begun to constitute a widespread form of payment. With only 30% of smartphone users having made a mobile payment, the technology is still relatively new for consumers. My research considers how the newness of these payment tools impacts the psychological aspects of spending.

## **2.3 Theory**

### 2.3.1 Novelty

I propose that the perceived novelty of a payment can play a large role in how a consumer interacts with and feels about the payment. I define perceived novelty of payment format as simply the “newness or freshness in the eyes of the consumer.” Similar definitions have been published, as in Wells, Campbell and Featherman (2010)[33], where novelty is de-

defined in reference to technology as "the newness or freshness of the innovation in the eyes of the adopter." Wells et al.(2010)[33] makes it clear that novelty is not only inherent in the product, but that perceptions of novelty differ widely across individuals. Using this definition, a novel form of payment may range from a new version of an old payment method (a new credit card) to an entirely new form of paying (mobile payments). A consumer's own use of the payment format plays a role in how novel it is perceived to be, as well as how pervasive the payment format is in society. My research shows that novelty does not stem only from technological advances. For example, a new dollar bill can also invoke novelty and lower pain of payment. This dollar bill is different only in amount and design- it is still made of paper and carries no additional technology.

Previous research suggests that payment novelty is merely "unfamiliarity" with a payment form, and therefore the payment just does not "seem like real money" to the consumer. Alter and Oppenheimer (2008)[34] showed that participants perceived higher purchasing power for currency with a familiar form (e.g. two \$1 bill) than currency with an unfamiliar form (e.g. a \$2 bill). The authors attributed the disparity of perceived purchasing power to the processing fluency of the currency, where familiar currency could be processed more fluently compared to unfamiliar currency. Similar to the measure of transparency used in Chapter 1, the more easily recognizable the money, the greater the feelings of wealth. Looking at this study, it could be that paying with a familiar form of payment (more fluent and transparent) would be less painful than paying with the unfamiliar format. This phenomena can also be seen in the "mere exposure effect" (Zajonc, 1968)[35], which posits that familiar items are preferred to their unfamiliar, but otherwise identical, counterparts. However, while participants may feel more comfortable and prefer familiar formats, this also may mean that they are less willing to part with the money. This reluctance could lead to greater pain of payment, It is unclear from previous research whether familiar formats would lead to greater feelings of wealth and subsequently lower pain of payment, or conversely, greater reluctance to part with the money.

### 2.3.2 Excitement

Beyond the impact of novelty through disfluency (which may influence pain of payment in either direction), excitement caused by novelty may influence consumers' emotions and behavior when paying. Evidence suggests that consumers may, in fact, prefer novel ideas and items. Berlyne (1970)[36] ran two experiments in which subjects were exposed to sequences of colored shapes. The results indicate that overall, both pleasingness and interestingness increase with novelty. Berlyne (1970)[36] also found that simple stimuli became less pleasant as they became less novel. Other research suggests that consumers are naturally novelty-seeking. Coombs and Avrunin (1977)[37] cite physiological evidence which indicates that once a consumer has reached an optimal level of an attribute, s/he feels satiated and may choose to consume a different attribute on the next occasion. In other situations, consumers may be satisfied with their current choices, but may be looking to try something new or different for the fun of it, or for the thrill of it (e.g., Berlyne 1963, 1970)[38][36]. Berlyne posited that arousal functions as an additive effect derived from an object's collative properties (e.g., novelty, complexity, incongruity). The prediction follows that using a novel form of payment may lead to high, positive arousal. While some novel products may lead to high arousal with a negative valence (e.g. carbonated milk (Noseworthy, Di Muro and Murray (2014)[39]), overwhelmingly, the literature on novelty shows us that consumers seek novelty. As researchers study new payment formats, the level of adoption of mobile payments shows them that many consumers are attracted to innovation. This indicates that consumers should generally have a high, positive level of arousal (excitement) when using a novel payment format.

As noted in the introduction, monetary format should not (rationally) play a role in consumers' pain of payment. Many of the payment formats that are investigated here have a large symmetry: the money is coming from the exact same place. For example, most mobile phone payments (including all of the ones presented here), utilize a credit card company to make a payment. Therefore, the back end payment processing is equivalent

to that of the plastic card that they would have otherwise used. Economically, there is no difference in the two payments. However, the fact that mobile payments are a relatively new phenomenon leads to the proposal that payments made with mobile phones will be more novel, and therefore more exciting, leading to lower pain of payment. Along with showing the difference in novelty between mobile phones and credit cards, this research shows that this effect is not limited to mobile payments, and applies to any novel form of payment. For example, consumers report high novelty and excitement when using new forms of credit cards, new denominations of cash, and redesigned cash.

H1: Consumers will feel lower pain of payment when paying with an unfamiliar payment format

H2: Novelty and Excitement will mediate the relationship between payment format and pain of

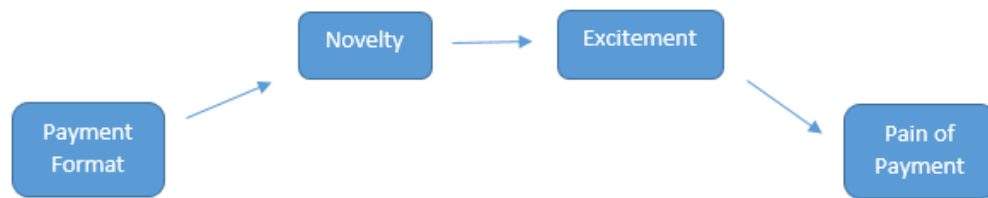


Figure 2.1: Theoretical Framework

## 2.4 Overview of the Studies

Seven studies and a pretest test are employed to examine the prediction that paying with a mobile phone is less painful than paying with a credit card. The pretest shows many real world examples of how cash is more painful to pay with than a mobile phone. Studies 1a and 1b test H1 by providing participants with a scenario and comparing payments made using cash vs. credit card vs. mobile phone. Study 2 examines mediation (H2) for the process through novelty and excitement. Study 3 provides additional support for novelty

and excitement as the mechanism through which payment mechanism affects pain, and Study 4 investigates whether this effect occurs with many other formats of payment. Study 5a and 5b provide additional understanding of “novelty,” and show that novelty can exist in ways other than new technology.

## **2.5 Pretest: Real World Example**

### 2.5.1 Method

To get a feel for whether consumers remember feeling more pain of payment with cash purchases, participants were split into two conditions: one in which they recalled the last time they made a payment using cash, and one in which they recalled making a payment using a mobile device. Participants were asked to write a few sentences describing the transaction in which they used cash (their mobile phones).

Participants then recorded the dollar amount that they paid during this transaction, and recalled how they felt at the time of transaction. Measures were included to uncover the differences in payment format. Participants were asked how much pain they felt at the point of purchase, and this was used as the dependent variable. Other measures included asked participants to recall how excited, nervous, cool, confident, enthusiastic, and unsure they felt using the particular payment. It should be noted that these emotions are not easy to recall, especially because some of these payments were made months ago. However, that this issue should be similar across conditions, and any differences in the two conditions would indicate true differences in payment formats.

### 2.5.2 Results

172 undergraduate students from a marketing department at a well-known public university participated in this survey. After removing 12 participants who had never made a mobile payment, 160 participants remained (43.1% male, average age: 20.23 years, range: 18-44).

Participants recalled their last cash or mobile purchases, and a few excerpts are included



below:

*“I was paying home depot. I used cash because it was my own money and I didn’t want to use my credit card that contains my parents money.”*

*“I paid in cash for a smoothie at Tropical Smoothie. I chose to use cash payment here because I had been charging my card quite a bit and had extra cash.”*

*“I paid my friend 3 dollars via Venmo because he bought me iced coffee at Dunkin Donuts.”*

The results show a significant difference in pain felt between the two conditions. When participants recalled the experience of the last time they paid with cash, they felt more pain than the participants who recalled paying with their mobile phones (M<sub>cash</sub>= 3.42, M<sub>mobile</sub>=2.02, F(1,159)=21.04, p<.001). Although the average amounts in each condition did not significantly differ (M<sub>cash</sub>= 27.91, M<sub>mobile</sub>=25.31, F(1,159)=.076, p=.783), the analysis was done with amount as a covariate.

### 2.5.3 Discussion

This pretest provided initial results that consumers remember cash payments as more painful than their mobile counterparts. The next seven studies provide more evidence of the effect of payment mechanism on pain of payment, as well as show the indirect effect of payment mechanism on pain of payment through novelty and excitement.

## **2.6 Study 1a: Mobile Phones and Pain of Payment (3rd Person)**

Study 1a examines the pain of paying consumers feel when paying with cash, credit cards, and mobile phones.

### 2.6.1 Method

296 participants on MTurk participated in a five-minute study in exchange for \$0.50 (56.8% male, average age: 34.40 years, range: 19-68). This study was a 3-cell between subjects experiment where payment format was manipulated (cash vs. card vs. phone), and pain of payment was measured. Participants were asked to read and respond to a scenario adapted from Raghubir and Srivastava (2008). The scenario asked participants to imagine a situation in which an individual named Chris was buying supplies for a dinner party. They were asked to visualize Chris at the grocery store, buying ingredients (chicken, salad, vegetables, bread, wine and pie) to make dinner for a 6-person sit-down dinner. They were then asked to imagine Chris at the cash register, paying in either cash, card, or by phone, and to indicate the amount they believed Chris would have paid for the supplies. Next, participants were asked to respond to the question: "How much pain do you think Chris felt when paying for his purchase with his credit card (cash, mobile phone)?" (1=no pain at all, 10=extreme pain). Demographic information was collected at the end of the survey. An attention check was included, and six participants were excluded from the analysis for the final count of 296 participants.

### 2.6.2 Results

A preliminary ANOVA revealed that the perceived amount of money spent by Chris did not significantly differ across the three payment conditions (Mean<sub>cash</sub>= 82.30, Mean<sub>card</sub>=87.68, Mean<sub>mobile</sub>=84.83,  $F(2,295)=.259$ ,  $p=.772$ ). This result suggests that the scenario was perceived similarly across the conditions. In the main analysis, ANOVA revealed that the perceived pain of payment felt by Chris differed across the three conditions (Mean<sub>cash</sub>=4.42, Mean<sub>card</sub>= 4.01, Mean<sub>mobile</sub>= 3.14;  $F(2, 295)=9.916$ ,  $p<.000$ ). Consistent with prior research, follow-up contrasts revealed that pain of payment was lower in the credit card condition than the cash condition, though the difference did not reach significance ( $F=1.791$ ,  $p=.182$ ). Pain of payment was significantly lower in the mobile phone

condition than the credit card condition ( $F=9.017, p=.003$ ).

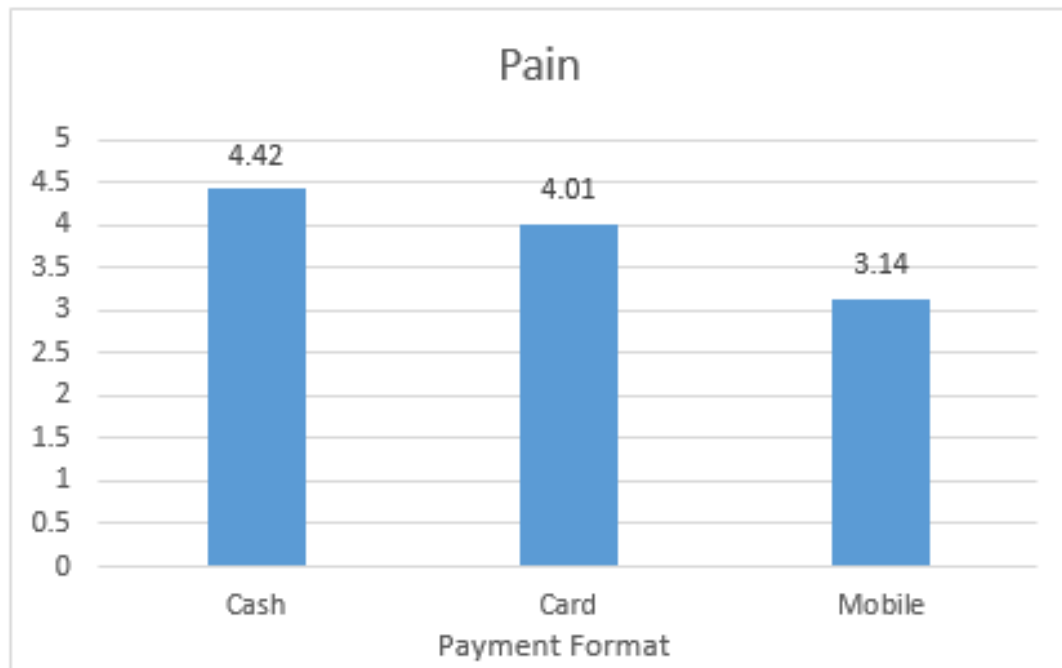


Figure 2.2: Study 1a Pain Means

### 2.6.3 Discussion

Study 1a provides preliminary evidence for Hypothesis 1: that consumers experience lower pain of payment when they pay with mobile phones than when they pay with credit cards. However, the design of Study 1a contains idiosyncrasies that need to be addressed. Because the scenario involved a third party (Chris), participants might have felt removed from the situation and cared less about the money spent. It is also possible that they may have made assumptions about Chris based on the format of money he was spending, and adjusted their responses accordingly. Additionally, allowing participants to estimate the amount spent may have influenced their subsequent projections of pain (i.e. worries about if the answer was right). TO address these limitations, Study 1b uses a scenario in which participants themselves are the main actor, and the purchase amount is fixed.

## **2.7 Study 1b: Mobile Phones and Pain of Payment (1st Person)**

### 2.7.1 Method

202 individuals on MTURK participated in a five-minute study in exchange for \$0.50. The study was a 2-cell between participants experiment where payment format was manipulated (card vs. phone; the cash condition was dropped), and pain of payment was measured. Differing from Study 1a, participants were told to imagine themselves doing the shopping for a dinner party they were hosting, not Chris. In addition, they were told that the total cost of the items was \$85. Upon reading the scenario, participants responded to the same questions as in Study 1a capturing pain of payment, as well as demographic information and attention checks.

### 2.7.2 Results

The analyses were conducted with 174 participants (56.3% male, average age: 34.36 years, range 18-69); 28 participants were dropped from the analyses because they failed one or more attention checks. An ANOVA with payment format as the independent variable and pain of paying as the dependent variable showed that participants who paid with their phones reported lower pain of paying compared to those who paid with their cards (Mean<sub>card</sub>=4.32, SD<sub>card</sub>=2.50; Mean<sub>mobile</sub>= 3.25, SD<sub>mobile</sub>= 2.01;  $F(1, 172) = 9.63, p < .002$ ).

### 2.7.3 Discussion

The findings from Study 1b are in agreement with the findings from Study 1a, and support our proposal. This study addressed the potential issues in Study 1a. Study 2 examines possible mediators for the effect found in Studies 1a and 1b.

## **2.8 Study 2: Novelty and Excitement**

Study 2 provides evidence for the mediating process in this phenomenon. Introduced to a new scenario in this study, participants felt more novelty and more excitement when paying with a mobile phone as compared to cash and a credit card, These feelings of novelty and excitement led to lower pain of payment.

### 2.8.1 Method

Study 2 was run with 276 participants on Amazon's Mechanical Turk. The study had three conditions: cash, credit card, and mobile phone. In all conditions, participants were told to imagine themselves in this scenario:

*You're walking through Target one afternoon, and you put a few items in your cart: a shirt, a backpack, and some snacks. Once you are done walking around, you head to the checkout lane and get in line. After a couple of minutes, the customer ahead of you is picking up their bags, and you reach the register. The cashier scans your items for a total of \$81.73! This is MUCH more than you expected! Nevertheless, you take out your cash (credit card, mobile phone) to pay. You count out your money, hand it to the cashier, and she puts it in the cash register. Your receipt prints and the cashier hands it to you before you collect your bags.*

The last three sentences of the scenario were adjusted slightly for the credit card and mobile phone conditions. To measure pain of payment, participants responded to the question "When you paid the \$81.73 with your credit card, how much pain did you feel?" on a scale from 1 (no pain) to 10 (a great deal of pain). Participants then rated the statements "Paying with cash/my credit card/my mobile phone was novel", and "Paying with cash/my credit card/my mobile phone was exciting" on a scale from 1 (strongly disagree) to 7 (strongly agree). A measure of salience was also collected by asking participants to rate the cash/credit/mobile payment they just made, compared to other forms of payment, on physicality, transparency, and immediacy.

### 2.8.2 Results

The analyses were conducted with 222 participants (58.1% male, average age: 38.44years, range: 21-74). 54 participants were excluded for failing one or more attention checks. This study found that participants reported that mobile phones are less painful to use than credit cards and cash ( $M_{\text{cash}}=6.44$ ,  $M_{\text{credit}}=6.16$ ,  $M_{\text{mobile}}=5.40$ ). An ANOVA test found a significant difference between the credit and mobile conditions ( $F=3.96$ ,  $p=.049$ ). Participants rated mobile payments as significantly more novel than paying with either cash ( $M_{\text{cash}}=2.52$ ,  $M_{\text{mobile}}=4.37$ ;  $F(1,151)=46.78$ ,  $p<.001$ ) or a card ( $M_{\text{credit}}=2.01$ ,  $M_{\text{mo}}$

bile=4.37;  $F(1,142)=91.37$ ,  $p<.001$ ). There was no significant difference in novelty between cash and a credit card, as expected. Similarly for excitement, there is a significant difference between cash and mobile payment ( $M_{cash}=2.22$ ,  $M_{mobile}=3.22$ ;  $F(1,151)=15.35$ ,  $p<.001$ ), and between card and mobile payment ( $M_{card}=1.84$ ,  $M_{mobile}=3.22$ ;  $F(1,142)=32.05$ ,  $p<.001$ ).

Additionally, using the PROCESS macro in SPSS (Hayes, 2013, model 6)[26], this study shows evidence for serial mediation. Considering the credit and mobile conditions, payment format had an effect on novelty, which in turn led to excitement, and finally, to pain of payment. ( $\beta=-.63$ ,  $CI= (-1.20, -.15)$ ). The direct effect of payment format on pain of payment was no longer significant after accounting for this pathway ( $\beta=-.46$ ,  $CI= (-1.41, .48)$ ). Additionally, no significant pathway emerged using either novelty or excitement alone. While a significant difference in salience (an average of transparency, physicality and immediacy) between the credit and mobile conditions did exist ( $M_{credit}=5.1$ ,  $M_{mobile}=4.45$ ;  $F(1,142)=13.21$ ,  $p<.001$ ), salience did not mediate the relationship between payment format and pain.

Table 2.1: Psychological Outcomes by Receipt Format (Study 2)

<b>Payment Format</b>	<b>Pain</b>	<b>Novelty</b>	<b>Excitement</b>
Cash	6.44 <sup>A</sup>	2.52 <sup>A</sup>	2.22 <sup>A</sup>
Credit	6.16 <sup>A</sup>	2.01 <sup>A</sup>	1.84 <sup>A</sup>
Mobile	5.4 <sup>B</sup>	4.37 <sup>B</sup>	3.22 <sup>B</sup>

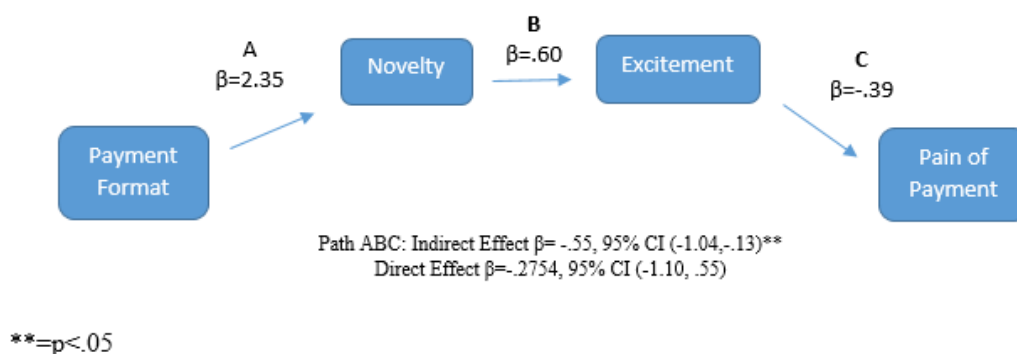


Figure 2.3: Mediation Estimation Model, Study 2

### 2.8.3 Discussion

Study 2 provides evidence for Hypothesis 2 by showing that novelty and the resulting excitement mediate the relationship between payment format and pain of payment, and not salience. This study shows clear evidence that mobile phones are a less painful payment mechanism than cash and credit, but does not extrapolate to other novel forms of payment. Subsequent studies show how novelty can be shown in monetary formats other than mobile phones.

## **2.9 Study 3: Manipulating Novelty within Payment Format**

This study was run in order to rule out other confounding variables that may occur when comparing varied payment formats. When comparing a mobile device with a credit card, so many factors differ between the two items that it is difficult to separate out novelty. To combat this issue, this study compares two different forms of credit cards. Novelty was manipulated through the type of credit card (control vs. biometric).

### 2.9.1 Method

200 participants on Prolific participated in a five-minute study in exchange for \$.60. In both conditions (control and biometric credit card), participants were given the same scenario



from Study 2. They were asked to imagine that they were walking through Target, and put a few items in their cart: a shirt, a backpack, and some snacks.

When they reached the checkout counter, participants in the low novelty condition were told that they would pay the total (\$81.73) with their credit card. The credit card was described as one that they had just received in the mail, but was otherwise identical to their old credit card. They were told that they had received it as a replacement for their old card, and that it has all of the same features. Next, they were asked to imagine they insert the card into the card reader, and that it is approved.

In the high novelty condition, participants were told that they pull out a new, biometric credit card that they have just received in the mail. They do not need to insert this credit card. Instead, they hold their thumbprint over a spot on the card, hold it near the reader, and the payment is complete. They were told that they had never used a card like this, but that it was simple and intuitive. Both cards can be seen in figure 2.4.

Participants were then asked about how painful the purchase would be to make, along with how novel and exciting the card payment would be. Additionally, participants were asked to rate themselves using the Consumer Novelty Seeking scale by Manning, Bearden and Madden (1995)[40], which includes statements such as “I often seek out information about new products,” and “I frequently look for new products and services.” The end of the survey included two attention checks, along with demographic information.



Figure 2.4: Control and Biometric Credit Card Stimuli

## 2.9.2 Results

The analyses were conducted with 197 participants (52.3% male, average age: 37.2 years, range: 18-71). Three participants were excluded for failing one or more attention checks.

Participants in the control credit card condition felt more pain of payment than those in the biometric credit card condition ( $M_{\text{control}}=6.95$ ,  $M_{\text{biometric}}=5.99$ ;  $F(1,196)=6.8$ ,  $p=.01$ ). Looking at novelty and excitement, participants rated the biometric credit card as significantly more novel ( $M_{\text{control}}=2.93$ ,  $M_{\text{biometric}}=5.2$ ;  $F(1,196)=110.19$ ,  $p<.001$ ) and exciting ( $M_{\text{control}}=2.81$ ,  $M_{\text{biometric}}=4.52$ ;  $F(1,196)=49.21$ ,  $p<.001$ ) than the control credit card. Using an average from the consumer novelty seeking scale, the level of novelty seeking can moderate the relationship between condition and pain. Those who are more novelty seeking see a larger reduction in pain from the biometric credit card. Participants who scored below a 3.12 (33.5%) on a scale from 1 (low novelty seeking) to 7 (high novelty seeking) on the novelty seeking scale did not see a difference in pain between the two credit cards, while participants who scored above a 3.12 (65.3%) felt significantly less pain with the biometric card than the control card.

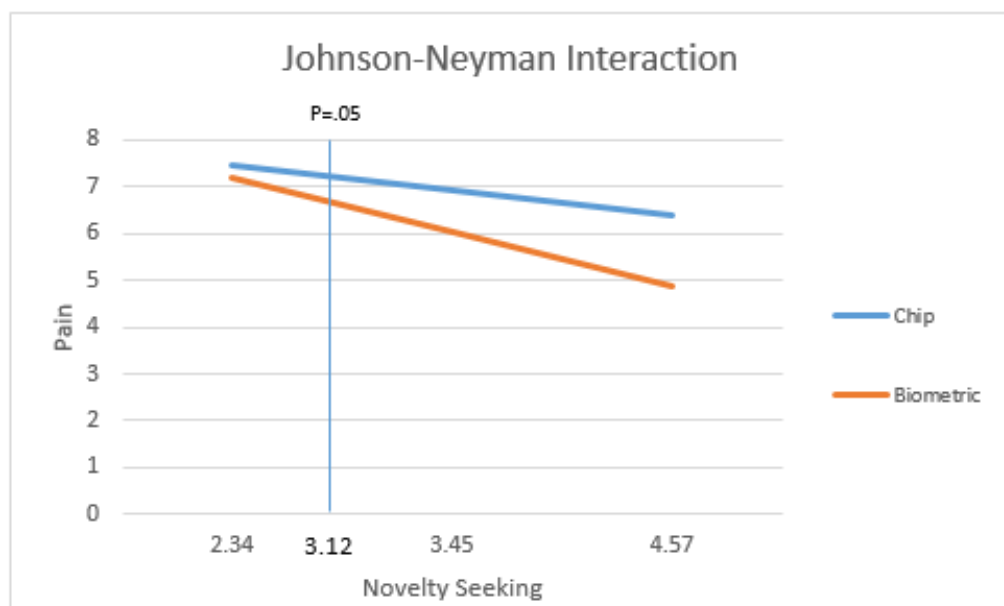
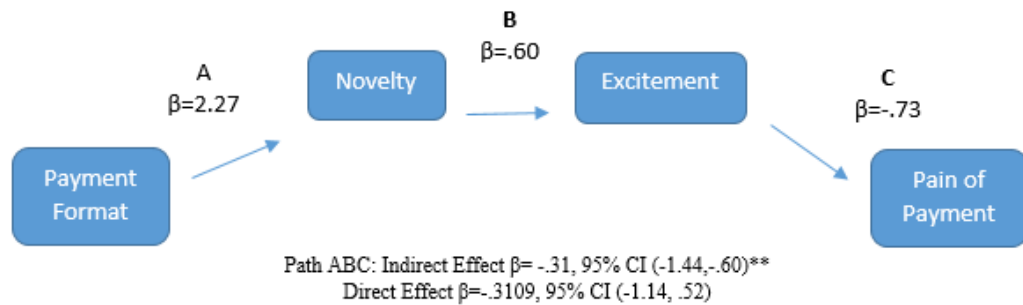


Figure 2.5: Johnson-Neyman Plot, Study 3

Additionally, using the PROCESS macro in SPSS (Hayes, 2013, Model 6)[26], there is evidence of serial mediation through novelty and excitement ( $\beta=-.9862$ , CI= (-1.43, -.60)). The direct effect of payment format on pain of payment was no longer significant after accounting for this pathway ( $\beta=-.31$ , CI= (-1.14, .52)). Again, there is no significant pathway using either novelty or excitement alone.



\*\*= $p < .05$

Figure 2.6: Mediation Estimation Model, Study 3

### 2.9.3 Discussion

Study 3 provides evidence for the pathway from payment format through both novelty and excitement on pain of payment. This study supports the proposal that novelty, without other factors such as distraction or social support, can have a significant effect on pain of payment. Additionally, this study provides evidence that payment formats do not have to differ greatly for this effect to occur. The two credit cards did not differ in shape, size or monetary source. The only difference was the additional biometric technology.

### 2.10 Study 4: Additional Payment Formats

While mobile payments may be thought of as a new frontier in payment formats, many other novel payment formats have been introduced to the market. Some of these new

devices include a smart watch, a key chain, or fingerprint payment technology. In Study 4, many of these new payment formats are explored.

### 2.10.1 Method

605 individuals on Amazon's Mechanical Turk platform completed a five-minute study in exchange for \$0.50. The study was a 6-cell between subjects experiment where tool of payment was manipulated (cash vs. card vs. phone vs. watch vs. key chain vs. fingerprint). Pain of payment was measured, along with novelty. Participants were asked to read and respond to the same scenario as in experiment 1a, however with the fixed amount of payment as in Study 1b. The scenario asked participants to imagine a situation in which Chris was buying the supplies for a dinner party. Participants were told how Chris would be paying for the dinner, and a short explanation, e.g., "He will be paying for his purchase using his watch. The watch links the expenses for his purchase to his bank account." Next, participants were asked to respond to the question: "How much pain do you think Chris felt when paying for his purchase with his watch?" on a scale from 1 (no pain at all) to 10 (extreme pain). Additionally, participants were questioned on their thoughts on how novel, how secure, how risky, and how stressful the payment would be. Demographic information was collected at the end of the survey.

### 2.10.2 Results

The analyses were conducted with 504 participants (52.6% male, average age: 34.5 years, range: 18-73). 101 participants were excluded for failing one or more attention checks.

An ANOVA with payment format as the independent variable and pain of paying as the dependent variable showed that payment format significantly affected pain of payment. Looking at the contrasts between conditions, participants in the cash condition felt significantly more pain of payment than those participants who were in the card condition ( $M_{\text{cash}}=4.04$ ,  $M_{\text{card}}=3.45$ ,  $F(1, 181) = 3.5$ ,  $p=.063$ ). Additionally, participants in the card

condition felt significantly more pain than those in the phone (Mcard=3.45, Mphone= 2.15;  $F(1, 173) = 22.01, p < .001$ ), watch (Mcard=3.45, Mwatch= 2.29;  $F(1, 167) = 14.98, p < .001$ ), key chain (Mcard=3.45, Mkeychain= 2.53;  $F(1, 169) = 9.69, p = .002$ ) or fingerprint condition (Mcard=3.45, Mfinger= 2.21;  $F(1, 165) = 16.76, p < .001$ ). None of the last four conditions were significantly different from each other ( $p = .548$ ).

Looking at perceived novelty of the six payment formats, paying with a card is significantly less novel than paying with a mobile phone (Mcard=3.07, Mphone=6.42,  $F(1, 173) = 88.07, p < .001$ ), and paying with a phone is seen as significantly less novel than paying with a watch (Mphone=6.42, Mwatch=7.62,  $F(1, 163) = 12.07, p = .001$ ), key chain (Mcard=6.42, Mkeychain=7.43,  $F(1, 165) = 9.71, p = .002$ ), or fingerprint (Mcard=6.42, Mfinger=7.62,  $F(1, 161) = 12.23, p = .001$ ). However, participants did rate paying with a card as less novel than cash (Mcash=5.14, Mcard=3.07,  $F(1, 181) = 25.42, p < .001$ ). This may be related to the nature of the scenario. In today’s society, is uncommon to pay \$85 in cash at a grocery store, and therefore participants may have rated it as a “novel” way to pay. These means can be seen in Table 6 below.

Table 2.2: Psychological Outcomes by Receipt Format (Study 4)

Payment Format	Pain	Novelty
Cash	4.04 <sup>A</sup>	5.14 <sup>A</sup>
Credit Card	3.45 <sup>B</sup>	3.07 <sup>B</sup>
Mobile Phone	2.15 <sup>C</sup>	6.42 <sup>C</sup>
Watch	2.29 <sup>C</sup>	7.62 <sup>C</sup>
Keychain	2.53 <sup>C</sup>	7.43 <sup>C</sup>
Fingerprint	2.21 <sup>C</sup>	7.65 <sup>C</sup>

The mediation analysis was done using the PROCESS macro in SPSS (Hayes, 2013, Model 4)[26] without the cash condition, due to the high, unexpected level of novelty participants reported. There is marginal evidence supporting novelty as the mechanism between payment format and pain, although the difference is not significant ( $\beta=-.07$ , CI= (-.15, .01)). Additionally, with this pathway included, the direct effect has decreased to near non-significance ( $\beta=-.15$ , CI= (-.30, -.002)). This mediation model can be found in Figure 2.7. below.

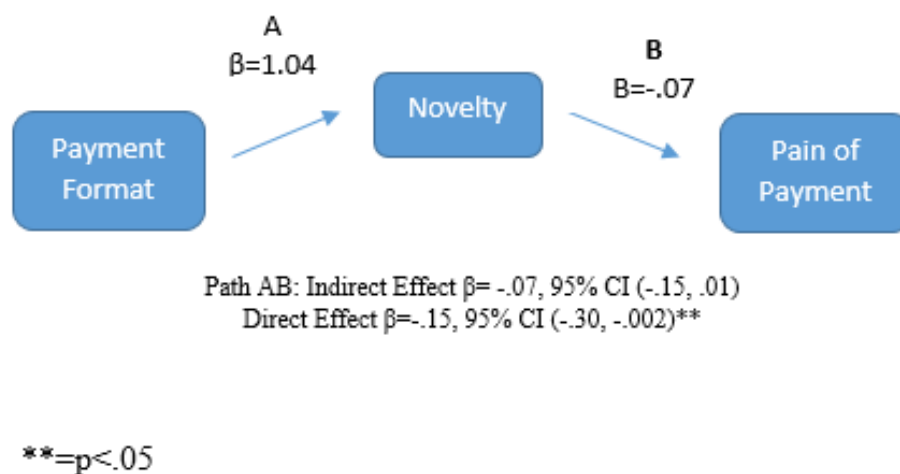


Figure 2.7: Mediation Estimation Model, Study 4

### 2.10.3 Discussion

Study 4 provides preliminary evidence for the effect of payment format on pain of payment. This study shows that paying with cash is more painful than paying with a card, which in turn is more painful than paying with a phone, watch, key chain or fingerprint. Additionally, consumers perceived a mobile phone to be a more novel payment format than a card and less novel than the other forms of payment (which was expected.) However, the relatively high novelty in the cash condition was unexpected. Studies 5a and 5b examine cash and novelty more closely.

## **2.11 Study 5a: New \$15 bill**

Study 5a tests the parameters of novelty. Novelty can be manipulated in many ways other than new technology, including design and denomination. Study 5a looks at how consumers would perceive a new denomination of cash, whether that can produce perceived novelty, and if it will lead to lower pain of payment.

### 2.11.1 Method

Study 5a included 206 participants on Amazon's Mechanical Turk Cloud Research platform. This study had two conditions, one in which the participants were told that they paid with a \$10 bill and a \$5 bill, and one in which participants paid with a new, government issued \$15 bill. The images used in the study can be found in Figure 2.8. In all conditions, participants are taken through a vivid scenario, in which they are at a neighborhood Farmer's Market. They wander through the market, buy a cup of coffee, and then remember that they need to purchase some eggs. They find a table selling eggs, pick up two cartons, and bring them to the cash register. Once at the register, they are informed that the two dozen farm to table eggs cost \$15.

In both scenarios, the participants decide that they will purchase the eggs (though expensive), and reach into their wallets for money. Participants in the 10/5 condition open their wallet, and find a \$10 bill and a \$5 bill, and hand both to the cashier as payment for the eggs.

In the \$15 bill condition, participants look into their wallet and see that they have one of the new \$15 bills that have been issued by the government in honor of the anniversary of the National Bank. The fact that they were issued by the government was included to explicitly explain that the bill is real, and will be accepted. They are also told that the new bills will soon be as common as a \$10 bill, in order to dispel the thought that the bill might be rare. Once participants read through the entire scenario, they were asked to indicate how

much pain they would feel in the scenario. Pain was measured on a scale from 1 (no pain) to 10 (worst pain imaginable).



Figure 2.8: Study 5a Stimuli

### 2.11.2 Results

The analyses were conducted with 206 participants (43.9% male, average age: 38.8 years, range: 20-78). No participants were excluded. An ANOVA with payment format as the independent variable and pain of paying as the dependent variable showed that payment format significantly affected pain of payment. Participants in the 10/5 condition felt significantly more pain of payment than the participants in the 15 bill condition ( $M_{10/5}=7.39$ ,  $M_{15}=6.45$ ,  $F(1, 204) = 7.9$ ,  $p=.005$ ,  $\eta^2 = .037$ ). Again, novelty and excitement were found to be the reasons for this difference in pain. Using the PROCESS macro in SPSS (Hayes, 2013, Model 6)[26] there is evidence of serial mediation through novelty and excitement ( $\beta = -.317$ ,  $CI = (-.5676, -.1143)$ ). The direct effect of payment format on pain of payment was no longer significant after accounting for this pathway ( $\beta = -.3036$ ,  $CI = (-1.00, .3929)$ ).

### **2.12 Study 5b**

Study 5b adds a realistic and slight change to the scenario from Study 5a. The U.S. government has announced that the treasury will begin to produce a redesigned \$20 bill starting in



2024. This bill will feature Harriet Tubman, an American abolitionist and political activist most known for helping enslaved people escape by way of the “Underground Railroad.” Prior to this announcement, the last change to U.S. dollar bills came in 2013 with a re-design of the \$100 bill. The \$5 bill, \$10 bill, \$20 bill and \$50 bill went through a similar redesign process between 2003-2008. While not adding or changing monetary denominations, these designs introduce novelty to the payment in the form of design, and therefore should produce excitement, and lower pain of payment.

### 2.12.1 Method

Study 5b included 199 participants on Amazon’s Mechanical Turk Cloud Research platform. This study set two conditions, one in which the participants were told that they paid with a (regular) \$20 bill, and one in which participants paid with a new Harriet Tubman \$20 bill. The stimuli can be found in Figure 2.9. The scenario is identical to the scenario used in 5a, other than the price of the eggs, which was increased to \$20 for two dozen eggs.

In the regular \$20 bill condition, participants open their wallet, find a \$20 bill, and hand it to the cashier as payment for the eggs. There is no mention of it being a “regular” \$20 bill. In the Harriet Tubman condition, they look into their wallet and read this statement about the Harriet Tubman \$20 bill:

*After years of waiting, the U.S. government has finally issued a new \$20 bill that honors Harriet Tubman, an American abolitionist and conductor of the Underground Railroad, and the first female to be featured on American money!*

*The new \$20 bills will enter widespread circulation throughout the year, and they are expected to soon be just as common as the old \$20 bill.*

An additional contribution from this study is the inclusion of a new pain measurement tool. For this study, pain was measured using a 7-item pain measurement scale found in Sheehan and Van Ittersum (2018)[41]. This approach measured the extent to which

participants felt seven emotions: pain, restricted, comfortable [r], empowered [r], irritated, annoyed, and pleasant [r] (not at all to very much).



Figure 2.9: Study 5b Stimuli

### 2.12.2 Results

Although there was support for the advent of the new Harriet Tubman \$20 bill, a number of people in the study did not approve of the change, and those 22 participants were excluded, leaving 177 participants (43.9% male, average age: 40 years, range: 19-73). An ANOVA with payment format as our independent variable and an average of our 7 pain measures as our dependent variable showed that payment format significantly affected pain of payment. Participants in the regular \$20 bill condition felt significantly more pain of payment than those participants who were in the Tubman bill condition ( $M_{\text{regular}}=5.1$ ,  $M_{\text{Tubman}}=4.61$ ,  $F(1, 176) = 4.85$ ,  $p=.029$ ,  $\eta^2 = .027$ ) Using the PROCESS macro in SPSS (Hayes, 2013, Model 6)[26] there is evidence of serial mediation through novelty and excitement ( $\beta = -.47$ ,  $CI = (-.7455, -.2314)$ ). The direct effect of payment format on pain of payment was no longer significant after accounting for this pathway ( $\beta = .3741$ ,  $CI = (-.0938, .8419)$ ).

### 2.12.3 Discussion

Studies 5a and 5b help to define what is meant by “novelty.” Novelty, although correlated with technological advances, does not depend on them. These studies show that a new U.S.

Table 2.3: Psychological Outcomes by Receipt Format (Studies 5a and 5b)

	<b>Pain</b>	<b>Novelty</b>	<b>Excitement</b>
<b>Study 5a: \$10 and \$5</b>	7.39	3.16	2.22
<b>Study 5a: \$15 bill</b>	6.45	4.62	3.42
<b>Study 5b: Regular \$20</b>	5.1	2.56	2.08
<b>Study 5b: Tubman \$20</b>	4.61	4.71	3.74

dollar bill creates the same sense of novelty as other forms of technologically advanced payments, leading to lower pain of payment. While these studies examined only a few aspects of cash (denomination and central figure), this research suggests that any change to make cash more novel may lead to lower pain of payment.

### 2.13 General Discussion

Pain of payment research has largely ignored the growing variety of payment formats that have emerged in recent years. Despite having many of the same characteristics as established formats, these new formats also introduce new variables whose implications are not yet understood. One of these new variables, novelty, is the focus of my research. Across seven studies, I find that consumers perceive greater novelty in new payment formats, and as a result feel excitement during the payment. This excitement leads in turn to lower pain of payment. Moreover, I find that novelty is not restricted to new technologies, but can also be created by small changes to existing payment formats.

My research has important implications for consumers, retailers, banks, governments, and technology companies. If pain of payment can be curtailed, consumers will not only feel better about their shopping experiences, but will also be more willing to spend during those experiences. Such an inducement to spending can be beneficial to any retailer, bank,

or more broadly, the overall economy. Importantly, consumers do not need “entirely new” forms of payment to feel less pain of payment. A small change, such as a new design, new dollar amount, or new technological feature may be sufficient to increase the perceived novelty of the payment mechanism. This suggests that if a credit card company were to change the layout of a credit card, the background image, or the physical movement used to pay (for example, swiping vs. inserting), consumers may feel less pain of payment and spend more money. A specific implication of my findings is that as the U.S. government begins to produce the new Harriet Tubman bill, and as it makes any broader changes to the way cash looks, feels, or is spent, such a development is likely to encourage consumer spending and resulting economic activity. Of course, novelty is not a lasting sensation, and consumers will necessarily adapt to new payment formats. However, this suggests a unique opportunity for continuing innovation: by ensuring that consumers continue to feel a sense of novelty when paying, the phenomenon would be expected to repeat.

Although retailers have been slow to adapt to mobile payments, discovering the downstream consumer benefits may entice them to accelerate implementation. Similarly, banks might consider sending out new cards - with “novel” features – on a regular basis. As tech companies develop new applications for money transfer, they might embed substantial updates to the features most widely used. Such updates do not have to be costly; for example, simple changes to the sounds, colors, or logo of an app could be sufficient to induce perceptions of novelty. For consumers themselves, switching to more novel forms of payment could be an efficacious way to reduce the psychological pain felt when spending. Alternatively, consumers looking to spend less money may wish to avoid new payment formats entirely and “stick to cash.”

Moving forward, I plan to explore other mechanisms by which new payment formats influence pain of payment. Although it is clear that novelty is a main driver of the effect, complex new formats introduce other factors into the equation. For example, mobile phones are used for a diverse multitude of daily activities

other than paying. To the extent that using a phone to pay reminds consumers of any of those activities, the shift of attention elsewhere may itself reduce pain of payment. Additionally, using a phone may remind consumers of their social connections, providing social affirmation that has been shown to lower pain of payment.

As payment formats become more complex and dynamic, steep learning curves are likely to create frustration, fear, or inconvenience that may counteract some of the benefits presented here. It is also important to note that as mobile payments become more commonplace and less “novel,” the excitement they generate will necessarily subside. Already, findings of the present research suggest that credit cards are perceived to be no more novel than cash, despite their fairly recent introduction. As consumers have adapted to credit cards, they are sure to adapt to newer forms of payment as well. Should current trends continue, it is possible that cash itself will become a “novel” format within the next decade. This evolution has intriguing implications for consumer pain of payment.

This research comes at a pivotal time in the consumer marketplace, in which new technologies and globalization have enabled rapid innovations in payment technology. New payment formats have the potential to be easier, more convenient, and (arguably) safer than traditional formats. Hence, it is all the more important to research, understand, and optimize their psychological and behavioral consequences.

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