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DO COLLEGE STUDENTS EXPERIENCE MORE PAIN OF PAYING WITH CASH OR CARD?

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DO COLLEGE STUDENTS EXPERIENCE MORE PAIN OF PAYING WITH CASH OR
CARD?

By

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A capstone project submitted for Graduation with University Honors

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ABSTRACT

Past research suggests that spending cash is more psychologically painful than using other payment methods because cash is tangible and more salient (Prelec & Loewenstein, 1998). However, with shifts in how cash is viewed and used due to increased digital payments and online shopping, it is unclear whether these prior findings hold true, especially among younger consumers. The purpose of this study is to examine whether the psychological pain of paying differs by payment method (cash, credit, debit) and purchase type (splurge, hedonic, utilitarian), and whether these effects differ from past research. This study measured the pain of paying among UCR undergrads ($n = 832$) using a 5-point Likert scale across the three purchase-type scenarios. We hypothesized that these younger consumers would experience less pain of paying when spending cash compared to using credit or debit, and more pain for splurges than hedonic and utilitarian. We found support for both hypotheses. For UCR undergrads, cash was indeed less painful than credit or debit. Utilitarian purchases were also less painful than hedonic or splurge purchases, but there was no interaction between purchase type and payment type. We also measured additional individual differences, such as employment status, bank apps frequency of use, and tightwad-spend thrift tendencies, but none significantly moderated the effect of payment type.

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Introduction

Although spending money is a routine part of everyday life, it can also evoke emotional and psychological responses. Not all purchases feel equally painful, even when their costs are identical. This suggests that spending is not purely a financial act, but also an emotional and cognitive experience shaped by how individuals perceive and evaluate their transactions.

People do not treat all money as the same when making decisions. Instead, they tend to mentally organize and evaluate their spending in separate categories, a process known as mental accounting (Thaler, 1985). Rather than viewing money as interchangeable, individuals assign different meanings to it depending on its source, purpose, and context. These categories also extend to the type of purchase being made. Consumer behavior research differentiates between utilitarian purchases, which are practical and necessity-based, and hedonic purchases, which are driven by pleasure and enjoyment (Hirschman & Holbrook, 1982). Thaler (1985) and Hirschman and Holbrook (1982) demonstrate that financial decisions are influenced not only by objective prices but also by subjective perceptions of value and loss. Building on prior research, this study investigates how payment method and purchase type influence the pain of paying among college students.

When consumers make purchases, they often experience what is referred to as the pain of paying, a negative emotional response associated with parting with money (Zellermayer, 1996). This emotional response reflects the psychological cost of spending, which can influence how individuals evaluate purchases beyond their actual monetary value. Traditional economic theory assumes that the utility of a purchase is determined by weighing its benefits against its cost (Deaton, 1992; Hicks, 1946; Marshall, 1920; von Neumann & Morgenstern, 1944). However,

research in behavioral economics suggests that the experience of paying introduces an additional psychological factor that can shape consumer decision-making.

The intensity of the pain of paying is not constant but varies with the characteristics of the payment methods. Prior research suggests that this feeling is stronger when the payment type is more salient and tangible, such as when using cash, and weaker when payments are less immediate or less visible, such as when using credit or debit cards (Prelec & Loewenstein, 1998). The form of payment plays a critical role in shaping the pain associated with spending, as different payment methods vary in their transparency and salience (Raghubir & Srivastava, 2008; Soman, 2001, 2003; Thomas et al., 2011). Cash payments tend to produce greater discomfort because they require individuals to physically observe and feel the loss of money, making the cost of a transaction more immediate (Soman, 2002). In contrast, less tangible payment methods, such as credit and debit cards, reduce the visibility of spending and weaken the connection between payment and consumption, making purchases feel less costly (Feinberg, 1986; Raghubir & Srivastava, 2008; Soman, 2003; Thomas et al., 2011). This study will test whether the past relationship between payment method and the pain of paying (i.e., that cash is more painful) remains the same in today's increasingly digital payment environment.

This question is particularly important in the context of college students, who increasingly rely on digital and card-based payment methods. Shah et al. (2015) note that in 1999, paper payments such as cash and checks accounted for nearly 60% of in-store payments, but by 2010 that number had dropped to a little over 40%, as plastic cards became the preferred form of payment for most purchases. As methods such as Apple Pay, Zelle, Venmo, debit cards, and credit cards become more common, transactions have become faster, more convenient, and increasingly digital compared to traditional cash payments.

Recent research suggests that this shift may also reduce the psychological visibility of spending, making purchases feel less immediate and less emotionally salient than cash transactions (Faraz, 2025). As a result, digital payment methods may weaken the cognitive association between the act of paying and the perceived loss of money. At the same time, as payment methods become increasingly less tangible, consumers may begin to view spending differently, relying more on abstract indicators such as account balance rather than on the physical exchange of money. This shift matters because it raises the possibility that prior findings about the pain of paying may not apply in the same way to younger consumers.

These past research findings raise the question of how payment methods influence the pain of paying among college students. Specifically, do different forms of payment, such as cash, credit, and debit, lead to different levels of psychological discomfort when making purchases? Additionally, does the type of purchase, such as utilitarian versus hedonic or splurge spending, further influence the intensity of this experience? To test this question, we conducted a study that examined the pain of paying across payment methods, purchase types, and scenario orders among UCR undergraduates. First, we predicted that cash would produce lower levels of pain of paying compared to credit and debit among college students. Second, we predicted that the pain of paying would differ across purchase types, with splurge purchases producing higher levels of discomfort than hedonic purchases, and utilitarian purchases producing the lowest levels of pain.

Methodology

This study examines how payment method and purchase type influence the pain of paying among undergraduate students at the University of California, Riverside (UCR). Using a within-subjects design, participants reported their level of discomfort across purchase scenarios representing different types of consumption: splurge, hedonic, and utilitarian. Payment method

(cash, credit, or debit) was systematically varied, and the order of the scenarios was randomized to account for potential order effects. This design allows for the examination of both the independent effects of payment type and purchase type, as well as potential interaction effects between them. In particular, the study assesses whether differences in pain of paying across payment methods are consistent across contexts or vary depending on the type of purchase. The study also considers whether the effects of payment method and purchase type operate independently or jointly influence the pain of paying, although no strong directional prediction is made.

Participants: In this IRB-approved study, we examined the relationship between payment method and the pain of paying among undergraduate students. The sample consisted of 832 undergraduate business students (54.8% male and 45.2% female; 14% White, 5% African American, 39% Hispanic, 56% Asian, 2% Middle-Eastern/North-African, 1% Native American) at the University of California, Riverside (UCR). Participants were recruited to complete the study as part of a series of studies in exchange for partial course credit (0.5 credits), of which this study was one. Participants completed a series of hypothetical purchase scenarios in which they imagined making everyday purchases and reported their level of pain of paying for each transaction. In addition to these scenarios, participants completed measures assessing their spending habits, tightwad–spendthrift tendencies, and other financial behaviors.

Design: The study employed a 3×3 within-subjects design. The first factor was payment type (cash, credit, debit), and the second factor was purchase type (splurge, hedonic, utilitarian). Each participant completed all three purchase scenarios, with payment type randomly assigned to each scenario. The order of scenarios was also randomized to control for order effects.

Scenarios: Participants were presented with three hypothetical purchase scenarios representing different types of spending: splurge, hedonic, and utilitarian. Each scenario asked participants to imagine themselves making an everyday purchase and report how much pain of paying they would experience.

Splurge Scenario: *You're walking across campus after having breakfast at home when you pass your favorite coffee shop. The smell of coffee and pastries catches your attention, and you consider stopping in for your favorite drink and a pastry that would cost around \$20.*

Hedonic Scenario: *Between your classes, you start feeling a bit hungry and think about grabbing a bite to eat. You pass by one of your favorite restaurants on campus and look over the menu. You consider ordering a meal that costs around \$20.*

Utilitarian Scenario: *On your way home from school, you realize you're missing a few things you need for dinner. You stop by the grocery store and look around for some healthy items. You are considering purchasing a few items that would cost around \$20.*

Each scenario was paired with a randomly assigned payment method (cash, credit, or debit), and participants reported their responses based on the specified payment type: *How much 'pain of paying' would you feel if you used (cash, credit, or debit) for this purchase?*

Measures: Pain of paying was measured using a 5-point Likert scale (1 = no pain/discomfort, 5 = very strong pain/discomfort). Participants indicated the extent to which they would feel discomfort when making each purchase. Pain of paying was defined at the start of the survey as “the uneasy or uncomfortable feeling some people get when they spend money.” In

addition to the scenario-based measure, several additional variables were collected to assess individual differences in spending behavior. Participants completed the Tightwad-Spendthrift Scale, which measures how much people feel discomfort when spending money and whether they tend to restrict or facilitate their spending (Rick, Cryder, & Loewenstein, 2008). Frequency of payment method (cash, credit, debit, gift card, Venmo/Zelle/CashApp) was assessed using an 8-point frequency scale ranging from 1 (never) to 8 (more than once a day). Employment status was measured using a 3-point categorical scale (1 = not currently working, 2 = part-time, 3 = full-time). The proportion of personal expenses paid by participants was measured using a 6-point scale ranging from 1 (0-19%) to 6 (100%). Frequency of checking banking applications was assessed using an 8-point scale ranging from 1 (do not have a bank account) to 8 (more than once a day). Finally, participants reported their typical level of pain of paying across different payment methods using a 5-point Likert scale (1 = no pain/discomfort, 5 = very strong pain/discomfort), providing a general measure of spending discomfort independent of the scenarios

Procedure: Participants completed the study online through Qualtrics, ensuring accessibility and efficiency in data collection. Upon providing informed consent, participants were first presented with a brief introduction explaining the concept of pain of paying and the task instructions. Participants then completed three hypothetical purchase scenarios, each paired with a randomly assigned payment method (cash, credit, or debit) and in randomized order. For each scenario, participants reported their level of pain of paying. Following the scenarios, participants completed additional measures assessing their typical payment behaviors, tightwad–spendthrift tendencies, and financial habits, including their employment status and the proportion of expenses they paid. Participants also reported how frequently they checked their

banking accounts and their general level of pain when paying across payment methods. An attention check was embedded within the spending habits section to assess participant attentiveness. Finally, participants completed demographic questions. The entire survey took approximately 5 minutes to complete (median = 5:11 minutes; Interquartile range = 4:09-6:24 minutes).

Exclusion: An attention check was embedded within the spending habits section to assess participant attentiveness. Following the scenario-based portion of the survey, participants were asked to report their frequency of carrying cash. Immediately after, they were asked a similar question about the frequency of carrying coins: “In a typical week, how often do you carry coins on your person (in a wallet, purse, pocket, or a bag you are carrying)? *Do not count coins left in your car or at home.* If you are paying attention, please leave this question blank. If you already clicked, please select ‘Some days’ for this question.” This question served as a subtle attention check, as attentive participants were expected to follow the instructions instead of answering the question. Participants who failed to follow these instructions were flagged as inattentive. Of the total sample ($N = 832$), 255 participants (30.6%) passed the attention check, while 577 participants (69.4%) failed. Per the pre-registration, analyses were conducted on both the full sample and the attention-passed subsample to assess the robustness of the findings. However, as results were highly similar across both samples, subsequent analyses were conducted using the full sample as the primary analytic sample. Additionally, participants completing the survey faster than the mean completion time minus two standard deviations were to be excluded. However, due to the right-skewed distribution of completion times, this criterion resulted in a negative threshold value ($\text{Mean} - 2\text{SD} = -1,581$ seconds), rendering it inapplicable. As a result, no participants were excluded based on completion time.

Results

We first examined overall patterns in pain of paying across payment methods and purchase scenarios. Results indicated that both factors influenced the level of discomfort associated with spending. Across purchase types, splurge purchases produced the highest levels of pain ($M = 2.88$, $SD = 1.24$), followed by hedonic ($M = 2.50$, $SD = 1.12$), with utilitarian purchases producing the lowest levels of pain ($M = 1.86$, $SD = 0.99$). Across payment methods, cash produced the lowest levels of pain of paying ($M = 2.25$), followed by credit ($M = 2.45$) and debit ($M = 2.54$).

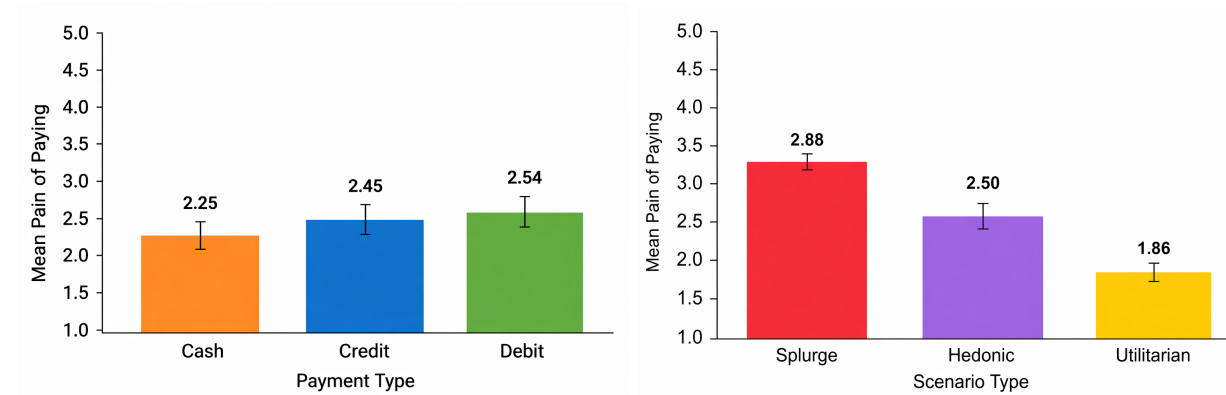


Figure 1. Pain of Paying by Payment Type / Purchase Scenario

To test whether pain of paying differed across payment methods, we conducted a repeated-measures ANOVA with payment type (cash, credit, debit) as the within-subjects factor. Results from the full sample indicated that payment type significantly influenced the reported pain of paying. Relative to cash, both credit ($\beta = 0.20$, $p < .001$) and debit ($\beta = 0.29$, $p < .001$) were associated with significantly higher pain levels. There was no significant difference in the pain of payment between credit and debit cards ($\beta = 0.09$, $p > .05$). These results indicated that payment method significantly influenced the experience of spending, with cash producing lower levels of pain compared to credit and debit.

We next examined whether the pain of paying differed across purchase scenarios. Pairwise comparisons using Bonferroni corrections indicated that all differences between purchase types were statistically significant. Specifically, splurge purchases produced greater pain than hedonic purchases (mean difference = 0.38, $t(825) = 9.81$, $p < .001$, $d = 0.34$) and substantially greater pain than utilitarian purchases (mean difference = 1.02, $t(825) = 21.10$, $p < .001$, $d = 0.73$). Hedonic purchases also produced greater pain than utilitarian purchases (mean difference = 0.64, $t(825) = 15.95$, $p < .001$, $d = 0.55$).

To assess whether the effect of payment type varied across purchase types, we tested the interaction between payment type and scenario type. The interaction was not statistically significant ($p > .05$), indicating that the effect of purchase type on pain of paying was consistent across payment types, and the effect of payment type did not vary across scenarios (Figure 2). These results suggest that payment method and purchase type independently influenced the pain of spending.

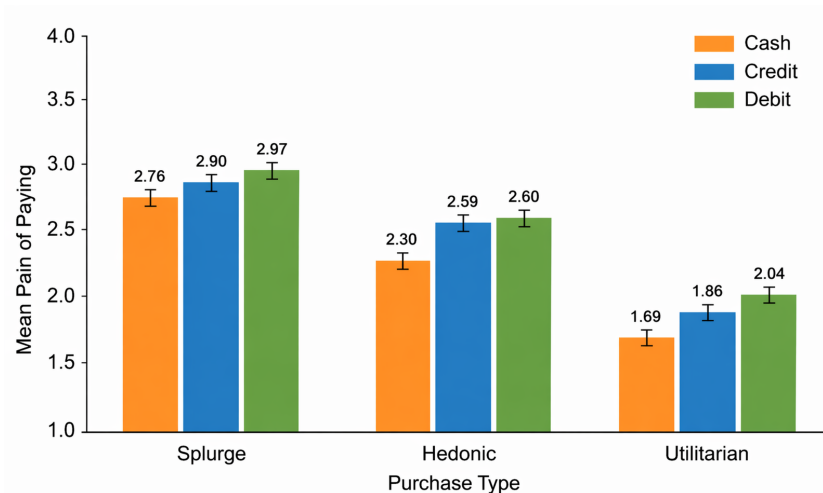


Figure 2. 3×3 Interaction Plot: Pain Ratings by Scenario and Payment Type.

To examine whether the order in which scenarios were presented influenced participants' responses, we conducted first-order analyses comparing the pain of paying based on the initial

scenario presented. These analyses captured unadjusted responses before controlling for contextual differences across scenarios. Results indicated no significant first-order effects across payment types. Comparisons between payment methods, including card versus cash ($t(830) = -0.34, p = .732$), debit versus cash ($t(568) = -0.41, p = .681$), credit versus cash ($t(555) = -0.17, p = .866$), and credit versus debit ($t(535) = 0.24, p = .811$), were all non-significant.

We also examined a three-way interaction between payment type, purchase type, and order position. This interaction was not statistically significant ($F(8, 2463) = 0.95, p = .475$), indicating that the effects of payment method and purchase type were consistent regardless of the order in which scenarios were presented.

We conducted additional analyses to examine whether individual differences influenced the pain of paying. Tightwad–spendthrift (TWST) scores averaged ($M = 6.06, SD = 2.54$), slightly above the midpoint of the scale, indicating that the sample was marginally more spendthrift than tightwad. Regression analyses revealed that TWST scores significantly predicted pain of paying ($\beta = -0.065, t = -2.99, p = .003$); however, TWST score did not significantly moderate the effects of as significant moderators ($p > .05$). While variables related to spending behavior and financial responsibility were expected to moderate the relationship between payment method, purchase type, and pain of paying, additional analyses indicated that these factors did not significantly influence the observed effects. Frequency of payment method usage, including cash, credit, and debit, did not significantly predict pain of paying (all $p > .05$). Employment status did not significantly influence pain of paying ($p > .05$), and no meaningful differences in pain rating were observed across employment groups. The proportion of expenses paid by participants was also not significantly related to pain of paying ($p > .05$). In addition, frequency of banking app usage did not significantly predict pain ratings ($p > .05$). These

findings suggest that individual differences in financial behavior and responsibility did not significantly moderate the relationship between payment method, purchase type, and pain of paying.

Participants also reported their typical level of pain of paying when using different payment methods. Results indicated variation in reported pain across payment methods, with debit producing the highest level of reported pain ($M = 2.74$), followed by digital payments ($M = 2.29$) and credit paid by oneself ($M = 2.23$). Lower levels of pain were reported for credit paid by family ($M = 2.05$) and cash ($M = 1.92$), while gift cards produced the lowest levels of pain ($M = 1.23$). These descriptive patterns were consistent with the main findings, suggesting that cash is generally experienced as less painful than card-based payment methods.

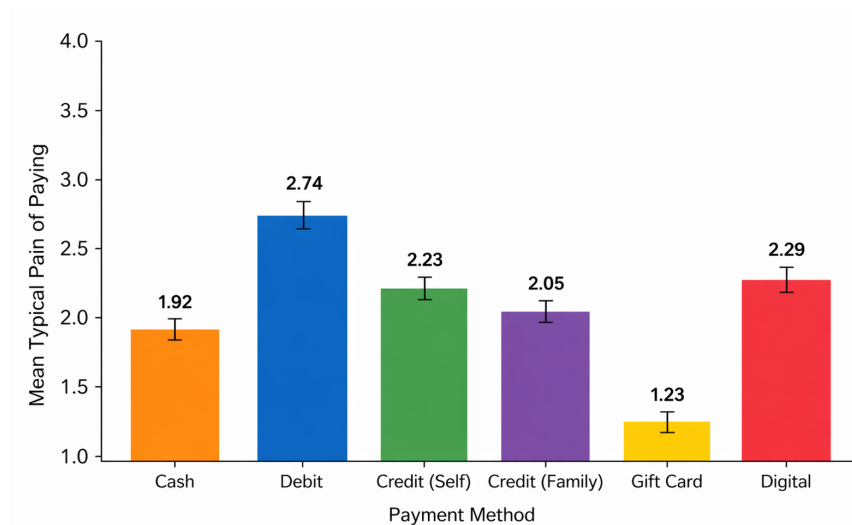


Figure 3. Self-Reported Typical Pain of Paying in Everyday Life

Discussion

This research examined how payment method and purchase type influence the pain of paying among UCR undergraduate students. Consistent with our predictions, both factors significantly shaped the experience of spending. Across purchase types, splurge purchases

produced the highest levels of pain, followed by hedonic purchases, with utilitarian purchases producing the lowest levels of discomfort. Across payment methods, cash was associated with the lowest levels of pain of paying, while both credit and debit produced higher levels of pain. Importantly, these patterns remained consistent when analyses were conducted using the attention-passed subsample, suggesting that the findings are robust and not driven by inattentive responses. In addition, the interaction between payment method and purchase type was not statistically significant, indicating that these effects operate independently. The effect of payment method was consistent across purchase types, and the effect of purchase type was consistent across payment methods. Finally, additional analyses indicated that individual differences, including spending tendencies, payment usage, and financial responsibilities, did not significantly moderate the pain of paying. These variables were expected to potentially influence how participants experienced spending, as individuals who differ in financial habits or levels of financial responsibility may psychologically respond to purchases in different ways. However, the absence of a significant moderation effect suggests that the influence of payment method and purchase type on the pain of paying remained relatively consistent across individuals.

These findings contribute to the literature on the pain of paying by challenging established assumptions about the relative effects of payment methods. Prior research has consistently found that cash is more painful than less tangible forms of payment due to its greater salience and immediacy (Prelec & Loewenstein, 1998; Raghurir & Srivastava, 2008; Soman, 2003). However, in the present study, cash was associated with the lowest levels of pain of paying. One possible explanation for this difference is that the psychological mechanism of mental accounting may be shifting in response to changes in payment behavior. As digital and card-based payments become more common, particularly among college students, these methods

may become more psychologically salient than cash. Instead of focusing on the physical loss of money, consumers may increasingly rely on abstract indicators such as account balances or transaction history.

Several factors may help explain this shift. First, there has been a substantial increase in digital and card-based payment methods among young consumers, making these forms of payment more central to everyday spending. Second, there has been a shift in how credit cards are used, with greater awareness of debt and the ability to track spending in real time through banking applications. This may reduce the perception of credit as “free money” and increase the perceived cost of card-based transactions. Finally, reduced reliance on cash may lower its psychological salience, making it feel less immediate and therefore less painful when used. Together, these factors provided a potential explanation for why both preregistered hypotheses were supported. As payment behaviors shift toward more frequent use of digital and card-based methods, these forms of payment may become more psychologically salient, leading them to produce greater pain than cash. At the same time, differences in purchase type continue to shape the experience of spending, with splurge purchases producing the highest levels of pain. These findings suggest that while the overall pattern of the pain of paying remains the same, the effect of different payment methods may be changing as payment behaviors evolve.

Another way to interpret these findings is that the pain of paying may depend less on the physical form of money itself and more on which payment method feels most connected to an individual’s actual financial resources. For younger consumers, debit cards and banking applications may create a stronger connection between purchases and available account balances than cash does. Once cash has already been withdrawn, it may feel psychologically separate, almost like a pre-budgeted amount that has already been mentally spent. In contrast, debit and

credit payments may feel more directly tied to account monitoring, transaction alerts, and concerns about future balances or repayment. Debit payments may be especially psychologically salient because they are directly connected to a consumer's checking account, making purchases feel like an immediate reduction in available money. Consumers may assign different meanings to money depending on how it is stored and accessed. Cash may represent discretionary spending money, while card-based payments may represent a more direct reduction in one's financial account. These patterns may help explain why cash produced lower pain of paying among UCR undergraduates, despite earlier research suggesting the opposite pattern.

These findings have important implications for understanding modern consumer behavior. As payment methods become increasingly digital and less tangible, the psychological experience of spending may change in ways that influence decision-making. The absence of a significant interaction between payment method and purchase type also suggests that these factors independently shaped the pain of paying. Splurge purchases produced greater pain regardless of payment type, while cash remained less painful across purchase types. This pattern suggests that consumers may evaluate the emotional cost of spending through separate psychological processes, including how justifiable a purchase feels and how financially connected a payment method feels. For consumers, this suggests that the perceived cost of a purchase may depend not only on its price but also on how it is paid for. For financial institutions, these results highlight the value of transparency and real-time feedback in shaping spending behavior. Features such as spending notifications, budgeting tools, and account tracking may increase the salience of transactions and influence how consumers experience the pain of paying. For businesses, the idea that cash always feels more painful than card payments may no

longer apply, especially for younger consumers. This could affect how companies think about pricing and how they design payment options.

While this study emphasized how payment method and purchase type shape the pain of paying, several limitations should be considered. First, the study relied on hypothetical purchase scenarios and self-reported responses, which may not fully capture real-world spending behaviors. Participants were asked to imagine purchases rather than make actual financial decisions, so the emotional experience of spending may differ in real purchasing situations involving real monetary consequences. Second, the sample consisted of undergraduate students from a single university, which may limit how well these findings apply to other populations. College students may have unique financial habits, payment preferences, and levels of financial responsibility that differ from those of older adults or individuals with different economic backgrounds. Additionally, a substantial portion of participants failed the attention check, which may introduce noise into the data. However, the results were similar in the attention-passed subsample, suggesting that the main findings are still reliable.

Future research should build on these findings by examining the pain of paying in real-world settings using actual monetary transactions or behavioral experiments. For example, participants could be given a spending budget and asked to make real purchasing decisions using different payment methods to determine whether the patterns observed in this study translate into actual spending behaviors. It would also be useful to include a more diverse sample across different age groups to determine whether these patterns are unique to college students or apply more broadly. In addition, future studies could examine how newer payment methods, such as mobile wallets and automated payments, influence the psychological experience of spending.

Conclusion

Overall, the study provides evidence that the experience of the pain of paying may be evolving among younger consumers. Contrary to prior findings, cash was associated with lower perceived pain, while card-based payment methods produced higher levels of discomfort. These results suggest that changes in payment technology and consumer behavior may be reshaping how individuals experience spending.

The findings also reinforce the idea that spending decisions are influenced not only by objective financial costs but also by the psychological and emotional experience associated with making purchases. While the overall pattern of pain of paying stayed consistent across scenarios, the effect of payment methods may be changing as digital spending becomes more common. As payment systems continue to evolve, understanding how consumers psychologically experience transactions may become increasingly important for researchers, businesses, and financial institutions.

This project highlights the importance of understanding consumer behavior within the context of modern financial practices. By applying concepts from behavioral economics and mental accounting to modern payment systems, this research contributes to a better understanding of how technological changes may influence spending behavior and financial decision-making among young consumers.

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APPENDIX

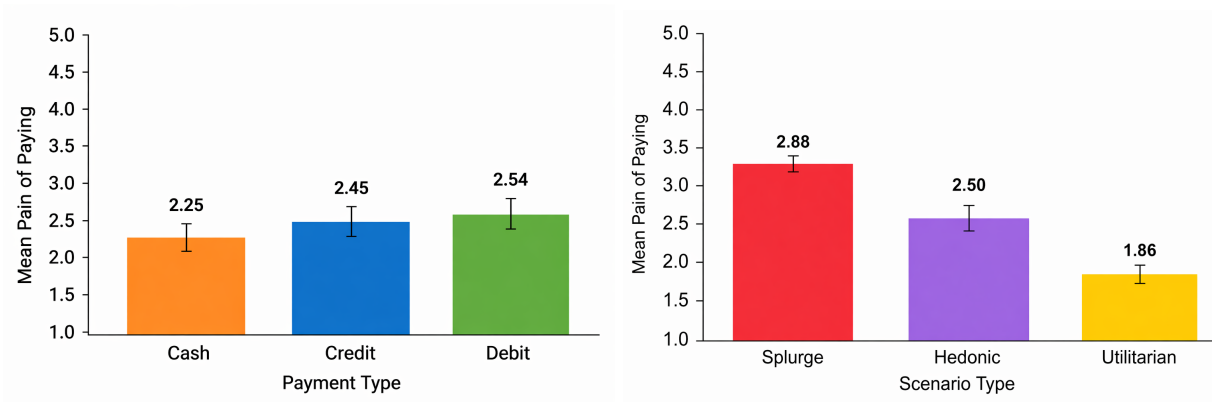


Figure 1. Pain of Paying by Payment Type / Purchase Scenario

This figure displays the overall mean pain-of-paying ratings across payment methods and purchase scenarios. Error bars represent 95% confidence intervals.

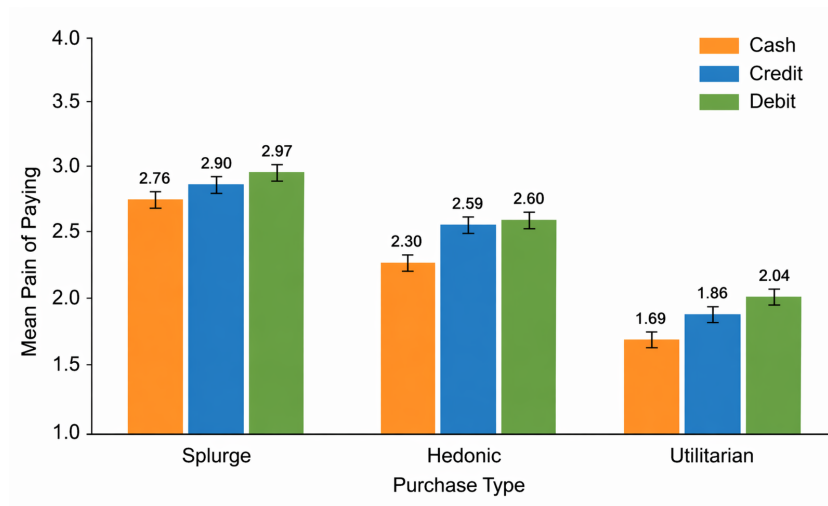


Figure 2. 3×3 Interaction Plot: Pain Ratings by Scenario and Payment Type.

This figure displays the mean pain-of-paying ratings for each combination of purchase scenario and payment method. Error bars represent 95% confidence intervals.

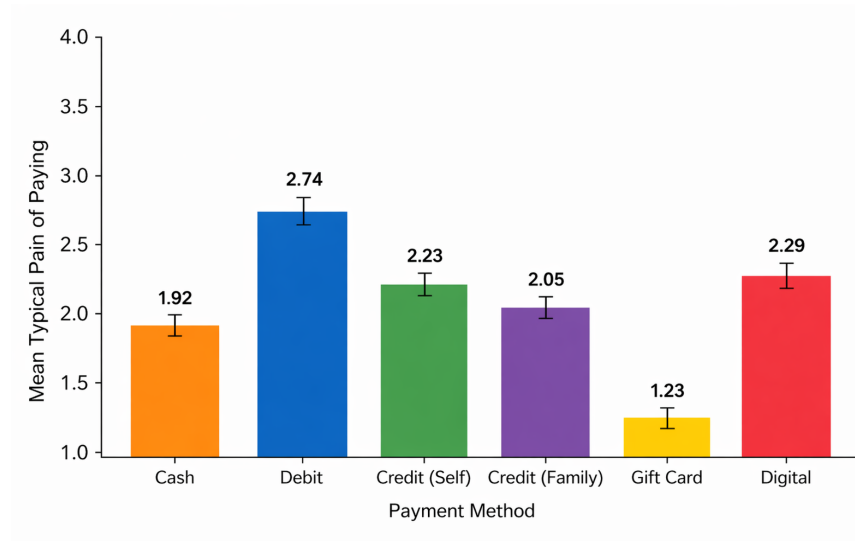


Figure 3. Self-Reported Typical Pain of Paying in Everyday Life

This figure displays the mean self-reported pain of paying ratings across different payment methods when participants were asked about their typical everyday spending experiences. Error bars represent 95% confidence intervals.