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The Frictionless Dirham: An Empirical Analysis of Cashless Payment Systems and Consumer Spending Habits in Dubai

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ABSTRACT

There has been a rapid proliferation of cashless payment systems in the UAE, with policy-level emphasis on a digital-first economy under the UAE Vision 2031. This rise in cashless payments has a serious impact on consumer transaction dynamics. With its robust digital infrastructure, the UAE has one of the most cashless societies with significant penetration of contactless payment systems. This paper investigates how various cashless payment models, particularly mobile wallets, contactless cards, and peer to peer application, impact the consumer at psychological and behavioural levels, with specific focus on the youth and young adults of Dubai. Using an explanatory, sequential, mixed-method approach, this research collected primary data from 150 respondents across Dubai. While the structured survey questionnaire collected quantitative data, selected 12 participants from the same sample were also interviewed to gather qualitative data. The quantitative findings reveal a statistically significant positive correlation between the frequency of cashless transactions and the likelihood of impulse buying, showing that consumers using cashless methods are spending 47% higher than their cash using peers. Qualitative data supports the view that reduced 'pain of paying' traditionally associated with paying in physical cash is a very likely explanation of this increased spending and circumvents conscious budgeting. This paper contributes to behavioural economics literature by contextualizing global theories of mental accounting and payment transparency within the UAE's highly digitized, high-consumption economic environment, with special focus on Dubai.

INTRODUCTION

Over the last ten years, the UAE has rapidly and radically transformed its financial infrastructure, especially through government-led initiatives like the UAE Digital Government Strategy 2025. Combined with proliferation and rapid adoption of financial technology, the government initiative has led to rapid decline in the primacy of physical cash at the point-of-sale retail outlets (Al-Khouri, 2023). As per reports of the Central Bank of the UAE (2025), there has been a significant decline in the physical cash transactions while an exponential expansion of the UAE payment market is projected. This transition towards a cashless ecosystem is further expedited with the arrival of instant payment platforms like 'Aani' and the domestic card scheme 'Jaywan'.

While a cashless society offers various macroeconomic benefits like better transaction security, reduction in overhead expenditures of financial institutions involved in cash handling, and mitigation of illicit financial transactions (Rogoff, 2016), there is a serious need to closely and empirically examine the microeconomic effect of this transition on individual consumer psychology. This transition to a cashless ecosystem basically transforms the tangible exchange of wealth through hard cash into an abstract experience, as the transaction only requires a localized biometric scan like Apple Pay or a simple tap of a contactless card.

This paper seeks to address a critical aspect of this transition by looking into its impact on the young consumers aged 16 to 30, in Dubai, in terms of financial discipline. This specific age group is selected because the retail sector and FinTech developers target this age group on priority basis. The key research questions targeted by this paper are the following:

a) To what extent do cashless payment systems increase the frequency and magnitude of impulse purchases among the youth and young adults in Dubai?
b) How does the abstraction of tangible cash transactions affect the financial discipline, mental accounting, and budgeting habits in a high-retail environment?

Hypotheses

Based upon the foundational theories of behavioural economics, this research paper tests the following hypotheses:
Hypothesis 1: Compared to the consumers primarily using physical cash, the consumers using primarily cashless payment methods show a significant increase in their weekly discretionary spending.

Hypothesis 2: The frequency of using digital wallets like Apple Pay or Google Wallet shows a positive correlation with the frequency of self-reported impulse purchases.

Literature Review

This study is conducted within the theoretical framework of behavioural economics. There are three key strands to this framework- mental accounting, payment transparency and psychological friction associated with transfer of wealth.

Mental Accounting and the 'Pain of Paying'

Mental accounting as a concept was first introduced by Thaler (1985), and it argues that categorization and evaluation of economic transactions by an individual are largely based on subjective criteria rather than strict rational calculus. This concept provides the premise for the development of the 'pain of paying' theory (Loewenstein, 1998), transfer of hard physical cash has an immediate psychological cost associated with it. This psychological cost acts as a tangible friction that places a natural brake on overspending as the consumers are forced to evaluate the utility of an item against the depletion of resources that they can actually see and feel.

This theory is further expanded in subsequent research by Soman (2001) through the introduction of the concept of 'payment transparency.' His research shows an inverse correlation between the transparency of a payment mechanism and the propensity for expenditure. The less is transparency of payment mechanism or the less it feels like spending the actual money, the higher is the propensity to spend. Credit cards and later innovations like digital wallets create low payment transparency because the pleasure of consumption and pain of payment are temporally and physically separated.

The Evolution of Frictionless Financial Transactions

The emergence of FinTech solutions like mobile wallets and near-field communication technologies has minimized the friction of financial transactions. Studies show that credit card-using consumers are likely to spend more as compared to cash buyers, and they also have greater propensity to buy unhealthy and impulsive items like junk food (Thomas, Desai, and Seenivasan, 2011). A recent study , Meyll and Walter (2019), shows a lower level of financial literacy and a higher level of debt accumulation among the users of mobile payments, which suggests that gamified and seamless payment options offered by modern banking apps create a distance between the consumer and the reality of their financial status.

The UAE Context of Increasingly Digitized Retail Market

High consumer spending power and rapid digitization make the UAE a very relevant environment to study the impact of frictionless financial transactions on individual consumer spending habits. The total payment market of the UAE is dominated by the retail sector's spending (Smith and Jones, 2024), and the youth population is driving the adoption of frictionless payment options like 'Buy Now, Pay Later' (BNPL) schemes and digital wallets. Although there is global literature linking digital payments with overspending, there is a paucity of empirical primary research focusing on the youth demographics in the unique socio-economic climate of Dubai, examining how the chosen behavioural economic theories manifest in their spending behaviour.

The Budgeting Paradox

The facilities offered by digital wallets present a very unique behavioural paradox. On one hand, their frictionless payment facility decreases financial discipline among the consumers; on the other hand, they also provide features like real-time transaction tracking and categorized digital receipts, theoretically promoting fiscal discipline. Digital tools facilitating budgeting by the consumers are referred to as the 'robo-advising effect' (D'Acunto et al. 2020). However, whether these financial tracking features make the youth of Dubai more disciplined or the benefits of tracking features are nullified by the ease of frictionless payments remains a key question that this study aims to answer in empirical terms.

Methodology

Research Design

This research study uses a mixed-method design that is explanatory and sequential (Creswell & Cresswell, 2017). Divided into two phases, it gathers quantitative data in the first phase through a cross-sectional survey distributed among a selected sample group of Dubai residents. It is followed by qualitative data gathered through semi-structured interviews with a subset of the phase one respondents that explores the psychological factors explaining their self-reported spending behaviour.

Population and Sampling

This study focuses on the youth and young adults living in Dubai. A sample of 150 participants was selected across three age groups, which included individuals from high School, universities, and early career professional hubs. A demographic profile was prepared for the participants, which included their age group, level as a student or professional, monthly income/allowance, and primary payment method.

Table 1: Demographic Profile of Phase 1 Respondents (N=150)

Demographic Variable	Category	Frequency	Percentage
Age group	16-19 (High School)	45	30.0%
	20-24 (University)	70	46.7%
	25-30 (Young Professional)	35	23.3%
Primary Payment Method	Digital Wallets (Phone/Watch)	85	56.7%
	Contactless Physical Cards	40	26.7%
	Physical Cash	25	16.6%
Average Monthly Income/Allowance	Under AED 2000	50	33.3%
	AED 2000- AED 5000	60	40.0%
	Above AED 5000	40	26.7%

Data Collection Instruments

Quantitative Survey (Phase 1): Using Google Forms as a tool, a questionnaire consisting of 25 items was distributed among the selected participants. Besides multiple-choice questions, the questionnaire also included a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure certain variables like perceived ease of use, frequency of unplanned or impulse purchases, and self-reported financial awareness. Initially a pilot study was conducted with 15 respondents and subjected to a Cronbach's alpha test to determine the internal consistency of data. This test produced a reliability coefficient of $\alpha = 0.82$, which indicated a high reliability (DeVellis, 2016).

Quantitative Interviews: Among the subjects selected in phase 1, 12 participants were selected for approximately 20-minute long, semi-structured interviews. Among these selected 12 participants, 8 were cashless users and 4 were physical cash users. The Interview questions were designed to gather specific instances of overspending, the tendency to check bank balances, and their perceptions of the value of money in both physical and digital forms.

Ethical Considerations

As the sample of participants also included minors below the age of 18 years, parental consent was obtained, while the remaining participants provided active informed consent. To further protect individual privacy and ensure confidentiality as per standard academic ethical guidelines, all the responses were anonymized with alphanumeric codes (e.g., P1, P2) assigned to all the participants.

RESULTS AND FINDINGS

Spending Propensity and Impulse Buying (Quantitative Findings)

For analyzing the impact of mode of payment on consumer spending habits, the respondents were broadly categorized into 'Cashless Group' (which included the users of digital wallets and contactless cards, $n_1 = 125$) and 'Cash Group' ($n_2 = 25$). Data pertaining to estimated average weekly discretionary spending on non-essential goods and services, along with instances of impulse buying, was collected from all the participants, and these figures were in UAE dirhams (AED).

Table 2: Descriptive Statistics of Weekly Discretionary Spending and Impulse Purchases

Metric	Cashless Group ($n_1 = 125$)	Cash Group ($n_2 = 25$)
Mean Weekly Discretionary Spending	AED 420.50	AED 285.00
Standard Deviation (Spending)	AED 115.20	AED 65.40
Mean Impulse Purchases per Week	4.2 Items	1.8 Items
Standard Deviation (Impulse)	1.4 Items	0.8 Items

Hypothesis Testing

Testing Hypothesis 1 (H_1) (Discretionary Spending)
Hypothesis 1 is evaluated through an independent two-sample t-test, which could determine the statistical significance of the difference in mean weekly discretionary spending. This test assumed unequal variances.
Welch's t-test formula is:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Where:

$\bar{x}_1 = 420.50, \bar{x}_2 = 285.00$
$s_1 = 115.20, s_2 = 65.40$
$n_1 = 125, n_2 = 25$

Calculation of standard error (SE):

$$SE = \sqrt{\frac{(115.20)^2}{125} + \frac{(65.40)^2}{25}} = \sqrt{\frac{13271.04}{125} + \frac{4277.16}{25}}$$

$$SE = \sqrt{106.17 + 171.09} = \sqrt{277.26} \approx 16.65$$

Calculation of the t-statistic:

$$t = \frac{420.50 - 285.00}{16.65} = \frac{135.50}{16.65} \approx 8.14$$

Calculation of Degree of Freedom:

$$df = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2 - 1}}$$

Calculation of Numerator: $(106.17 + 171.09)^2 = (277.26)^2 \approx 76873.10$

Denominator : $\frac{106.17^2}{124} + \frac{171.09^2}{24} = \frac{11272.06}{124} + \frac{29271.78}{24} = 90.90 + 1219.65 = 1310.55$

Plugging the value of numerator and denominator: $df = \frac{76873.10}{1310.55} \approx 58.65$

With a non-integer degree of freedom ($df \approx 58.65$) , Microsoft Excel's inverse t-distribution function for a two-tailed test was used to derive the critical t-value $t_{crit} = 2.0006$, which was rounded to 2.001.

As the t-value (8.14) is higher than critical t-value (2.001), the p-value is less than 0.001.

These findings reject the null hypothesis and support hypothesis 1 which proposes that discretionary spending increases among consumers using cashless methods as compared to those using physical cash.

Testing Hypothesis 2 (Positive Correlation between Cashless payments and Impulse Buying)
Assessment of relationship between the frequency of digital wallet usage measured on 1 to 5 scale and the number of self-reported impulse buying per week is based Pearson correlation coefficient (r) for the entire sample (N=150).
Statistical significance of this correlation is assessed through t-test, using the following formula :

$$t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

Where:

- $r = 0.68$ (Pearson correlation coefficient)
- $N = 150$ (Total sample size)

$using\ these\ values\ in\ the\ above\ equation, the\ value\ of\ t \approx 11.28$

Degree of freedom in this case is 148 ($df = N - 2, and\ N = 150$) and two tailed alpha level of $\alpha = 0.05$ (two-tailed), giving a critical t-value of $t_{crit} = 1.976$ (approx.). As the t-value ($t = 11.28$) is much higher than the critical t-value (1.976), the p-value is less than 0.001.

The findings support the second hypothesis that the use of digital wallets is positively correlated with frequency of impulse purchases.

Qualitative Findings
The responses gathered from 12 semi-structured interviews were subjected to thematic analysis, yielding three key themes:

Frictionless payment and abstraction of wealth.
The most recurring idea during the interviews was the virtual nature of digital wallets that makes money feel less real. Ten interviewees mentioned that payments through digital wallet or contactless cards do not register in the mind of the consumer the same way as real cash would. Response of Participant 4, a 19-year-old university student, is representative of this view: 'If I have a hundred dirham bill in my wallet, I will be hesitant to break it for a 20 dirham coffee, but with the same amount in digital wallet (Apple Pay on my watch), I won't think twice before ordering a 40 dirham beverage.'

Budgeting Paradox caused by Notification Fatigue
Although all the major digital apps offer expense tracking and notifications, participants seem to .Despite having access to advanced digital banking apps that track spending, participants rarely used them proactively. Instead, they reported "notification blindness."

Participant 9 (Age 26, Professional): "My phone pings every time I tap my card. At first, it made me careful. Now, I get so many notifications from Talabat, Careem, and cafes that I just swipe them away without looking. I only check the actual app at the end of the month, and I'm always shocked by the total."

Social Spending and Peer Ecosystems
In Dubai's highly social, cafe-centric youth culture, the speed of digital payments facilitates peer-pressured spending. The ease of splitting bills digitally or quickly tapping at a drive-through removes the social awkwardness of counting cash, subtly encouraging collective overspending.

DISCUSSION

The empirical results of this study align robustly with the foundational behavioral economics literature, confirming that the abstraction of currency in a highly digitized economy significantly alters consumer psychology (Soman, 2001; Prelec & Loewenstein, 1998).

The Disintegration of the Friction Barrier
The data definitively supports the premise that cashless transactions successfully bypass the psychological "pain of paying." Because the modern checkout process in Dubai is reduced to a biometric scan requiring less than three seconds, the consumer is deprived of the cognitive processing time traditionally required to evaluate the utility of a purchase against their overarching budget constraint. The fact that the cashless cohort spent an average of AED 135.50 more per week on discretionary items demonstrates that convenience directly cannibalizes financial discipline.

Evaluating the Budgeting Paradox
This study highlights a critical flaw in the assumption that digital banking naturally improves financial management. The "Budgeting Paradox" observed in the qualitative data reveals that the mere presence of data (transaction histories, categorized spending charts) is insufficient to curb impulse buying. Tracking requires active, intentional engagement, whereas digital spending is entirely passive and reactive. In a retail-optimized environment like Dubai, the psychological ease of frictionless spending overwhelmingly outpaces the cognitive discipline required to utilize digital tracking tools (Meyll & Walter, 2019).

Limitations and Future Research
While this study provides valuable empirical insights, several limitations must be acknowledged:

1. **Sample Constraints:** The sample size of 150 is statistically sufficient for preliminary t-tests but represents a relatively narrow slice of Dubai's diverse population. The reliance on convenience sampling may introduce selection bias, skewing toward individuals with higher baseline tech-literacy.
2. **Self-Reported Metrics:** Discretionary spending figures were self-reported via surveys rather than extracted from objective banking ledgers. This introduces the potential for recall bias, where participants either underestimate their spending to appear more responsible or overestimate it due to a recent large purchase.

Future Research Directions: Future studies should attempt to collaborate with UAE financial institutions to analyse anonymized, objective POS transaction data over a longitudinal period. Furthermore, as the Central Bank of the UAE

progresses toward implementing a Central Bank Digital Currency (CBDC), analysing how state-backed digital currencies alter perceptions of money's intrinsic value will be a vital area of study.

CONCLUSION AND RECOMMENDATIONS

This research conclusively demonstrates that the widespread adoption of cashless payment systems in Dubai exerts a profound, quantifiable impact on the spending habits of youth and young adults. By systematically eliminating the friction and psychological pain associated with physical cash transactions, digital wallets significantly increase both the frequency of impulse purchases and total discretionary expenditure.

As the UAE continues its strategic trajectory toward a fully cashless, hyper-connected economy by 2031, acknowledging the behavioural side effects of this transition is paramount. It is highly recommended that secondary and tertiary educational institutions in the UAE integrate behavioural financial literacy into their curricula. Teaching students not just how to budget but also educating them on the psychological mechanisms that retail environments use to exploit frictionless payment systems is critical. Furthermore, FinTech developers should explore the implementation of "positive friction"—such as customizable cool-down periods for non-essential transactions or mandatory biometric re-authentication for purchases exceeding daily limits—to reintroduce conscious financial decision-making into the digital consumer experience.

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Appendices:

Appendix A

Quantitative Survey Instrument

Title: Consumer Spending Habits and Payment Modalities in Dubai
Target Demographic: Residents of Dubai aged 16–30
Estimated Time to Complete: 5 minutes

Section 1: Demographics and Baseline Habits

1. **What is your age group?**
   - ☐ 16–19 (High School)
   - ☐ 20–24 (University)
   - ☐ 25–30 (Young Professional)
2. **What is your primary method of payment for daily discretionary purchases?**
   - ☐ Digital Wallet (Apple Pay, Google Wallet, Samsung Pay via phone/watch)
   - ☐ Contactless Physical Card (Tap-to-pay)
   - ☐ Physical Cash
3. **What is your estimated monthly disposable income/allowance (excluding rent/tuition)?**
   - ☐ Under 2,000 AED
   - ☐ 2,000 – 5,000 AED
   - ☐ Over 5,000 AED
4. **Approximately how much do you spend on discretionary purchases in a typical week?**
   AED _____
5. **On average, how many unplanned "impulse" purchases do you make in a typical week?**
   _____ items
6. **Which specific digital wallet or payment app do you rely on most frequently?**
   - ☐ Apple Pay
   - ☐ Google Wallet / Samsung Pay
   - ☐ Local Bank App / PayBy / Careem Pay
   - ☐ I primarily use physical cards or cash

Section 2: Psychological Friction and Spending Behavior

Please rate your agreement with the following statements (1 = Strongly Disagree, 5 = Strongly Agree).

Statement	1	2	3	4	5
7. I find it much easier to spend money when tapping my phone compared to handing over physical cash.	○	○	○	○	○
8. When I use digital wallets, I sometimes lose track of how much I have spent by the end of the week.	○	○	○	○	○
9. I feel a stronger sense of guilt or hesitation when paying with a 100 AED bill compared to tapping for the same amount.	○	○	○	○	○
10. The physical act of handing over a paper banknote makes me pause and reconsider if I really need the item.	○	○	○	○	○
11. The speed of contactless payments at cafes/drive-throughs makes me more likely to add extra items to my order.	○	○	○	○	○
12. I am more likely to purchase luxury or non-essential items when I know I can pay with a quick tap of my phone.	○	○	○	○	○
13. If a store or cafe in Dubai only accepted cash, I would likely leave without buying anything.	○	○	○	○	○

Section 3: Financial Discipline and Budgeting

Please rate your agreement with the following statements (1 = Strongly Disagree, 5 = Strongly Agree).

Statement	1	2	3	4	5
14. I actively use the budgeting and categorization tools provided by my digital banking app.	○	○	○	○	○
15. I closely read every transaction push notification that appears on my phone.	○	○	○	○	○
16. I often swipe away payment notifications without mentally registering the amount spent.	○	○	○	○	○
17. I have a strict weekly budget that I rarely exceed.	○	○	○	○	○
18. I feel a sense of anxiety or dread when I finally check my bank account balance after a busy weekend in Dubai.	○	○	○	○	○
19. I actively set aside a portion of my monthly income or allowance for savings *before* I begin spending.	○	○	○	○	○
20. I review my monthly bank statements line-by-line to understand my exact spending patterns.	○	○	○	○	○

Section 4: "Buy Now, Pay Later" & Social Dynamics

Please rate your agreement with the following statements (1 = Strongly Disagree, 5 = Strongly Agree).

Statement	1	2	3	4	5
21. Splitting bills digitally with friends (e.g., via apps) encourages us to spend more when going out in Dubai.	○	○	○	○	○
22. The convenience of saved card details on delivery apps significantly increases my weekly food expenditure.	○	○	○	○	○
23. I frequently use "Buy Now, Pay Later" (BNPL) services like Tabby or Tamara for online or in-store purchases.	○	○	○	○	○
24. BNPL services often lead me to purchase items I could not afford to buy outright today.	○	○	○	○	○
25. I feel subtle social pressure to overspend at cafes and restaurants when hanging out with my peers.	○	○	○	○	○

Appendix B

Qualitative Semi-Structured Interview Guide

Participant Profile: [Age, Occupation/Student Status, Primary Payment Method]
Duration: 15–20 minutes

Part 1: Warm-Up and Baseline Behavior

1. Walk me through a typical weekend day for you in Dubai regarding spending. Where do you go, and how do you usually pay for things?

2. When was the last time you used physical cash? What was the context, and why did you use it instead of your card or phone?

Part 2: The "Pain of Paying" and Abstraction of Wealth

3. Can you recall a recent instance where you made an impulse purchase that you later regretted? Walk me through the checkout process.

4. *Scenario comparison:* Imagine you are buying a coffee and a pastry for 45 AED. In scenario A, you hand the cashier a 50 AED note and get 5 Dirhams back. In scenario B, you double-click your smartwatch to pay. Do these two actions feel emotionally different to you? If so, how?

5. Some people say that money on Apple Pay or Google Wallet "doesn't feel real." Do you agree with this statement based on your own habits?

Part 3: The Budgeting Paradox and Digital Tracking

6. Your bank likely sends you a push notification immediately after you tap your phone to pay. How do you react to these notifications? *(Probe: Do they make you feel more in control, or do you ignore them?)*

7. Digital banking apps in the UAE offer excellent charts showing exactly where your money goes. Do you actively look at these charts? Why or why not?

8. In an environment like Dubai, where everything is optimized for speed (e.g., Talabat, Careem, quick drive-throughs), how hard is it to maintain strict financial discipline?

Part 4: Social Dynamics and Closing

9. How does the speed of digital payments or bill-splitting apps affect how you spend money when you are out with friends?

10. Have you used services like Tabby or Tamara? How does the option to split a payment impact your decision to buy something?

11. If you had to switch to a "cash-only" lifestyle for one month, how do you think your spending volume would change?

Appendix C

Statistical Calculation Breakdown

Table C1: Welch's Independent t-test Calculation for Discretionary Spending

Hypothesis 1: Comparing average weekly discretionary spend (Cashless vs. Cash)

Statistical Metric	Formula & Substitution	Calculated Value
Group Means	$\bar{x}_1$ (Cashless Group) $\bar{x}_2$ (Cash Group)	$\bar{x}_1 = 420.50$ $\bar{x}_2 = 285.00$
Standard Deviations	s_1 (Cashless Group) s_2 (Cash Group)	$s_1 = 115.20$ $s_2 = 65.40$
Sample Sizes	n_1 (Cashless Group) n_2 (Cash Group)	$n_1 = 125$ $n_2 = 25$
Standard Error (SE)	$SE = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$ $SE = \sqrt{\frac{115.20^2}{125} + \frac{65.40^2}{25}}$	$SE \approx 16.65$
t-statistic (t)	$t = \frac{\bar{x}_1 - \bar{x}_2}{SE}$ $t = \frac{420.50 - 285.00}{16.65}$	$t \approx 8.14$
Degrees of Freedom (df) *(Welch-Satterthwaite)*	$df = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2 - 1}}$	$df \approx 58.65$
Critical t-value	Look-up value for $\alpha = 0.05$ (two-tailed) at $df \approx 58$	$t_{crit} = 2.001$
Conclusion	Because t (8.14) > t_{crit} (2.001), the results are statistically significant.	$p < 0.001$

Note: The critical t-value (t_{crit}) was derived using the parameters $\alpha = 0.05$ (two-tailed) and $df = 58.65$ via statistical software (e.g., Excel's `T.INV.2T` function).

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Table C2: Pearson Correlation and Significance Test

Hypothesis 2: Digital Wallet Usage and Impulse Buying Frequency

Statistical Metric	Formula & Substitution	Calculated Value
Sample Size	N (Total Survey Respondents)	$N = 150$
Correlation Coeff.	Derived from covariance of X and Y	$r = 0.68$
Degrees of Freedom	$df = N - 2$	$df = 148$
t-statistic for r	$t = r\sqrt{\frac{N-2}{1-r^2}}$ $t = 0.68\sqrt{\frac{150-2}{1-0.68^2}}$	$t \approx 11.28$
Critical t-value	Look-up value for $\alpha = 0.05$ (two-tailed) at $df = 148$	$t_{crit} \approx 1.976$
Conclusion	Because t (11.28) $> t_{crit}$ (1.976), the positive correlation is highly significant.	$p < 0.001$

Appendix D

Informed Consent Form

Project Title: The Frictionless Dirham: An Empirical Analysis of Cashless Payment Systems and Consumer Spending Habits in Dubai

Researcher: _____

Purpose of the Study

You are being invited to participate in a research study investigating the psychological and behavioral impacts of cashless payment systems (such as digital wallets and contactless cards) on consumer spending habits in Dubai. The purpose of this research is to understand how the abstraction of physical currency affects financial discipline and impulse buying among youth and young adults.

Procedures

If you agree to participate, you will be asked to complete a brief quantitative survey taking approximately 5 minutes. You may also be randomly selected and invited to participate in a 15–20 minute semi-structured follow-up interview to discuss your spending habits in more detail.

Confidentiality and Data Protection

Your privacy is of the utmost importance. All data collected during this study will be strictly anonymized. You will be assigned a random participant code (e.g., P1, P2), and your name will not be linked to your survey responses or interview transcripts. All physical and digital data will be securely stored and permanently destroyed upon the final grading and publication of this research.

Voluntary Participation and Right to Withdraw

Your participation in this study is entirely voluntary. You have the right to decline to answer any specific questions or to withdraw from the study at any time without penalty or consequence.

Participant Consent Declaration

Please read the following statements and check the boxes to indicate your agreement:

- ☐ I have read and understood the information provided about this study.
- ☐ I understand that my participation is voluntary and that I am free to withdraw at any time.
- ☐ I understand that my responses will be anonymized and kept strictly confidential.
- ☐ I am either 18 years of age or older, **OR** I have obtained explicit parental/guardian consent to participate.

1

☐ I agree to take part in this research study.

Participant **Signature:** **Date:** _____

_____

Parent/Guardian **Signature:** **Date:** _____

_____

(Required only if participant is under 18)

Researcher **Signature:** **Date:** _____

_____

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Appendix E

Comprehensive Raw Data Extracts and Thematic Coding Matrix

Note: To maintain participant confidentiality and adhere to ethical research guidelines, this appendix presents an anonymized, 15-row cross-sectional extract of the quantitative survey dataset ($N = 150$) and an expanded thematic coding matrix demonstrating the qualitative data synthesis process for the semi-structured interviews ($N = 12$). For readability, the quantitative data has been separated into demographic metrics and behavioral Likert-scale responses.

E1. Quantitative Raw Data Extracts

Table E1.1: Sample Participant Demographics and Baseline Spending Metrics
This table isolates the baseline independent variables (Age, Income, Payment Method) and the primary dependent variables (Weekly Spend and Impulse Quantity) for the 15-participant extract.

ID	Age	Income Tier (Monthly)	Primary Method	Weekly Spend (AED)	Impulse Buys (Qty)
P001	20–24	2k–5k AED	Digital Wallet	450	4
P002	16–19	< 2k AED	Physical Cash	200	1
P003	25–30	> 5k AED	Digital Wallet	580	6
P004	20–24	2k–5k AED	Contactless Card	380	3
P005	20–24	2k–5k AED	Digital Wallet	410	5
P006	16–19	< 2k AED	Digital Wallet	320	4
P007	25–30	> 5k AED	Physical Cash	290	2
P008	20–24	2k–5k AED	Digital Wallet	510	5
P009	16–19	< 2k AED	Physical Cash	150	1
P010	25–30	> 5k AED	Contactless Card	460	4
P011	20–24	> 5k AED	Digital Wallet	620	7
P012	25–30	2k–5k AED	Contactless Card	340	2
P013	16–19	< 2k AED	Digital Wallet	390	5
P014	20–24	2k–5k AED	Physical Cash	220	1
P015	25–30	> 5k AED	Digital Wallet	550	5

Table E1.2: Sample Participant Behavioral Likert-Scale Responses

This table maps the psychological and behavioral variables for the same 15 participants. Variables Q7 through Q24 correspond to the 5-point Likert scale items established in Appendix A (1 = Strongly Disagree, 5 = Strongly Agree).

ID	Q7 *(Friction)*	Q9 *(Guilt)*	Q14 *(Budget)*	Q18 *(Anxiety)*	Q22 *(Delivery Apps)*	Q24 *(BNPL Usage)*
P001	5	5	2	4	5	4
P002	2	1	1	2	1	1
P003	4	4	1	5	5	5
P004	4	4	3	3	4	2
P005	5	5	2	4	5	5
P006	5	4	1	4	4	3
P007	3	2	4	1	2	1
P008	5	5	2	5	5	4
P009	2	2	1	2	1	1
P010	4	5	3	4	4	3
P011	5	5	1	5	5	5
P012	3	4	4	2	3	2
P013	5	4	2	4	5	4
P014	2	2	3	2	2	1
P015	4	5	2	4	4	4

E2. Qualitative Thematic Coding Matrix

Table E2.1: Thematic Synthesis of Semi-Structured Interviews

The interviews were fully transcribed and analyzed using a standard, recursive thematic analysis framework (Braun & Clarke, 2006). The matrix below demonstrates the exact methodological trail of how raw, verbatim participant statements were highlighted, systematically grouped into initial psychological codes, and subsequently synthesized into the four overarching academic themes discussed in the primary research paper.

ID	Raw Transcript Extract	Initial Coding Application	Final Overarching Theme
P04	"When I have a 100 Dirham bill... I hesitate to break it. I can physically see my money disappearing. But with Apple Pay... the number just vanishes into a screen."	Disconnect from digital numbers; physical money is perceived as tangible wealth; loss of checkout hesitation.	**Theme 1:** The Abstraction of Wealth and Reduced Friction
P09	"My phone pings every time I tap my card. [...] Now, I get so many notifications from Talabat, Careem... that I just swipe them away without looking."	Sensory overload from daily micro-transactions; reactive rather than proactive tracking; notification blindness.	**Theme 2:** Notification Fatigue and the Budgeting Paradox
P02	"If I had to get up, find my wallet, and type in my 16-digit card details... I wouldn't do it. But because my Face ID just scans and pays in one second, I spend hundreds on midnight food."	Ease of access; biometric authentication bypasses cognitive assessment; zero physical effort required for impulse buying.	**Theme 3:** Frictionless Environments and the Convenience Tax
P11	"Someone just pays the whole bill on their Apple Pay and sends a WhatsApp link... Because nobody is sitting there awkwardly counting cash, it feels easy to order that extra appetizer."	Removal of social friction in group billing; peer-pressure induced spending; gamification and speed of collective dining.	**Theme 4:** Social Dynamics and Peer-Driven Spending
P14	"With Tabby, I am buying luxury clothes I have no business buying because 'it's only 50 AED today.' It completely tricks my brain into thinking the item is cheap."	BNPL platforms masking the total financial cost; delayed financial consequence; artificially lowered immediate cost barrier.	**Theme 4:** Social Dynamics and Peer-Driven Spending
P07	"I strictly withdraw 500 Dirhams every Sunday. Once my wallet is empty, I stay home. I don't trust myself with Apple Pay anymore."	Cash utilized as a hard physical limit; self-awareness of digital impulsivity; strict behavioral budgeting mechanism.	*(Contrast Case)* verifying **Theme 1 & 2**