A Study on the Impact of UPI Micro-Transactions on Budgetary Control and Savings Behavior among Young Consumers in India

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ABSTRACT

Objectives: This study aims to understand the relationship between the frequency of small value (₹10-₹50) Unified Payments Interface (UPI) payments and budgetary control and savings behavior among young Indian consumers, to test if the relationship between small value (₹10-₹50) Unified Payments Interface (UPI) payments and savings behavior is mediated by budgetary control and to evaluate the mediating role of financial literacy and self-control. The design/methodology comprised a structured Google Forms questionnaire consisting of 25 five-point Likert items which were completed by 134 UPI users who were selected by convenience sampling. The five scales were reliable (Cronbach's $\alpha = .79–.89$). Data were analyzed using chi-square tests of independence, one-way ANOVA with Tukey post hoc tests, linear regression, mediation (Baron–Kenny, Sobel and bootstrap) and moderation (mean-centered interaction) analyses. Findings: Participants indicated that they made regular micro-payments, with 84.3% indicating they regularly make small UPI payments (agreed or strongly agreed). UPI micro-transactions was significantly associated with the level of budgetary control (χ^2 (1, N = 134) = 5.76, p = .016, Cramér's V = .207) and predicted budgetary control ($\beta = .40$, $R^2 = .16$) and perceived savings erosion ($\beta = .66$, $R^2 = .44$). The relationship was mediated, in part, by budgetary control (indirect effect = 0.152, 95% bootstrap CI [0.055, 0.333]). Financial literacy and self-control together accounted for .56 of the variance in budget control and significantly interacted with the UMT–savings relationship. ANOVA revealed differences between the groups in regard to age, gender and education, employment and income. Originality/value: The study highlights the micro-transactions in the range of ₹10 to ₹50 and provides an integrated framework of budgetary control (mediator) and financial literacy and self-control (moderators) in the context of young people in India. The findings are from a small, convenience sample, mostly consisting of young female students, and should be interpreted with some caution.

keywords: UPI, Micro Transactions, Budgetary Control, Savings Behavior, Financial Literacy, Self-control, Young Consumer, Digital Payment, India.

INTRODUCTION

The digital payment system is rapidly growing and has completely transformed the Indian consumer behavior. One of the popular payments is Unified Payments Interface (UPI) because of its convenience, speed and availability. These are the mobile apps, like Google Pay, PhonePe and Paytm, that enable consumers to pay for daily necessities like buying food, transportation, and shopping in just one single click. As more and more people are using UPI, young consumers are altering their perception of money. Although digital payments are convenient, this can also impact an individual's financial decisions, budgeting and saving.

Youth are one of the big consumers of digital payment technologies, especially young working youth. It is the time when people acquire financial skills and how they handle their allowances and personal finances. Using UPI, they can make a lot of small payments without having to carry cash. This can make it easier to overlook the cost of the overall expenditure, even though, if there are several small payments in the same day. Therefore, it is important to study the relationship between the micro-transactions using UPI, budgetary control, and the saving pattern of youth to encourage responsible savers.

Micro transactions are small value transactions made on regular basis on daily basis. Although the individual amounts are small, they can add up with time. The "pain of paying" is reduced and cashless payment can lead to more than consumers would like to spend since they are not mindful of the costs (Prelec & Loewenstein, 1998; Thaler, 1999). In India, Batham and Jaiswal (2026) studied 312 participants across the urban and semi-urban areas and found that convenience as well as trust is an important factor in determining the transaction behaviors of UPI adoption and that there is a positive correlation between the frequency of using UPI and reducing cash-based budget planning, and also an increase in impulsive spending.

Budgetary control is a person's ability to plan, monitor and control expenses in the planned budget of the financial resources. In good budgetary control, consumers can monitor their expenditure, save for essentials and refrain from needless expenditure and saving. If you're making a lot of transactions, it may be difficult to stick to a budget unless you check your transactions regularly or use a budgeting tool. While UPI offers transaction history, how young consumers will leverage it to develop financial discipline is yet to be established in the research. The study of Jayanthi, Arunima and Dhanya (2026) found that an increase in the frequency of use of UPI is positively associated with the number of transactions and impulsive purchasing and that students have concerns about overspending and the lack of funds control.

Saving behavior refers to the mindset or behavior of an individual while he saves some of his income or allowance for future consumption. Financial strength and preparedness are developed by regular saving. Spending habits, financial knowledge, self-control and budgeting may be factors that impact saving behaviors for young consumers. If regular saving is done on a regular basis, without monitoring, the amount left for regular saving may decline. Self-control (Tangney, Baumeister & Boone, 2004) and financial knowledge (Lusardi & Mitchell, 2014) could also be important factors in determining the ability of young consumers to control their digital payments and save regularly.

In spite of the rising popularity of UPI and research on digital payments, more needs to be done to understand the connection between micro transactions, budgetary control and saving habits of young Indians. Though the existing studies have centered on digital payment adoption, general spending pattern and impulsive buying, few studies have focused on budgetary control as an intervening variable, and financial literacy and self-control as moderating variables. The present study therefore aims at exploring how UPI micro-transactions affects budgetary control and savings behavior of young consumers in India, how financial literacy and self-control moderate the effect of UPI micro-transactions on budgetary control and how UPI micro-transactions mediate the relationship between budgetary control and savings behavior of young consumers in India.

Research Gap

While the studies that have investigated the adoption of UPI, digital payment usage and consumers spending behavior, studies that specifically investigate the impact of small-value UPI micro-transactions (₹10 to ₹50) on budget management and saving behavior of young consumers in the Indian context is limited. Researchers have previously studied ease of use, adoption and spending, but the effects of frequent micro payments on spending awareness, budgeting behavior and savings objectives have remained overlooked. Earlier research also has been primarily conducted through cross-sectional surveys and convenience samples and has paid little attention to the mediation of budgetary control and moderation by financial literacy and self-control. This study aims to fill these gaps in India.

Problem Statement

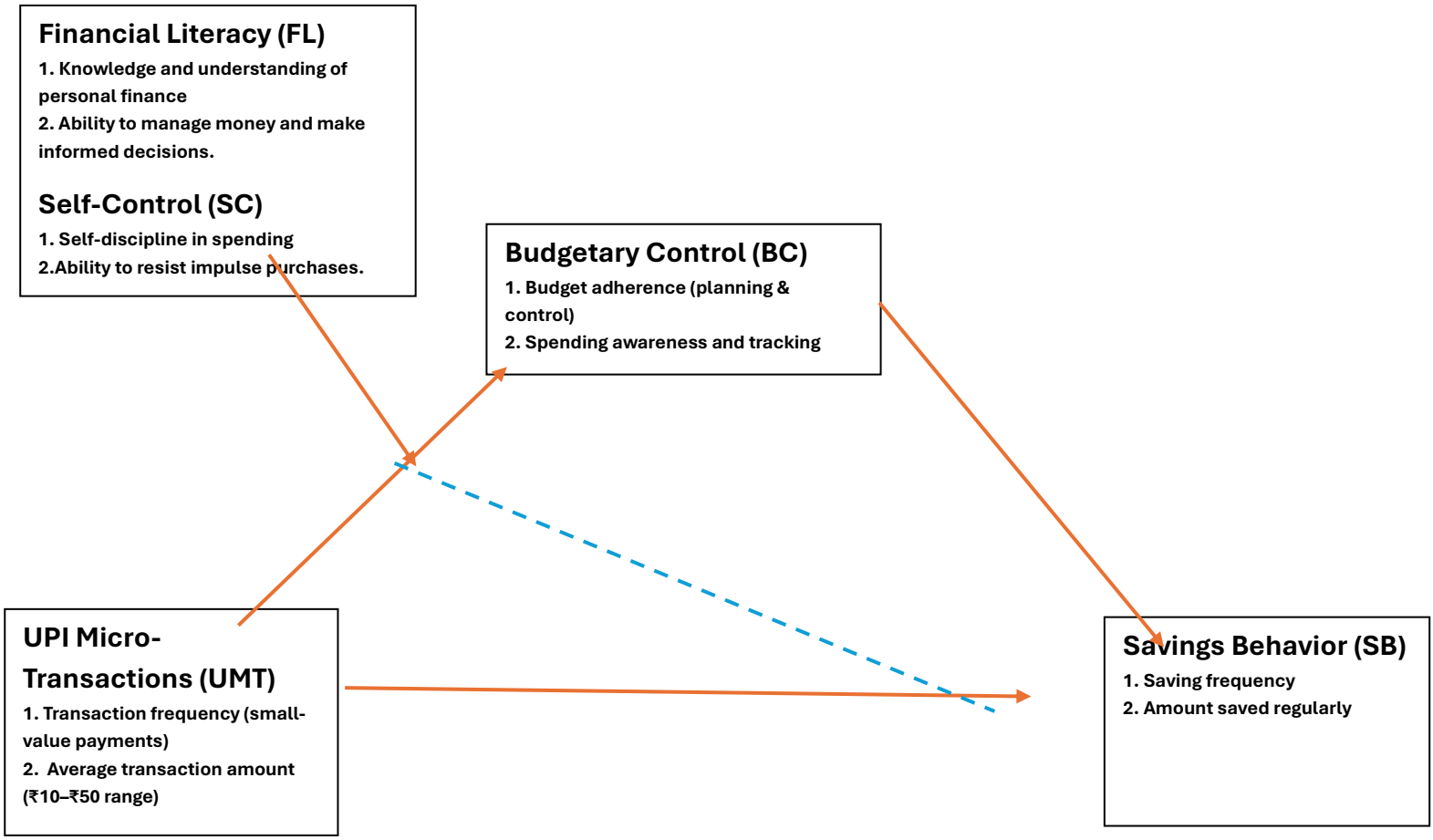
UPI has transformed the standard of shopping for the younger generation of Indians, making buying things digital, speedy and convenient. But, if you are making tiny payments, particularly Rs 10 to 50, you may not notice it in your pocket, and it will be hard to maintain a budget and save. Although some studies have investigated adoption of UPI and spending behavior among youth, the impact of micro-transactions on budgeting and saving among young consumers has not been studied much and the role of budgetary control as a mediating factor and financial literacy and financial self-control as modifying factors have remained largely unexamined. The study hence investigates the effect of the UPI micro-transactions on the saving behavior and budgetary control of the young consumers in India and the influence of financial literacy and self-control in encouraging digital spending and good saving habits among the young consumers in India.

RESEARCH QUESTIONS

- RQ1: Does UPI micro-transactions influence budget management for young consumers in India in terms of number and value?
- RQ2: Does the number of UPI micro-transactions and its value impact the young consumer budget management in India?
- RQ3: What are the effects of budgetary control on the saving behavior of young consumers making many micro-payments via UPI?
- RQ4: What is the direct impact of UPI micro-transactions on the savings habit of young Indians?
- RQ5: How does financial literacy and self-control moderate the relationships between young consumers' UPI micro-transactions, budgetary control, and savings behavior?

CONCEPTUAL FRAMEWORK

Based on this, the study suggests that the impact that UPI micro-transactions (UMT) has on young consumers' savings behavior (SB) is mediated by budgetary control (BC). Financial literacy (FL) and self-control (SC) are suggested to moderate such relationships (Figure 1). The design is based on mental accounting (Prelec & Loewenstein, 1998; Thaler, 1999), which proposes that low-friction payments reduce the awareness of spending, and the financial literacy and self-control literature which proposes that knowledge and self-regulation help people make spending and saving their budgeting habits.



RESEARCH OBJECTIVES

1.To understand how UPI Micro Transactions impacts budget management of the young Indian consumers.

2.To evaluate the effect of UPI micro-transactions on the savings habit of youth in India.

3. To test if budgetary control is a mediator between UPI micro-transactions and savings behavior.

4.To understand how financial literacy affects consumers' budgeting and saving.

5. To learn about the importance of self-control in consumers' spending and saving behavior with regard to UPI micro-transactions.

RESEARCH HYPOTHESES

Table 1. Null and alternative hypotheses

No.	Null hypothesis (H_0)	Alternative hypothesis (H_1)
H1	$H_0$1: No significant difference exists between the rating (level) of UPI micro-transactions and budgetary control among young consumers of India.	$H_1$1: UPI micro-transactions are significantly related to budgetary control in young consumers in India.
H2	$H_0$2: UPI micro-transactions have no significant effect on savings behavior of young consumers in India.	$H_1$2: UPI micro-transactions are significantly related to savings behavior among young consumers in India.
H3	$H_0$3: There is no significant mediation effect between UPI micro-transactions and savings behavior when budgetary control is included.	$H_1$3: Budgetary control significantly mediates the relationship between UPI micro-transactions and savings behavior.
H4	$H_0$4: Financial literacy and self-control do not significantly affect budgetary control and savings behavior of young consumers in India.	$H_1$4: Financial literacy and self-control have a significant impact on budgetary control and savings behavior of young consumers in India.

REVIEW OF LITERATURE

Digital payments systems, like Unified Payments Interface (UPI) have revolutionized the consumer payment landscape in India, especially for daily transactions. Previous studies focused on the exploratory dimensions of UPI adoption, UPI convenience, consumer trust, UPI security, consumer satisfaction, consumer spending behavior. But the impact of multiple micro-payments through UPIs on young consumers' budgeting and saving has received limited focus. The following literature is reviewed on the major themes that were relevant to the current study.

UPI Adoption, Convenience and Consumer Behavior

The factors that contributed to the success of UPI were identified. Contributing factors for the success of UPI were identified.

In this study, Fahad and Mohammad Shahid (2022) have used the Diffusion of Innovation theory to study the adoption of UPI. They analyzed factors that affect the uptake of UPI and emphasized the need for personal, cultural, security, risk, and price related factors that are not necessarily accounted for by traditional technology-adoption models.

To examine consumer perception and behavioral intention towards UPI, the study is based on an extended UTAUT2 framework, as done by Jha and Kumar (2021). They found that performance expectancy, effort expectancy, social influence, facilitating conditions and promotional benefits are significant. The study further recommended a larger sample and more studies focusing on non-pandemic time periods.

Kiran and Sailaja (2025) analyzed the adoption of UPI with the help of the factors related to UTAUT, promotional benefits, trust and demographic factors. They found that promotional incentives and demographic differences did not

appear to be consistent, however, and additional research is needed on factors that may be driving the continued use of UPI.

Upadhya, Bhavsar and Jani (2026) correlated the factors like convenience, security, reliability and frequency of usage of UPI with consumer satisfaction. The study revealed that convenience is an integral part of the digital-payment experience and that other factors like trust and technological awareness should also be taken into account.

However, Motheram and Buteau (2026) studied various district-level factors that influence the adoption of UPI, such as digital infrastructure, merchant network, and gender differences. Their research suggests that adoption of UPI can be different across various demographic and geographical factors and it needs more studies to understand the differences.

Malhotra (2026) has analyzed how secure, easy to use, useful, and aware it is for consumers to use the UPI ecosystem to gain trust. The study highlighted the need for the analysis of time and demographic variations in digital-payment behavior.

UPI Usage, Spending and Impulsive Buying

One of the key topics of previous research is on the relationship between digital payments and consumer spending. Samit (2025) explored the adoption and growth of UPI usage, behaviors of spending, savings, and impulsive buying from the UTAUT and behavioral finance perspective. The study suggested that psychological aspects and budgeting process must be given more attention when it comes to the link between digital payments and expenditure.

The purpose of the study conducted by Jayanthi, Arunima and Dhanya (2026) was to analyze the usage of UPI among college students and the factors which are associated with it with special focus on impulsive buying, saving behavior, financial discipline and security perception. The found that students were concerned about spending too much and controlling their finances; they recommended the need for an expense tracking system and a spending alert system.

Sureka (2026) explored the correlation between the use of UPI, frequency of transaction and impulse purchase. The study showed that it was not a very powerful tool in explaining the findings, and more detailed studies were needed that took other factors into account like financial literacy and financial budgeting.

Karthik and Vyshnavi (2026) investigated the correlation between UPI convenience and security, as well as the UPI usage frequency and the percentage of consumer spending done using UPI. They found relatively low correlations and recommended that financial awareness, financial habits, cultural factors should be added in the future.

Bodhankar et al. (2026) investigated the performance of UPI with regards to personal spending, financial control and expenditure tracking, such as impulse purchases. Other factors like perceived usefulness, trust, and service quality were recommended as other factors that could be included in future studies.

Abhinaya (2024) investigated the adoption of Buy Now Pay Later and UPI and its impact on consumer expenditure and payment behavior in the metros of South India. The study pointed to the need to take into account the income, education and technological skills and geographical attributes in the study of digital payment behavior.

This is a crucial phase that requires attention when engaging in online shopping.It is an important stage that should not be overlooked when shopping online.

Small and frequent digital payments' behavioral effects have also been gaining traction. The study by Sehgal and Sarode (2026) examined the research related to UPI and financial behavior of consumers and the factors such as convenience, salience of payment and frequency of spending. Their research indicates that the effect of lots of small-scale transactions should be more thoroughly investigated, especially in budgeting and saving money.

Singh (2026) examined digital-payment behavior by employing the concepts of the pain of paying, mental accounting and impulse buying. The findings indicate that low payment salience can affect spending habits, and that the importance of financial monitoring and spending control.

Dev et al. (2024) examined the linkage between digital payments and expenditure at the micro level and suggested the creation of financially responsible payment-interface features. Based on their work, future studies need to focus more on spending awareness, long-term plans in financial planning and budgeting.

Nagare (2026) summarized the studies on UPI and e-wallets, focusing on areas of transaction frequency, payment salience, impulsivity, incentives and trust. The study emphasized the importance of studies at a longitudinal and transactional level to determine the causal effects of digital payments on spending and saving behavior.

Gnana Swaroop J (2026) studied the factors associated with ease of payment, convenience, trust and cashback in terms of the use of UPI. The research also suggested the necessity of further studies at the micro level on consumer psychology, money management and consumption patterns.

These studies suggest that these individual digital payments are not necessarily large, but could still affect consumers' sense of how much they're spending. But a detailed study on how frequent transactions of ₹10-₹50 on UPI affects the budgetary control and saving behavior among the youth in India is yet to be studied.

Payment Salience, Micro Transactions and Spending Awareness

Small and frequent digital payments are also gaining attention in relation to their behavioral impacts. Sehgal and Sarode (2026) conducted a review of the literature on UPI and financial behavior of consumers including convenience, payment salience and spending frequency. They found that the negative side effects of repeated small-dollar transactions should be considered more, in the context of budgeting and saving.

Singh (2026) used the concepts of the pain of paying, mental accounting and impulse buying to explain digital-payment behavior. The study indicates that the payment salience has an impact on spending behavior, which calls into attention the need for financial monitoring and spending controls.

Dev et al. (2024) explored the link between digital payments and micro-level spending and came up with the idea of creating financially responsible payment-interface features. Based on their work, further research is needed and it is recommended that spending awareness is given more consideration in future studies, as are long-term financial planning and budgeting strategies.

Nagare (2026) summarized the research findings on UPI and e-wallets, focusing on transaction frequency, payment salience, impulsivity and incentives and trust. The study emphasized the importance of longitudinal and transaction level studies to determine the effect of digital payments on the behavior of spending and saving.

This paper, titled “Factors affecting the use of Unpaid Interactive Methods (UPI)”, by Gnana Swaroop J (2026) looked at various factors like ease of payment, convenience, trust and cashback. The study also provided a pointer towards the necessity of further studies at the micro level on consumer psychology, money management and consumption patterns.

Such research suggests that even though it might be a small portion per one digital payment, there is a possibility that repeated payments can contribute to consumers' sense of their total spending. But the link between frequent transactions of the ₹10-₹50 segment of UPI and budgetary control and saving behavior by young Indian consumers is still under-studied.

UPI, Savings and Financial Management.

The links between digital payments and financial results have also been explored. Srivastava et al. (2026) examined the adoption of UPI and saving behavior in terms of expenditure, income, occupation and place of residence. They conclude that there is a need to consider the urban-rural differences, occupational and regional differences in the findings.

Prasad (2026) explored the UPI convenience, security, trust, reward, satisfaction and demographic characteristics with consumer spending behavior. The study also identified the need for more research to be done on the longer-term effects of UPI usage on budgeting, impulse buying and financial well-being.

Gopi and Kannan (2026) examined the empirical studies to understand the role of UPI in achieving cashless economy in India. Their review identified the need for longitudinal and district-level, comparative and transaction level research.

Khan (2023) analyzed consumer and merchant attitudes towards digital payments, their awareness, the amount of money spent on transactions, their preferred payment modes and acceptance of UPI payments. The study identified small convenience samples and limited geographical location as study limitations.

Vishwakarma et al. (2024) employed bibliometric analysis to study the trends and patterns in the research on digital payment adoption and consumer perceptions in India. The study found that there were gaps in the language, database coverage, and socioeconomic issues, and thus, there was a need for further studies in other population groups.

Financial Literacy and Self-Control: Students will develop their financial literacy and self-control skills.

Some of the behavioral influences that need to be investigated are financial literacy and self-control. Lusardi and Mitchell (2014) established the importance of financial knowledge in individuals' financial decision-making and long-term financial planning. Well-informed consumers might be better able to appreciate the implications of regular spending and take sensible saving decisions.

Tangney, Baumeister and Boone (2004) emphasized that self-control is a key mechanism to control behavior. The importance of self-control in the context of digital payments could be a way of helping consumers say no to spur-of-the-moment items when they know they have the option to make an easy payment.

The existing UPI literature has tended to emphasize more on the adoption and convenience, on trust and spending behavior than on the overall effect of financial literacy and self-control on the

linkage between micro-transactions, budgetary control and savings. This gives the foundation for putting both variables into the present research framework.

RESEARCH METHODOLOGY

Research Design

The study adopted quantitative and cross-sectional research design. Primary data was gathered using a structured self-administered survey with young consumers who are users of UPI for their daily transactions. Secondary data was collected from research papers, journals, published articles and reports on digital payments, consumer spending and budgeting and saving behavior. Using a quantitative approach, the statistical analysis of the relationships between the UPI micro-transactions, budgetary control and savings behavior, and the moderating factors of financial literacy and self-control can be tested.

Sampling and Data Collection

Convenience sampling was used to choose a sample of 134 young consumers of 200 potential consumers. Respondents were friends, family members and other UPI users from varying locations. The questionnaire was conducted using Google Forms and addressed four factors: UPI micro-transaction frequency and amount, budgetary control, savings behavior, and financial literacy and self-control.

Instrument Development

The questionnaire was developed from the constructs of the conceptual framework and the research objectives. There are three sections: demographic questions, UPI usage, and constructing items. All the construct items are rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The items were checked to be clear, relevant and consistent with the research objectives. Composite scores were created by averaging the items for each construct (Table 3; Appendix A for items wording).

Table 3. Constructs, items and reliability

Code	Construct	Items	k	Cronbach α	Mean	SD
UMT	UPI micro-transactions	Q1–Q6	6	.889	3.99	0.80
SB	Savings behavior*	Q7–Q10	4	.830	3.72	0.85
BC	Budgetary control	Q11–Q15	5	.786	3.87	0.67
FL	Financial literacy	Q16–Q20	5	.836	3.99	0.69
SC	Self-control	Q21–Q25	5	.802	3.90	0.68

*Note. N = 134. * The SB items describe difficulty or reduction in saving because of UPI spending (e.g., "Frequent small UPI transactions reduce the amount of money I am able to save"); a higher SB score therefore indicates greater perceived erosion of savings. All alpha values exceed the .70 benchmark (Nunnally, 1978).*

Statistical Tools

All analysis was performed in Microsoft Excel (formulas, along with the associated workbook) and then checked using Python (SciPy/NumPy). The following techniques were used, at a 5% level of significance:

Reliability: Cronbach's (1951) alpha for each scale.

Descriptive statistics and correlation means, standard deviations, skewness, kurtosis and Pearson correlations.

A chi-square test of independence was used to test H1 by cross tabulating levels (High: composite mean ≥ 4.00; Low–Moderate: < 4.00) of the constructs and to examine associations of demographic groups with construct levels. Effect size is the report given for Cramér's V. Low and Moderate were combined to ensure adequate expected counts for most constructs since scores below 3.00 were uncommon.

• One-way ANOVA: to test differences in the construct scores across gender, age, income, employment and education groups, with Tukey HSD post hoc tests, Levene's test and the Kruskal–Wallis test as a robustness check, and eta-squared (η^2) as effect size.

Linear regression: simple regression for H2 (and for the a-path of H3); multiple regression for H4; mediation analysis according to Baron and Kenny (1986), based on Sobel (1982) test and a percentile bootstrap (5,000 resamples; Preacher & Hayes, 2008). Moderation was assessed using mean centered interaction terms (Aiken & West, 1991) and simple-slope analysis at ±1 SD.

DATA ANALYSIS AND RESULTS

Respondent Profile

Table 4. Demographic profile of respondents (N = 134)

Variable	Category	Frequency	Percent
Age	18–20 years	95	70.9%
	21–23 years	21	15.7%
	24–26 years	3	2.2%
	27–30 years	9	6.7%
	Above 30 years	6	4.5%
Gender	Female	98	73.1%
	Male	36	26.9%
Education	Undergraduate	107	79.9%
	Postgraduate	21	15.7%
	Other	6	4.5%
Employment	Student	110	82.1%
	Employed	15	11.2%
	Self-employed	6	4.5%
	Other	3	2.2%
Monthly income / allowance	Below ₹5,000	101	75.4%
	₹5,001–₹10,000	6	4.5%
	₹10,001–₹20,000	9	6.7%
	₹20,001–₹30,000	3	2.2%
	Above ₹30,000	15	11.2%

The sample is young and predominantly female (73.1%), with 70.9% aged 18–20 years, 79.9% undergraduates, 82.1% students and 75.4% receiving less than ₹5,000 a month. Because some categories are very small, groups were combined for inferential tests (see Section 7.4).

Descriptive statistics and correlations

The means for all constructs were between 3.72 and 3.99 on this 5-point scale (Table 3), suggesting a consensus with the statements. The mean (M = 3.99, SD = 0.80) of the participants who agreed or strongly agreed that they pay UPI frequently was the highest, with 84.3% agreeing or strongly agreeing that they pay UPI frequently (56.7% strongly agreed). 85 respondents (63.4%) scored 4.00or higher on UMT, compared with 62 (46.3%) on BC and 67 (50.0%) on SB.

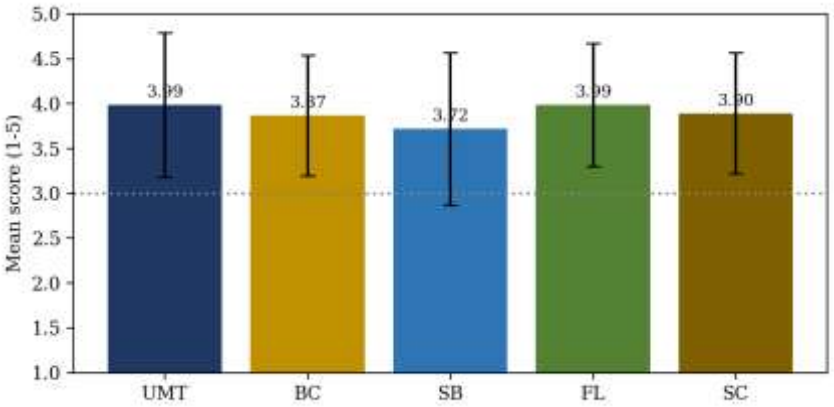


Figure 2. *Mean scores of the study constructs (error bars = ±1 SD)*

Table 5. Pearson correlations among the study variables

Variable	UMT	BC	SB	FL	SC
UMT	1	.398***	.661***	.443***	.379***
BC	.398***	1	.567***	.707***	.704***
SB	.661***	.567***	1	.499***	.474***
FL	.443***	.707***	.499***	1	.773***
SC	.379***	.704***	.474***	.773***	1

Note. N = 134. * p < .05, ** p < .01, *** p < .001 (two-tailed). All of the correlations are positive and significant. Harman's single factor test: value of first factor is less than 50% (39.4%).

There was moderate correlation with BC (r = .398) and strong correlation with SB (r = .661) for UMT. BC was strongly correlated with FL (r = .707) and with SC (r = .704); FL was also strongly correlated with SC (r = .773) which is important if using a regression model as the VIF = 2.49, within acceptable limits.

Chi-square tests of independence

Table 6. Chi-square tests of independence

Cross-tabulation	χ^2	df	p	Cramér's V	Decision
UMT level × BC level	5.76	1	.016	.207	Significant
UMT level × SB level	30.92	1	< .001	.480	Significant
BC level × SB level	27.02	1	< .001	.449	Significant
Gender × UMT level	2.84	1	.092	.146	Not significant
Gender × SB level	0.00	1	1.000	.000	Not significant
Income × UMT level	15.66	2	< .001	.342	Significant
Income × SB level	3.40	2	.183	.159	Not significant
Age × BC level	12.05	2	.002	.300	Significant
Employment × BC level	1.77	2	.412	.115	Not significant

Note. Without continuity correction Pearson chi squared. Levels: High (composite mean ≥ 4.00) vs. Low–Moderate (< 4.00). In all tests, except Employment × BC (33% of cells had < 5 expected counts), all expected counts were ≥ 5. Beware of that result!

Test of H1. The micro-transactions level was also strongly associated with the level of budgetary control, χ^2 (1, N = 134) = 5.76, p = .016, Cramér's V = .207, a small-to-moderate association. Fifty-four percent (46/85) of the respondents who had high UMT also had high BC, while 32.7 percent (16/49) of those who had low-moderate UMT had high BC. So, the null hypothesis $H_0 1$ is rejected.

Level of UMT was also strongly associated with level of SB (χ^2(1, N = 134) = 30.92, p < .001, Cramér's V = .480), and BC with SB (χ^2 (1, N = 134) = 27.02, p < .001, Cramér's V = .449). Among demographic factors, income group was associated with UMT level (χ^2(2, N = 134) = 15.66, p < .001, Cramér's V = .342) and age group with BC level (χ^2 (2, N = 134) = 12.05, p = .002, Cramér's V = .300). No association was found between gender and UMT (p = .092) or between employment and BC (p = .412); and no association was found between income and SB (p = .183).

One-way ANOVA

Table 7. One-way ANOVA: F-values of construct scores by demographic groups

Factor (df)	UMT	BC	SB	FL	SC
Gender (1, 132)	1.45	0.29	0.42	0.60	10.75**
Age group (2, 131)	2.48	7.42***	2.46	4.97**	4.63*
Income group (2, 131)	3.10*	0.39	2.95	0.24	0.35
Employment (2, 131)	2.70	1.28	5.33**	0.90	1.43
Education (2, 131)	9.51***	1.03	2.78	0.33	3.51*

Note. * p < .05, ** p < .01, *** p < .001. Age: 18–20 / 21–23 / 24 & above; Income: below ₹5,000 / ₹5,001–₹20,000 / above ₹20,000; Employment: student / employed / self-employed & other.

Table 8. Group means and post hoc results for significant ANOVA effects

Effect	Group means	F	p	η^2	Tukey HSD (p < .05)
Gender → SC	Female: 3.78 (n=98); Male: 4.20 (n=36)	10.75	.001	.075	n/a (2 groups)
Age group → BC	18–20: 3.90 (n=95); 21–23: 3.43 (n=21); 24 & above: 4.20 (n=18)	7.42	< .001	.102	18–20 vs 21–23; 21–23 vs 24 & above
Age group → FL	18–20: 4.03 (n=95); 21–23: 3.60 (n=21); 24 & above: 4.23 (n=18)	4.97	.008	.071	18–20 vs 21–23; 21–23 vs 24 & above
Age group → SC	18–20: 3.94 (n=95); 21–23: 3.51 (n=21); 24 & above: 4.10 (n=18)	4.63	.011	.066	18–20 vs 21–23; 21–23 vs 24 & above
Income group → UMT	Below ₹5,000: 3.89 (n=101); ₹5,001–₹20,000: 4.17 (n=15); Above ₹20,000: 4.36 (n=18)	3.10	.049	.045	No pair significant
Employment → SB	Student: 3.81 (n=110); Employed: 3.55 (n=15); Self-employed/Other: 2.92 (n=9)	5.33	.006	.075	Self-employed/Other vs Student
Education → UMT	Undergraduate: 3.98 (n=107); Postgraduate: 4.36 (n=21); Other: 2.83 (n=6)	9.51	< .001	.127	Other vs Postgraduate; Other vs Undergraduate
Education → SC	Undergraduate: 3.94 (n=107); Postgraduate: 3.89 (n=21); Other: 3.20 (n=6)	3.51	.033	.051	Other vs Undergraduate

Note. Tukey comparisons for education and employment involve very small groups (n = 6 and n = 9); interpret with caution.

Gender. Only self-control differed by gender: men (M = 4.20) reported higher self-control than women (M = 3.78), F(1, 132) = 10.75, p = .001, η^2 = .075 (medium effect). No gender differences were found for UMT, BC, SB or FL.

Age. Age groups differed in budgetary control, F(2, 131) = 7.42, p < .001, η^2 = .102, financial literacy (p = .008) and self-control (p = .011). In each instance the 21-23 group was the lowest and was significantly different from the 18-20 group and the 24 or above group on BC (Tukey p = .008 and .001). However, differences in UMT (p = .088) and SB (p = .090) were not significant at the 5% level.

Income, employment and education. There were income differences with F(2, 131) = 3.10, p = .049, where the higher income respondents were transacting more (M = 4.36 vs. 3.89 for the lowest income group), but no Tukey pair was significant. For employment, there was a difference between SB and self-employed/other respondents (F(2, 131) = 5.33, p = .006; Tukey p = .006, where students reported lower perceived savings erosion than did self-employed/other respondents). UMT and SC differed by education, with the small "Other" group (n = 6) scoring lowest on both, F(2, 131) = 9.51, p < .001.

Robustness. The variances were unequal for some comparisons in Levene's test and the numbers of scores are not equal for each group. All of the above ANOVA results were confirmed by the Kruskal–Wallis test, and some additional findings

were found UMT differences by age (p = .047) and employment (p = .019), which were not identified by the ANOVA should be considered tentative.

Regression analysis

Effect of UMT on budgetary control(H1) and on savings behavior (H2)

Table 9. Simple linear regressions

Model / predictor	B	SE	β	t	p
Model 1: DV = Budgetary control (BC)					
Constant	2.535	0.273	–	9.30	< .001
UMT	0.334	0.067	.398	4.99	< .001
Model 2: DV = Savings behavior (SB)					
Constant	0.940	0.281	–	3.35	.001
UMT	0.698	0.069	.661	10.12	< .001

Note. Model 1: R^2 = .159, adj. R^2 = .152, F(1, 132) = 24.88, p < .001, Durbin–Watson = 2.08. Model 2: R^2 = .437, adj. R^2 = .433, F (1, 132) = 102.45, p < .001, Durbin–Watson = 2.14.

UPI micro-transactions significantly predicted budgetary control (B = 0.334, β = .398, t = 4.99, p < .001); UMT explained 15.9% of the variance in BC (Cohen's (1988) f^2 = 0.19, a medium effect). Again it is found that $H_0$1 is rejected as is the chi square result. UMT was also a strong predictor of savings behavior (B = 0.698, β = .661, t = 10.12, p < .001), explaining 43.7% of the variance in SB (f^2 = 0.78, a large effect). There is a significant decrease in the amount of money respondents put into savings when they make more frequent small UPI payments, which is why $H_0$2 is rejected.

Mediation by budgetary control (H3)

Table 10. Mediation analysis: UMT → BC → SB

Path / effect	B	SE	t / z	p	Result
Step 1 – Total effect c (UMT → SB)	0.698	0.069	10.12	< .001	Significant
Step 2 – Path a (UMT → BC)	0.334	0.067	4.99	< .001	Significant
Step 3 – Path b (BC → SB | UMT)	0.453	0.081	5.62	< .001	Significant
Direct effect c' (UMT → SB | BC)	0.547	0.068	8.07	< .001	Significant (reduced)
Indirect effect a × b (Sobel)	0.152	0.041	3.73	< .001	Significant
Bootstrap 95% CI of a × b	[0.055, 0.333]	–	–	–	Excludes zero

Note. Model 3 (SB on UMT and BC): $R^2 = .546$, $F(2, 131) = 78.86$, $p < .001$, VIF = 1.19. Proportion mediated = 21.7%.

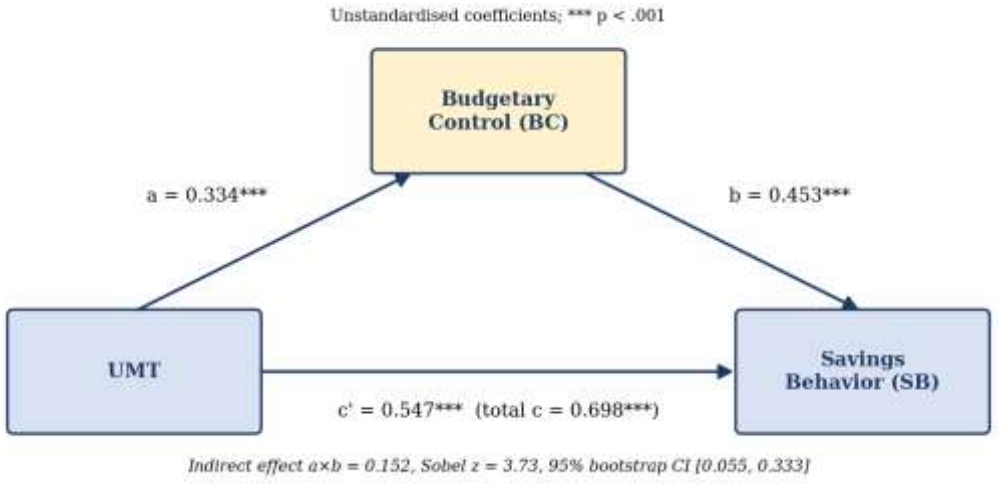


Figure 3. *Mediation model with unstandardized path coefficients*

The overall effect of UMT upon SB was significant (c = 0.698); BC was predicted by UMT (a = 0.334); and SB was predicted by BC, controlling for UMT (b = 0.453). The effect of UMT was partially mediated by BC (c' = 0.547) but remained significant. The indirect effect (a × b = 0.152) was significant by the Sobel test (z = 3.73, p < .001) and by the bootstrap procedure (95% CI [0.055, 0.333]), with the latter being preferred, as the sampling distribution of a × b is not normal. Approximately one-fifth (22%) of the total impact of UMT on SB is mediated by BC. $H_0 3$ is rejected. The sign on b is positive: there is an increase in savings erosion as the budgets become more tightly controlled (see Section 9).

Financial literacy and self-control (H4)

***Table 11. Multiple regressions of BC and SB on financial literacy and self-control**

Model / predictor	B	SE	β	t	p
Model 4: DV = Budgetary control (BC)					
Constant	0.761	0.243	–	3.13	.002
FL	0.399	0.090	.406	4.45	< .001
SC	0.389	0.091	.389	4.27	< .001
Model 5: DV = Savings behavior (SB)					
Constant	1.025	0.395	–	2.60	.011
FL	0.407	0.146	.329	2.79	.006
SC	0.276	0.148	.220	1.87	.064
Model 6: DV = SB (all predictors)					
Constant	-0.273	0.345	–	-0.79	.431
UMT	0.539	0.070	.511	7.66	< .001
BC	0.409	0.113	.325	3.61	< .001
FL	0.009	0.126	.007	0.07	.944
SC	0.059	0.125	.047	0.47	.641

Note. Model 4: $R^2 = .561$, $F(2, 131) = 83.80$, $p < .001$. Model 5: $R^2 = .269$, $F(2, 131) = 24.07$, $p < .001$. Model 6: $R^2 = .548$, $F(4, 129) = 39.03$, $p < .001$; maximum VIF = 2.98.

Financial literacy ($\beta = .406$, $p < .001$) and self-control ($\beta = .389$, $p < .001$) were significant predictors of budgetary control and accounted for 56.1% of its variance ($f^2 = 1.28$, a large effect). In terms of savings behavior, financial literacy was significant ($\beta = .329$, $p = .006$) and self-control was marginal ($\beta = .220$, $p = .064$) which accounted for 26.9% of the variance. If UMT and BC were added to this model as well (Model 6), UMT and BC remained the significant factors while FL and SC were not, indicating that their effect on SB is mostly mediated by their relationship with BC. H_o4 is rejected in terms of budgetary control and, in part, in terms of savings behavior.

Moderation by financial literacy and self-control

Table 12. Moderation tests: UMT × moderator interaction terms (mean-centered predictors)

Interaction term	B	SE	t	p	ΔR^2	p (ΔR^2)
UMT × FL → SB	0.492	0.077	6.36	< .001	.121	< .001
UMT × SC → SB	0.448	0.086	5.23	< .001	.088	< .001
UMT × FL → BC	0.065	0.069	0.95	.346	.003	.346
UMT × SC → BC	-0.021	0.074	-0.28	.780	.000	.780

Both financial literacy and self-control significantly moderated the relationship between UMT and SB (UMT × FL: B = 0.492, p < .001, ΔR^2 = .121; UMT × SC: B = 0.448, p < .001, ΔR^2 = .088). Neither did the UMT affect the BC relationship (p = .346 and p = .780). Simple-slope analysis (Figure 4) indicated that the positive slope of UMT–SB was significantly higher at high financial literacy (slope = 0.849, p < .001) compared to low financial literacy (slope = 0.173, p = .058), and the same trend was observed for self-control (high: 0.870; low: 0.265, p = .004). The moderation is real, but not buffering as expected: The relationship between micro-transactions and perceived savings erosion is more negative than it is less negative, among those with more literacy and self-control.

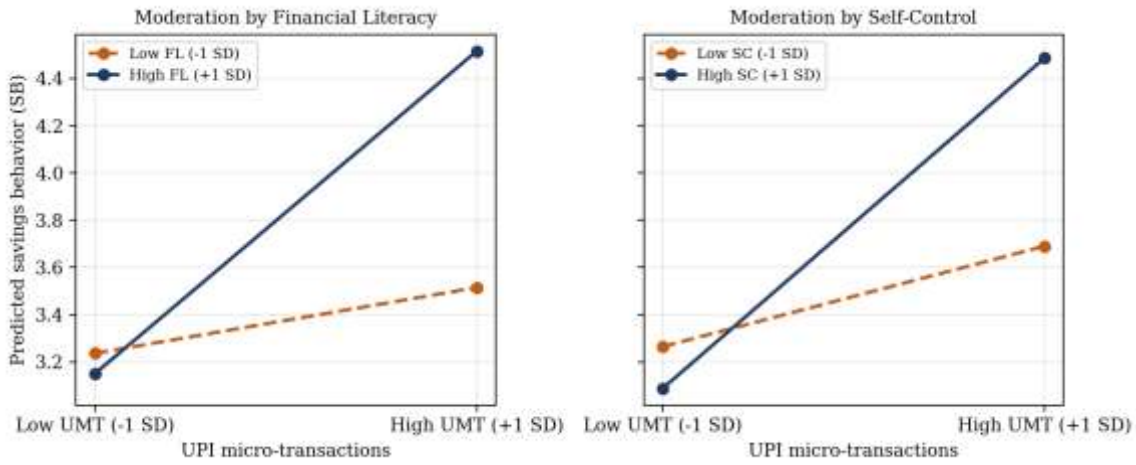


Figure 4. *Simple slopes of UMT on savings behavior at low and high financial literacy and self-control*

Summary of hypothesis testing

Table 13. Decisions on the hypotheses

Hypothesis	Test	Evidence	Decision
$H_0$1: no difference between UMT and BC levels	χ^2 test; regression (Model 1)	$\chi^2(1, N = 134) = 5.76$, $p = .016$, Cramér's $V = .207$; $\beta = .398$, $p < .001$	Rejected
$H_0$2: UMT has no effect on SB	Regression (Model 2)	$\beta = .661$, $R^2 = .437$, $p < .001$	Rejected
$H_0$3: no mediation by BC	Baron–Kenny, Sobel, bootstrap	$a \times b = 0.152$, $z = 3.73$, 95% CI [0.055, 0.333]	Rejected (partial mediation)
$H_0$4: FL and SC do not affect BC and SB	Multiple regression; interaction tests	BC: $R^2 = .561$; SB: $R^2 = .269$; moderation of UMT→SB significant	Rejected (BC fully; SB in part)

DISCUSSION

The results confirm the hypothesized links between UPI micro-transactions, budgetary control and savings behavior but the signs are direction of the pattern should be read carefully. UPI transactions and savings with micro-transactions. The relationship between micro-transactions and savings behavior is the strongest ($\beta = .661$). The findings reflect both the challenges that people have in saving and the amount of money they are spending on things other than planned savings, which means that more frequent UPI payments are associated with a greater perception that money is being spent on things other than planned savings. It is consistent with the argument of payment salience and pain of payment (Prelec & Loewenstein, 1998; Sehgal & Sarode, 2026; Singh, 2026) and Jayanthi et al. (2026) who reported the concern for overspending among students. The issue of micro-transactions and budget management with UPI. Reported budgetary control was not lower, but higher, associated with higher UMT ($p < .001$). One interpretation is that they see more of the transaction histories and app summaries and, thus, they report more monitoring, while another is that those who feel the stress of many small payments react by monitoring more. These explanations cannot be teased apart from the cross-sectional design. The correlation is moderate ($R^2 = .16$) and the majority of the variance in budgetary control can be accounted for by the other variables such as financial literacy and self-control. Mediation. The effect of UMT on SB was partially mediated by budgetary control, which accounted for 22% of the total effect. Respondents who monitor and control their UPI spending more also say they are losing more of their savings, the positive sign for the b-path. This should be interpreted as a statistical correlation and not as an indication that budgeting reduces savings. One possible explanation is that budget monitoring is a response to, and a factor of, a sense of savings pressure. It is also consistent with the item wording: The SB scale measures perceived erosion, while the BC items are positive attitudes toward tracking. Knowledge of money and self-restraint. Financial literacy and self-control were found to be the best predictors of budgetary control ($R^2 = .56$), consistent with the findings that financial knowledge and self-regulation are associated with planning and monitoring (Lusardi & Mitchell, 2014; Tangney et al., 2004). Their important interactions with UMT in the SB model suggest that there is a difference in UMT–SB slope between the literacy and the self-control levels, but in the direction of amplification. One plausible explanation is that more literate and self-controlled respondents also know about and report the loss of their savings. Response style may contribute to this – all scales are worded in the same direction; the means are high (3.7–4.0) and FL and SC are correlated at $r = .77$. The proposed protective (buffering) function of FL and SC is thus not found in the sample. Demographic differences. Men indicated greater self-control than women; the 21–23 age group indicated a lower level of budgetary control and literacy and a lower level of self-control than their younger and older counterparts; and higher income respondents made more micro-payments. Some of these

comparisons are based on small numbers (such as 3 respondents aged 24-26 and 6 others with 'Other' education) and should be treated with caution as exploratory.

KEY FINDINGS

84.3% of respondents feel that they make small value UPI payments regularly.

• UMT level is significantly associated with BC level (χ^2 (1, N = 134) = 5.76, p = .016, Cramér's V = .207), and UMT predicts BC (R^2 = .16).

The perceived savings erosion is a strong predictor of UMT (β = .661, R^2 = .44).

• Budgetary control partially mediates the UMT–SB link (indirect effect = 0.152, 95% CI [0.055, 0.333]; ≈ 22% of the total effect).

Financial literacy and self-control co-explain 56% of the variance in budgetary control and are significant amplifiers of the UMT–SB relationship, rather than buffers.

The group differences are found in the area of self-control (gender), budgetary control, literacy and self-control (age), micro-transaction use (education, income) and savings erosion (employment).

IMPLICATIONS

For young consumers. Micro-spending is something which can be easily observed if the weekly spending limits and the savings are set first, and the history of the UPI transaction is regularly reviewed.

For teachers and schools. Financial-literacy and budgeting courses for undergraduates should explicitly include education about digital-payment habits, such as the fact that small, recurring payments have a significant impact on the monthly budget, because the strongest relationships with budgetary control were found with financial-literacy and budgeting measures.

Payment providers and policymakers. The results validates in-app tools such as category and limit alerts, periodic micro-spend summaries and savings goals, as well as young target groups-focused digital financial-literacy campaigns by regulators and banks. These are ideas based on the outcomes and not interventions that have been tested.

For theory. This study examines the moderations of financial literacy and self-control on the relationship between budgetary control and perceived savings erosion, as well as the buffering and amplifying effect of moderations, in one model within the digital-payment literature for Indian youth and demonstrates a buffering and amplifying effect of perceived savings erosion.

Limitations of this study

The sample size (N = 134) is convenience sampled and skewed by young, female students, undergraduate students, and low-income young consumers, and results cannot be generalised to all young consumers in India.

The causality of the design, whether budgeting comes before or after micro-spending, cannot be determined because the design is cross-sectional and self-reported. The results of the mediation are statistical.

The constructs were assessed based on perceptions instead of real transaction record of ₹ 10-₹ 50. Future work should utilize transaction level information or app logs.

The wordings of the items in the scales are single-direction Likert items, with high means and the savings behavior scale is worded around savings difficulty. There may be common-method and acquiescence effects although the first factor accounted for only 39% of variance (Podsakoff et al., 2003). Items should be worded backwards, and a savings scale should be provided with a separate set of keys (actual amount saved, etc.).

Normality of regression residuals (Shapiro–Wilk $p < .05$), variances across some groups, very small subgroups—bootstrapping and Kruskal–Wallis checks as appropriate; larger samples are needed.

Future studies should employ larger probability samples, longitudinal designs, structural equation modeling for latent mediation and moderation, and comparisons of urban and rural, and of student and working youth.

CONCLUSION

This study explored the relationship between UPI micro-transactions and budgetary control and saving behavior of 134 young Indian consumers. Perceived savings loss was strongly associated with frequent small UPI payments, as was also slightly higher perceived budgetary control. The micro-transaction–savings link was partly accounted for by budgetary control, and was well correlated with financial literacy and self-control, which moderated the link between micro-transaction and savings. There were no instances of acceptance of any of the four null hypotheses. The results of this study are preliminary and stand as preliminary evidence to encourage further, larger, and more longitudinal, and transaction-based studies, due to the limitations of the small, convenience-based cross-sectional sample and the wording of the saving scale. The take-home lesson for young consumers is that it is important to make the small payments tangible and develop budgeting habits so that convenience doesn't sneak in to take the place of savings.

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APPENDIX A: QUESTIONNAIRE ITEMS AND CONSTRUCT MAPPING

No.	Statement (five-point Likert: 1 = strongly disagree, 5 = strongly agree)	Construct
Q1	I frequently make small-value payments using UPI	UMT
Q2	The convenience of UPI encourages me to make small purchases more frequently	UMT
Q3	I make small UPI transactions without planning them in advance	UMT
Q4	Frequent small UPI transactions make it difficult for me to keep track of my total spending	UMT
Q5	Frequent UPI micro-transactions sometimes cause me to exceed my planned budget	UMT
Q6	I tend to spend more on small purchases because UPI payments are convenient	UMT
Q7	I sometimes make UPI purchases with money that I had planned to save	SB
Q8	Frequent small UPI transactions reduce the amount of money I am able to save	SB
Q9	I find it difficult to save regularly because of frequent small UPI expenses	SB
Q10	Reducing unnecessary UPI micro-transactions would help me increase my savings	SB
Q11	I regularly monitor my UPI transactions to control my spending	BC
Q12	Keeping track of my UPI expenses helps me stay within my budget	BC
Q13	Better control over my small UPI expenses helps me save more money	BC
Q14	When I follow a budget, I am less likely to make unnecessary UPI purchases	BC
Q15	Maintaining budgetary control helps me reduce the negative effect of frequent UPI micro-transactions on my savings	BC
Q16	I understand the importance of preparing and following a personal budget	FL

No.	Statement (five-point Likert: 1 = strongly disagree, 5 = strongly agree)	Construct
Q17	I can distinguish between essential and non-essential expenses	FL
Q18	I understand how frequent small expenses can affect my overall financial position	FL
Q19	I understand the importance of saving regularly for future financial needs	FL
Q20	My financial knowledge helps me make better spending and saving decisions	FL
Q21	I can resist buying things that I do not really need	SC
Q22	I think carefully before making purchases through UPI	SC
Q23	I can control my spending even when UPI payments are quick and convenient	SC
Q24	I can avoid impulsive purchases when using UPI	SC
Q25	I am able to prioritize saving money over unnecessary spending	SC

Demographic questions: age group, gender, educational qualification, employment status, monthly personal income/allowance.