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Do Smart Teens Pay Responsibly?
The Case of BNPL in Japan

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Abstract

The growing trend of "buy now, pay later" (BNPL) services presents a lower barrier to entry compared with credit cards, exposing youths to potential financial risks due to weak authentication. This study presents a novel investigation of how financial literacy and cognitive skills in adolescents influence utilization, spending exceeding cash, and overdue payments in BNPL services. Notably, BNPL services are significantly influenced by the financial literacy of youths, with cognitive skills demonstrating an opposing effect. Additionally, spending exceeding cash through BNPL is positively associated with higher financial literacy and inversely related to cognitive ability. Furthermore, delays in payments are attributed to overconfidence rather than objective cognitive abilities and financial literacy. Overall, teenagers with higher financial literacy tend to have more risky financial behavior whereas those with higher cognitive ability demonstrate a greater reluctance to utilize BNPL services.

Keywords: Behavioral factor; financial literacy; financial behavior overconfidence; buy now, pay later

JEL classification: G41, I22

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1. Introduction

Do smart teens get caught in a money trap? Japan, known as one of the most cash-oriented countries among developed nations, experienced a shift toward a completely contactless payment society owing to concerns about the potential spread of coronavirus disease 2019 through hand-to-hand cash exchanges. This rapid transition to a cashless society has given rise to "buy now, pay later" (BNPL) services. Accessible credit cards and other low-entry barriers may negatively impact adolescents, whose cognition and financial knowledge are still in the early stages of development compared to adults.

Adolescents are faced with significant and trivial financial decisions daily (Moreno-Herrero et al. 2018). While a growing body of research exists on BNPL (Berg et al. 2023; Guttman-Kenney et al. 2023), there remains a significant gap in understanding its impact on teenagers. Adolescents have higher risk appetite as compared to adults (Defoe et al. 2015; Steinberg et al. 2008). They tend to exhibit higher levels of impulsivity as well, potentially leading to more impulsive utilization of BNPL services.

The distinctive features of BNPL, such as instant approval without a credit check, make young people vulnerable to serious financial risks. Unlike adults, teenagers readily embrace cashless systems, facilitated by their familiarity with smartphones. Although BNPL services typically require parental consent for lending money, there exists a vulnerability to unauthorized usage, as circumventing this requirement can be as simple as placing an unauthorized check.

Therefore, our study presents an empirical study on the utilization of BNPL services among adolescents. Our study addresses what characteristics make teenagers more predisposed to using BNPL services and subsequently defaulting on their payments. Notably, few BNPL studies focus specifically on youths. Therefore, we conducted a purpose-based survey involving 2,000 teenagers and 1,000 young adults across Japan. Our survey revealed that the rate of BNPL utilization among teenagers under the age of 18 was nearly equivalent to that of adults. Remarkably, approximately half of these teenage participants engage with the service without consulting their parents.

We formulated three key questions. First, who uses BNPL often? Our empirical findings demonstrated that teens with higher financial literacy tend to use BNPL services, whereas those with higher cognitive abilities are less likely to do so. Essentially, financial literacy and cognitive ability have opposite effects on BNPL use.

Second, who spends exceeding cash through BNPL? Regarding those who use BNPL for spending mechanism, consumers may not have cash on hand because of income and expenditures mismatch. Expanding credit access for liquidity constrained consumers is generally expected to be welfare improving. Our results showed that teenagers with higher levels of financial literacy and increased financial confidence tend to actively engage in BNPL spending exceeding cash. Conversely, a negative correlation was observed regarding cognitive performance.

Third, who is overdue on BNPL? While financial literacy and cognitive ability did not demonstrate statistical significance in predicting late payments, individuals exhibiting higher levels of financial and cognitive overconfidence tend to default. This suggests that overconfidence, rather than genuine financial and cognitive ability, affects the occurrence of late payment.

Overall, our findings suggest that the use of BNPL is characterized by boldness in financially literate teens and conservativeness in cognitively literate teens. These findings indicate the need to regulate BNPL use and foster healthy financial literacy among youths.

The remainder of the paper is structured as follows: Section 2 provides an overview of the institutional background and current status of youths' usage of BNPL services. Section 3 presents a conceptual framework. Section 4 outlines the methodology, including data collection and questionnaire design. Section 5 presents the empirical findings, and Section 6 concludes the paper.

2. Institutional Background

2.1. BNPL Use by Teens

While there is existing insight into BNPL usage among adults—such as by Guttman-Kenney et al. (2023) in the United Kingdom and Powell et al. (2023) in Australia—there is a notable gap in credible data regarding the circumstances of BNPL usage among teenagers. Powell et al. (2023) analyzed younger adults under 25, but not teenagers. We address this gap by exploring the extent to which youths use BNPL, focusing on adolescents in Japan. To compare BNPL usage characteristics, we also examined young adults under the age of 25.

Figure 1 illustrates the age demographic of BNPL usage from our survey. Our findings revealed that Japanese teens use the service at a rate fairly comparable to adults. While young adults show a slightly higher usage tendency, we observed a steady increase in BNPL usage among teens from 16 to 19 years old. These results further show that teens are exposed to associated risks.

It is legal for teens to use BNPL services in Japan in most cases after seeking parental consent. However, teens do not usually follow this instruction. Certain BNPL services enforce age restrictions, allowing access to only individuals over 18 years of age. The grey bar in Figure 1 represents the percentage of BNPL users who used BNPL without parental consent, labeled as "No parental consultation." According to our survey, approximately half of BNPL users aged 18 and 19 did not inform their parents about their BNPL usage.

A noteworthy challenge in this context is that BNPL does not neatly fit into the financial regulatory space. Positioned in the regulatory gray area between traditional credit sectors and BNPL products, providers often navigate without full adaptation to a country's credit rules. Although parental consent is a requirement for children to use BNPL services, a simple checkbox confirming such consent makes them easily accessible to young Japanese individuals. Furthermore, teens can create their own cards, adding to the distinctive characteristics of BNPL, characterized by relatively

small amounts and instant approval, thereby heightening the risk of financial activity for young people.

2.2 Danger of BNPL Usage in Adolescence

Despite the growing interest in BNPL services, there is no law to regulate teenagers' usage. Even among older college students, concerns arise regarding poor financial literacy leading to indebtedness (Gerrans and Heaney 2019; Xiao et al. 2014). The extent to which adolescents are engaging in risky BNPL usage remains unclear. Figure 2 illustrates the rate of late payments in BNPL transactions categorized by age. Survey results indicate that adolescents, akin to adults, exhibit a significantly higher rate of late payments among BNPL users.

Unlike credit cards, late payments under BNPL services are not reported to credit bureaus in Japan. BNPL services in Japan can be categorized into two types: those subject to the Installment Sales Law, which involves postpaid transactions with a term longer than two months (similar to credit cards), and those not covered by this law (most BNPL services). Providers under the Installment Sales Law are required to report accident information to credit bureaus, while those not under the Law have no such obligation. Consequently, it is assumed that BNPL payment information is only used internally by the implementing company.

Regarding fees, BNPL usage fees vary among service providers. Some providers may not charge any fees, while others may charge a standard fee of approximately 300 yen per payment for transactions made at convenience stores. Importantly, it is the child, not the parent, who is responsible for repaying the debt incurred through BNPL transactions.

The operation of such financially precarious services can have adverse effects on the formation of financial values among young people. Unlike adults, adolescents may rely on their parents to resolve overdue payments, which may not be conducive to fostering financial independence. This dependence on parents also complicates regulatory justifications for government authorities, as apparent financial data may seem "superficially" healthy.

3. Conceptual Framework

We examine three primary behavioral outcomes: BNPL usage, overspending, and repayment delinquency. Figure 3 presents a simplified decision flow diagram that intuitively demonstrates BNPL behavior among youths. This conceptual framework illustrates three key decision nodes. While the diagram illustrates a sequential logic of BNPL-related behaviors, our empirical analysis does not assume a strict causal pathway among these stages. Instead, we treat each outcome—BNPL usage, overspending, and overdue repayment—as a distinct behavioral decision and estimate separate regression models for each. This approach enables the assessments of the direct effects of explanatory variables (e.g., financial literacy, cognitive reflection, and overconfidence) on each decision independently.

To examine the impact on BNPL usage, we assess the financial literacy and cognitive levels of youths, categorized into objective level and overconfidence. In the objective category, we objectively evaluate two critical abilities: financial literacy and cognitive level. Extensive literature highlights financial literacy as fundamental for prudent financial decision-making (Disney and Gathergood 2013; Grohmann 2018; Kawamura et al. 2021; Xue et al. 2019), with stronger financial knowledge correlating with healthier financial behaviors (Shen et al. 2016). Consequently, teenagers with higher financial literacy are likely to exhibit more prudent financial behaviors.

Regarding spending through BNPL services, research exploring the association between financial literacy and spending behavior in the BNPL context remains limited. Although BNPL spending exceeding cash shares similarities with credit card borrowing, a key distinction lies in the allowance for long-term borrowing by deferring payments, a characteristic historically associated with social problems in the United States and distinct from BNPL spending. Conversely, young consumers lacking a stable income or savings may resort to borrowing through BNPL services as a form of "spending exceeding cash," increasing their risk of payment default. Jappelli and Padula (2017) demonstrate a positive association between high financial literacy scores and non-durable consumption, while Dinkova et al. (2021) report mixed evidence regarding the impact of financial literacy on consumption growth. We hypothesize that higher financial literacy may lead to a higher propensity for BNPL usage, although existing research primarily focuses on general consumption rather than spending exceeding cash.

For delinquency in BNPL payments, Sevim et al. (2012) demonstrate that financial literacy reduces the likelihood of overdue payments. However, overconfident individuals, as highlighted by Kilborn (2005), may be more prone to late payments due to underestimating associated risks. In the overconfidence path, we explore the influence of overconfidence on financial literacy and cognitive skills. Despite the inclination of financially literate teens toward healthy financial behaviors, overconfidence can prove counterproductive. Previous research links overconfidence to financial behavior (Fellner-Röhling and Krügel 2014; Grinblatt and Keloharju 2009; Kinari 2016), with overconfident individuals often relying on their own judgments for financial decisions rather than seeking external advice (Kramer 2016). Among adolescents, overconfidence increases the likelihood of disregarding parental or teacher advice, potentially leading to loss of financial control (Asaad 2015).

In our analysis, we include elicited economic preferences—such as loss aversion, time preferences, and risk aversion—as control variables to better understand individual heterogeneity in BNPL usage. Although using such elicited preferences as explanatory variables remains debatable (Charness et al. 2013; Falk et al. 2023), increasing evidence supports their empirical validity and predictive power in explaining economic and financial behaviors. For instance, Kadoya and Khan (2020) investigate socioeconomic factors as determinants of financial literacy, while preferences such as loss aversion, discount rate, and risk aversion are examined alongside socioeconomic

characteristics including gender, age, and self-perceived household income. Notably, loss aversion influences borrowing and repayment decisions, as individuals may avoid actions that increase the risk of perceived financial losses (Tversky and Kahneman 1991). Similarly, time discounting affects intertemporal trade-offs: more impatient individuals (i.e., those with higher discount rates) are more likely to prioritize immediate consumption and neglect future repayment obligations (Laibson 1997; Meier and Sprenger 2010). Risk aversion also correlates with credit behavior and default risk, as risk-tolerant individuals may engage more freely with BNPL services without adequate consideration of the downside risks (Barsky et al. 1997). These preferences are measured using validated survey-based elicitation techniques widely employed in behavioral economics. Accordingly, we consider them as relevant explanatory variables when assessing individual decision-making within the BNPL framework.

4. Data and Measures

4.1. Survey Design

This study uses purpose-built survey data obtained in March 2022 from 13 million Japanese registered members of Freeasy, a prominent web survey company in Japan. The recruitment process involves informing registered members about the survey's commencement and encouraging their participation. To encourage participation, respondents receive reward points worth 1 yen per question answered. The reward points can be exchanged for gift certificates or discount coupons depending on the website or application.

The total sample size comprises 3,000 respondents: 2,000 aged 15–19 and 1,000 aged 20–24. To ensure gender balance, half of each gender is represented in the sample. This diverse and sizable sample is integral to capturing a comprehensive understanding of BNPL usage patterns among Japanese adolescents and young adults. By providing these additional details, we offer a clearer perspective of the study's data collection process and the characteristics of the surveyed population.

4.2. Variable

The survey questions are tailored to capture financial behaviors in BNPL payments, financial literacy, cognitive reflection, standard and nonstandard preferences, and other individual characteristics. We examine three types of BNPL payment-related financial behaviors using the following three dummy variables: frequent use, spending exceeding cash, and late payment. Frequent use is coded as 1 if the respondent reported using BNPL almost monthly. Spending exceeding cash is coded as 1 if the respondent answered yes to the question, "Have you ever paid for a purchase with BNPL that you could not afford to pay with cash on hand or a bank deposit?" This variable reflects the use of BNPL as a borrowing tool rather than a payment method. Late payment is coded as 1 if the respondent answered yes to, "Have you ever used BNPL and then failed to pay by the due date?" This variable reflects default in BNPL payment that could result in the respondent being blacklisted as an

untrustworthy borrower. Thus, we consider spending exceeding cash and late payment as indicatives of riskier financial behaviors.

To evaluate objective financial decision-making capacity, we incorporate two key indicators: financial literacy and cognitive ability. Financial literacy is measured using the "Big Three" questions developed by Mitchell and Lusardi (2011), which assess understanding of compound interest, inflation, and risk diversification. These questions are widely used as a benchmark for basic financial knowledge.

Cognitive ability is assessed using the cognitive reflection test (CRT), proposed by Frederick (2005). The CRT quantifies fluid intelligence—the capacity for reflective, non-automatic thinking and the ability to override impulsive or intuitive responses. It offers a practical and efficient measure of cognitive ability with minimal respondent burden, especially when compared with more comprehensive tools such as the Wonderlic personnel test, need for cognition scale, scholastic assessment test, or American college testing.

Toplak et al. (2014) extended the CRT to a seven-item version and demonstrated its predictive validity for rational thinking. Oechssler et al. (2009) showed that CRT performance is significantly correlated with behavioral traits such as time preference and risk preference, highlighting its relevance in financial behavior research. Notably, higher CRT scores have been linked to stronger intertemporal reasoning, more accurate risk assessment, and lower susceptibility to present bias—traits particularly relevant in the context of BNPL services, where consumers must balance immediate consumption benefits against future repayment obligations.

For each of the big-three and CRT, respondents are asked how many questions they thought they answered correctly. Financial literacy overconfidence and cognitive reflection overconfidence are the expected number of correct answers minus the actual number of correct answers.

Loss aversion, discount rate, and risk aversion are adapted from Falk et al. (2018) and simplified to fit the structure of our survey. Table 1 and Table 2 shows the basic statistics. Men and women are split exactly in half, with a mean value of 0.5.

Table 1. Descriptive Statistics (ages 15–19)

Variable	Obs	Mean	Std. Dev.	Min	Max
BNPL usage: every month	2000	.08	.271	0	1
BNPL usage: more than once	2000	.285	.452	0	1
BNPL spending exceeding cash	570	.263	.441	0	1
BNPL overdue	570	.33	.471	0	1
Financial literacy	2000	1.067	1.063	0	3
Cognitive reflection	2000	.855	1.044	0	3
Financial literacy overconfidence	2000	-.051	.908	-3	3

Cognitive reflection overconfidence	2000	.738	1.143	-3	3
Loss aversion	2000	.623	.485	0	1
Discount rate	2000	1.333	1.294	0	3
Risk aversion	2000	1.797	1.206	0	3
Male	2000	.5	.5	0	1
Age	2000	17.168	1.339	15	19
Household income	2000	.434	2.303	0	20

Table 2. Descriptive Statistics (ages 20–24)

Variable	Obs	Mean	Std. Dev.	Min	Max
BNPL usage: every month	1000	.102	.303	0	1
BNPL usage: more than once	1000	.391	.488	0	1
BNPL spending exceeding cash	391	.253	.435	0	1
BNPL overdue	391	.345	.476	0	1
Financial literacy	1000	1.156	1.095	0	3
Cognitive reflection	1000	.815	1.005	0	3
Financial literacy overconfidence	1000	-.029	.836	-3	3
Cognitive reflection overconfidence	1000	.73	1.152	-3	3
Loss aversion	1000	.642	.48	0	1
Discount rate	1000	1.285	1.27	0	3
Risk aversion	1000	1.763	1.218	0	3
Male	1000	.5	.5	0	1
Age	1000	22.068	1.396	20	24
Household income	1000	2.692	3.755	0	20

5. Results

The OLS regressions with robust standard errors in this study primarily included financial literacy and cognitive variables. They were estimated using the following equation:

$$Y_i = \beta_0 + \beta_1 FL_{i_i} + \beta_2 CR_i + \beta_3 CL_i + \varepsilon_i,$$

where "FL" indicates financial literacy and "CR" implies cognitive reflection level. Further, *CL* is a vector of control variables: loss aversion, discount rate, risk aversion, income, gender, and age. ε_i is an error term.

5.1. Usage: Who Uses BNPL Often?

Table 3 presents an analysis of frequent users of BNPL services among teenagers and young adults aged 20–24. Among teenagers (aged 15–19), our study revealed a positive association between higher

levels of financial literacy and increased usage of BNPL services, while individuals with greater cognitive reflection exhibited a reluctance to utilize such services. Introducing overconfidence into the analysis, our model showed a statistically significant positive correlation between overconfidence and financial literacy, although the impact of overconfidence in cognitive abilities was statistically insignificant.

Table 3. BNPL Usage: Every Month

	(1)	(2)	(3)	(4)
	Adolescence (15–19)	Young adult (20–24)	Any BNPL usage	All
Objective index				
Financial literacy	0.038***	0.037***	0.061***	0.037***
	(0.008)	(0.012)	(0.010)	(0.007)
Cognitive reflection	-0.020***	-0.029**	-0.023**	-0.023***
	(0.008)	(0.013)	(0.011)	(0.007)
Overconfidence				
Financial literacy	0.033***	0.047***	0.068***	0.037***
	(0.009)	(0.016)	(0.012)	(0.008)
Cognitive reflection	0.006	-0.005	0.000	0.003
	(0.007)	(0.011)	(0.009)	(0.006)
Preference				
Loss aversion	-0.044***	-0.064***	-0.039**	-0.051***
	(0.013	(0.021)	(0.017)	(0.011)
Discount rate	0.012***	-0.005	0.031***	0.006*
	(0.005)	(0.008)	(0.006)	(0.004)
Risk aversion	0.009*	-0.006	0.018***	0.003
	(0.005	(0.008)	(0.007)	(0.004)
Other factors				
Male	0.009	-0.020	-0.125***	-0.001
	(0.013	(0.020)	(0.017)	(0.011)
Age	0.001	-0.009	0.022***	0.003
	(0.005	(0.007)	(0.003)	(0.002)
Household income	-0.002	0.001	0.001	-0.001
	(0.002	(0.003)	(0.003)	(0.002)
Constant	0.023	0.346**	-0.127*	0.034
	(0.081	(0.152)	(0.066)	(0.039)
Adjusted R-squared	0.031	0.024	0.061	0.028
Obs.	2000	1000	3000	3000

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors are in parentheses,

Similarly, young adults aged 20–24 exhibited comparable patterns in BNPL service usage. Higher levels of financial literacy were positively associated with increased service usage, while greater overconfidence in financial knowledge also correlated with higher usage rates. Conversely, individuals with higher cognitive abilities tended to use the service less frequently.

Column 3 represents "any BNPL usage" as an outcome variable. Columns 1–2 compare heavy BNPL users to light and non-BNPL users. By contrast, Column 3 compares the group that used BNPL services at least once with those who did not use BNPL at all. Despite the variations in comparison groups, the analysis consistently shows that the direction of the effect of financial literacy and cognitive abilities on BNPL usage remains unchanged. Column 4 shows the results of the combined sample of youths and adults.

When it comes to personal preferences, loss aversion stands out with a negative impact in all columns. Higher levels of loss aversion were associated with lower utilization of BNPL services. Conversely, increased discount rates were linked to higher BNPL usage. Notably, individuals who perceived greater current value from BNPL were likely to use the service. Regarding risk aversion, Columns 1 and 3 show that the more risk-averse individuals were, the more likely they were to use BNPL services at least once; however, this trend did not hold among young adults. Regarding Column 2, although it was not statistically significant, the more risk-averse people were, the more they refrained from using BNPL.

These findings suggest that higher financial literacy is associated with more frequent BNPL service usage across both age groups, while higher cognitive ability appears to have a dampening effect on service utilization. Additionally, overconfidence in financial literacy was found to influence BNPL usage, though the effect of overconfidence in cognitive skills did not achieve statistical significance.

5.2 Spending Exceeding Cash: Who Spends through BNPL?

Table 4 presents an analysis of characteristics associated with spending exceeding cash of BNPL services among both teenagers and young adults. Among teenagers, our findings indicate that higher levels of financial literacy were positively associated with spending exceeding cash behavior, suggesting that increased financial knowledge may lead individuals to exceed their budget constraints. Conversely, higher cognitive ability was associated with a reduced likelihood of spending exceeding cash, indicating a more cautious approach to financial decisions. Similarly, among young adults, higher levels of financial literacy were associated with increased spending on BNPL services, while higher cognitive ability was associated with a decreased likelihood of overspending. Additionally, overconfidence in financial knowledge was linked to both increased service usage and spending behavior. However, statistically significant results were not observed for overconfidence in cognitive ability. Column 3 is a limited sample analysis of heavy users of BNPL monthly. The results showed

that financial literacy had the strongest impact on spending behavior, while cognitive ability had a negative but not statistically significant effect. Column 4 shows the result of the entire sample of youths and adults combined and provides stronger statistical significance for financial literacy and cognitive reflection.

These findings suggest that among both teenagers and young adults, higher financial literacy contributes to the spending exceeding cash of BNPL services, while higher cognitive abilities appear to have a mitigating effect. Overconfidence in financial knowledge also led to increased service usage and overspending behavior among teenagers.

Table 4. Spending Exceeding Cash Through BNPL

	(1)	(2)	(3)	(4)
	Adolescence (15−19)	Young adult (20−24)	Heavy user	All
Objective index				
Financial literacy	0.079***	0.085***	0.106***	0.078***
	(0.020)	(0.027)	(0.035)	(0.016)
Cognitive reflection	-0.038*	-0.064**	-0.039	-0.047***
	(0.023)	(0.028)	(0.041)	(0.018)
Overconfidence				
Financial literacy	0.091***	0.053*	0.082**	0.075***
	(0.023)	(0.031)	(0.034)	(0.018)
Cognitive reflection	-0.001	0.008	-0.008	0.002
	(0.019)	(0.023)	(0.030)	(0.015)
Preference				
Loss aversion	-0.127***	-0.059	-0.125*	-0.098***
	(0.037)	(0.047)	(0.065)	(0.029)
Discount rate	0.011	0.032*	0.017	0.021**
	(0.014)	(0.017)	(0.025)	(0.011)
Risk aversion	0.023	0.018	0.043	0.021*
	(0.015)	(0.019)	(0.028)	(0.012)
Other factors				
Male	0.143***	0.087*	0.080	0.120***
	(0.039)	(0.049)	(0.064)	(0.031)
Age	-0.004	-0.023	-0.015	-0.006
	(0.013)	(0.017)	(0.013)	(0.006)
Household income	0.010	0.004	0.016	0.004
	(0.012)	(0.007)	(0.011)	(0.006)
Constant	0.216	0.614	0.554**	0.251**
	(0.232)	(0.381)	(0.272)	(0.119)

Adjusted R-squared	0.104	0.054	0.077	0.086
Obs.	570	391	261	961

Note. *** p < 0.01, ** p < 0.05, * p < 0.1. Robust standard errors are in parentheses.

5.3 Overdue: Who is Overdue on BNPL?

In Table 5, an analysis of factors related to late payments on BNPL services among both teenagers and young adults is presented. Among teenagers, overconfidence in their cognitive skills was found to be positively associated with delinquent behavior, overshadowing the significance of objective measures of financial literacy and cognitive skills. This highlights the dominant influence of overconfidence on cognitive ability in this age group.

For young adults, higher levels of financial literacy and cognitive reflection were negatively associated with delinquency, though not statistically significant. Conversely, higher levels of overconfidence in financial literacy were linked to more delinquent behavior. The impact of overconfidence on financial behavior is more pronounced in young adults compared to adolescents.

Restricting the sample to heavy users who use BNPL at least once a month (Column 3) revealed a positive effect of overconfidence in financial literacy on delinquency. In Column 4 of the analysis, overconfidence in both financial literacy and cognitive skills was associated with more delinquent payments. However, the objective index was not statistically significant.

Table 5. BNPL Overdue

	(1)	(2)	(3)	(4)
	Adolescence (15−19)	Young adult (20−24)	Heavy user	All
Objective index				
Financial literacy	0.029	-0.005	0.047	0.015
	(0.022)	(0.029)	(0.036)	(0.018)
Cognitive reflection	-0.011	-0.034	-0.055	-0.022
	(0.024)	(0.031)	(0.039)	(0.019)
Overconfidence				
Financial literacy	0.037	0.080**	0.070*	0.054***
	(0.024)	(0.032)	(0.035)	(0.019)
Cognitive reflection	0.042**	0.040	0.036	0.040**
	(0.021)	(0.026)	(0.030)	(0.016)
Preference				
Loss aversion	-0.172***	-0.065	-0.120*	-0.127***
	(0.039)	(0.052)	(0.066)	(0.031)
Discount rate	0.054***	0.025	0.039	0.043***
	(0.014)	(0.018)	(0.025)	(0.011)

Risk aversion	0.018	0.027	0.005	0.017
	(0.015)	(0.021)	(0.028)	(0.012)
Other factors				
Male	0.120***	-0.018	0.036	0.063**
	(0.040)	(0.052)	(0.062)	(0.032)
Age	-0.013	0.020	-0.022*	-0.001
	(0.014)	(0.019)	(0.013)	(0.006)
Household income	0.026*	0.008	0.014	0.013**
	(0.014)	(0.007)	(0.011)	(0.006)
Constant	0.416	-0.167	0.820***	0.255**
	(0.254)	(0.425)	(0.260)	(0.127)
Adjusted R-squared	0.118	0.055	0.082	0.083
Obs.	570	391	261	961

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors are in parentheses.

The results indicate that while financial literacy and cognitive abilities may not directly predict late payments on BNPL services, overconfidence is crucial in influencing delinquent behavior across both age groups. Notably, the significance of financial literacy and cognitive reflex tests in predicting spending exceeding cash, but not late payments, may be attributed to the influence of parental relationships. Financially literate adolescents may use BNPL services more, including for excessive purchases; however, they maintain timely payments possibly owing to parental guidance or oversight.

5.4. Summary

Figure 4 visually compares the effects of financial literacy, cognitive abilities, and overconfidence on BNPL service usage among teenagers and young adults. It shows that individuals with higher levels of financial literacy tend to exhibit greater enthusiasm and confidence in using BNPL services, while those with higher cognitive abilities demonstrate a more cautious and restrained approach. Notably, overconfidence in financial knowledge is associated with active and risky financial behavior regarding BNPL service usage across both age groups.

The figure also highlights that, overall, teenagers and young adults exhibit similar trends in financial behavior, suggesting that factors influencing financial behavior in adolescents may persist into early adulthood. A notable difference is regarding delinquencies, where higher financial literacy tends to increase delinquencies among teenagers, while it tends to decrease delinquencies among young adults. This difference may be attributed to the unique dynamics of parental influence on financial activities among teenagers, where they may expect their parents to have a greater authority over their financial decisions.

To test whether the associations differ significantly between adolescents and young adults, we estimated the pooled models including interaction terms between the **adolescence** dummy variable and each key covariate. As shown in Table 6, financial literacy consistently predicts BNPL behavior

across the full sample. However, its interaction terms with the adolescence indicator are statistically insignificant in most specifications. For example, while financial literacy is positively associated with spending exceeding cash, the interaction with adolescence is small and insignificant, indicating similar effects across age groups. These findings suggest that the psychological and cognitive mechanisms shaping BNPL use operate similarly in both age groups.

Table 6. Interactions for the Adolescence Group

	(1)	(2)	(3)	(4)	(5)	(6)
	Usage		**Spending exceeding cash**		**Overdue**	
	Any BNPL	Every Month	Heavy user	All	Heavy user	All
Adolescence	0.016	-0.052*	0.040	-0.057	-0.108	-0.083
	(0.046)	(0.028)	(0.157)	(0.071)	(0.167)	(0.076)
Objective index						
Financial literacy	0.049***	0.035***	0.152***	0.078***	0.053	-0.010
	(0.017)	(0.012)	(0.054)	(0.026)	(0.061)	(0.029)
× Adolescence	0.018	0.004	-0.067	0.003	-0.006	0.045
	(0.021)	(0.014)	(0.068)	(0.032)	(0.074)	(0.036)
Cognitive reflection	-0.020	-0.030**	-0.091	-0.062**	-0.082	-0.037
	(0.020)	(0.013)	(0.064)	(0.028)	(0.060)	(0.031)
× Adolescence	-0.004	0.010	0.068	0.024	0.049	0.026
	(0.023)	(0.015)	(0.082)	(0.036)	(0.079)	(0.039)
Overconfidence						
Financial literacy	0.049**	0.044***	0.087*	0.045	0.135**	0.070**
	(0.021)	(0.016)	(0.052)	(0.029)	(0.054)	(0.030)
× Adolescence	0.029	-0.011	-0.016	0.049	-0.109	-0.021
	(0.025)	(0.018)	(0.067)	(0.037)	(0.068)	(0.038)
Cognitive reflection	-0.006	-0.005	0.020	0.006	0.030	0.032
	(0.015)	(0.011)	(0.042)	(0.023)	(0.046)	(0.025)
× Adolescence	0.010	0.012	-0.047	-0.006	0.009	0.013
	(0.019)	(0.013)	(0.059)	(0.030)	(0.061)	(0.032)
Preference						
Loss aversion	-0.039**	-0.051***	-0.132**	-0.097***	-0.129*	-0.126***
	(0.017)	(0.011)	(0.066)	(0.029)	(0.067)	(0.032)
Discount rate	0.032***	0.006	0.020	0.021*	0.041	0.043***
	(0.006)	(0.004)	(0.025)	(0.011)	(0.025)	(0.011)
Risk aversion	0.018***	0.004	0.050*	0.021*	0.012	0.019
	(0.007)	(0.004)	(0.028)	(0.012)	(0.028)	(0.012)

Other factors						
Male	-0.123***	-0.001	0.075	0.120***	0.029	0.066**
	(0.017)	(0.011)	(0.064)	(0.031)	(0.062)	(0.032)
Age	0.028***	-0.002	-0.024	-0.012	-0.037	-0.001
	(0.006)	(0.004)	(0.023)	(0.010)	(0.023)	(0.011)
Household income	0.001	-0.001	0.017	0.004	0.013	0.012**
	(0.003)	(0.002)	(0.011)	(0.006)	(0.011)	(0.006)
Constant	-0.250*	0.153*	0.691	0.392*	1.160**	0.293
	(0.142)	(0.086)	(0.503)	(0.234)	(0.515)	(0.256)
Obs.	3000	3000	261	961	261	961
Adjusted R-squared	0.060	0.028	0.069	0.085	0.078	0.083

5.5. Discussion

Why do financial literacy and cognitive reflection have opposite effects, even though they are highly correlated? We do not have sufficient evidence to definitively answer this question but attempt to offer a possible explanation below.

Notably, higher financial literacy leads to greater participation in financial transactions (e.g., stock ownership). This is typically interpreted to mean that financial literacy encourages rational behavior, such as engaging in investments that offer high returns despite some level of risk.

However, Kawamura et al. (2021) showed that higher financial literacy can also lead to daring or reckless financial behavior—a phenomenon referred to as the **Strong Swimmer Effect**. The term originates from a warning by Charlie Munger, co-chair of Berkshire Hathaway, who cited the proverb "It's the strong swimmers who drown." This effect implies that individuals with high financial literacy may exhibit overconfidence, believing they can skillfully navigate risky financial environments, which paradoxically increases their exposure to loss.

BNPL, the focus of this study, is a payment method with both rational and risky features. However, it enables consumers without credit cards to complete online transactions efficiently and quickly. Conversely, excessive or misinformed use of BNPL may lead to budgeting issues, unexpected fees, and defaults due to overlooked repayment deadlines. Moreover, given the novelty of this payment method in Japan, limited consumer awareness can lead to further mistakes.

If some BNPL services are not fully rational or transparent from a consumer perspective, then high usage by individuals with strong financial literacy might not always reflect informed, rational decisions. Instead, overconfidence stemming from financial knowledge may have driven higher BNPL usage.

This interpretation helps make sense of the opposite effect observed for **cognitive reflection**, as measured by the **CRT**. The CRT captures an individual's tendency to suppress intuitive responses and engage in reflective, analytical thinking. Individuals with higher CRT scores may have been more

attuned to the risks and uncertainties of BNPL, opting not to use it until they had saved enough or secured more stable means of payment.

Alternatively, the divergence between the effects of financial literacy and cognitive reflection may reflect the distinction between **System 1 and System 2** in **Dual Process Theory**. While it is commonly hypothesized that both financial literacy and CRT performance are associated with System 2 (analytical thinking), the strong swimmer effect challenges this view. It suggests that financial literacy, in some cases, may activate intuitive (System 1) thinking via overconfidence, whereas high CRT performance consistently promotes deliberative (System 2) processing. This could explain the opposing influences of financial literacy and CRT performance on BNPL use.

6. Conclusions

Our study offers valuable insights into the factors shaping the utilization of BNPL payment services and financial decision-making behaviors among Japanese adolescents. We have demonstrated that both financial literacy and cognitive ability are crucial in influencing youths' financial decisions. Specifically, adolescents with higher levels of financial literacy tend to engage more frequently with BNPL services, while those with higher cognitive abilities demonstrate a more cautious approach.

Our investigation also highlights the impact of overconfidence in one's financial knowledge on delinquent behavior, with overconfidence showing a notable positive association while financial literacy and cognitive ability exhibiting lesser influence in this regard. Moreover, we have explored the tendency of certain youths to use BNPL services for exceeding their budget, revealing that higher financial literacy correlates with a propensity for spending exceeding cash, whereas higher cognitive ability appears to mitigate such behavior.

As the number of BNPL users, especially among young people, continues to rise rapidly, our findings emphasize the importance of addressing regulatory gaps to mitigate the potential propagation of poor financial behavior among adolescents. We urge policymakers to closely monitor the use of BNPL services by youths and consider implementing tailored educational initiatives on financial literacy. Furthermore, future studies should explore effective strategies for fostering responsible financial behavior from an early age. By addressing these concerns, we can better equip young individuals with the necessary skills and knowledge to navigate the increasingly complex landscape of financial services responsibly and effectively.

References

Asaad, Colleen T. 2015. "Financial Literacy and Financial Behavior: Assessing Knowledge and Confidence," Financial Services Review 24, no. 2: 101-117. doi: 10.61190/fsr.v24i2.3236.

Barsky, Robert B., Thomas F. Juster, Miles S. Kimball, and Matthew D Shapiro. 1997. "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and

Retirement Study," The Quarterly Journal of Economics 112, no. 2: 537-579. doi: 10.1162/003355397555280.

Berg, Tobias, Valentin Burg, Jan Keil, and Manju Puri. 2023. "The Economics of "Buy Now, Pay Later": A Merchant's Perspective" Available at SSRN: ssrn.com/abstract=4448715 or doi: 10.2139/ssrn.4448715.

Charness, Gary, Uri Gneezy, and Alex Imas. 2013. "Experimental Methods: Eliciting Risk Preferences," Journal of Economic Behavior & Organization 87: 43-51. doi: 10.1016/j.jebo.2012.12.023.

Defoe, Ivy N., Judith Semon Dubas, Bernrd Figner, and Marcel A. G. van Aken. 2015. "A Meta-Analysis on Age Differences in Risky Decision Making: Adolescents Versus Children and Adults," Psychological Bulletin 141, no. 1: 48-84. doi: 10.1037/a0038088.

Dinkova, Milena, Adrian Kalwij, and Rob Alessie. 2021. "Know More, Spend More? The Impact of Financial Literacy on Household Consumption," De Economist 169, no. 4: 469-498. doi: 10.1007/s10645-021-09391-4.

Disney, Richard, and John Gathergood. 2013. "Financial Literacy and Consumer Credit Portfolios," Journal of Banking & Finance 37, no. 7: 2246-2254. doi: 10.1016/j.jbankfin.2013.01.013.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde. 2018. "Global Evidence on Economic Preferences," The Quarterly Journal of Economics 133, no. 4: 1645-1692. doi: 10.1093/qje/qjy013.

Falk, Armin, Anke Becker, Thomas Dohmen, David Huffman, and Uwe Sunde. 2023. "The Preference Survey Module: A Validated Instrument for Measuring Risk, Time, and Social Preferences," Management Science 69, no. 4: 1935-1950. doi: 10.1287/mnsc.2022.4455.

Fellner-Röhling, Gerlinde, and Sebastien Krügel. 2014. "Judgmental Overconfidence and Trading Activity," Journal of Economic Behavior & Organization 107: 827-842. doi: 10.1016/j.jebo.2014.04.016.

Frederick, Shane. 2005. "Cognitive Reflection and Decision Making," Journal of Economic perspectives 19, no. 4: 25-42. doi: 10.1257/089533005775196732.

Gerrans, Paul, and Richard Heaney. 2019. "The Impact of Undergraduate Personal Finance Education on Individual Financial Literacy, Attitudes and Intentions," Accounting and Finance 59, no. 1: 177-217. doi: 10.1111/acfi.12247.

Grinblatt, Mark, and Matti Keloharju. 2009. "Sensation Seeking, Overconfidence, and Trading Activity," The Journal of Finance 64, no. 2: 549-578. doi: 10.1111/j.1540-6261.2009.01443.x.

Grohmann, Antonia. 2018. “Financial Literacy And Financial Behavior: Evidence from the Emerging Asian Middle Class,” Pacific-Basin Finance Journal 48: 129-143. doi: 10.1016/j.pacfin.2018.01.007.

Guttman-Kenney, Benedict, Chris Firth, and John Gathergood. 2023. “Buy Now, Pay Later (BNPL)...on your Credit Card,” Journal of Behavioral and Experimental Finance 37: 100788. doi: 10.1016/j.jbef.2023.100788.

Jappelli, Tullio, and Mario Padula. 2017. “Consumption Growth, the Interest Rate, and Financial Sophistication*,” Journal of Pension Economics & Finance 16, no. 3: 348-370. doi: 10.1017/S147474721600010X.

Kadoya, Yoshihiko, and Mostafa S. R. Khan. 2020. “What Determines Financial Literacy in Japan?,” Journal of Pension Economics & Finance 19, no. 3: 353-371. doi: 10.1017/S1474747218000379.

Kawamura, Tetsuya, Tomoharu Mori, Taizo Motonishi, and Kazuhito Ogawa. 2021. “Is Financial Literacy Dangerous? Financial Literacy, Behavioral Factors, and Financial Choices of Households,” Journal of the Japanese and International Economies 60: 101131. doi: 10.1016/j.jjie.2021.101131.

Kilborn, Jason J. 2005. “Behavioral Economics, Overindebtedness & Comparative Consumer Bankruptcy: Searching For Causes and Evaluating Solutions,” Emory Bankruptcy Developments Journal 22: 13. doi: 10.2139/ssrn.690826.

Kramer, Marc M. 2016. “Financial Literacy, Confidence and Financial Advice Seeking,” Journal of Economic Behavior & Organization 131: 198-217. doi: 10.1016/j.jebo.2016.08.016.

Kinari, Yusuke. 2016. “Properties of Expectation Biases: Optimism and Overconfidence,” Journal of Behavioral and Experimental Finance 10: 32-49. doi: 10.1016/j.jbef.2016.02.003.

Laibson, David. 1997. “Golden Eggs and Hyperbolic Discounting,” The Quarterly Journal of Economics 112, no. 2: 443-478. doi: 10.1162/003355397555253.

Meier, Stephan, and Charles Sprenger. 2010. “Present-Biased Preferences and Credit Card Borrowing,” American Economic Journal: Applied Economics 2, no. 1: 193-210. doi: 10.1257/app.2.1.193.

Mitchell, Olivia. S., and Annamaria Lusardi. 2011. *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*. OUP Oxford. https://play.google.com/store/books/details?id=wH5DCC4JdwMC.

Moreno-Herrero, Dolores, Manuel Salas-Velasco, and Jose Sánchez-Campillo. 2018. “Factors that Influence the Level of Financial Literacy among Young People: The Role of Parental Engagement and Students’ Experiences With Money Matters,” Children and Youth Services Review 95: 334-351. doi: 10.1016/j.childyouth.2018.10.042.

Oechssler, Jorg, Andreas Roider, and Patrick W. Schmitz. 2009. “Cognitive Abilities and Behavioral Biases,” Journal of Economic Behavior & Organization 72, no. 1: 147-152. doi: 10.1016/j.jebo.2009.04.018.

Powell, Robert, Anh Do, Denise Gengatharen, Jaime Yong, and Rasia Gengatharen. 2023. “The Relationship Between Responsible Financial Behaviours And Financial Wellbeing: The Case of Buy-Now-Pay-Later,” Accounting and Finance 63 (4): 4431-4451. doi: 10.1111/acfi.13100.

Sevim, Nurdan, Faith Temizel, and Özlem Sayılır. 2012. “The Effects of Financial Literacy On The Borrowing Behaviour of Turkish Financial Consumers,” International Journal of Consumer Studies 36, no. 5: 573-579. doi: 10.1111/j.1470-6431.2012.01123.

Shen, Chung-H., Shih-Jie Lin, De-Piao Tang, and Yu-Jen Hsiao. 2016. “The Relationship between Financial Disputes and Financial Literacy,” Pacific-Basin Finance Journal 36: 46-65. doi: 10.1016/j.pacfin.2015.11.002.

Steinberg, Laurence, Dustin Albert, Elizabeth Cauffman, Marie Banich, Sandra Graham, and Jennifer Woolard. 2008. “Age Differences in Sensation Seeking and Impulsivity as Indexed by Behavior and Self-Report: Evidence For A Dual Systems Model,” Developmental Psychology 44, no. 6: 1764-1778. doi: 10.1037/a0012955.

Toplak, Maggie. E., Richard. F. West, and Keith E. Stanovich. 2014. “Assessing Miserly Information Processing: An Expansion of the Cognitive Reflection Test,” Thinking & Reasoning 20, no. 2: 147-168. doi: 10.1080/13546783.2013.844729.

Tversky, Amos, and Daniel Kahneman. 1991. “Loss Aversion in Riskless Choice: A Reference-Dependent Model,” The Quarterly Journal of Economics 106, no. 4: 1039-1061. doi: 10.2307/2937956.

Xiao, Jing. J., Sun Young Ahn, Joyce Serido, and Soyeon Shim. 2014. “Earlier Financial Literacy And Later Financial Behaviour of College Students,” International Journal of Consumer Studies 38, no. 6: 593-601. doi:10.1111/ijcs.12122.

Xue, Rue, Adrian Gepp, Terry J. O’Neill, Steven Stern, and Bruce J. Vanstone. 2019. “Financial Literacy amongst Elderly Australians,” Accounting and Finance 59, no. S1: 887-918. doi: 10.1111/acfi.12362.

Appendix

A. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Financial literacy	1.000									
(2) Cognitive reflection	0.423	1.000								
(3) Financial literacy overconfidence	-0.468	-0.145	1.000							
(4) Cognitive reflection overconfidence	-0.105	-0.500	0.231	1.000						
(5) Loss aversion	0.045	0.088	-0.091	-0.066	1.000					
(6) Discount rate	-0.041	-0.045	0.064	0.045	-0.079	1.000				
(7) Risk aversion	0.071	-0.002	-0.048	0.012	0.025	0.034	1.000			
(8) Male	0.092	0.112	0.081	0.049	-0.070	0.003	-0.137	1.000		
(9) Age	0.059	-0.007	-0.007	-0.021	0.025	-0.042	-0.016	-0.025	1.000	
(10) Household income	-0.017	-0.053	0.011	0.041	0.006	-0.019	-0.012	0.013	0.374	1.000

B. Survey questionnaire

Variables	Questionnaire	Choice
Usage	**Have you ever used BNPL services (i.e., receive the goods first and pay for them later) or heard about this service?**	• I use it almost every month • I have used it, but not every month • I've never used the service, but I've heard of it and have a general idea of what the service entails • I've heard of it, but I don't know what the service entails. • Never heard of it
Spending exceeding cash	**Have you ever paid for a purchase with BNPL that you could not afford to pay with cash on hand or a bank deposit?**	• Yes • No
Overdue	**Have you ever used BNPL and then failed to pay by the due date?**	• Many times • Only one time • Never
Financial literacy	**The next three questions are quizzes about money.** **You have 10,000 yen on deposit and the interest rate is 2% per year. If you leave the deposit as is, how much will it be after 5 years?**	• More than 10,200 yen • Just 10,200 yen • Less than 10,200 yen • I don't know
	Suppose the interest rate on your savings account is 1% per year and the rate of inflation (the rate at which prices rise) is 2% per year. After one year, how many things can you buy with the money in this account?	• More than at present • Same as present • Less than present • I don't know
	Is the following statement correct or incorrect? **"You can safely make more money by buying a few shares of stock in several companies (investing a little in several companies) than by buying shares of stock in one company (investing in one company).**"	• Right • Wrong • I don't know
Financial literacy overconfidence	**How many of the three money-related quizzes so far do you think you have answered correctly?**	• 3 questions • 2 questions • 1 question • 0 question
Discount rate	**Please choose which is better for you, 10,000 yen today or 10,200 yen a year from now.**	• 10,000 yen you can get today • 10,200 that you are sure to get after 1 year.
	Please choose which is better for you, 10,000 yen today or 12,000 yen a year from now.	• 10,000 yen you can get today • 12,000 yen that you are sure to receive after 1 year
	Please choose which is better for you: 10,000 yen today or 15,000 yen a year from now.	• 10,000 yen you can get today • 15,000 yen, which is always given after 1 year

Risk aversion	**There are two crops, Crop A and Crop B, that grow quickly, bear fruit, and die. You are to grow one of the seedlings.** **Crop A will surely grow and bear only 1 fruit that will sell for 2,000 yen.** **Crop B has a 50–50 chance of producing only 1 fruit that will sell for 20,000 yen, or it may fail to produce any fruit at all owing to disease.** **It does not cost any money or effort to grow the crops.** **Which would you choose, Crop A or Crop B?**	• Crop A • Crop B
	There are two crops, Crop A and Crop B, that grow quickly, bear fruit, and die. You are to grow one of the seedlings. **Crop A will surely grow and bear only 1 fruit that will sell for 4,000 yen.** **Crop B has a 50–50 chance of producing only 1 fruit that will sell for 20,000 yen, or it may fail to produce any fruit at all owing to disease.** **It does not cost any money or effort to grow the crops.** **Which would you choose, Crop A or Crop B?**	• Crop A • Crop B
	There are two crops, Crop A and Crop B, that grow quickly, bear fruit, and die. You are to grow one of the seedlings. **Crop A is certain to grow and bear only 1 fruit that will sell for 8,000 yen.** **Crop B has a 50–50 chance of producing only 1 fruit that will sell for 20,000 yen, or it may fail to produce any fruit at all owing to disease.** **It does not cost any money or effort to grow the crops.** **Which would you choose, Crop A or Crop B?**	• Crop A • Crop B
Loss aversion	**This question is different from the previous one, regarding crop C.** **There is a crop C that grows quickly, bears fruit, and dies.** **You can grow seedlings of this crop.** **Crop C has a 50–50 chance of producing a single fruit that sells for 5,000 yen, or of failing to produce any fruit at all owing to disease.** **If it gets sick, you have to pay 1,000 yen to have it disinfected after it dies.** **No other money or effort is required to grow the crop.** **Do you want to grow Crop C?**	• I'm going to grow crop C. • I don't want to grow crop C.
Cognitive reflection test	**There is a bat and a ball that together cost 1,100 yen. The bat costs 1000 yen more than the ball. What is the cost of the ball?**	
	If it takes 5 minutes to make 5 toys on 5 machines, how many minutes would it take to make 100 toys on 100 machines?	
	Water lily leaves are spreading over the lake. Its area doubles every day. If it takes 48 days for the water lilies to cover the lake, how many days will it take for the water lilies to cover half of the lake?	
Cognitive reflection overconfidence	**How many of the three quizzes so far do you think you have answered correctly?**	• 3 questions • 2 questions • 1 question • 0 question

C. **Logit model**

As a robustness check, we also estimated logistic regression models, given the binary nature of the outcome variables (BNPL usage, overspending, and overdue). The results are reported in Appendix Table C. Across both adolescents and young adults, the key findings from the OLS models remain consistent. These results reinforce the robustness of our conclusions across model specifications.

Table C. Logit Model

	(1)	(2)	(3)	(4)	(5)	(6)
	Usage		**Spending exceeding cash**		**Overdue**	
	Adolescence	Young adult	Adolescence	Young adult	Adolescence	Young adult
Objective index						
Financial literacy	0.499***	0.402***	0.434***	0.478***	0.134	-0.035
	(0.103)	(0.125)	(0.118)	(0.151)	(0.113)	(0.137)
Cognitive reflection	-0.272**	-0.339**	-0.210	-0.387**	-0.047	-0.173
	(0.120)	(0.159)	(0.138)	(0.179)	(0.127)	(0.161)
Overconfidence						
Financial literacy	0.398***	0.490***	0.487***	0.277*	0.178	0.376**
	(0.110)	(0.153)	(0.126)	(0.160)	(0.120)	(0.150)
Cognitive reflection	0.076	-0.049	-0.003	0.032	0.218**	0.182
	(0.095)	(0.125)	(0.111)	(0.130)	(0.106)	(0.118)
Preference						
Loss aversion	-0.582***	-0.676***	-0.703***	-0.323	-0.844***	-0.318
	(0.167)	(0.209)	(0.204)	(0.258)	(0.191)	(0.235)
Discount rate	0.164**	-0.058	0.057	0.190*	0.278***	0.121
	(0.064)	(0.088)	(0.080)	(0.097)	(0.075)	(0.086)
Risk aversion	0.124*	-0.067	0.138	0.110	0.095	0.122
	(0.074)	(0.086)	(0.095)	(0.109)	(0.084)	(0.098)
Other factors						
Male	0.101	-0.227	0.780***	0.484*	0.594***	-0.106
	(0.178)	(0.226)	(0.215)	(0.271)	(0.199)	(0.251)
Age	0.018	-0.103	-0.024	-0.135	-0.070	0.102
	(0.063)	(0.076)	(0.073)	(0.094)	(0.072)	(0.089)
Household income	-0.035	0.008	0.059	0.021	0.123*	0.036
	(0.037)	(0.031)	(0.055)	(0.036)	(0.067)	(0.030)

Constant	-3.398***	0.529	-1.395	0.947	-0.312	-3.195
	(1.146)	(1.668)	(1.308)	(2.121)	(1.301)	(1.994)
Obs.	2000	1000	570	391	570	391

Figure 1. Ratio of BNPL usage by age

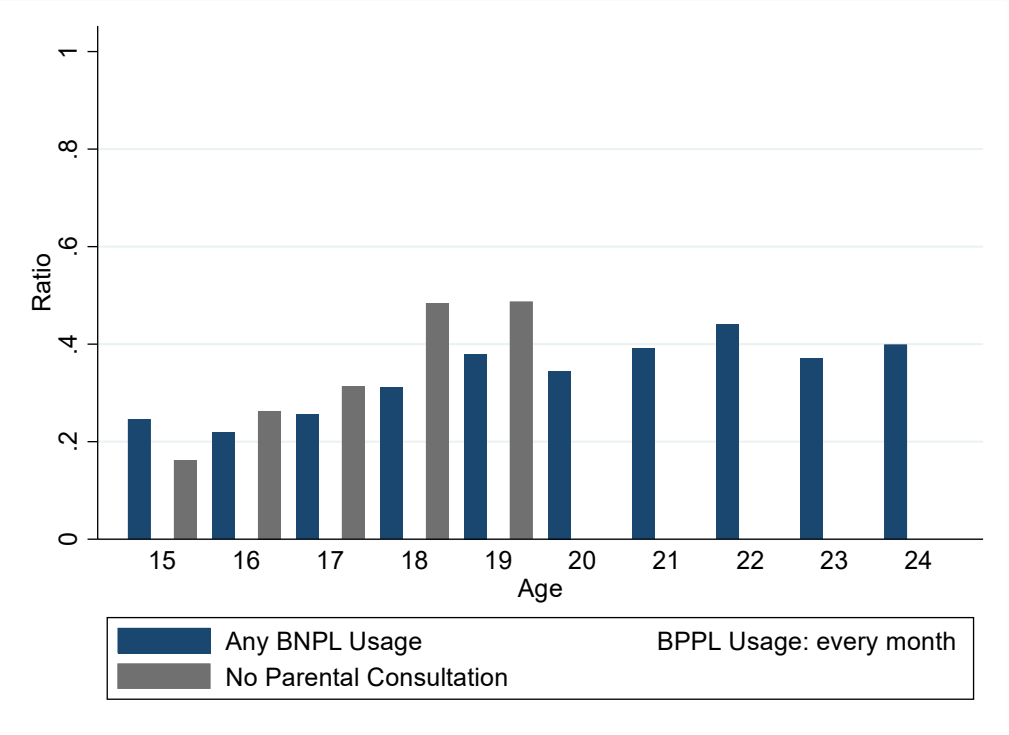


Figure 2. Ratio of late payment by age

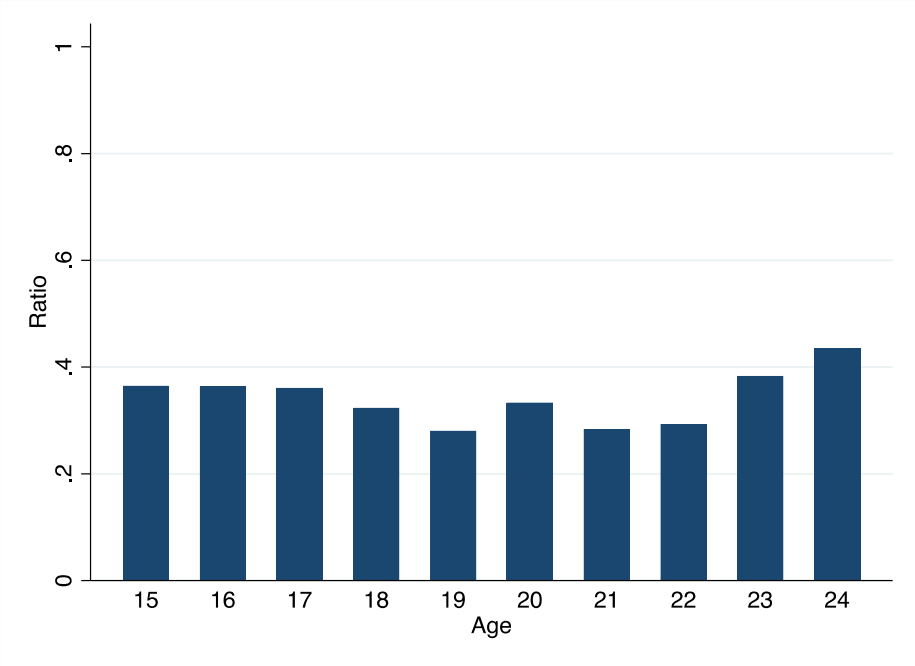
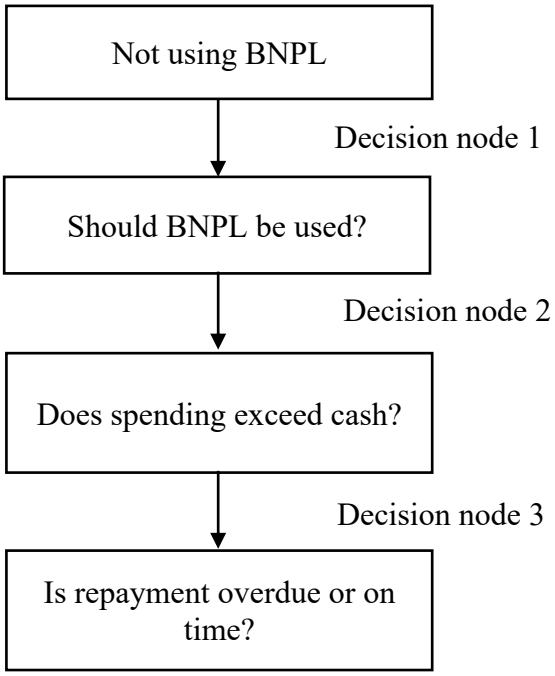


Figure 3. Conceptual flow of BNPL decisions



Note: Decision node 1: Decide whether to use BNPL. Decision node 2: Given BNPL usage, determine whether spending exceeds available cash. Decision node 3: Given overspending, determine whether repayment is overdue.

Figure 4. Comparison of each BNPL behavior between adolescences and adults