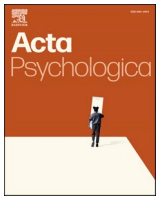
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Financial literacy and self-control for a sustainable future: a cross-sectional study with middle school students on the parallel mediating effects of patience and responsibility

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ABSTRACT

This study explored the psychological mechanisms behind financial literacy in early adolescence, a key period for setting long-term financial goals and advancing the Sustainable Development Goals (SDGs). Focusing on secondary school students in Türkiye, the research examined how responsibility and patience serve as parallel mediators in the relationship between self-control and three aspects of financial literacy: conscious consumption, savings and future planning, and the meaning of money. A cross-sectional survey involving 663 students was conducted, and parallel mediation analyses tested the proposed model. Results showed that self-control significantly predicted conscious consumption, savings, and future planning. The links between self-control and conscious consumption, as well as between self-control and savings and future planning, were concurrently mediated by responsibility and patience. Regarding the meaning of money, self-control had no significant direct effect, but responsibility played a notable mediating role; patience alone did not, although the combined indirect effect of responsibility and patience was still significant, indicating an indirect-only mediation pattern. These findings suggest that financial literacy in early adolescence is best understood as a character-based skill, with self-control operating through virtues such as patience and, especially, responsibility. The results underscore the importance of integrating financial education with character development to promote conscious consumption, savings behaviors, and a reflective understanding of money, ultimately supporting individual financial well-being and broader goals such as poverty reduction, quality education, and responsible consumption.

1. Introduction

With the ever-increasing development of science and technology, production and consumption continue to rise. Technological products are constantly being renewed and transformed into smaller devices that offer more functions. As is known, people's desires are unlimited, but the natural resources available to meet them are limited. For this reason, individuals need to possess specific skills to fulfill their unlimited desires. One of the most important of these skills is undoubtedly financial literacy. Financial literacy measures a person's ability to comprehend financial principles and make informed decisions about savings and investments (Corsini & Giannelli, 2021). Since knowledge, attitude, and behavior contribute to financial literacy, examining these three elements together makes sense to define financial literacy (Atkinson & Messy, 2012). Financial literacy refers to the knowledge and skills necessary to make informed financial decisions and manage challenges in daily life (Sohn et al., 2012). Individuals must make numerous financial decisions to survive. Financial literacy is a foundational skill that empowers individuals to make sound and informed financial choices. Providing informal and formal financial literacy education starting from preschool positively affects children's knowledge and attitudes about the subject (Birbili & Kontopoulou, 2015; Fabris & Luburić, 2016; He et al., 2024; Williams et al., 2022). Additionally, research indicates that financial literacy positively impacts financial decision-making (Goyal & Choudhary, 2024; Grohmann et al., 2015). In 2012, the Program for International Student Assessment (PISA), overseen by the OECD, introduced a financial literacy module into its assessment, which measures math, science, and reading proficiency

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among 15-year-old students. In 2015, the OECD conducted a study assessing the financial knowledge of the population aged 18–79 in 30 countries. These studies reveal relatively poor global financial knowledge (Hizgilov & Silber, 2020). In Turkey, very few studies have examined the financial literacy levels of middle school students. Aydoğdu and Tuna's (2024) study found that the financial literacy level of middle school students was not at the desired level. Therefore, it is essential that financial literacy education starts in the family and then continues in a planned manner in educational institutions.

1.1. Financial literacy and sustainable development goals

Financial literacy is a core competency for individuals to make responsible financial decisions (Santini et al., 2019). This ability entails a comprehensive understanding of financial principles and the ability to assess and mitigate risks across diverse contexts. Those with advanced financial literacy are more adept at comprehending and navigating complex financial products, such as investment vehicles, which enables informed decision-making and strategic financial planning. This competence increases the likelihood of making informed choices that support long-term financial stability and enables them to take strategic, reliable steps in the markets. As a result, financial literacy is critical in ensuring both individual well-being and the sustainability of the economic system (Boto-García et al., 2022; Lusardi & Mitchell, 2014). Financial literacy plays a pivotal role in achieving sustainable development goals by empowering individuals to make informed financial decisions that preserve economic stability, ensure social justice, and promote environmental sustainability (Dupuy et al., 2024; Mishra et al., 2024; Senaya, 2024). This competency enables individuals to effectively manage personal financial resources, undertake strategic investments, and actively engage in sustainable economic policies, thereby supporting the realization of sustainable development goals (Robles et al., 2024; Wan Nawang et al., 2024; Wang et al., 2022). Research indicates that individuals with greater financial knowledge tend to excel at saving, investing, and managing debt, which subsequently leads to higher household earnings and a better quality of life (Senaya, 2024; Wang et al., 2022). Economic empowerment holds vital importance in developing countries, where structural barriers to financial access hinder broad economic development (Masimbi, 2025; Wang et al., 2022). By promoting financial literacy, societies can overcome these barriers and foster equitable growth that integrates all segments into economic processes. Such an approach directly aligns with Sustainable Development Goals 10 (reduced inequalities) and 1 (no poverty), which prioritize expanding opportunities for disadvantaged groups and mitigating disparities (Masimbi, 2025; Wan Nawang et al., 2024).

In some areas of developing countries, women face challenges such as limited access to financial services, which restricts their economic autonomy, and a lack of educational opportunities. Financial literacy programs targeting women have strengthened their participation in economic processes and entrepreneurial initiatives, elevating household welfare levels and contributing to societal advancement (Masimbi, 2025). These programs enhance women's financial competencies, helping mitigate gender-based disparities and fostering an inclusive economic growth model accessible to all (Masimbi, 2025; Mishra et al., 2024; Robles et al., 2024). Empowering women in financial matters enables them to overcome socioeconomic barriers and actively engage in economic processes, thereby contributing to Sustainable Development Goal 5 (Gender Equality) (Mishra et al., 2024). Financial literacy directly impacts individuals' financial well-being and influences their environmental sustainability behaviors. The mediating role of financial attitudes and behaviors underscores the strategic importance of financial education in promoting responsible consumption and production practices. Financial well-being is integrally linked to sustainable development goals such as health and quality of life (Goal 3), climate action (Goal 13), and poverty reduction (Goal 1) by fostering a stable economic environment that supports sustainable practices (Robles et al., 2024; Wan Nawang et al., 2024).

1.2. Financial literacy and self-control

One factor thought to affect financial literacy is self-control. Self-control refers to the capacity to change one's reactions. This change is necessary to align reactions with standards, including ideals, values, morals, and social expectations, and to strive for long-term goals (Baumeister et al., 2007). Financial self-discipline is a fundamental element of financial literacy. It significantly shapes individuals' ability to adhere to their financial plans and control their tendency to shop impulsively. The self-control mechanism enables individuals to apply the financial knowledge they have acquired daily. People who resist impulsive purchases and plan their expenditures in advance can use their financial resources more effectively and protect themselves from financial problems such as excessive borrowing. In this way, they can enhance their economic well-being by applying their financial knowledge effectively (Anita et al., 2022; Aydin & Sumer, 2023; Gathergood, 2012). Financial literacy equips individuals with the knowledge and skills to make informed decisions about budgeting, saving, and investing (Davydenko et al., 2021). However, it is not enough to have this knowledge; self-control skills are equally critical. Self-control enables individuals to resist impulse spending and prioritize long-term financial goals over short-term pleasures. Studies show that people with high levels of self-control are more likely to exhibit positive financial behaviors, such as saving money for unexpected situations and planning for future spending (Anita et al., 2022; Gathergood, 2012; Strömbäck et al., 2017). Research has shown that self-control influences various aspects of financial behavior, including saving, spending, and investment decisions (Gathergood, 2012; Younas et al., 2019). Individuals with high self-control tend to resist tempting offers and adhere to their financial plans, resulting in higher levels of financial well-being (Mabkhot & Talat, 2023). A study by Silver (2024) found that self-regulation techniques significantly reduce expenditures and increase savings, indicating a moderate effect on financial decision-making. The relationship between self-control and impulsivity is significant in finance. Studies show that individuals who experience temporary depletion of self-control resources are more prone to impulse buying, which may have adverse financial consequences (Allom et al., 2018; Silver, 2024). Therefore, improving self-control is crucial for making more informed financial decisions and adopting a disciplined approach to spending and saving (Davydenko et al., 2021).

Taken together, these findings indicate that self-control is a necessary but not sufficient condition for adolescents' financial literacy. Self-control offers a general ability to suppress impulses and prioritize long-term goals. However, it does not specify which self-regulatory traits are most important for specific financial outcomes, such as avoiding wasteful spending, planning for the future, or developing a coherent understanding of money. Therefore, there is a need to move beyond models that view self-control as a single, direct predictor of financial behavior and to explore how more specific character strengths, such as patience and responsibility, shape this general ability into different aspects of adolescent financial literacy (Lusardi & Mitchell, 2014; Moffitt et al., 2011; Strömbäck et al., 2017).

1.3. The mediating role of patience and responsibility

In this study, patience and responsibility are seen as two related but distinct character strengths that transform general self-control into specific financial behaviors. Patience reflects adolescents' time preferences and willingness to delay gratification, which have been shown to develop significantly during childhood and predict educational success, health, and economic outcomes later in life (Andreoni et al., 2019; Moffitt et al., 2011). Responsibility, on the other hand, involves internalizing social and moral obligations, including readiness to face the consequences of one's actions and to act in ways aligned with shared

norms and long-term commitments (Park et al., 2004; Peterson & Seligman, 2004). While both concepts are based on self-regulation, patience primarily concerns the time aspect of intertemporal choice, whereas responsibility relates to the normative aspect that connects financial decisions to duties toward oneself, family, and society. By modeling these traits as parallel mediators, we can investigate whether they serve different roles in explaining how self-control influences various components of financial literacy.

Financial literacy contributes to the development of patience and self-control skills in individuals. Individuals equipped with financial knowledge and skills make more informed decisions about money management, set realistic goals, and create systematic plans to achieve these goals. This process supports their internalization and reflection on self-control, responsibility, and patience. A financially literate person learns to manage immediate spending desires, maintain budget discipline, and be patient with long-term savings goals. Thus, they make rational choices for the future rather than instant gratification (Bai, 2023; Frisancho, 2020; Mabkhot & Talat, 2023; Shubert et al., 2022). Financial responsibility involves a variety of behaviors and habits that contribute to a person's overall financial health. At its core is the ability to make informed decisions, practice self-discipline, and consider the future effects of financial choices (Björklund & Sandahl, 2023). One key aspect of this concept is the ability to "delay gratification." This means managing the desire for immediate rewards to focus on long-term financial goals. Delaying gratification helps build an emergency fund and enhances self-control, allowing individuals to develop more deliberate and mindful spending habits. This strategy creates the foundation for financial stability by helping people balance short-term wants with long-term interests (Aydin & Sumer, 2023; Boto-García et al., 2022; Riley, 2023).

Financial literacy, which provides individuals with the essential skills to handle their finances, along with self-control and patience, helps them stick to their financial plans. As people take an active role in managing their money and planning for their future, this sense of responsibility can lead to greater economic well-being (Alan & Ertac, 2018; Mudzingiri, 2021). Patience, as a vital part of financial responsibility, is a key factor that allows individuals to make well-informed, long-term financial decisions by delaying their desire for instant gratification, thus supporting the process of asset accumulation and investment growth (Lusardi & Mitchell, 2014; Mudzingiri, 2021; Silver, 2024). In today's world of instant gratification, patient behavior is crucial in overcoming the challenges of financial planning and emphasizing sustainable growth and solid investment strategies (Lusardi & Mitchell, 2014). This trait becomes a behavioral habit, supported by disciplined financial practices such as regularly reviewing financial goals and building an emergency fund. Patience is especially vital for achieving long-term financial goals, like investing. Since these goals require time and consistency, patient individuals tend to stick with their investments by remaining calm during short-term market swings. This mindset increases the chances of higher returns over time and reduces the influence of emotional reactions on financial decisions (Alan & Ertac, 2018; Frisancho, 2020; Gur, 2022; Mancone et al., 2024). Therefore, patience is a key factor in building financial well-being and creating a resilient financial profile in the face of market uncertainties. Patient investors are less likely to make impulsive decisions driven by fear or greed, allowing them to concentrate on their long-term goals. This emotional stability not only helps them avoid rash actions during market ups and downs but also encourages thorough research and strategic planning for entry and exit points. By waiting for the right opportunities, they can often prevent costly mistakes caused by hasty choices (Sunchu, 2024). Patience also encourages delaying gratification and resisting the temptation for immediate rewards, which benefits long-term gains. For example, patient individuals might prefer saving for a larger purchase instead of taking on debt, thus avoiding high-interest debt cycles (Moloi, 2024).

The investment process requires emotional self-control, and patience is a crucial element in maintaining this self-control (Schnitker et al., 2017; Younas et al., 2019). Patient investors tend to avoid making impulsive decisions driven by emotions such as fear or overambition. This mindset allows them to focus on long-term goals and stay calm during market fluctuations, rather than panicking (Bucciol et al., 2011; Castillo et al., 2011). Emotional stability prevents impulsive behavior and promotes careful analysis and strategic timing when choosing investment strategies. By waiting for the right opportunities, patient investors can reduce mistakes that often result from rushing decisions (Sunchu, 2024).

Financial literacy, self-control, patience, and responsibility are interconnected elements that collectively influence individuals' financial well-being and decision-making (Mergler & Shield, 2016; Schnitker et al., 2017). Understanding these connections can enhance individuals' ability to manage their finances and reach their long-term goals more effectively. The dynamic interaction among these concepts may also be shaped by social factors, such as education level and socioeconomic status (Rehman & Mia, 2024). Specifically, access to financial education and resources can greatly improve individuals' financial literacy, promoting self-regulation and responsible financial behaviors. Simultaneously, supportive social environments that emphasize financial responsibility can reinforce these behaviors by highlighting the importance of patience and rational decision-making. Therefore, removing societal barriers to financial education is essential for spreading financial literacy and making responsible financial behavior a cultural norm (Allom et al., 2018; Bai, 2023; Boto-García et al., 2022; Strömbäck et al., 2017). This step is fundamental for sustaining both individual and collective well-being.ing.

1.4. Research gap and contribution

Although research on financial literacy has increased significantly over the past twenty years, several important gaps still exist. Existing reviews indicate that most empirical studies focus on adults or older teenagers and prioritize cognitive outcomes such as financial knowledge and numeracy over the psychological processes that translate these skills into everyday financial actions (Amagir et al., 2018; Kaiser & Menkhoff, 2017; Lusardi & Mitchell, 2014). School-based programs can boost children's and adolescents' financial knowledge and, to some degree, their attitudes, but there remains substantial variation in their effectiveness and ongoing inequalities in financial skills (Amagir et al., 2018; Atkinson & Messy, 2012; OECD, 2020). Early adolescence is especially underrepresented, even though this developmental stage is crucial for building self-control, time preferences, and money-related values that influence future financial behavior (Andreoni et al., 2019; Moffitt et al., 2011).

Within this broader body of literature, research on adolescent financial literacy in non-Western and lower- or middle-income contexts remains relatively limited. Comparative policy reports and international assessments show that many adolescents lack essential financial skills and are not adequately prepared for increasingly complex digital financial environments (Atkinson & Messy, 2012;Lusardi & Mitchell, 2014; OECD, 2020). These gaps tend to be more pronounced among students from socioeconomically disadvantaged backgrounds and in education systems where financial literacy is not systematically integrated into the curriculum (Lusardi & Mitchell, 2014; OECD, 2020). In Turkey, policy initiatives have started to emphasize financial literacy, but empirical studies focusing on middle school students remain scarce and are primarily descriptive, highlighting modest or inadequate levels of financial literacy and calling for more theory-based research on the psychological processes that underpin responsible financial behavior in this context (Atkinson & Messy, 2012; OECD, 2020). By focusing on early adolescents in Turkey and employing a multidimensional measure of financial literacy, the present study aims to fill this contextual and developmental gap.

A second gap concerns the limited focus on endogenous

psychological mechanisms linking general self-regulation to specific financial literacy components. A substantial body of research shows that self-control is a strong predictor of saving, budgeting, debt management, and overall financial well-being (Moffitt et al., 2011; Strömbäck et al., 2017). Childhood self-control predicts adult wealth, credit issues, and financial security even after accounting for intelligence and family background (Fergusson et al., 2013; Moffitt et al., 2011). However, most studies treat self-control as a direct cause of financial outcomes and rarely investigate how certain character strengths shape this general capacity into specific areas of financial literacy, such as mindful consumption, savings and future planning, or the meaning of money. As a result, the literature still lacks comprehensive models that explain which self-regulatory traits are most relevant to different aspects of financial literacy in early adolescence (Lusardi & Mitchell, 2014; Strömbäck et al., 2017).

In this context, patience and responsibility are theoretically important yet insufficiently defined constructs. Patience reflects adolescents' time preferences and willingness to delay gratification, which have been linked to educational achievement, health, and economic outcomes later in life (Andreoni et al., 2019; Moffitt et al., 2011). Responsibility, on the other hand, involves internalizing social and moral obligations, accepting the consequences of one's actions, and maintaining long-term commitments to oneself and others (Peterson & Seligman, 2004). Both constructs are closely related to self-control but are not identical: patience emphasizes the temporal dimension of intertemporal choice, while responsibility highlights the normative dimension that links financial decisions to duties toward family, community, and future generations. Research on character strengths suggests that traits like responsibility, persistence, and self-regulation are associated with prosocial behavior, academic success, and adaptive coping during adolescence (Morris et al., 2024; Park et al., 2004). However, to our knowledge, no study has examined patience and responsibility as concurrent mediators that jointly explain how self-control relates to multiple components of adolescent financial literacy.

A third gap concerns how the meaning of money is understood in adolescent financial literacy research. A long-standing tradition in psychology holds that money is not just an economic tool but also a complex psychological concept encompassing emotional, symbolic, and behavioral meanings (Mitchell & Mickel, 1999; Tang, 1992; Yamauchi & Templer, 1982). Studies on money attitudes indicate that aspects such as power and prestige, retention and time, distrust, and anxiety are linked to spending, saving, and personal financial well-being (Roberts & Jones, 2001; Yamauchi & Templer, 1982). Research with teenagers suggests that they develop money meanings that reflect the symbolic, emotional, and practical aspects of financial life, and that these meanings can shift in response to macroeconomic or currency changes (Kõiv, 2012). Nevertheless, most adolescent financial literacy studies measure financial literacy through knowledge tests or behavioral indicators without explicitly treating money meanings as a separate psychological outcome (Amagir et al., 2018; Lusardi & Mitchell, 2014). Research that treats money as its own construct in middle school samples is uncommon, and evidence of how self-regulatory traits relate to this construct remains limited.

The connections between financial literacy education and the Sustainable Development Goals (SDGs) are often highlighted in policy documents, but are not sufficiently explained in terms of individual psychological processes. Financial literacy is widely accepted as an essential skill for achieving SDG 1 (No Poverty), SDG 4 (Quality Education, including Target 4.4 on skills for financial success), SDG 5 (Gender Equality), SDG 10 (Reduced Inequalities), and SDG 12 (Responsible Consumption and Production) (Lusardi & Mitchell, 2014; OECD, 2020). International reports emphasize that enhancing financial literacy and inclusion is vital for developing resilient, fair, and environmentally conscious economies, especially amid rising debt and increasing social inequalities (Atkinson & Messy, 2012). Yet empirical research rarely links these broad national goals with individual-level mechanisms, such as adolescents' self-control, patience, and sense of responsibility, or with specific actions, such as mindful consumption and future-focused saving.

The present study addresses these gaps in multiple ways. First, it focuses on early adolescents in Turkey, a group and context that are underrepresented in the financial literacy literature, and examines their financial literacy using a multidimensional measure that captures conscious consumption, savings, future planning, and the meaning of money. Second, it advances theory on self-regulation and financial literacy by conceptualizing patience and responsibility as complementary character strengths that define the temporal and normative pathways linking general self-control to financial literacy components (Andreoni et al., 2019; Peterson & Seligman, 2004). By modeling these traits as parallel mediators, the study tests whether and how they jointly explain the associations between self-control and adolescents' financial literacy, and whether their relative contributions differ across financial literacy dimensions (Moffitt et al., 2011; Strömbäck et al., 2017). Third, by considering the meaning of money as a separate psychological concept, the study adds to the existing research on money attitudes and meanings in adolescence and clarifies how self-control, patience, and responsibility relate to adolescents' personal understanding of money (Mitchell & Mickel, 1999;Roberts & Jones, 2001; Yamauchi & Templer, 1982). Fourth, by linking conscious consumption, savings, and future planning, and money meanings to responsible resource use and long-term financial well-being, the study connects financial literacy with the SDG agenda and supports educational strategies that combine financial education with character development to foster sustainable economic and social outcomes (Atkinson & Messy, 2012; Lusardi & Mitchell, 2014; OECD, 2020).

In addition, the present study conceptualizes the "*meaning of money*" as a psychological construct rather than a purely cognitive or behavioral indicator. Research on money attitudes has long demonstrated that money carries affective, symbolic, and behavioral meanings, and that these meanings are associated with spending, saving, indebtedness, and subjective financial well-being (Mitchell & Mickel, 1999; Roberts & Jones, 2001; Tang, 1992; Yamauchi & Templer, 1982). Influential models distinguish dimensions such as power and prestige, retention and time, distrust, and anxiety, which capture how individuals use money to regulate emotions, express identity, and structure social relationships (Roberts & Jones, 2001; Yamauchi & Templer, 1982). Studies with adolescents further suggest that young people construct money meanings that reflect symbolic, emotional, and functional aspects of financial life, and that these meanings can shift in response to macroeconomic changes (Kõiv, 2012). Building on this tradition, the meaning of the money dimension in the present study refers to adolescents' tendency to view money as a resource that should be used carefully and responsibly, and to recognize its potential consequences for their own and others' lives. Investigating how self-control, patience, and responsibility relate to this construct can therefore deepen our understanding of the psychological foundations of financial literacy in early adolescence.

1.5. Current study

- Building on the theoretical foundation and existing literature outlined previously, this study seeks to address the following hypotheses:
- RQ: How and in what direction are there relationships between the research variables?
-

Hypothesis 1(H1): Responsibility and patience, as parallel mediators, mediate the relationship between self-control and "conscious consumption".

-

Hypothesis 2(H2): Responsibility and patience, as parallel mediators, mediate the relationship between self-control and "savings and future planning."

- Hypothesis 3(H3): Responsibility and patience, as parallel mediators, mediate the relationship between self-control and the "meaning of money".

2. Method

This study used a correlational design with mediator variables. It examines six variables: conscious consumption (COC), savings and future planning (SFP), and the meaning of money (MoM), as predicted; responsibility (RES) and patience (PAT) as mediators; and self-control (SLC) as a predictor.

2.1. Participants and procedure

The study was conducted in Gaziantep Province, located in southern Turkey. 663 middle school students (girls = 347, 52.3 %; boys = 316, 47.7 %) aged 10–14 years ($mean_{(age)} = 11.79$, SD = 1.40) participated in this study. The students were studying in grades five (28.2 %), six (23.1 %), seven (27.3 %), and eight (21.4 %) in the 2024–2025 academic year. A power analysis was conducted to assess the adequacy of the sample size. According to this sensitivity analysis, at the $\alpha = 0.05$ level, the study can detect even small effects of approximately $|r| \approx 0.11$ with 80 % power, and small-to-medium indirect effects can also be detected with sufficient statistical power (Cohen, 1988; Faul et al., 2009; Fritz & MacKinnon, 2007). These findings indicate that the statistical power is adequate to examine the relationships between self-control, patience, responsibility, and financial literacy. The researchers collected face-to-face data from randomly selected students at three public middle schools with varying socioeconomic levels (e.g., the general income level of the area where the school is located, students' socioeconomic profiles, etc.) after obtaining the necessary permissions (Ethics committee approval and research implementation approval). Researchers did not intervene in the selection of research schools. Within the framework of the research application permit, the schools were determined by the Gaziantep Provincial Directorate of National Education. The researchers selected the schools by considering the balance among rural, suburban, and city centre settings. Afterwards, the application was carried out in the classes deemed appropriate by the school administrators without any difficulties. Necessary explanations were made, and students were asked to sign the consent form in the questionnaire. Participation in the study was voluntary and anonymous.

2.2. Instruments

The Brief Self-Control Scale, Financial Literacy Scale, Responsibility Scale, Patience Scale, and Personal Information Form were used to collect the data. The Personal Information Form included the students' age, gender, and grade level. For reliability, Cronbach's alpha (α) internal consistency was calculated. An α value between 0.60 and 0.70 indicates acceptable reliability (Hulin et al., 2001). Confirmatory Factor Analysis (CFA) was performed to test the validity of the scales. The fit indices (RMSEA [≤ 0.08], SRMR [≤ 0.08], CFI [≥ 0.90], TLI [≥ 0.90]) are expected to be at least acceptable (Kline, 2015).

2.2.1. Brief self-control scale

The Brief Self-Control Scale (Tangney et al., 2004; Turkish adaptation = Author et al., in press) was used to measure students' self-control levels. The scale consists of 9 items in a single factor (Sample item: "Sometimes I cannot stop myself from doing what I love, even if I know it is wrong"). Scale items were scored on a five-point Likert scale (1: Not at all suitable for me, 5: Very suitable for me). All scale items were reverse-coded; high scores indicate high self-control. CFA confirmed the original one-factor structure of the scale, and the fit indices were acceptable: RMSEA = 0.053, SRMR = 0.034, CFI = 0.938, TLI = 0.915. The α was calculated as 0.730.

2.2.2. Financial literacy scale

The Financial Literacy Scale (Üztemur et al., 2025) was used to assess students' financial literacy. The scale consists of 18 items in three factors (Conscious consumption [seven items]: I know that I cannot buy everything I want); savings and future planning [seven items] = It is important to save money to buy the things I want); the meaning of money [four items] = "Money is important, and I realize I should spend it carefully." Scale items were scored on a five-point Likert scale (1: Strongly Disagree, 5: Strongly Agree). High scores are interpreted as a high level of financial literacy. CFA confirmed the original three-factor structure of the scale, and the fit indices were acceptable: RMSEA = 0.047, SRMR = 0.040, CFI = 0.930, TLI = 0.919. The α were 0.763, 0.765, and 0.707, respectively.

2.2.3. Responsibility scale

The Responsibility Scale (Gökalp, 2021a), developed for middle school students, was used to measure students' level of responsibility. The scale consists of one factor and seven items (Sample item: I bear the consequences when I fail to fulfill my responsibilities). The scale items were scored on a four-point Likert scale (1: Not at all suitable for me, 4: Completely suitable for me). High scores on the scale are interpreted as a high degree of responsibility. The CFA confirmed the original one-factor structure of the scale, and the fit indices were acceptable: RMSEA = 0.039, SRMR = 0.028, CFI = 0.959, TLI = 0.939. The α was calculated as 0.651.

2.2.4. Patience scale

The Patience Scale, developed for middle school students (Gökalp, 2021b), was used to assess patience. The scale consists of a single factor and six items (Sample item: When my parents say they will buy something I like later, I wait by not insisting). The items were scored on a four-point Likert scale (1: Not at all suitable for me, 4: Completely suitable for me). High scores on the scale are interpreted as a high degree of patience. The CFA confirmed the original one-factor structure of the scale, and the fit indices were acceptable: RMSEA = 0.053, SRMR = 0.032, CFI = 0.942, TLI = 0.903. The α was calculated as 0.628.

2.3. Data analysis

For the analyses, the authors carefully transferred the data collected from the students to the Statistical Package for the Social Sciences (SPSS). The analyses were conducted in two stages: preliminary analyses and mediation analyses. For preliminary analyses, the means, standard deviations, skewness, and kurtosis values of the scores obtained from the research variables, as well as the Pearson correlation coefficients between the variables, were calculated using SPSS. One of the assumptions for the Pearson correlation coefficient is that the sample distribution is normal (Wilcox, 2017). Skewness and kurtosis values of ±1.5 indicate that the sample distribution is normal (Kline, 2015). Assuming that the mediating variables do not causally influence one another (Hayes, 2013), the study examined the parallel mediating effects of responsibility and patience between self-control and financial literacy. To assess whether there was a multicollinearity problem among the mediating variables, the Variance Inflation Factor (VIF) values were calculated (responsibility = 1.312; patience = 1.364). The calculated values indicated a generally accepted moderate level of correlation, with $1 < VIF < 5$ (Shrestha, 2020). Jeffrey's Amazing Statistics Programme (JASP) was used for mediation analyses. The significance of the mediation analyses was tested with the 5000-bootstrap bias-corrected

percentile method at 95 % confidence intervals. The indirect effect test is statistically significant if the 95 % confidence interval (Lower - Upper) contains zero (Hayes & Scharkow, 2013).

3. Results

3.1. Preliminary analyses

Table 1 presents descriptive statistics and correlation coefficients. There are statistically significant positive relationships between self-control, responsibility, patience, savings, and future planning, and conscious consumption. However, there is no statistically significant relationship between self-control and the "meaning of money".

3.2. Mediation analyses

Fig. 1 presents the standardized coefficients for the parallel mediation models. Self-control positively predicted responsibility ($b = 0.223$, $z = 4.507$, $p < .001$), and 3 % of the variance in responsibility was explained by self-control ($R^2 = 0.030$). Self-control positively predicted patience ($b = 0.335$, $z = 6.892$, $p < .001$), and 6.7 % of the variance in responsibility was explained by self-control ($R^2 = 0.067$). Responsibility positively predicted conscious consumption ($b = 0.161$, $z = 3.980$, $p < .001$). Patience positively predicted conscious consumption ($b = 0.218$, $z = 3.980$, $p < .001$).

As shown in Table 2, the direct effect (b = 0.250, z = 5.271, p < .001) and total effect (b = 0.359, z = 7.414, p < .001) of self-control on conscious consumption are statistically significant. The indirect effect of self-control on conscious consumption is significant when responsibility serves as the mediator (b = 0.036, SE = 0.012, 95 % CI [0.014, 0.069]). The indirect effect of self-control on conscious consumption is significant when patience serves as the mediator (b = 0.073, SE = 0.017, 95 % CI = [0.037, 0.118]). Additionally, the total indirect confidence interval limits did not include the zero value, and the H1 hypothesis, suggesting that responsibility and patience parallel mediate the relationship between self-control and conscious consumption, was confirmed ($b = 0.109$, $SE = 0.020$, 95 % CI [0.065, 0.160]). Self-control, responsibility, and patience explained 17.7 % of the variance in conscious consumption ($R^2 = 0.177$). It shows that these characteristics (i.e., self-control, responsibility, and patience) have moderate explanatory power for students' conscious consumption behavior.

As shown in Fig. 1, responsibility was positively associated with savings and future planning (b = 0.214, $z = 5.329$, $p < .001$). Patience positively predicted savings and future planning ($b = 0.199$, z = 4.847, $p < .001$).

As shown in Table 2, the direct effect (b = 0.200, z = 4.238, p < .001) and total effect (b = 0.315, z = 6.456, p < .001) of self-control on savings and future planning are statistically significant. The indirect effect of self-control on savings and future planning is significant when responsibility serves as the mediator (b = 0.048, SE = 0.014, 95 % CI = [0.023, 0.083]). The indirect effect of self-control on savings and future planning is significant when patience is the mediator ($b = 0.067$, $SE = 0.017$, 95 % CI [0.034, 0.112]). Also, the total indirect confidence interval limits did not include zero value, and H2 suggests that responsibility and patience have mediated the relationship between self-control and savings and future planning, which was confirmed ($b = 0.115$, $SE = 0.021$, 95 % CI [0.069, 0.168]). Self-control, responsibility, and patience explained 17.9 % of the variance in savings and future planning ($R^2 = 0.179$). In this context, self-control, responsibility, and patience explain students' financial behaviors in a moderately effective way.

As seen in Fig. 1, responsibility positively predicted the "meaning of money" ($b = 0.173$, $z = 3.976$, $p < .001$). However, the predictive effect of patience on the meaning of money is not statistically significant ($b = 0.043$, z = 0.962, $p = .336$). Similarly, the predictive effect of self-control on the meaning of money is not statistically significant ($b = -0.079$, $z = -1.544$, $p = .123$).

As seen in Table 2, the indirect effect of self-control on the meaning of money is significant when responsibility is the mediator (b = 0.039, SE = 0.013, 95 % CI [0.016, 0.076]), whereas the indirect effect is nonsignificant when patience is the mediator (b = 0.014, SE = 0.015, 95 % CI [−0.017, 0.051]). The total indirect confidence interval did not include zero, and H3, which proposed that responsibility and patience parallel mediate the relationship between self-control and the meaning of money, was therefore supported (b = 0.053, SE = 0.017, 95 % CI [0.020, 0.096]). Self-control, responsibility, and patience together explained 3.8 % of the variance in the meaning of money ($R^2 = 0.038$). This pattern indicates an indirect-only form of mediation in which responsibility, rather than a direct path from self-control, carries most of the explanatory power for adolescents' money meanings, consistent with a suppression-like effect that becomes visible only when responsibility is included in the model (Zhao et al., 2010).

4. Discussion

The present study aimed to illuminate how self-control, patience, and responsibility function collectively to shape early adolescents' financial literacy, including their understanding of the meaning of money. Rather than treating financial literacy as a purely cognitive competence, the findings suggest that it is deeply rooted in character-like dispositions that organise how young people relate to time, obligation, and material resources. In this sense, the results address the theoretical gap identified earlier: while much of the financial literacy literature focuses on what adolescents know and do, less attention has been paid to who they are becoming as financial agents in relational and moral terms (Lusardi & Mitchell, 2014; Shim et al., 2010).

4.1. Self-control, patience, and responsibility as character-based pathways

The robust indirect paths from self-control to conscious consumption, as well as to saving and future planning through patience and responsibility, indicate that self-control operates as a higher-order regulatory resource channelled through more domain-specific virtues.

Table 1
Descriptive statistics and correlations ($N = 663$).

	M (*SD*)	(1)	(2)	(3)	(4)	(5)	(6)
1. SLC	3.27 (0.77)	–	0.172**	0.259**	0.277**	0.243**	−0.020
2. RES	3.12 (0.49)		–	0.485**	0.300**	0.338**	0.184**
3. PAT	3.04 (0.55)			–	0.346**	0.343**	0.111**
4. COC	4.08 (0.73)				–	0.586**	0.445**
5. SFP	4.07 (0.72)					–	0.412**
6. MoM	4.25 (0.76)						–
Skewness		−0.10	−0.39	−0.38	−0.98	−0.94	−1.12
Kurtosis		−0.34	−0.16	−0.03	0.51	0.85	1.16

Note. ** $p < .001$; *SD* = standard deviation; SLC = self-control; RES = responsibility; PAT = patience; COC = conscious consumption; SFP = savings and future planning; MoM = meaning of money.

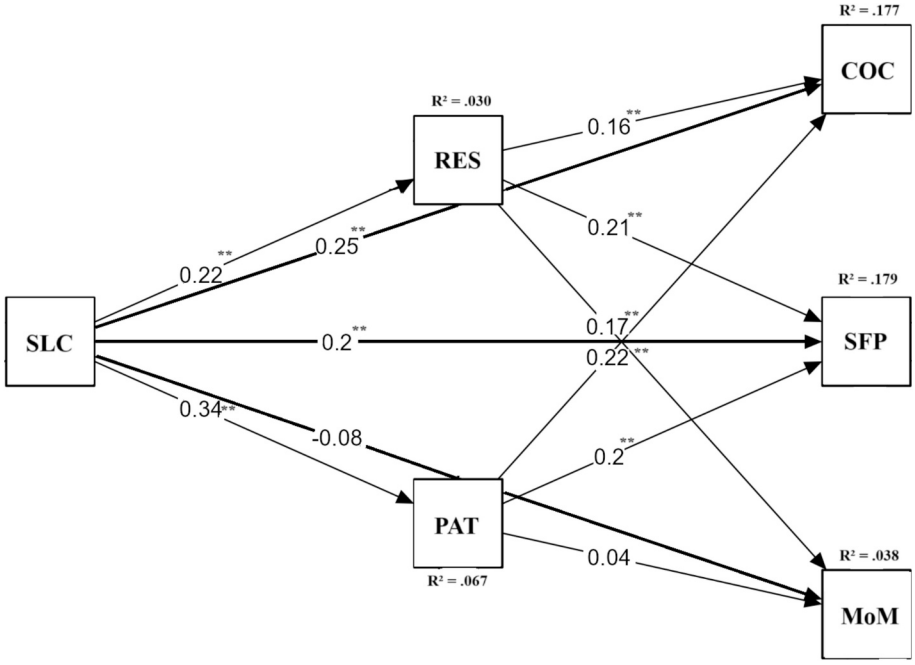


Fig. 1. Path coefficients among variables (N = 663).
Note. ** $p < .001$; SLC = self-control; RES = responsibility; PAT = patience; COC = conscious consumption; SFP = savings and future planning; MoM = meaning of money.

Table 2
Standardized indirect, total indirect, direct and total effects among variables.

										95 % CI	
	Path ways					*b*	*SE*	*z*	*p*	Lower	Upper
Indirect effects	SLC	→	RES	→	COC	0.036	0.012	2.983	0.003	0.014	0.069
	SLC	→	PAT	→	COC	0.073	0.017	4.204	< 0.001	0.037	0.118
	SLC	→	RES	→	SFP	0.048	0.014	3.441	< 0.001	0.023	0.083
	SLC	→	PAT	→	SFP	0.067	0.017	3.965	< 0.001	0.034	0.112
	SLC	→	RES	→	MoM	0.039	0.013	2.982	0.003	0.016	0.076
	SLC	→	PAT	→	MoM	0.014	0.015	0.953	0.341	−0.017	0.051
Total indirect effects	SLC	→	COC			0.109	0.020	5.381	< 0.001	0.065	0.160
	SLC	→	SFP			0.115	0.021	5.358	< 0.001	0.069	0.168
	SLC	→	MoM			0.053	0.017	3.187	0.001	0.020	0.096
Direct effects	SLC	→	COC			0.250	0.047	5.271	< 0.001	0.149	0.353
	SLC	→	SFP			0.200	0.047	4.238	< 0.001	0.105	0.298
	SLC	→	MoM			−0.079	0.051	−1.544	0.123	−0.183	0.020
Total effects	SLC	→	COC			0.359	0.048	7.414	< 0.001	0.255	0.461
	SLC	→	SFP			0.315	0.049	6.456	< 0.001	0.217	0.418
	SLC	→	MoM			-0.026	0.050	−0.515	0.606	−0.124	0.070

Note. CI = Confidence Interval; *SE* = Standard Error; SLC = self-control; RES = responsibility; PAT = patience; COC = conscious consumption; SFP = savings and future planning; MoM = meaning of money.

Longitudinal work has consistently demonstrated that childhood self-control predicts adult financial stability, lower debt, and better socio-economic outcomes (Fergusson et al., 2013; Moffitt et al., 2011). The current results refine this picture by demonstrating that, in early adolescence, this global capacity is not translated directly into financially prudent behavior, but rather through dispositions to wait, plan, and honor obligations.

From a character education perspective, this holds significant theoretical weight. Patience and responsibility are often conceptualized as "practical" or "civic" virtues that connect inner regulation with external expectations and social roles (Arthur et al., 2017; Jubilee Centre for Character and Virtues, 2017). In the proposed model, adolescents with higher self-control appear better equipped to cultivate patience in postponing consumption and to assume responsibility for the consequences of their financial decisions. These two virtues, in turn, serve as the immediate mechanisms through which financial literacy manifests in everyday practices such as comparing prices, resisting impulsive spending, and allocating pocket money for future goals. Stated differently, self-control furnishes the psychological energy, while patience and responsibility provide the normative direction.

The strong mediating role of responsibility is particularly noteworthy. Responsibility, by definition, involves taking others' perspectives, acknowledging long-term consequences, and aligning behavior with shared norms and duties. For early adolescents in Turkey, this often includes contributing to family needs, avoiding wastefulness, and staying attuned to how one's spending reflects on the family's reputation. These culturally embedded expectations may explain why responsibility emerged as a potent mediator, surpassing patience alone. Theoretically, this supports approaches that conceptualize financial literacy as a relational and moral practice rather than a purely individual skill set (Atkinson & Messy, 2012; OECD, 2023).

4.2. Understanding the meaning of money: mediation without a direct effect

The most counterintuitive pattern in the model concerned the "meaning of money" dimension. The direct paths from self-control to the meaning of money were not statistically significant, whereas the indirect path through responsibility was significant despite a small total effect. At first glance, this appears paradoxical. If adolescents with high self-control do not differ from their peers in their views of money, the question arises as to why responsibility still exerts a meaningful indirect effect.

The literature on money attitudes helps to clarify this pattern. Decades of research have established that money is not only an economic resource but also a symbolic carrier of power, security, autonomy, achievement, and relational meaning (Furnham, 1984; Furnham et al., 2012; Lay & Furnham, 2019). Adolescent money attitudes, in particular, are shaped by entitlement beliefs, conscientiousness, and internalized family norms rather than by isolated cognitive traits (Beutler & Gudmunson, 2012; Fenton-O'Creevy & Furnham, 2022). The observations made here align with this perspective. In early adolescence, self-control per se may not be sufficient to alter how money is construed at a deep symbolic level. What appears to matter is whether self-control is embedded in a sense of responsibility that frames money as something to be handled carefully, fairly, and with concern for others' needs.

From the perspective of mediation analysis, this pattern can be understood as a case of "indirect-only mediation" or potentially partial suppression, where the mediator carries the theoretically meaningful effect even in the absence of a significant direct path (Hayes, 2018; Shrout & Bolger, 2002; Zhao et al., 2010). Adolescents with higher self-control might develop more critical or ambivalent attitudes toward money, which may cancel out simple positive associations at the zero-order level. Once responsibility is considered, however, the segment of self-control channelled into responsible role-taking becomes visible as a positive predictor of a more reflective and values-based understanding of money. In other words, responsibility acts as a compensatory filter, transforming general impulse regulation into a particular stance toward money that emphasizes obligation, fairness, and long-term consequences.

Philosophically, this suggests that the psychological meaning of money is not simply a direct extension of self-control. Money is a complex symbol that represents both temptation and duty, as well as personal autonomy and interdependence (Furnham, 1984; Lea & Webley, 2006). The results show that adolescents who see themselves as responsible are more likely to view money as a duty, considering it a resource to manage rather than to spend. Self-control is important to the degree that it supports this responsible attitude, rather than being a direct cause of how money is understood.

4.3. Contextualizing early adolescents in Turkey

The age group and context of the current sample are theoretically important. Early adolescence is a developmental stage when abstract reasoning, time understanding, and social comparison skills become more advanced, yet financial independence remains limited (Crone & Dahl, 2012). In Turkey, as in many emerging economies, young people often witness economic instability, inflation, and unequal opportunities firsthand, while family structures and school practices still influence their personal financial experiences. This situation may heighten the sense of responsibility. Adolescents are not just learning how to handle "their" money but are also gradually realizing that their small decisions reflect larger family and societal vulnerabilities. The findings suggest that cultivating patience and responsibility in this context is not merely a matter of individual self-discipline. It represents a way of helping young people position themselves ethically in relation to material constraints and future uncertainties. The fact that self-control affects financial literacy primarily through these virtues indicates that programmes that teach only budgeting techniques or financial facts, without engaging with questions of character and social justice, risk remaining superficial (Fernandes et al., 2014; Lusardi & Mitchell, 2014).

4.4. Implications for the sustainable development goals (SDGs)

Motivation for this enquiry also stemmed from the 2030 Agenda for Sustainable Development, which emphasizes eradicating poverty (SDG 1), ensuring quality education (SDG 4), and promoting responsible consumption and production (SDG 12) (United Nations, 2015). The results facilitate a more nuanced articulation of how micro-level psychological mechanisms in early adolescence are linked to these macro-level goals.

First, the mediation of financial literacy through patience and responsibility offers a concrete account of how SDG 4 can contribute to SDG 1. Education that strengthens self-control, patience, and responsibility in financial contexts equips young people with dispositions that help break intergenerational cycles of over-indebtedness, vulnerability to informal credit, and susceptibility to financial scams (Lusardi & Mitchell, 2014; OECD, 2023). In this sense, financial literacy is not a luxury add-on to the curriculum, but a form of human capital that directly underpins poverty reduction.

Second, the prominent role of responsibility suggests that financial education aligned with SDG 4 should be understood as character education that integrates knowledge, skills, and virtues. The literature on education and the SDGs stresses that education is most transformative when it fosters agency and ethical commitment, rather than merely the transmission of information (Vladimirova & Le Blanc, 2016). These results resonate with this view. Adolescents who are not only financially informed but also patient and responsible are better positioned to act as "mini citizens" capable of navigating complex financial products, resisting predatory marketing, and advocating for fairer economic practices.

Third, the meaning of money in this context is directly relevant to SDG 12. Responsible consumption involves not only what individuals purchase but also how they understand value, sufficiency, and waste. If teenagers start to see money as a resource that carries moral responsibilities toward others and the environment, they are more likely to question impulsive, status-driven buying and support sustainable choices, even when these offer less immediate gratification (European Commission, 2023; OECD, 2023). The finding that responsibility mediates the relationship between self-control and the meaning of money shows that financial education can help achieve SDG 12 by changing how young people think about money, beyond just teaching them about financial products.

Taken together, these implications bolster a broader theoretical claim. Financial literacy should be viewed as a multi-dimensional skill that is equally cognitive, behavioral, and ethical. Self-control, patience, and responsibility are not just "background variables" to be controlled but core parts of what it means to be financially literate in a world facing inequality, ecological limits, and systemic risk. The present study offers empirical support for such a virtue-based framework and shows that even among early adolescents with limited economic power, the foundations of sustainable financial citizenship are already being laid.

4.5. Limitations and implications for future research

Several limitations of the present study warrant consideration when interpreting the results. First, the cross-sectional design restricts the ability to draw causal inferences. Although self-control was modeled as an antecedent influencing financial literacy through patience and responsibility, this temporal ordering relies on theoretical assumptions rather than empirical demonstration. Mediation analysis in cross-sectional data quantifies statistical patterns but cannot capture causal processes as they unfold over time (Hayes, 2018; Shrout & Bolger, 2002; Zhao et al., 2010). Consequently, it remains plausible that adolescents

who already exhibit financial literacy gradually develop stronger self-control, patience and responsibility, or that these relations are mutually reinforcing.

Second, the findings are bounded by the specific cultural and socio-economic context of early adolescents in Turkey. The meaning of money, obligations toward family and consumption expectations are inevitably shaped by local economic volatility, religious traditions and family structures. In this environment, avoiding waste often carries moral and relational weight that transcends individual prudence. Therefore, the results should be viewed not as universal laws of early adolescence but as context-sensitive patterns. These dynamics may manifest differently in nations with more generous welfare systems, more individualized family cultures or varying levels of financial inclusion (Atkinson & Messy, 2012; Lusardi & Mitchell, 2014).

Third, reliance on self-report instruments introduces potential biases related to social desirability and the limits of introspection. Adolescents may overstate their responsibility or conscious consumption to align with perceived adult expectations, particularly within a school setting. Furthermore, the assessment of financial literacy focused on conscious consumption, saving, and the meaning of money, without incorporating objective tests of financial knowledge or behavioral indicators such as actual savings records or observed consumer choices (Fernandes et al., 2014; Lusardi & Mitchell, 2014). Thus, the data capture how adolescents understand and represent their financial habits rather than how they necessarily behave under real-world market pressures.

A specific methodological constraint concerns the internal consistency of the Responsibility and Patience scales, which approached the lower acceptability bounds. This pattern suggests potential measurement error and warrants caution in interpreting the observed effects. Given that modest reliability tends to attenuate relationships between constructs (Crocker & Algina, 2008; Raykov, 2007), the true associations between responsibility, patience, and financial literacy may be somewhat stronger than the estimates reported here.

Fourth, the psychological scope of the study was intentionally narrow, concentrating on three character traits and three dimensions of financial literacy. Other individual differences known to shape financial decisions, such as risk attitudes, materialism, moral identity, future time perspective, or numeracy, were not included (Beutler & Gudmunson, 2012; Fenton-O'Creevy & Furnham, 2022). Similarly, structural variables like family income, parental debt, or exposure to financial stress were not incorporated. Viewing financial literacy primarily through the lens of character may inadvertently understate the structural constraints and institutional arrangements that enable or limit practical financial responsibility.

Finally, the integration of the Sustainable Development Goals (SDGs) remained theoretical rather than empirical. While it was argued that self-control, patience, and responsibility have implications for SDG 1, SDG 4, and SDG 12, no specific SDG-related outcomes—such as poverty trajectories or concrete sustainable consumption behaviors—were measured. As the SDGs are multi-scalar political commitments and the data analyzed here are individual-level psychological measures, the proposed links should be interpreted as normatively attractive hypotheses for future inquiry rather than demonstrated impacts.

These limitations point toward a richer research agenda that treats financial literacy as a convergence of psychological processes, moral commitments, and structural conditions. First, longitudinal and intervention-based designs are needed to trace how self-control, patience, and responsibility co-evolve with financial literacy. Tracking cohorts across educational transitions would help clarify whether character strengths precede, follow, or develop alongside changes in financial knowledge and behavior (Fergusson et al., 2013; Moffitt et al., 2011). Experimental work embedding virtue-focused activities within financial education programs could test whether fostering patience and responsibility yields benefits beyond those of information-centric curricula (Fernandes et al., 2014; Lusardi & Mitchell, 2014). If financial literacy is indeed a character-infused capability, interventions must be evaluated not only on short-term test scores but also on long-term shifts in habits and financial narratives.

Second, future scholarship should employ multi-method and multi-informant approaches to transcend self-reports. Behavioral tasks involving delay discounting, saving simulations or purchasing decisions could complement self-ratings. Reports from parents and teachers would offer alternative vantage points on adolescents' responsibility and real-world money management. Qualitative and participatory methods, inviting adolescents to narrate their financial dilemmas, could uncover layers of meaning—such as ambivalence, shame or pride—that standard scales often miss (Furnham, 1984; Furnham et al., 2012). Such approaches would help validate constructs and refine the “meaning of money” dimension in culturally sensitive ways.

Third, adolescent financial literacy must be situated more explicitly within relational and structural ecologies. Parents, peers, media and financial institutions jointly shape the opportunities and constraints surrounding young people. Multi-level models integrating family income, school climate and national policy indicators could elucidate how virtues like patience and responsibility operate across different contexts (Atkinson & Messy, 2012; OECD, 2023). This would prevent an overly individualistic reading of the findings, ensuring that adolescents are not implicitly held responsible for outcomes conditioned by factors beyond their control.

Fourth, the link to the SDGs invites both normative and empirical work. Researchers could examine how adolescents understand concepts like poverty and responsible consumption, and whether their financial values align with global policy discourses. Tensions between the encouragement of personal prudence and structural realities—such as precarious labor markets and aggressive marketing—merit exploration. The question is not merely whether financial literacy promotes SDG targets, but whose vision of a “good financial citizen” is being enacted (Vladimirova & Le Blanc, 2016).

Financial literacy research would benefit from deeper engagement with moral and political philosophy. Concepts like responsibility and sufficiency are not value-neutral; they are embedded in contested ideas about justice and the good life. Future studies could draw on capability theory or care ethics to ask what forms of financial agency should be cultivated and how they relate to social and environmental justice. In this light, the present study represents an initial step toward a virtue-based framework, reminding us that early adolescents are learning to navigate a world marked by uncertainty, in which financial education must honor complexity rather than reduce it to isolated skills.

5. Conclusion

This study showed that early adolescents' financial literacy is shaped not only by what they know about money, but also by who they are becoming as financial agents, with self-control influencing conscious consumption, saving and future planning primarily through the character dispositions of patience and, in particular, responsibility, and with the meaning of money being linked to self-control only insofar as self-control is embedded in a responsible stance toward resources and others. These findings suggest that financial literacy in lower secondary education should be conceived as a character infused capability rather than a purely cognitive skill set, and that effective programmes in contexts such as Turkey need to combine financial knowledge with systematic opportunities for students to practise waiting, planning and taking responsibility in real or realistic financial dilemmas, thereby contributing not only to individual financial well-being but also to the broader aims of poverty reduction, quality education and responsible consumption articulated in the Sustainable Development Goals.

CRediT authorship contribution statement

Ali Gökalp: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Methodology,

Investigation, Formal analysis, Data curation, Conceptualization. **Servet Üztemur:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Tuba Çengelci Köse:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Informed consent

All procedures followed were by the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants for being included in the study.

Consent for publication

Not applicable.

Ethical considerations

This research was approved by the Anadolu University Ethics Committee's Social and Human Sciences Ethics Committee's decision, No. 813213, dated 15/11/2024.

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Declaration of competing interest

The authors declare that they have no conflict of interest.

Data availability

The original form and data of this study are available from the corresponding author upon reasonable request.

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