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The Link between Family Financial Socialization in Adulthood and Investment Literacy of P2P Investors

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Abstract
This paper examines how family financial socialization in adulthood is linked to the development of investment literacy among individual family members within the context of innovative financial services, specifically peer-to-peer (P2P) lending. Our findings revealed that P2P lending investors engage in a moderate level family financial socialization suggesting that family, as a key financial socialization agent in childhood and adolescence, maintains its role in adulthood. Additionally, such investors possess a high-level investment knowledge, skills, and attitudes. Explicit family financial socialization has a significant and positive effect on the individuals' investment knowledge, skills, and attitudes, while the effect of implicit financial socialization is significant but negative for knowledge and attitudes. Such findings suggest that family discussion among adult members result in higher, while observations of family members' investment behavior led to lower investment literacy. Our study found no significant moderating effect of the strength of social ties indicating that dynamics of family relations neither strengthen nor weaken proximal socialization outcomes. The analysis of differences across demographic groups unveiled statistically significant distinctions concerning respondents' gender, income, and education. These results provide important insights for stakeholders, underscoring the significant role family socialization in adulthood plays in shaping individuals' investment literacy, particularly of those investing on P2P lending platforms.

Keywords Investment literacy · Family financial socialization in adulthood · Strength of social ties · P2P lending

JEL Classification G41 · G53

Introduction

Family financial socialization is a process through which one family member transmits financial knowledge, attitudes, and behavior to the others within the family setting (Kim et al., 2017). It is primarily built on the family financial socialization theory (Gudmunson & Danes, 2011) incorporating financial attitudes, knowledge, and capabilities referred to as proximal socialization outcomes mediating between family socialization process and distal financial socialization outcomes, such as financial behavior and wellbeing. Family financial socialization, as suggested by Gudmunson and Danes (2011), can take a purposive (also referred to as explicit) approach, having a positive effect through direct learning, discussions, and monitoring of children financial activities (Gibby et al., 2021; LeBaron & Kelley, 2021). For example, Hira et al. (2013) found that a habit of adults to regularly invest from early adulthood was positively affected by their financial discussion with parents during childhood. Also, young adults who in adolescence received direct parental teaching on how to manage their finances were less likely to make late student loan payments or be worried about student loan debt (Fan & Chatterjee, 2019). Alternatively, financial socialization may also exert implicit influence through interactions, emotional attachment, observations, and modeling behaviors within family relationships (Fan et al., 2022; Shim et al., 2010). For example, Gouskova et al. (2010) found that parents' positive investment behavior shapes their children's time preference

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rates and positively affected by their children's investing towards pension planning.

Family is the most commonly explored and influential socialization agent (Danes, 1994; Gudmunson & Danes, 2011; Jorgensen & Savla, 2010) while the other agents (peers, media, formal education, product/service providers) are comparably less studied and demonstrate lower socialization effect than the parents (Cho et al., 2012; LeBaron & Kelley, 2021). Shim et al. (2010) found that parents' impact on learning about money during young adults' childhood and adolescence was „substantially" higher than the combined impact of financial education at high school and work experience. Generally, LeBaron and Kelley (2021) indicated that the effects of school-based financial education programs explain only 0.1% of the variance in young adults' financial behavior, although performance of specific programs could be more promising. Pak et al. (2023) explored the effect of multiple agents on financial wellbeing of young adults in South Korea concluding on a positive effect of parental modeling, a negative effect of formal financial education and no significant effect of peer and media as well as direct parental teaching. Alshebami and Aldhyani (2022) found that peer discussions, their behavior modeling, and social ties with them have a positive and significant impact on individuals' financial literacy and their saving behavior. Legenzova et al. (2023) found that peers' financial socialization had the most substantial and positive impact on financial literacy of adult investors across all socialization channels (discussions, modeling, and lessons). In contrast, the effects of family, media and formal education were also positive but comparably weaker. Legenzova et al. (2023), Pak et al. (2023), and Shim et al. (2015) propose that significance of a family as the key socialization agent may diminish in adulthood, losing its intensity, importance, and impact on socialization outcomes. Yet the limited research on this topic underscores the need for further studies.

Within the family context, majority of studies focus on parent-child socialization and its outcomes (LeBaron & Kelley, 2021) revealing that parents serve as the primary source of children's financial learning and influence their financial behavior (Grohmann et al., 2015). Parents' financial socialization predominantly emphasizes their influence on children's financial socialization during childhood and adolescence and its continuous influence during young adulthood (Cho et al., 2012; Kim & Torquati, 2021). Research in children and adolescent groups (Kagotho et al., 2017; Moreno-Herrero et al., 2018; Sohn et al., 2012) and among students (Gutter & Copur, 2011; Jorgensen & Savla, 2010; Jorgensen et al., 2017; White et al., 2021; Xiao et al., 2014) concluded on the positive influence of parent financial socialization on their children's financial literacy and financial behavior. Cho et al. (2012) demonstrated that financial discussions between parents and children during their childhood had a positive impact on the latter's financial management behavior in adulthood. Kim and Torquati (2019) discovered that college students whose parents openly shared information about their finances demonstrated greater financial responsibility. Conversely, when parents avoided discussing finances with their children, it did not contribute to the development of positive financial attitudes or the acquisition of responsible financial skills. This evidence highlights the crucial role of parental communication about family finances in fostering the acquisition of knowledge and skills related to positive financial attitudes and behaviors in children. Palaci et al. (2017) conducted a study involving middle-aged Spanish individuals and found that their childhood financial socialization with parents was positively and significantly related to financial retirement planning through financial literacy. This suggests an enduring connection between parental influence and responsible financial behavior, even over the extended period. Copur and Gutter (2019) investigated financial discussions carried out during childhood in a sample of university employees (aged 20–64) and found that roughly half of the respondents did not engage in any financial discussion with their parents. For those who had some discussion, it was the range of themes (saving, credit use, budgeting) rather than their content that had a significant positive effect on financial behavior. While previous studies underscore the undeniable influence of parent financial socialization during childhood, it is important to recognize that individuals‘ socialization in adulthood evolves, with them simultaneously assuming roles as initiators and learners in the process (Lutfey & Mortimer, 2003). In adulthood individuals assume more diverse social roles as parents, peers, children. Therefore, they not only learn from their social environment, but also begin teaching themselves.

While family financial socialization continues into adulthood with family members (Curran et al., 2018; Gudmunson et al., 2016; Serido et al., 2015), extending beyond parents and children socializing with each other (Gudmunson & Danes, 2011), research in this area remains limited (Curran et al., 2018; LeBaron & Kelley, 2021). Family socialization in adulthood is explored between romantic partners (Curran et al., 2018; LeBaron et al., 2019; Payne et al., 2014; Serido et al., 2015), siblings and other family members (Copur & Gutter, 2019; Gibby et al., 2021; Hota & Bartsch, 2019; Marchant & Harrison, 2020; Solheim et al., 2011). Yet, similar to research on parent financial socialization, it addresses the continuous effect of socialization extending from childhood to young adulthood. Marchant and Harrison (2020) explored the financial capacity of emerging adults discovering that, in matters related to finance, emerging adults still turn to their parents and are increasingly relying on siblings before seeking advice from anyone else. Solheim et al. (2011) conducted qualitative analysis on emerging adults and found that, along with parents, older siblings and grandparents played a positive and effective role in shaping individuals' practices of saving money. This influence primarily took the form of modeling saving behavior in childhood and continuing it in adulthood. Gibby et al. (2021) surveyed newlyweds to explore the effect of their childhood family financial socialization on their marital financial disagreements and found that childhood financial socialization had a statistically significant and negative effect on spouses' financial disagreements. Serido et al. (2015) explored financial socialization with parents and romantic partners in matters such as budgeting and/or tracking monthly expenses and found evidence that the influence of romantic partners is higher but does not supersede that of the parents. Modelling of romantic partners behavior had indirect (through financial attitudes) and direct positive effect on students' financial behavior while for parents only the direct effect was positive and significant. On the other hand, Curran et al. (2018) found that financial knowledge and behavior of young adults was more affected by financial socialization with the romantic partner than by parental socialization suggesting decreased dependence on parents and higher importance of financial independence and new relationships. This supports Serido et al. (2015) who assert that the influence of the romantic partner does not supersede that of the parents. Instead, it gives a rise to a cognitive process enabling the young adult to select an appropriate behavior fitted to the specific situation. While previous studies support the influence of socialization with extended family on individuals' behavior, further research is needed to comprehensively understand the processes, outcomes, and determinants of such socialization in adulthood.

Research on financial decision making (Zaimovic et al., 2023) and family financial socialization (Curran et al., 2018; Grohmann et al., 2015; Shim et al., 2010) commonly involves financial literacy as one of the key research variables. Remund (2010) categorizes financial literacy into such areas as understanding financial concepts, discussing them competently, making sound financial decisions, managing personal finances effectively, and developing plans for future financial needs. Researchers predominantly apply a multidimensional approach when measuring financial literacy, incorporating key attributes like knowledge, skills, behavior, and attitudes (Atkinson & Messy, 2012; Rai et al., 2019). In our study, we opted to focus on investment literacy as a targeted measure of proximal socialization outcomes. This involves assessing investment knowledge, skills, and attitudes essential for making informed, risk and return-weighted decisions regarding investments in both traditional and innovative financial products. Investment literacy has been measured in previous research, but mostly in relations to traditional investment products. Halim et al. (2021) examined the relationship between the readiness of young adults in Malaysia to participate in the stock market and their investment literacy, revealing that higher investment literacy was associated with an enhanced readiness to participate in stock market. Volpe et al. (2002) explored investing experience, demographic factors, and investment literacy of online investors, finding that investment literacy scores tend to increase with higher education and age among investors. However, they also concluded on the deficiency in the knowledge of investing concepts, indicating a need for improvement in the future. Exploring how retail investors react to a market crashes, Kim, Hanna, & Lee, (2022) found that in times of market downturns investors possessing higher levels of investment literacy are more likely to increase their stock holdings and less likely to sell their holdings. In relation to innovative investment products, Kim, Hanna, & Lee, (2022) concluded that higher objective investment literacy is associated with a negative attitude towards cryptocurrency holdings, while higher subjective investment literacy is positively correlated with holding cryptocurrency. As for peer to peer (P2P) lending market, Ran et al. (2019) found that efficiency of P2P borrowings and investments is positively associated with borrowers' and lenders' investment literacy, while Legenzova et al. (2023) documented that high investment literacy of P2P lending investors was significantly influenced by their interactions with peers.

In this study, the decision to choose investment literacy over financial literacy enables a more precise focus, addressing individuals' investment behavior and the factors shaping it. We also posit that while certain aspects of investment knowledge and attitudes begin developing in childhood and adolescence through family socialization and formal education (Halim et al., 2021; Hira et al., 2013; Gouskova et al., 2010), investment literacy undergoes its most extensive development during adulthood when individuals start actively participating in financial markets. In many countries, including Lithuania where this research was conducted, underage individuals are restricted from making independent investments. Hence, financial socialization in adulthood may be viewed as an efficient mean to gather a substantial flow of information, transform it into investment knowledge, skills, and attitudes and, integrate them into rational investment behavior (Takeda et al., 2013).

Recent systematic literature review (Basha et al., 2021; Gonzalez, 2023) highlights growing body of P2P lending research in multiple direction, such as operational efficiency, default prediction and loan performance analysis, platform design and user experience, secondary market and liquidity dynamics, regulation and legal aspects and the impact on financial inclusion and social welfare. However, there is little known about investor behavior and literacy in P2P platforms and their determinants, especially financial socialization. Sparse prior studies indicate that, besides economic factors and borrower characteristics (Basha et al., 2021; Chen et al., 2016a), P2P lending investors demonstrate bounded rationality behavior (Legenzova & Leckė, 2024), which has been significantly influenced by such factors as investor literacy (Ran et al., 2019) and social relationships between borrowers and lenders (Lin et al., 2009, 2013). Ran et al. (2019) conducted research in one of the largest P2P lending platforms in China and discovered that investors with higher financial literacy earn 1.1% higher returns on P2P platforms than their counterparts. Gonzalez (2023) utilized testimonials on P2P lending platforms to randomly condition financially literate lenders toward either for-profit or pro-social decision-making. The study found that pro-social investors reported higher levels of financial literacy and lower perceived risk in P2P lending. Allen et al. (2018) explored the economic impact of social interactions on individual investing and borrowing decisions on the largest P2P lending platform in the U.S. Their findings indicated that P2P loan demand rises in socially connected areas with significant past P2P borrowing activity, suggesting that social connectivity plays a crucial role in influencing individual economic decisions within the context of P2P lending.

In the context of financial socialization within P2P lending, there is a gap in research concerning family financial socialization in adulthood and its outcomes. Prior research mainly identifies two main types of social networks in an online P2P lending market: group and friendship networks (Chen et al., 2016b; Lin et al., 2013). Lin et al. (2009) found that friendships increased the likelihood of a loan being funded and decreased the interest rate as well as the ex-post default rate on funded loans. Similarly, Lin et al. (2013) found that the friendship networks of borrowers are positively associated with the likelihood of their loans getting funded, and negatively related to the interest rate and default risk on funded loans. Freedman and Jin (2008) utilized US data to investigate the role of informal online social networks in facilitating P2P markets. Their findings indicated that borrowers with social ties on the platform were consistently more likely to secure funding for their loans and receive lower interest rates. However, it was observed that most borrowers with social ties were also more prone to overdue payments or defaults. Herding was also found to be a significant socialization related phenomena in online P2P lending. For example, Vo and Phan (2017) concluded that under information asymmetry situation P2P lending investors will seek collective wisdom (i.e., socialize) increase subjective efficiency of their investment decisions, which may lead to herding behavior.

The aim of the current study is to investigate the relationship between family financial socialization in adulthood and acquisition of investment literacy among extended family members within the context of innovative financial services, specifically P2P lending. This study differs from previous research in several significant ways. Firstly, it seeks to expand the existing evidence on the family financial socialization in adulthood among grown-up extended family members, including romantic partner and/or spouse, parents, and siblings. Secondly, our research specifically assesses investment literacy, rather than general financial literacy, by employing a risk and return tailored, multicriteria measurement approach that incorporates investment knowledge, skills, and attitudes. Moreover, we assert that the current sample of P2P lending investors allows us to distinguish family financial socialization in adulthood and its outcomes from such in respondents' childhood and adolescence. Considering that P2P lending as investment product emerged rather recently (in Lithuania, where the study was conducted, was firstly introduced in 2014), we posit that surveyed individuals were not exposed either to explicit and implicit family socialization or to formal education about P2P lending during the childhood or adolescence. Therefore, their investment literacy on P2P lending predominantly developed in adulthood and financial socialization had to play a significant role in it. In saying so, we also acknowledge that some general investment literacy could be carried over as a result of their socialization in childhood and adolescence. Lastly, our study contributes new evidence on the individual characteristics of P2P lending investors and their determinants, which remains under-researched in the current P2P lending-related studies.

The remaining paper is structured as follows. Firstly, we build a conceptual framework of our research and formulate research hypotheses supporting them with the findings of previous research. The next section is dedicated to research methodology, describing the data, variables, and measurement as well as our analytical strategy. The research design is constructed around four objectives (1) to measure investment knowledge, skills and attitudes of individual P2P investors and their variations across demographic groups; (2) to assess the level and the attributes of family socialization in adulthood as well as explore their variations across demographic groups; (3) using structural equation modelling (SEM) to assess what is the link between family financial socialization in adulthood and investment knowledge, skills and attitudes of individual family members investing in P2P lending; (4) to extend SEM with the multi-group analysis to explore the differences in such link among demographic groups. The results of the research are presented in the third section of the paper following the above-mentioned objectives. The section starts with descriptive statistics for investment literacy and financial socialization, followed by their analysis among demographic groups. Next the findings of the influence of family socialization in adulthood on investment knowledge, skills and attitudes of P2P investors are presented followed by their further analysis among demographic groups. The fourth section discusses the research results and their implications. The paper is closed with conclusions.

Theoretical Background and Conceptual Model

The conceptual model for this study is based on the Family Financial Socialization Theory (FFST; Gudmunson & Danes, 2011). FFST focuses on the link between family socialization processes and its outcomes and has been widely employed within scientific literature (Copur & Guter, 2019; Furrebøe et al., 2023; Jorgensen et al., 2017; Kim & Torquati, 2021; Okamoto et al., 2023; Payne et al., 2014; Vijaykumar, 2022; White et al., 2021). The family socialization process incorporates personal and family characteristics, family interactions and relationships, as well as explicit and implicit financial socialization (Jorgensen & Savla, 2010). Different research perspectives and measurement methods have been employed to approach socialization and evaluate its effects. Some scholars (Copur & Guter, 2019; Gibby et al., 2021; Jorgensen et al., 2017; Miller et al., 2021; Vijaykumar, 2022; Watkins et al., 2024; White et al., 2021) have focused on explicit family socialization, while the others (Gibby et al., 2021; Shim et al., 2015; Vijaykumar, 2022) examined implicit socialization, affirming that family financial interactions can occur both purposefully and intuitively. Other researchers also questioned the significance and strength of family relationships in family socialization process and outcomes (Kim et al., 2011; Kim & Torquati, 2021; Okamoto et al., 2023). In FFST financial socialization outcomes are categorized into proximal outcomes, namely financial knowledge, attitudes, and capabilities and distal outcomes, representing financial behavior and financial well-being. Previous studies have differed in their approaches to evaluating socialization effects. Some authors have focused exclusively on proximal outcomes (Moreno-Herrero et al., 2018) or distal outcomes (Cho et al., 2012; Miller et al., 2021; White et al., 2021), while others have incorporated both types (Copur & Guter, 2019; Curran et al., 2018; Jorgensen et al., 2017; Jorgensen & Savla, 2010; Kagotho et al., 2017; Kim & Torquati, 2021; Okamoto et al., 2023; Shim et al., 2015).

Our conceptual research model (see Fig. 1) combines two main elements of FFST: the family socialization process, represented by explicit and implicit financial socialization and strength of social ties between extended family members, and its proximal outcomes, namely investment knowledge, skills, and attitudes. This study does not cover the effects of financial socialization on the distal outcomes (i.e., financial behavior and financial well-being). For better understanding, demographic factors, such as age, gender, education, income, and affiliation with financial sector, are also brought into this study as control variables. The conceptual research model was tested in an extended family setting on 2 scenarios. Model 1 examined the effect of explicit and implicit financial socialization on investment knowledge, attitudes, and skills without considering any moderating effects. Model 2 integrated the strength of social ties as a moderating effect aiming to determine whether stronger social ties with family members change the direction or the strength of the socialization's impact. During childhood and adolescence, parental influence holds a particular significance if compared to the other explicit sources of education such as schools and peers (Grohman et al., 2015; Shim et al., 2010). However, over time, the comparative influence of parents diminishes as the impact of the other socialization agents, like romantic partners, gains prominence (Curran et al., 2018). In this study the extended family included respondents' romantic partners/spouses, parents, siblings. In adulthood individuals take greater familial social roles, often simultaneously interacting with multiple family members (Curran et al., 2018; Serido et al., 2015), therefore in our model family financial socialization is a combined effort of all extended family members.

Investment Literacy

We define investment literacy as the investors' knowledge and skills of investment and the ability to use this knowledge effectively while making investment decisions. The concept and content of investment literacy was constructed referring to the relevant aspects of financial literacy. Following the multidimensional approach on financial literacy (Hizgilov & Silber, 2020; Ouachani et al., 2021; Remund, 2010), in the current study investment literacy integrates 3 key attributes: investment knowledge (the cognitive dimension), investment skills (the practical dimension) and investment attitudes (the psychological dimensions). Previous multidimensional research of financial literacy (Atkinson & Messy, 2012; Potrich et al., 2016; Rai et al., 2019) also incorporated financial behavior as one of its key attributes. The behavioral aspect (investment behavior) is not included in our conceptual model based on the FFST it where it is treated as a distal socialization outcome. This aspect is not within the scope of this study, yet as discussed by Lusardi and Mitchell (2014), comprehending financial literacy involves individuals' ability to analyze economic information to make

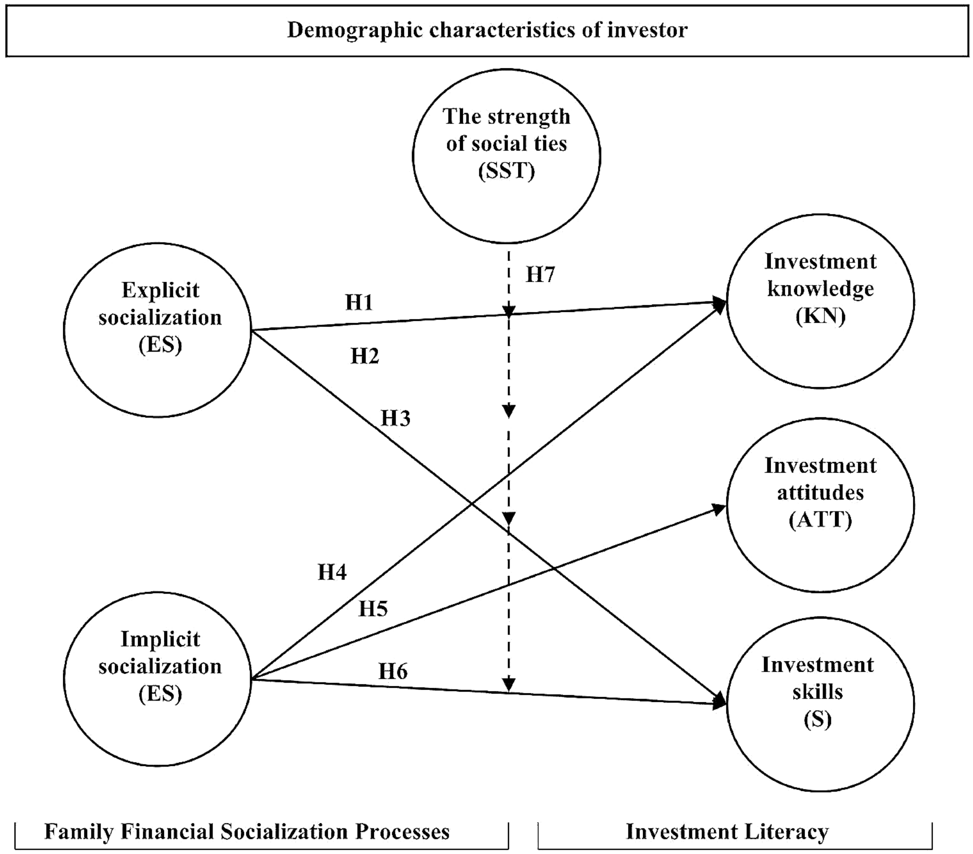

Fig. 1 Conceptual research model

Table 1 Demographic characteristics of the sample ($N=522$)

Profile	Groupe	Frequency	%
Gender	Women	138	26.4
	Men	384	73.6
Age group	18–24	53	10.2
	25–34	224	42.9
	35–44	179	34.3
	45–55	66	12.6
Net monthly income	Less than 1500 euros	233	44.6
	1501–3000 euros	193	37.0
	More than 3001 euros	96	18.4
Education	Professional, secondary	78	14.9
	Bachelor's degree	242	46.4
	Master's, PhD degree	202	38.7
Occupation	Student	29	5.6
	Employee	369	70.7
	Self-employed	112	21.0
	Others (retired, unemployed)	12	2.1
Residence	One of the largest cities in Lithuania (Vilnius, Kaunas)	374	71.6
	Other's cities	97	18.6
	Village	29	5.6
	Abroad	22	4.2
Affiliation with finance sector	Yes	202	38.7
	No	320	61.3

informed decisions concerning financial planning, wealth accumulation, indebtedness, and retirement. Prior research has demonstrated that family financial socialization (Jorgensen & Savla, 2010; Moreno-Herrero et al., 2018; Shim et al., 2015) holds significance as a factor in fostering the development of financial knowledge, attitudes, and skills in childhood and adolescence. The impact that parents have on their children's knowledge, behavior, attitudes, and financial capabilities begins early in life (Drever et al., 2015) and may persist into adulthood (Hira et al., 2013). However, as children mature and establish families of their own, the spouse or romantic partner (Gibby et al., 2021) as well as siblings (Solheim et al., 2011) assume a role in family socialization.

Family Financial Socialization Process

In our model family financial socialization is categorized into explicit and implicit socialization, both of which are investigated in the current study. It also includes extended family interactions and relationships, referred to as the strength of social ties, as a moderating factor.

Explicit family financial socialization involves deliberate conversations and interactions about financial matters between parents and children (Gibby et al., 2021) or, in this study, adult family members. In this study we define *explicit family financial socialization in adulthood* as purposive discussions and direct teaching the adult family members engage in aiming to transfer financial or more particularly investment knowledge, attitudes, and skills to the other family member. This form of socialization has shown a robust and positive impact on individuals' financial knowledge, attitudes, and behaviors (Chowa & Despard, 2014; Jorgensen & Savla, 2010). Curran et al. (2018) provided evidence that explicit family socialization from romantic partner and parents had a positive effect on financial knowledge. Niessen-Ruenzi and Mueden (2023) identified positive association between regular family financial conversations and discussions and higher investment literacy, with the effect being more pronounced for men than women. We expect that the effect of explicit family financial socialization in adulthood will have a positive impact on the proximal socialization outcomes. For this Hypotheses H1, H2, H3 are formulated:

H1 Explicit family financial socialization in adulthood will be positively associated with investment knowledge.

H2 Explicit family financial socialization in adulthood will be positively associated with investment attitudes.

H3 Explicit family financial socialization in adulthood will be positively associated with investment skills.

Implicit family financial socialization, also referred to as financial parenting, encompasses daily family interactions that play crucial role in shaping the financial behavior of their children (Gudmunson & Danes, 2011). The concept of implicit family financial socialization is used to explain how parents exhibit specific financial behaviors to their children without actively aiming to instruct their behavior or skills (Gibby et al., 2021). Research has consistently demonstrated that children often emulate their parents' behavior, including their financial practices (Gibby et al., 2021; LeBaron & Kelley, 2021; Shim et al., 2015). For instance, Gutter et al. (2010) discovered that students who observed their parents practicing prudent financial behaviors were more inclined to budget and save compared to students who did not, even after accounting for family finances and sociodemographic factors. On the other hand, Shim et al. (2010) observed that unhealthy parents' financial behaviors, such as budget overspendings and neglecting to control expenditure, were negatively associated with children's outcomes in emerging adulthood through financial attitudes. Similarly, Solheim et al. (2011) found that parental modelling led to both healthy behaviors (ability to save and efficiently manage money) and unhealthy behaviors (inability to do so efficiently) among young adults. Moreover, the influence of parental financial role modelling on financial behaviors may also manifest indirectly, such as by fostering a positive financial attitude toward such behavior (Shim et al., 2015). Similarly, Kim and Torquati (2019) found the indirect influence of implicit family socialization on college students' financial behaviors through positive effect on financial attitudes towards general money management, debt and credit, insurance, and budgeting. In this study we define *implicit family financial socialization in adulthood* as observations of the actions and attitudes of one adult family member by the other, which potentially leads to new investment attitudes as well as skills and knowledge. It is expected that in the context of investment activities implicit family financial socialization in adulthood will have positive impact on proximal socialization outcomes. To test this, we formulate Hypotheses H4, H5, H6:

H4 Implicit family financial socialization in adulthood will be positively associated with investment knowledge.

H5 Implicit family financial socialization in adulthood will be positively associated with investment attitudes.

H6 Implicit family financial socialization in adulthood will be positively associated with investment skills.

The *strength of social ties*, referred to as family interactions and relationships in the FFST model (Gudmunson & Danes, 2011) or as parental warmth in some other research (see LeBaron & Kelley, 2021 for further discussion), is also an important attribute of family financial socialization in childhood, adolescence, and young adulthood. Based on Gudmunson and Danes (2011), the perceived quality of family relationships, particularly between a parent and a child, correlates with both intentional financial socialization and its financial outcomes. For instance, stronger social ties with parents proved to enhance cash management behavior and mitigate financial anxiety (Kim & Torquati, 2021). In this study we expect that the strength of social ties should strengthen the impact both explicit and implicit family financial socialization has on investment knowledge, skills and attitudes and formulate hypothesis H7:

H7 The strength of social ties will moderate the association between family financial socialization in adulthood and investment literacy.

Research Methodology

Data

The data employed in this research were collected by online survey distributed to the investors of the largest P2P lending platforms in Lithuania (by email and social media). We used a random sampling approach, as all active P2P lending platforms investors had the same probability of being included in the survey sample. Data collection took place between March and October 2022 and a total of 522 valid responses were received from Lithuanian P2P lending investors.

Descriptive statistics of the sample are presented in Table 1. Most of the respondents were men (73.6%), which is a common trend among investors, especially in Lithuania. Although the research questionnaire did not impose any age restrictions, the study sample represented the investors between the ages of 18 and 55 years, with the highest proportion falling in the 25- and 34-years age group (42.9%). 44.6% of the respondents earned net income of less than 1500 euros per month. In comparison, the average net monthly salary in Lithuania at the time of data collection was 1116 euros. Most of the respondents were highly educated, with 46.4% holding a bachelor's degree and 38.7% having a master's or PhD degree. The majority of the respondents (61.3%) had no prior involvement with the finance sector. Three-quarters of them were employed by businesses or public organizations and resided in one of the largest cities in Lithuania.

Variables and Measurement

Dependent Variables

This study applied a multidimensional approach to investment literacy measuring it by three elements: investment knowledge, investment skills and investment attitudes. The questionnaire for investment knowledge was adapted from Lusardi et al. (2014), while the questionnaire for investment attitudes was derived from Keller and Siegrist (2006), Metzger and Fehr (2018), and the questionnaire for investment skills was based on Consumer Financial Protection Bureau (2018). The investment literacy questionnaire is presented in Annex 1. The latent variable of investment knowledge was assessed using five items pertaining to knowledge about investment risk and return (KN1), diversification (KN2), regulation (KN3), volatility (KN4) and default risk of P2P lending (KN5). The latent variable of investment attitudes was also measured using five items that assessed attitudes towards the level of investment risk to grow (ATT1) and to protect assets (ATT2), risk concerning investment horizon (ATT3), safe risk for safe return (ATT4), and the nature of risk in P2P lending investments (ATT5). Finally, the investment skills were measured using five items that assessed skills related to rational investment decisions taking into account investment return and risk (S1), analysis of the impact of interest rates on P2P lending investment risk and return (S2), analysis of the impact of COVID-19 on investment risk and return (S3), management of the risk and return tradeoff in P2P lending (S4), and analysis of available information in P2P lending (S5). Investment knowledge, attitudes, skills items were measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Independent Variables

Explicit Socialization Explicit socialization was assessed as a latent variable by measuring purposive financial discussions with family members - romantic partner/spouse, parents, siblings. The research presumed that both the respondent and extended family members could initiate financial discussions within the family. Respondents were asked if their family engages in discussions on general financial topics (ES1) as well as topics related to traditional financial services (ES2), innovative financial services (ES3), and P2P lending (ES4). Questions were adapted from Gibby et al. (2021) and Miller et al. (2021).

Implicit Socialization Implicit socialization was measured adapting questions from Vijaykumar (2022). This latent variable assessed the respondents' observations of the actions and attitudes by the other extended family members in regard to: investment in traditional investment instruments (IS1), rational decision-making (IS2), investment in innovative financial products, such as cryptocurrency and blockchain based products, crowdfunding (IS3), and investment in P2P lending (IS4). Explicit and implicit socialization items were measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A full list of questions for both explicit and implicit socialization is presented in Annex 1.

Moderating Variable

The study included the moderating effect of the strength of social ties variable aiming to determine whether stronger social ties with extended family members altered the direction or strengthened/weakened the effect of explicit and implicit family socialization on the investment knowledge, attitudes, and skills. Prior studies found that in adulthood parents' financial socialization is extended to romantic partner/spouse, siblings, and other members of extended family (Curran et al., 2018; Gibby et al., 2021; Serido et al., 2015). In our study two exploratory questions were asked to ascertain whether respondents engaged in investments related explicit and implicit financial socialization in adulthood with their romantic partner/spouse, siblings, and parents. Respondents were asked to state their position towards two statements: "I discuss financial and investment topics with the following family members (romantic partner/spouse, mother, father, siblings); "I observe investment practices of the (romantic partner/spouse, mum, dad, siblings). Both statements were measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

If participants reported no socialization with a specific extended family member, their social ties with that member were excluded from our Model 2.

The latent variable of the strength of social ties with family members assessed respondent's relationship with romantic partner/spouse (ST1), mother (ST2), father (ST3), and siblings (ST4). To manage the complexity of survey questionnaire, respondents, while answering explicit and implicit socialization questions, were tasked with providing their overall evaluation of family socialization in adulthood (not with specific extended family members). Consequently, the latent variable, the strength of social ties, was constructed to incorporate social ties with all extended family members. The strength of social ties with a family member was measured using a 5-point Likert scale, ranging from 1 (very week) to 5 (very strong) and non-relevant if family members did not exist.

Demographics

Financial socialization and financial literacy related research commonly incorporate individual and family characteristics to examine how financial socialization process and its outcomes differ by demographic characteristics (LeBaron & Kelley, 2021; Serido et al., 2015). As discussed by LeBaron and Kelley (2021) existing research on financial socialization most often involves gender variables leading to mixed results. The other common demographic characteristics represent race and socioeconomic status. Systematic literature review by Zaimovic et al. (2023) identified more than 20 determinants of financial literacy, education and gender being the most common fields of interest. Demographic variables incorporated into this study are gender, age group, monthly net income, education, occupation, residence, and affiliation with the financial sector. They were all analyzed in previous research. Additionally, based on Bertocchi et al. (2014), the variable of affiliation with the financial sector was also included to assess whether working or studying in the financial sector could impact the research variables and their relationship. The inclusion of demographic variables in the study aimed to offer further explanations of the effect of family financial socialization in adulthood on investment knowledge, attitudes, skills in relation to different demographic characteristics. Gender and affiliation with the finance sector were coded as dichotomous variables (1 = women, 2 = men; 1 = no, 2 = yes). The age group variable was coded from 1 to 4, where 1 represented the 18–24 age group and 4 represented the 44–55 age group. Additionally, we considered net monthly income (1 = less than 1500 euros, 2 = 1501–3000 euros, 3 = more than 3000 euros), education (1 = professional, secondary; 2 = bachelor's degree; 3 = master's or PhD degree), occupation (1 = student; 2 = employee; 3 = self-employed; 4 = others), and residence (1 = one of the largest cities in Lithuania; 2 = other cities; 3 = village; 4 = abroad).

Analytical Strategy

The first step of our analysis involved calculations of descriptive statistics, including the minimum and maximum values, means, and standard deviations, for all the dependent, independent, and moderating variables. Then reliability analysis was conducted, including calculations of Cronbach's alpha and confirmatory factor analysis (CFA) for all variables. To ensure internal consistency of the latent variables, the composite reliability (CR) (requiring it to be at least 0.60) and the average variance extracted (AVE) (requiring it to be at least 0.50) were calculated. Next, t-test and one-way ANOVA were used to determine any statistically significant mean differences in the variables (implicit and explicit socialization, investment knowledge, attitudes, skills, the strength of social ties) across demographic groups. The normality of the data was assessed using Skewness and Kurtosis values. In cases where Levene's test yielded significant results a robust test of equality of means was performed.

To examine the effects of explicit and implicit financial socialization on investment knowledge, attitudes, and skills and to test research hypotheses structural equation modeling (SEM) was employed. The model was opted over alternatives such as OLS regression because it enabled us to use latent variables, assess model fit and test all paths simultaneously within a single model (Gibby et al., 2021). Two SEM models were constructed. Model 1 evaluated the effect of implicit and explicit financial socialization on the investment literacy attributes (knowledge, skills, and attitudes) without considering a moderating effect of the strength of social ties while the Model 2 additionally incorporated the moderating effect of the strength of social ties variable. For moderation analysis, we standardize the variables (independent and moderator) by subtracting the mean of each variable from its respective observation and dividing the result by the standard error of the variable, i.e., by calculating Z-score, to reduce multicollinearity (Collier, 2020). The goodness-of-fit measures for both models included the chi-square value of the model, the comparative fit index (CFI; should be at least 0.90), the root mean squared error of approximation (RMSEA; should be no greater than 0.05), and the Tucker-Lewis index (TLI; should be at least 0.90) (West et al., 2012). Standardized coefficients were reported for all outcomes, and a maximum likelihood approach was used in our SEM models. Hypotheses

H1-H6 are evaluated based on the values of standardized coefficient and statistical significance. Hypotheses H1-H6 are accepted when $p < 0.05$ and $\beta > 0$. The hypothesis H7 is accepted when interaction term is statistically significant ($p < 0.05$).

Finally, we conducted a multi-group analysis (MGA) using structural equation modeling (SEM) based on demographic variables. Prior to the MGA, multicollinearity analysis of demographic characteristics was performed using tolerance and VIF statistics. VIF below 4 and tolerance above 0.2 indicated no multicollinearity problem. The MGA was used to assess whether the effect of explicit and implicit socialization on investment knowledge, attitudes and skills differed between demographic groups. It was performed only for those demographic characteristics, which proved to be significant for the dependent and independent variables (based on results of t-test and one-way ANOVA).

Results

Descriptive and Reliability Results

Table 2 presents the summary statistics of the key research variables. Descriptive results indicated that both explicit and implicit family socialization levels were moderate, with explicit socialization being higher (M = 11.85 out of 20, SD = 3.45) than implicit socialization (M = 10.64 out of 20, SD = 3.98). Further analysis of explicit and implicit socialization indicators revealed that the averages for general financial topics were higher compared to the topics on innovative financial services and P2P lending. Descriptive results also demonstrated that the level of investment knowledge was high, scoring an average of 20.17 out of 25 (SD = 2.87), which corresponds to 80.1%. The levels of investment attitudes and skills were also high, scoring 18.66 and 18.07 out of 25, respectively, placing them at 74.6%

Table 2 Descriptive and reliability results

Variable	Descriptive statistics				Reliability analysis	CFA		
	Min	Max	Mean	SD	Cronbach alpha	Factor loading	CR	AVE
Explicit socialization (ES)	**4**	**20**	**11.85**	**3.45**	0.87		0.87	0.62
ES_1	1	5	3.33	1.02		0.73		
ES_2	1	5	3.04	0.99		0.69		
ES_3	1	5	2.80	1.03		0.88		
ES_4	1	5	2.68	1.05		0.83		
Implicit socialization (IS)	**4**	**20**	**10.64**	**3.98**	0.83		0.83	0.56
IS_1	1	5	2.71	1.28		0.70		
IS_2	1	5	3.07	1.28		0.64		
IS_3	1	5	2.47	1.17		0.81		
IS_4	1	5	2.38	1.17		0.82		
Investment knowledge (KN)	**5**	**25**	**20.17**	**2.87**	0.71		0.72	0.36
KN1	1	5	4.21	0.71		0.55		
KN2	1	5	4.08	0.82		0.75		
KN3	1	5	3.63	0.74		0.58		
KN4	1	5	3.80	0.74		0.58		
KN5	1	5	3.81	0.69		0.43		
Investment attitudes (ATT)	**5**	**25**	**18.66**	**2.67**	0.72		0.72	0.35
ATT1	1	5	3.74	0.83		0.67		
ATT2	1	5	3.66	0.80		0.70		
ATT3	1	5	3.25	0.77		0.66		
ATT4	1	5	3.56	0.65		0.43		
ATT5	1	5	3.57	0.60		0.43		
Investment skills (S)	**5**	**25**	**18.07**	**3.00**	0.83		0.84	0.51
S1	1	5	3.83	0.69		0.67		
S2	1	5	3.70	0.80		0.79		
S3	1	5	3.43	0.78		0.79		
S4	1	5	3.53	0.71		0.72		
S5	1	5	3.51	0.78		0.55		
The strength of social ties (SST)	**4**	**20**	**13.80**	**3.65**	0.63		0.78	0.48
FD_1	1	5	3.82	1.47		0.70		
FD_2	1	5	3.64	1.16		0.69		
FD_3	1	5	3.10	1.37		0.77		
FD_4	1	5	3.22	1.29		0.57		

and 72.3%. Interestingly, questions related to investment knowledge, attitudes, and skills in P2P lending scored the lowest values (compared to general and innovative financial products related questions).

Before initiating the descriptive analysis of the strength of social ties variable, we conducted an exploratory analysis to identify which extended family members socialized in adulthood. The results indicated that both explicit and implicit financial socialization in adulthood occurred with all extended family members surveyed. Where respondents were more likely to agree that they discuss with and observe investment practices of romantic partners/spouses ($M=3.46$, $SD=1.19$; $M=3.23$, $SD=1.35$), followed by siblings ($M=3.02$, $SD=1.08$; $M=3.00$, $SD=1.19$) and less likely to agree that they discuss with and observe investment practices of fathers ($M=2.77$, $SD=1.04$; $M=2.60$, $SD=1.05$) and mothers ($M=2.62$, $SD=0.89$; $M=2.47$, $SD=0.87$). These results support that family socialization beyond parents to include partners/spouses and siblings. Further analysis of the strength of social ties among the respondents and their family members was above average ($M=13.80$ out of 20, $SD=3.65$), corresponding to 69%, whereas the highest average for the strength of social ties was observed for social ties with a romantic partner/spouse ($M=3.82$, $SD=1.47$).

Confirmatory factor analyses were conducted for all six latent variables. All indicators of the latent variables loaded significantly, with factor loadings ranging from 0.43 to 0.88. The Cronbach's alpha coefficients for all variables were satisfactory, indicating good reliability. In terms of composite values, all variables exceeded the threshold of 0.60, ranging from 0.72 to 0.87.

Differences Across Demographic Groups

The analysis of mean differences across demographic groups (see Annex 2) revealed some statistically significant differences in family financial socialization. According to the t-test results, the mean levels of explicit ($t=2.796$, $p=0.005$) and implicit ($t=1.940$, $p=0.049$) socialization were higher for women ($M=12.59$, $SD=3.65$ and $M=11.14$, $SD=4.12$) than for men ($M=11.62$, $SD=3.46$ and $M=10.36$, $SD=4.01$). These findings suggest that women were more likely than men to engage in financial discussions and to model investment behavior within the family. Significant differences were also observed in the groups of education for both implicit ($F=7.298$, $p=0.001$) and explicit socialization ($F=3.800$, $p=0.023$), indicating that respondents with a master's or PhD degree socialized more with family members than those with professional or secondary degree education. The mean levels of socialization were statistically significantly higher for investors with higher net income, but only for implicit socialization ($F=3.176$, $p=0.043$). Other demographic variables (age, occupation, residence, and affiliation with financial sector) did not reveal significant differences in the levels of implicit and explicit family financial socializations. Regarding investment literacy, t-tests and one-way ANOVA results revealed no statistically significant differences between the means of investment knowledge, attitudes, and skills in the respondents' age, education, occupation, residence. However, significant differences were found between the means of investment knowledge and the gender ($t=-3.440$, $p=0.001$). The mean level of investment knowledge was higher for men ($M=20.42$, $SD=2.77$) compared to women ($M=19.46$, $SD=3.03$), and these differences were statistically significant. Although the mean levels of investment skills and investment attitudes were also higher for men than women, those differences were not statistically significant. Regarding net income, statistically significant differences were observed for investment knowledge ($F=4.426$, $p=0.012$) and investment skills ($F=3.146$, $p=0.044$), indicating that investors with higher net monthly income had higher levels of knowledge. The mean levels of investment skills were higher for investors who had affiliation with finance sector ($M=18.30$, $SD=3.13$) compared to those who did not ($M=17.85$, $SD=2.90$), and these mean differences were statistically significant ($t=-2.062$, $p=0.040$). Finally, the analysis revealed no statistically significant differences between the means of the strength of social ties and the sociodemographic variables, indicating that the surveyed family interaction and relationships were rather homogenous across the research sample.

SEM Results

Two SEM models were constructed to examine the effect of explicit and implicit family financial socialization on investment knowledge, attitudes, and skills. Model 1 assessed the socialization effect without considering a moderating effect, while Model 2 additionally incorporated the moderating effect of the strength of social ties. Both models provided an adequate fit to the data, Model 1: $\chi2(303)=630.808$ and $p<0.001$, $CFI=0.928$, $TLI=0.915$, $RMSEA=0.062$, Model 2: $\chi2(349)=756.768$, $p<0.001$, $CFI=0.917$, $TLI=0.906$, $RMSEA=0.058$. Table 3 presents the path coefficients for Model 1 and Model 2.

Results of Model 1 indicate that explicit socialization had statistically significant and positive effect on investment knowledge ($\beta=0.32$, $p<0.001$), attitudes ($\beta=0.37$, $p<0.001$), and skills ($\beta=0.20$, $p<0.001$). The strongest effect was observed for investment attitudes, while the weakest effect was observed for investment skills. Since the p value was less than 0.05 and the β value was greater

Table 3 SEM results

	Path	Direct effect			*Hypothesis*
		B	β	SE	
Model 1	ES → KN	*0.15****	*0.32****	*0.04*	*H1 accepted*
	ES → ATT	*0.22****	*0.37****	*0.05*	*H2 accepted*
	ES → S	*0.14****	*0.20****	*0.05*	*H3 accepted*
	IS→ KN	*-0.11****	*-0.28****	*0.03*	*H4 rejected*
	IS → ATT	*-0.13***	*-0.24***	*0.04*	*H5 rejected*
	IS → S	*-0.08*	*-0.13*	*0.05*	*H6 rejected*
Model 2 (Main effect)	ES → KN	*0.14****	*0.31***	*0.02*	
	ES → ATT	*0.21****	*0.36****	*0.02*	
	ES → S	*0.12****	*0.18****	*0.03*	
	IS→ KN	*-0.12****	*-0.29****	*0.02*	
	IS → ATT	*-0.15***	*-0.25***	*0.02*	
	IS → S	*-0.11**	*-0.14**	*0.03*	
(Social ties effect)	ST → KN	*0.09****	*0.17****	*0.02*	
	ST → ATT	*0.16****	*0.24****	*0.03*	
	ST → S	*0.19****	*0.22****	*0.04*	
Model 2 (Moderating effect)	ES*SST → KN	*-0.006*	*-0.006*	*0.06*	*H7 rejected*
	ES*SST → ATT	*-0.008*	*-0.008*	*0.05*	
	ES*SST → S	*0.004*	*0.004*	*0.06*	
	IS*SST → KN	*0.017*	*0.018*	*0.06*	
	IS*SST → ATT	*-0.039*	*-0.040*	*0.05*	
	IS*SST → S	*0.053*	*0.056*	*0.06*	

Note: * the results for the moderating effect of the strength of social ties; *** $p<0.001$, ** $p<0.01$

than 0, the hypotheses H1, H2 and H3 were accepted. On the other hand, implicit socialization had a statistically significant negative effect on investment knowledge (β=-0.28, $p<0.001$) and attitudes (β=-0.24, $p<0.01$). As the p value was less than 0.05 and the β value was less than 0, the hypotheses H4 and H5 were rejected. The hypothesis H6 was rejected as the effect of implicit socialization on investment skills was statistically insignificant ($p>0.05$). Model 2 (SEM analysis with the moderator) revealed that the strength of social ties has no moderating effect on the relationship between explicit and implicit socialization and investment knowledge, attitudes, and skills. As the moderating effect of the strength of social ties was not statistically significant ($p>0.05$), the hypothesis H7 was rejected. According to the results, the strength of social ties had a statistically significant and positive effect on investment knowledge (β = 0.170, $p<0.001$), attitudes (β = 0.235, $p<0.001$), and skills (β = 0.220, $p<0.001$). However, such ties did not alter the direction or strength of the effect of explicit and implicit socialization on investment literacy components.

Multi-Group Analysis Results

Before the MGA, multicollinearity diagnostics of demographic variables were performed. As the values of the tolerance ranged from 0.77 to 0.98 and VIF statistics ranged from 1.02 to 1.30, there was no multicollinearity problem between demographic variables. Further SEM analysis across demographic groups revealed statistically significant variations on the impact of family financial socialization in adulthood on the individual's investment knowledge, skills and attitudes in gender, net monthly income, and education groups. The results of the multi-group analysis (MGA) are presented in Table 4. Since the moderating effect of the strength of social ties was not observed (the results of the SEM Model 2), MGA for Model 2 was not performed.

The results of MGA analysis for gender groups show that the greater effect of financial socialization on men than women's investment literacy. In a men group, explicit financial socialization had a positive effect on all three attributes of investment literacy; the highest influence was reported on investment attitudes (β = 0.38, $p<0.001$), followed by investment knowledge (β = 0.34, $p<0.001$) and investment skills (β = 0.21, $p<0.05$). Regarding implicit financial socialization in a men group, it had a greater negative effect on investment knowledge (β =-0.29, $p<0.01$) than on investment attitudes (β=-0.23, $p<0.05$). In women group, the effect of family financial socialization on investment literacy was less evident. The only statistically significant and positive effect was identified for explicit socialization on investment attitudes (β = 0.33, $p<0.05$).

Furthermore, the results of the MGA for net income groups demonstrated a more pronounced effect of explicit financial socialization on higher net income investors investment literacy. Among the smallest net income group, explicit socialization exhibited a positive effect on all

Table 4 MGA results for gender, net monthly income, and education demographic groups

Demographic groups		Path	Direct effect		
			B	β	SE
Gender	Women	ES → KN	*0.10*	*0.21*	*0.07*
		ES → ATT	*0.21**	*0.33**	*0.09*
		ES → S	*0.08*	*0.11*	*0.10*
		IS → KN	*-0.07*	*-0.18*	*0.06*
		IS → ATT	*-0.07*	*-0.13*	*0.08*
		IS → S	*0.02*	*0.03*	*0.09*
	Men	ES → KN	0.15***	*0.34****	*0.04*
		ES → ATT	0.20***	*0.38****	*0.05*
		ES → S	0.14*	*0.21**	*0.06*
		IS → KN	-0.12**	*-0.29***	*0.03*
		IS → ATT	-0.13*	*-0.23**	*0.04*
		IS → S	-0.09	*-0.14*	*0.05*
Net monthly income	< EUR 1500	ES → KN	*0.14**	*0.28**	*0.05*
		ES → ATT	*0.25****	*0.40****	*0.07*
		ES → S	*0.18**	*0.22**	*0.08*
		IS → KN	*-0.10**	*-0.22**	*0.05*
		IS → ATT	*-0.15**	*-0.27**	*0.06*
		IS → S	*-0.11*	*-0.15*	*0.08*
	EUR 1500–3000	ES → KN	0.14*	*0.26**	*0.06*
		ES → ATT	0.21*	*0.34**	*0.07*
		ES → S	0.02	*0.03*	*0.08*
		IS → KN	-0.06	*-0.17*	*0.05*
		IS → ATT	-0.12*	*-0.25**	*0.06*
		IS → S	0.02	*0.03*	*0.06*
	> EUR 3001	ES → KN	0.13	*0.27*	*0.07*
		ES → ATT	0.15	*0.24*	*0.10*
		ES → S	0.20*	*0.36**	*0.09*
		IS → KN	-0.16*	*-0.38**	*0.08*
		IS → ATT	-0.07	*-0.11*	*0.10*
		IS → S	-0.13	*-0.20*	*0.10*
Education	Professional, secondary	ES → KN	0.06	0.08	*0.17*
		ES → ATT	0.02	0.05	*0.14*
		ES → S	0.05	0.06	*0.17*
		IS → KN	-0.09	-0.17	*0.13*
		IS → ATT	-0.02	-0.05	*0.11*
		IS → S	-0.03	-0.06	*0.13*
Education	Bachelor's degree	ES → KN	0.27***	*0.52****	*0.06*
		ES → ATT	0.39***	*0.59****	*0.07*
		ES → S	0.32***	*0.38****	*0.08*
		IS → KN	-0.17**	*-0.36***	*0.05*
		IS → ATT	-0.23***	*-0.39****	*0.06*
		IS → S	-0.17*	*-0.23**	*0.07*
	Master's, PhD degree	ES → KN	0.03	0.08	*0.05*
		ES → ATT	0.07	0.13	*0.07*
		ES → S	-0.04	-0.06	*0.08*
		IS → KN	-0.04	-0.12	*0.04*
		IS → ATT	-0.03	-0.05	*0.07*
		IS → S	0.03	0.05	*0.07*

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

dimensions of investment literacy; highest effect for investment attitudes (β = 0.40, $p < 0.001$), followed by investment knowledge (β = 0.28, $p < 0.05$) and investment skills (β = 0.22, $p < 0.05$). Conversely, within the highest net income group, explicit socialization yielded a statistically significant and positive effect solely on investment skills (β = 0.36, $p < 0.05$). In the middle-income group, explicit socialization had a positive effect on investment attitudes (β = 0.34, $p < 0.05$) and investment knowledge (β = 0.26, $p < 0.05$). Implicit financial socialization had statistically significant and negative effect on investment knowledge in smallest (β=-0.22, $p < 0.05$) and largest (β=-0.38, $p < 0.05$) net income groups and on investment attitudes in smallest (β=-0.27, $p < 0.05$) and middle (β=-0.25, $p < 0.05$) income groups.

Finally, results of the MGA for education groups revealed statistically significant results in the bachelor's degree group only. Both explicit socialization and implicit socialization had a statistically significant and respectively positive and negative effect on investment knowledge (β = 0.52, $p < 0.001$ for explicit and β=-0.36, $p < 0.01$ for implicit socialization), attitudes (β = 0.59, $p < 0.001$ and β=-0.39, $p < 0.001$ respectively), and skills (β = 0.38, $p < 0.001$ and β=-0.23, $p < 0.05$ respectively).

Discussions

This study brings evidence on the effect family financial socialization in adulthood has on its members' investment literacy. Our findings expand the existing financial socialization literature by applying the family financial socialization theory beyond childhood and adolescence. It explores the influence of implicit and explicit family financial socialization in adulthood on the development of individuals' investment knowledge, skills, and attitudes, focusing on the context of P2P lending investors. Furthermore, it investigates if the effect of family financial socialization is tempered by the strength of social ties and whether it varies across the demographic characteristics of P2P investors.

Family Financial Socialization in Adulthood

Our findings bring new evidence on the occurrence of investment-oriented family financial socialization taking place beyond the boundaries of childhood, adolescence, and young adulthood and add to a scarce empirical literature in this respect. Contrary to the suggestions made by Pak et al. (2023) and Shim et al. (2015), who propose a diminishing significance of the family as a key socialization agent in adulthood, our research revealed that investment-related financial socialization persists into adulthood. This phenomenon extends to all extended family members—romantic partner/spouse, siblings, and parents— as included in our questionnaire. Such results underscore the evolving nature of financial socialization in adulthood, supporting its expansion beyond traditional parental-child roles to encompass socialization with romantic partners and siblings. However, further evidence on socialization dynamics among individual extended family members in the investment context is needed.

Descriptive analysis unveiled that levels of both explicit and implicit family financial socialization were moderate, with explicit socialization being marginally more pronounced than implicit socialization. This differs from the existing evidence on family financial socialization in childhood and adolescence, whereas parents more commonly engage in implicit than explicit financial socialization (Jorgensen & Salva, 2010; Gudmunson & Danes, 2011; Koochel et al., 2020). Further examination of variables demonstrated that discussions pertaining to general investment topics received higher levels of attention compared to innovative financial services and specifically, P2P lending. It implies that, particularly in instances where individuals possess limited investment literacy on a specific investment product, socialization serves as a pivotal mechanism for gathering information and reinforcing investment choices. The higher emphasis on general investment topics in family interactions could be seen as the continuity of long-term investment related family socialization that begins in childhood and extends through adolescence into adulthood. Conversely, the lower focus on innovative financial services, namely P2P lending, suggests that individuals may be more inclined to seek information and guidance from other socialization agents, such as peer (Legenzova et al., 2023), engage in personal research or use experiential learning to internalize investment knowledge (LeBaron et al., 2019).

Investment Literacy

Our findings exhibit a high-level investment literacy among the studied individuals with investment knowledge, attitudes, and skills among participants averaging 80.1%, 74.6%, and 72.3%, respectively. Similar to the scores for family financial socialization, the lowest scores in the domains of investment knowledge, attitudes, and skills were observed in answers related to peer to peer (P2P) lending. With the recent emergence of P2P lending as an innovative investment product, its easy accessibility to retail investors, small initial investment requirements, and low transactions costs let us initially assume that P2P lending attracts inexperienced investors. These investors might face challenges in understanding investment risks and returns and display more opportunistic behavior than in traditional investments.

However, our results rejected such assumption, suggesting that the investors in our study seem to understand the risks and rewards of investing well and that they have also developed the right mindset and abilities needed to make informed investment choices. Yet, their specific P2P lending related investment literacy is not that strong, which, at the end, questions rationality of their investment behavior. Drawing from the existing body of financial literacy literature, our results are in line with the notion that financial literacy plays a pivotal role in financial decision-making and can lead to more a rational individuals' financial behavior in savings, borrowing, pension planning and investment decisions (Atkinson & Messy, 2012; Chowa & Despard, 2014; Lusardi & Mitchell, 2014). This convergence of findings emphasizes the importance of fostering investment literacy, not only in general but also in specialized investment areas such as P2P lending. Future research is needed to understand how P2P investment-related knowledge, skills, and attitudes translate into tangible investment behaviors and what is the rationality of investment decisions made within the context of P2P lending.

The Influence of Family Financial Socialization on Individuals' Investment Literacy

In the context of this study, which primarily focuses on the effect of family financial socialization in adulthood on the investment literacy attributes of P2P lending investors, the findings have revealed some unexpected outcomes. Our model assumed that investment knowledge, skills and attitudes will be positively affected by explicit (H1, H2, H3) and implicit (H4, H5, H6) family financial socialization in adulthood. Our initial assumptions were validated for explicit financial socialization, leading to acceptance of H1, H2, H3 hypotheses. However, contrary to expectations, implicit financial socialization exhibited statistically significant and negative effect on two investment literacy attributes – knowledge and attitudes, therefore H4 and H5 hypotheses were rejected. Additionally, H6 hypothesis for implicit financial socialization was also rejected as socialization effect on investment skills was not statistically significant. Such findings give rise to a thought-provoking possibility - individuals who observe the financial actions and attitudes of other family members to a greater extent may tend to exhibit lower levels of investment knowledge and less favorable investment attitudes. This phenomenon prompts inquiry into the rationality of their investment decision-making processes, as it may suggest the presence of family related behavioral biases, such as herding whereas individuals, regardless of their knowledge and skills, mimic the decisions made by other investors, for example family members, whom they perceive as more knowledgeable. Prior research in the domain of family socialization (in childhood and adolescence) has also observed negative impacts of implicit financial socialization (LeBaron & Kelley, 2021), albeit typically in unfavorable contexts. For instance, Vijaykumar (2022) discovered that observing parents' financial behavior negatively impacted young adults' financial self-efficacy, assessed as beliefs in handling financial matters. Conversely, a more prevalent scenario entails a positive impact, wherein children who observe responsible financial behaviors and engage in discussions about finances within their families tend to develop improved financial literacy and acquire the ability to make well-informed budgeting, saving and other financial decisions (Gutter et al., 2010).

As anticipated, explicit family financial socialization in adulthood exhibited an overall positive and statistically significant influence on all three investment literacy attributes - knowledge, skills, and attitudes. Comparable results in children and adolescence samples were also documented in previous research (Chowa & Despard, 2014; Jorgensen & Savla, 2010; Shim et al., 2010). This implies that actively imparting purposive discussions and direct teaching within the family context during adulthood can effectively enhance various attributes of individuals' investment literacy, underlining the importance of targeted financial education within familial networks. Moreover, the impact of explicit family financial socialization was most pronounced on investment attitudes as opposed to investment knowledge and skills. This implies that deliberate discussions and direct teaching within the family setting to the most extent alter family members' attitudes and perspectives on investment and P2P lending. While these efforts also contributed positively to risk and return-related knowledge, they had a lesser impact on skill development. The implications of this unexpected emphasis on investment attitudes suggest that explicit financial socialization within families not only enhances investment knowledge but also has a transformative effect on individuals' overall investment outlook which reinforces our notion on collegial investment decision-making within households.

Our survey also explored potential supplementary influence of the strength of relationships between family members on the effect of both explicit and implicit family financial socialization. The results showed that the strength of social ties had a direct and positive effect on the respondents' investment knowledge, attitudes and skills. However, such ties did not alter the direction or strength of the effect of explicit and implicit socialization on their investment knowledge, attitudes, and skills. Therefore, H7 hypothesis was rejected. This suggests that when it comes to shaping outcomes of financial socialization, social ties and relationships in adulthood may not have the same influence as they do in childhood or adolescence (Kim et al., 2011). Yet further research is needed to better understand this absence of this moderating effect. We propose that current results may be attributed to the heterogeneous nature of family influence within our research sample. Additionally, other influential socialization agents, as well as the increasing independence typically experienced in adulthood, may be mitigating the moderating influence of family ties on financial socialization outcomes. Similar conclusions on the less prominent relationship between family socialization and financial knowledge level in the sample of college students were also expressed by Yao et al. (2023).

Demographic Characteristics

This study also investigated disparities across demographic groups concerning investment literacy (Ran et al., 2019), family financial socialization (Furrebøe et al., 2023; LeBaron & Kelley, 2021), particularly in adulthood, and the effect implicit and explicit socialization has effect on investment knowledge, skills, and attitudes among the investors in P2P lending. Our analysis found statistically significant distinctions across the gender, income, and education groups. The other demographic characteristics, such as age, occupation, residency, and engagement with the financial sector, did not yield significant differences in the intensity of financial socialization and in the level of investment literacy nor did they affect the relationship among them.

Similar to previous research on financial socialization and financial literacy, the present study has unveiled interesting disparities in gender. According to our results, in adulthood women tend to engage more actively in family financial socialization, both in explicit and implicit forms, compared to men. Previous research documented mostly the opposite findings (LeBaron & Kelley, 2021). Furrebøe et al. (2023) found that men had a greater degree of explicit socialization than women, while Gibby et al. (2021) documented comparable degrees of explicit and implicit familial socialization among both women and men. However, in line with previous research (Zaimovic et al., 2023; Yao et al., 2023) men exhibit higher levels of investment knowledge than women, while disparities in investment skills and attitudes across the gender groups were not statistically significant. The results of the multigroup analysis for the male subgroup align with the main SEM model, both in direction and strength. They indicate that for men explicit family financial socialization exerts a positive effect on all attributes of investment literacy, whereas implicit financial socialization negatively impacts investment knowledge and attitudes. Conversely, similar to Furrebøe et al. (2023), despite women's higher levels of both explicit and implicit family financial socialization, their overall influence is notably limited. The sole discernible impact is observed on women's investment attitudes, which registers as positive but relatively weak. Such findings are of particular interest as they suggest that, despite women's increased participation in financial discussions and role modeling within the family setting, family-based financial socialization has a modest effect on enhancing their investment literacy. However, the lower number of women participants (26%) in our survey may also contribute why such findings for women were observed. This calls for additional research on the effectiveness of current modes, forms, and outcomes of family financial socialization in adulthood across the gender groups, especially in the investment decision making context.

Net monthly income has also proven to be a significant demographic factor in this study. Statistically significant differences were noted in respondents' investment knowledge and skills among various net income groups, highlighting that investors with higher net monthly incomes tend to possess more substantial understanding of investments and better investment skills. Comparable results were reported by Chowa and Despard (2014). Regarding financial socialization, a noteworthy distinction emerged only in implicit socialization. Results indicate that individuals with higher net incomes tend to observe actions and attitudes of the other adult family members more intensely. As for the MGA results, explicit socialization demonstrates a discernible impact across all income intervals. This impact is the most pronounced among respondents with lower income. For this group, all three attributes of investment literacy were significantly affected with the highest impact on their investment attitudes. Conversely, in the highest earners group (incomes above EUR 3000), the only significant influence came from the explicit socialization solely affecting such investors' skills. Implicit socialization proved to have a statistically significant and negative impact across all income groups but only on investment attitudes. The most substantial effect here was observed in the highest earning group. Such findings highlight the varying effect of family socialization for the individuals with different income levels, shedding light on the complex interplay between income, financial socialization, and its investment-related outcomes.

Education was also identified as a demographic factor explaining the effect of implicit and explicit family financial socialization in adulthood. Interestingly, while education did not indicate any significant differences in respondents' investment knowledge, skills, and attitudes, it did reveal relevance concerning both implicit and explicit socialization. Based on our results, individuals with master or PhD degrees are more frequently engaged in family financial socialization about investment matters. MGA results also indicated that explicit and implicit socialization had a statistically significant effect on investment knowledge, attitudes, and skills but only for individuals with bachelor's degrees.

Within this group, both explicit and implicit socialization exhibited the same direction of effect as in the main model and the most robust results were observed for investment attitudes. Such results offer interesting insights, indicating that the most highly educated group of respondents might be the most inclined to interact on investment matters within the family setting, but the most substantial impact was observed within the group of investors with bachelor's degrees. This is a numerous group of investors entering financial markets, but they may lack the adequate investment literacy and experience to make efficient investment decisions. Consequently, for them, family financial socialization, and potentially interactions with other socialization agents, represent crucial and readily accessible avenues for acquiring both investment knowledge and the reassurance needed before making financial choices. This becomes even more pertinent, especially for innovative financial products, where alternative avenues for literacy acquisition may not yet be readily available.

Conclusions

This paper examines how family financial socialization in adulthood is related to the development of investment literacy among individual family members within the context of innovative financial services, specifically peer-to peer (P2) lending. Our findings provide new insights into recent studies on family financial socialization by confirming the occurrence of family financial socialization in adulthood and its influence on the proximal socialization outcomes. Also, it contributes to the broader financial socialization related literature by extending the findings beyond traditional investment products and exploring the dynamics within emerging financial landscapes, such as P2P lending.

The key findings support our conceptual model and suggest that both explicit and implicit financial socialization in adulthood is an important factor contributing to the development of investment literacy attributes (knowledge, skills, and attitudes) among the investors in innovative financial products. Applying a multifactor approach to assess the attributes of investment literacy, our study documents high-level investment knowledge, skills, and attitudes among individuals investing in P2P lending. The study also confirms that family financial socialization continues in adulthood with multiple extended family members (romantic partner/spouse, siblings, and parents) demonstrating its moderate level on the investment related matters. Unlike the findings for children and adolescents, it documents explicit socialization being more pronounced than implicit socialization. Exploring the link between family financial socialization in adulthood and the investment literacy of individual family members, our study uncovers new insights. We found that, as it was predicted, investment knowledge, skills and attitudes were significantly and positively affected by explicit financial socialization. However, contrary to our expectations, implicit financial socialization exhibited statistically significant and negative effect on investment knowledge and attitudes, while the effect on investment skills was not statistically significant. This suggests that engaging in intentional conversations about investment within the extended family can effectively enhance adult individuals' investment literacy and potentially lead to more rational investment decisions. However, observing financial actions and attitudes of other family members to a greater extent may lead to lower levels of investment knowledge and less favorable investment attitudes. These observations might imply the tendency to mimic investment decision of other family members or otherwise make biased investment decisions. In our study we also questioned if the socialization effect is contingent upon closeness of family relations. Although the study documents an above average level of the strength of social ties among the family members, this attribute of family socialization does not act as a moderator for investment literacy development. Additionally, our findings contribute to the existing body of literature by highlighting disparities in financial socialization and its effect among various demographic groups, including gender, net income, and education.

It is important to note some limitations of this study. There might been a selection bias in attracting participants to the survey as men engaged more actively compared to women. This unequal gender distribution could be attributed to the higher participation by men in investment practices. In future research, advanced random sampling methods could improve the representativeness of participants. Furthermore, one of the challenges encountered in this study was the reliance on self-reported responses from P2P lending investors. In the future, it would be relevant to include respondent family members to obtain simultaneous scores for the variables. As this study used a single period cross-sectional data, in the future it would be beneficial to incorporate longitudinal datasets to explore the long-lasting effects of family financial socialization during adulthood and conduct a more thorough investigation of the causation and effects. This study explored the effect of family financial socialization on its proximal outcome – investment literacy. In the future this study could be expanded to explore the impact on distal socialization outcomes, such as investment behavior and financial wellbeing.

Understanding the impact of family financial socialization in the context of innovative investment products holds significant implications for various stakeholders. For families, our findings highlight the pivotal role family plays in shaping the investment and, in a broader context, financial literacy of individual family members as well as their decision-making abilities. It also underscores the importance of various types of interactions within families beyond childhood and adolescence, emphasizing that discussions can empower individuals to develop their knowledge, skills, and attitudes and, subsequently, make more rational and informed investment choices. Families can use this evidence to consciously integrate financial discussions and other means of financial socialization into their daily lives, helping family members effectively navigate the complexities of modern financial landscapes. For policy makers, service providers and educators, results of our study could facilitate the development of targeted strategies aimed at enhancing individuals' financial literacy and decision-making capabilities in this specific domain. Future studies would benefit from undertaking systematic examinations of the effect of family financial socialization in adulthood on investment literacy, investment behavior and other socialization outcomes concerning innovative financial products.

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Data availability The datasets generated during the current study are available from the corresponding author upon reasonable request.

Declarations

Competing interests The publication is a part of the project "Strengthening the R&D activities of the Vytautas Kavolis Transdisciplinary Institute for Social Sciences and Humanities (SOCMTEP)".

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