Finance Research Letters 58 (2023) 104438

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Digital financial literacy and financial well-being

Youngjoo Choung [a], Swarn Chatterjee [b], Tae-Young Pak [c,*]

[a] Department of Consumer Science, Inha University, Incheon, South Korea
[b] Department of Financial Planning, Housing and Consumer Economics, University of Georgia, Athens, GA, United States
[c] Department of Consumer Science and Convergence Program for Social Innovation, Sungkyunkwan University, Seoul, South Korea

ARTICLE INFO

JEL classification:
D14
G50
G53
I31
O53

Keywords:
Digital finance
Financial literacy
Digital literacy
Financial inclusion
Financial well-being
South Korea

ABSTRACT

Digital financial literacy is an emerging concept that emphasizes necessary knowledge and skills to carry out financial transactions on digital platforms. In this study, we aim to examine the link between digital financial literacy and financial well-being among Korean adults. Using online survey data, this study shows that digital financial literacy is associated with financial well-being, and this association is largely due to financial knowledge and the ability to protect against digital fraud. Digital financial literacy carried larger marginal effects on financial well-being compared to financial knowledge, and demonstrated significant effects across sociodemographic groups. Implications for financial education were discussed.

1. Introduction

Digital innovations in finance have led to a surge in complex and innovative financial instruments, including digital wallets, cryptocurrency, peer-to-peer lending, and robo-advisors (Isaia and Oggero, 2022; Zavolokina et al., 2017). As digital finance evolves, a growing number of financial services are accessed and delivered exclusively through digital channels (Lyons and Kass-Hanna, 2021c). The current fintech landscape requires financial consumers to have adequate knowledge and ability to use digital financial services and take greater responsibility for their own finances (Morgan et al., 2019). Thus, achieving financial well-being depends not only on financial knowledge but also on digital skills and the ability to manage financial matters on digital platforms (Lyons and Kass-Hanna, 2021a).

Financial literacy is widely recognized as a crucial factor driving consumer engagement in financial markets and services (Lusardi and Mitchell, 2014). Ongoing and anticipated changes in the finance industry underscore the need to redefine financial literacy in a digital context (Kass-Hanna et al., 2022). Recently, the concept of digital financial literacy (DFL) has emerged to indicate "the knowledge, skills, confidence and competencies to safely use digitally delivered financial instruments and services and make informed financial decisions" (Alliance for Financial Inclusion, 2021). DFL is a multi-dimensional concept that encompasses financial and digital literacy, as well as additional elements related to access and use of digital financial services (Lyons and Kass-Hanna, 2021a). A growing literature is delving into the conceptualization and measurement of DFL (Koskelainen et al., 2023; Lyons and Kass-Hanna, 2021a,

* Corresponding author.
E-mail address: typak@skku.edu (T.-Y. Pak).

https://doi.org/10.1016/j.frl.2023.104438
Received 24 July 2023; Received in revised form 15 August 2023; Accepted 5 September 2023
Available online 6 September 2023

2021b; Morgan et al., 2019; Ravikumar et al., 2022) and its effects on fintech adoption (Lo Prete, 2022; Yoshino et al., 2020).

There exist only a few studies that have examined the relationship between DFL and financial well-being (Jhonson et al., 2023; Rahayu et al., 2022b). Lyons and Fontes (2021) examined the nationally representative sample in the US to show that digital literacy, financial literacy, and social media use are associated with household portfolio outcomes. In Kass-Hanna et al. (2022), digital literacy and financial knowledge were predictive of positive financial behaviors, including saving, borrowing, and risk management strategies. However, these findings contradict other studies, which suggest that digital financial services could prompt impulsive buying behaviors (Panos and Wilson, 2020), or that digital access to consumer credit increases the risk of falling into debt traps (Yue et al., 2022). Currently, the evidence is mixed regarding whether and to what extent DFL improves financial security and well-being. Previous studies were also limited in that they treated digital and financial literacy as distinct skills and could not reflect emerging financial services based on mobile platforms.

Financial well-being is a comprehensive construct that considers both objective and perceived financial conditions. The concept of financial well-being has been motivated by the findings that, although objective measures such as income and wealth can predict subjective well-being, there remains a variation that cannot be solely attributed to economic resources (Diener and Biswas-Diener, 2002). To address this limitation, the Consumer Financial Protection Bureau (CFPB) operationalized financial well-being with a subjective assessment of money management practices and the ability to meet future financial goals (CFPB, 2017b). Studies have shown that financial well-being is a significant determinant of life satisfaction and exhibits greater predictive power than objective financial indicators (Netemeyer et al., 2017). The CFPB measure of financial well-being has been increasingly used in research of financial literacy and education (Burke et al., 2020; Collins and Urban, 2020; Fan and Henager, 2022; Lee et al., 2020).

The link between financial literacy and financial well-being is rooted in the idea that individuals with financial knowledge are more likely to access financial services, engage in positive financial behaviors, and achieve higher financial well-being (Fan and Henager, 2022; Lee et al., 2020; Utkarsh et al., 2020). Financial hardship and stress were found to predict financial well-being (Lacombe and Khatun, 2023), and mediate the effects of financial literacy and financial behaviors (Fan and Henager, 2022; Zhang and Chatterjee, 2023). Digital financial literacy was associated with increased use and awareness of mobile financial services (Long et al., 2023; Morgan and Long, 2019; Yoshino et al., 2020), positive financial behaviors (Rahayu et al., 2022a), and ultimately financial well-being (Jhonson et al., 2023; Rahayu et al., 2022b). Synthesizing prior research and introducing digital finance landscape leads to the following conceptual framework (Fig. 1). In this study, we test a direct association between digital financial literacy and financial well-being in the Korean context.

2. Methods

2.1. Data description

Macromill Embrain is a market research company in South Korea that maintains a panel of more than one million individuals across sociodemographic groups. This study recruited individuals aged 25 to 59 from this panel using a stratified sampling method based on age, gender, and region of residence. The survey was approved by the Institutional Review Board of Sungkyunkwan University (No. 2023-04-046) and conducted anonymously between April 24 and May 16, 2023. A total of 1615 individuals participated in the online survey and received compensation proportional to the survey's duration ($0.77 per minute). The study sample has a mean age of 42.63, with women constituting 49% of the sample (Table 1).

2.2. Financial well-being

The CFPB's financial well-being scale asked participants to indicate their levels of agreement with the proposed descriptions regarding personal finance (Table A1). The first six questions were framed, "*How well does this statement describe you or your situation*?" (0 = not at all to 4 = completely), and the next four questions asked, "*How often does this statement apply to you*?" (0 = never to 4 = always). Responses to the ten statements were aggregated to construct a score of 0 – 40, indicating the degree of financial well-being. This score was then converted according to the CFPB's item response theory-based scoring method, which takes into account item polarity, age, and survey mode (CFPB, 2017a). Among a couple of scoring methods, we used a scoring table tailored for individuals aged 18–61 who self-administered the interview. The CFPB scale has been used to assess Korean adults' financial well-being in previous research (Jang and Kim, 2023; Pak et al., 2023).

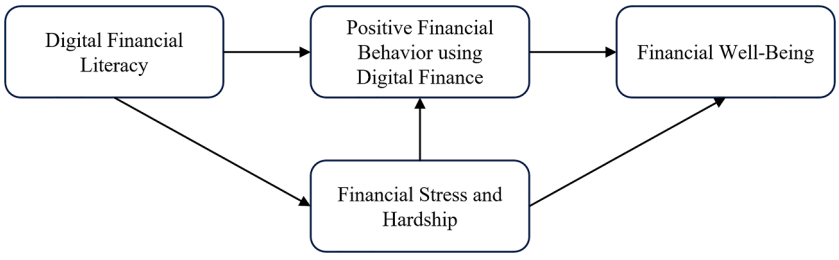

Fig. 1. Conceptual framework of digital financial literacy and financial well-being.

Table 1
Summary statistics ($N = 1615$).

	DFL ≤ median	DFL > median	Full sample Mean	SD
Financial knowledge[a]	4.64	6.24	5.44	1.45
Digital knowledge[a]	4.31	4.92	4.62	0.56
Awareness of digital financial services[a]	4.06	4.81	4.43	0.62
Practical know-how of digital financial services[a]	4.04	4.76	4.40	0.61
Self-protection from digital scam[a]	3.43	4.08	3.75	0.65
Digital financial literacy[a]			22.65	2.88
Age	43.91	41.34	42.63	9.67
Female	0.54	0.43	0.49	
Male	0.46	0.57	0.51	
High school graduate	0.24	0.13	0.19	
Vocational college graduate	0.20	0.14	0.17	
4-year college graduate	0.49	0.57	0.53	
Post graduate degree	0.07	0.16	0.12	
Married	0.32	0.35	0.34	
Single	0.60	0.59	0.59	
Separated, divorced, widowed	0.08	0.06	0.07	
Household size	2.93	2.94	2.93	
Household income (10k KRW)	9428	11,408	10,418	39,973
Financial assets (10k KRW)	11,418	15,023	13,219	47,074
Any risky equity	0.70	0.84	0.77	
Poverty status	0.03	0.01	0.02	
Own home	0.60	0.60	0.60	
Long-term rental	0.18	0.18	0.18	
Short-term rental and others	0.22	0.22	0.22	
Urban area	0.44	0.59	0.52	
MVNO plan	0.20	0.18	0.19	
Financial education in high school or college	0.24	0.38	0.31	

Notes: DFL, digital financial literacy; SD, standard deviation.
[a] Raw scores before normalization.

2.3. Digital financial literacy

Lyons and Kass-Hanna (2021a) defined DFL as a broad construct, encompassing five dimensions and eight subdimensions of financial and digital literacy. In this study, we propose a narrower definition of DFL, which includes financial knowledge and four dimensions of digital literacy (digital knowledge, awareness of digital financial services, practical know-how of digital financial services operations, and self-protection from digital scam) directly related to skills and ability required for a proper use of digital financial services (Table A2).

Financial knowledge was assessed using the OECD/INFE survey of adult financial literacy (OECD, 2020). This scale comprises seven questions measuring the time value of money, interest paid on a loan, simple interest, compound interest, risk and return, the concept of inflation, and risk diversification. The financial knowledge index is calculated as the number of correct responses (0–7).

Digital knowledge was assessed with 10 items related to the basic knowledge of hardware and software usage. Awareness of digital financial services was evaluated by eight items concerning knowledge of available digital solutions for online and mobile financial transactions. Practical know-how of digital financial services operations was conceptualized as the ability to effectively utilize software and mobile applications for personal finance, as measured by seven items. The subdimension of self-protection involves the capacity to identify and prevent fraudulent activities on digital platforms. Participants responded on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), and a summary score for each subdimension was constructed by averaging the responses.

The composite index for DFL was then obtained from the sum of the financial knowledge index and scores from the digital literacy subdimensions (4–27). This composite index and the subdimension scores were standardized using the z-score normalization method.

2.4. Empirical model

We estimated linear regressions in which financial well-being is regressed on DFL and covariates. All regressions controlled for age, gender, education, marital status, household size, annual household income, financial assets, risky equity ownership, poverty status, housing, urbanicity, and province fixed effects (Table 1).

To address potential endogeneity of DFL, this study used cell phone plan and prior exposure to financial education as instrumental variables. Specifically, our instruments were an indicator of whether a participant used Mobile Virtual Network Operator (MVNO) plan and an indicator of financial education during high school or college. In Korea, MVNO plans primarily serve individuals who use mobile phones and related services infrequently. As such, this variable operates as a variable that reflects one's willingness and capability to use mobile platforms for financial transactions, which might in turn influence DFL. Our instruments were expected to capture the exogenous variation in digital literacy attributable to an individual's predisposition towards mobile services, and

variations in financial knowledge due to financial education.

3. Results

Participants correctly answered an average of 5.44 out of seven financial knowledge questions (Table 1). Among the four sub-dimensions of digital literacy, participants scored highest in digital knowledge and lowest in self-protection from digital scam. The mean DFL score was 22.65, with a standard deviation of 2.88.

Table 2 presents regression results corresponding to the research questions. The first five columns indicate that each dimension of DFL is significantly associated with financial well-being at the 1% level, adjusting for sociodemographic covariates. The estimated coefficient was largest for self-protection from digital scam and smallest for financial knowledge. In column 6, both financial knowledge and self-protection variables were independently associated with financial well-being (Figure A1). The results in column 7 show that a one-standard deviation increase in DFL leads to a 1.33 point, or roughly 2.6% (=1.33/50.7) rise in financial well-being. The two-stage least squares estimates confirm a significant association between DFL and financial well-being at the 5% level.

Next, we estimated split-sample regressions, dividing the sample based on gender, education, and income (Table 3). The results suggest that self-protection from digital scam is positively associated with financial well-being across gender, education, and income groups. Other domains of DFL (financial knowledge, digital knowledge, awareness of digital financial services, and practical know-how) remain uncorrelated with financial well-being or show inconsistent results across grouping variables (Figure A2).

4. Discussion

This study explored the potential associations between DFL and financial well-being among Korean adults. Results showed that DFL is positively associated with financial well-being, and this association is attributable to financial knowledge and the ability to protect from digital scams. Other facets of DFL exhibited no significant association with financial well-being. We also found that the link between self-protection ability and financial well-being remained significant across different genders, education levels, and income brackets.

Our findings broadly support the evidence that digital finance can foster financial inclusion and help alleviate poverty among financially excluded households (Bruhn and Love, 2014; Ozili, 2021). Digital and financial literacy have been linked to resilient financial behaviors, as measured by risk management behaviors and precautionary saving (Kass-Hanna et al., 2022). Enhancing DFL may improve people's ability to access mobile finance, which could result in positive financial behaviors like switching from informal to formal savings channels (Aron, 2018). Those who adopted mobile money have shown consumption smoothing and a reduced risk of falling into poverty during negative income shocks (Blumenstock et al., 2016; Jack and Suri, 2014; N'dri and Kakinaka, 2020; Seng, 2021; Suri and Jack, 2016). Improvements in objective financial conditions likely lead to enhanced financial well-being and thus contribute to life satisfaction (Netemeyer et al., 2017).

This study highlights the role of the ability to avoid digital frauds in improving financial well-being. The prevalence of digital crime including identity theft, phishing, and smishing is alarmingly high in Korea, with more than 190,000 cases reported to the police agency in 2020 (Choi and Kim, 2016; Korean National Police Agency, 2023). Historically, the Korean regulatory environment has placed a greater responsibility on consumers to prevent digital crime, making them to exercise due diligence in telecommunication-based financial transactions (Park and Yoon, 2018). As digital fraud becomes more sophisticated and difficult to

Table 2
Associations between digital financial literacy and financial well-being.

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	IV 2SLS (8)
Financial knowledge	0.730***					0.501**		
	(0.184)					(0.196)		
Digital knowledge		0.873***				0.109		
		(0.173)				(0.265)		
Awareness of DFS			0.976***			−0.025		
			(0.199)			(0.404)		
Practical know-how of DFS				1.084***		0.279		
				(0.195)		(0.409)		
Self-protection from digital scam					1.306***	1.054***		
					(0.208)	(0.247)		
Digital financial literacy							1.330***	3.542**
							(0.193)	(1.700)
Kleibergen-Paap LM statistic[a]								22.52
Cragg-Donald Wald F statistic[b]								11.52

Notes: OLS, ordinary least squares; IV, instrumental variable; 2SLS, two-stage least squares; DFS, digital financial services. Robust standard errors in parentheses. Regressions control for age, gender, education, marital status, household size, household income, financial assets, any risky equity, poverty status, housing, urbanicity, and province fixed effects. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

[a] Kleibergen-Paap LM statistic for underidentification test.

[b] Cragg-Donald Wald F statistic for weak identification test.

Table 3
Subsample analyses by gender, education, and household income.

	Women (1)	Men (2)	Less than college (3)	College graduate (4)	HH income ≤ median (5)	HH income > median (6)
Financial knowledge	0.511*	0.380	0.569*	0.407	−0.039	0.872***
	(0.295)	(0.267)	(0.317)	(0.255)	(0.267)	(0.289)
Digital knowledge	0.466	−0.107	0.077	0.273	−0.072	0.234
	(0.430)	(0.351)	(0.457)	(0.341)	(0.323)	(0.440)
Awareness of DFS	−0.214	0.053	0.010	0.058	0.328	−0.531
	(0.571)	(0.581)	(0.658)	(0.525)	(0.492)	(0.662)
Practical know-how of DFS	−0.232	0.859	−0.443	0.680	−0.091	0.975
	(0.619)	(0.552)	(0.754)	(0.484)	(0.508)	(0.659)
Self-protection from digital scam	1.295***	0.813**	0.900**	1.124***	1.058***	0.944**
	(0.359)	(0.347)	(0.398)	(0.318)	(0.334)	(0.386)
N	788	827	572	1043	808	807

Notes: DFS, digital financial services; N, number of observations. Robust standard errors in parentheses. Regressions control for age, gender, education, marital status, household size, household income, financial assets, any risky equity, poverty status, housing, urbanicity, and province fixed effects. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

discern, it is becoming increasingly important for consumers to have the knowledge and ability to detect fraud attempts and employ best practices to avoid being victimized (Aziz and Naima, 2021; Morgan et al., 2019). Research has shown that fraud victimization undermines economic and subjective well-being in various population groups and contexts (Brenner et al., 2020; Dutt, 2023; Muscanell et al., 2014; Owen et al., 2017). Thus, enhancing the ability to identify fraudulent transactions may not only enhance financial security but also overall financial well-being.

Another noteworthy finding was that DFL had a larger marginal effect on financial well-being compared to financial knowledge. This finding confirms previous evidence that digital literacy is an independent predictor of financial behavior and well-being, after controlling for financial literacy (Kass-Hanna et al., 2022; Lyons and Fontes, 2021; Rahayu et al., 2022b), and highlights the prominent role of digital skills in the digital finance context. As discussed above, DFL is a broad concept that encompasses knowledge, skills, and ability to use digital financial instruments, as well as the technical competency to safeguard against cyber threats. While traditional financial literacy remains crucial, it may not be the sole determinant of financial well-being in a digital economy. As such, financial knowledge should be complemented with digital skills so that individuals can apply their knowledge efficiently and safely on digital platforms.

This study informs policymakers and educators about the importance of prioritizing the development of DFL alongside financial knowledge. Potential solutions may involve customized educational programs that focus on building basic financial knowledge and the necessary digital skills needed to apply this knowledge through digital platforms (Lyons and Kass-Hanna, 2021b; Morgan, 2021). These programs should be designed in consideration of the needs and learning preferences of digitally unskilled individuals (Lyons and Kass-Hanna, 2021a), and aim to develop practical knowledge related to financial transactions and fraud prevention in a digital environment. Furthermore, it would be prudent for financial institutions to offer foundational DFL education, which will empower consumers to make informed digital financial decisions and contribute to a more secure digital financial environment.

Readers should be cautious as our findings may not be generalizable to older adults or marginalized populations with limited mobile service access. Another limitation is that our regressions could not account for variables reflecting the potential capability and inclination of participants to achieve financial well-being, such as financial goal setting and savings habit (Lacombe and Khatun, 2023). Our identification strategy could also benefit from more exogenous instruments that are independent of the error term.

This study contributes to literature in several ways. First, it is among the few studies that have examined the impact of DFL on well-being. Second, this study introduced a multidimensional scale of DFL that can be applied in various settings. Lastly, this study provided a comprehensive assessment of DFL within the Korean context.

In conclusion, DFL plays a crucial role in achieving financial well-being. As society continues to digitize financial services, it is essential to provide the necessary support and resources to ensure that no one is excluded from financial services due to technological advancements.

CRediT authorship contribution statement

Youngjoo Choung: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Writing – original draft, Writing – review & editing. **Swarn Chatterjee:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **Tae-Young Pak:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

None.

Data availability

The authors do not have permission to share data.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.frl.2023.104438.

References

Alliance for Financial Inclusion. (2021). Digital financial literacy. Retrieved from https://www.afi-global.org/publications/digital-financial-literacy/.

Aron, J., 2018. Mobile money and the economy: a review of the evidence. World Bank Res. Obs. 33 (2), 135–188.

Aziz, A., Naima, U., 2021. Rethinking digital financial inclusion: evidence from Bangladesh. Technol. Soc. 64, 101509.

Blumenstock, J.E., Eagle, N., Fafchamps, M., 2016. Airtime transfers and mobile communications: evidence in the aftermath of natural disasters. J. Dev. Econ. 120, 157–181.

Brenner, L., Meyll, T., Stolper, O., Walter, A., 2020. Consumer fraud victimization and financial well-being. J. Econ. Psychol. 76, 102243.

Bruhn, M., Love, I., 2014. The real impact of improved access to finance: evidence from Mexico. J. Finance 69 (3), 1347–1376.

Burke, J., Collins, J.M., Urban, C., 2020. Does State-Mandated Financial Education Affect Financial Well-being? University of Wisconsin-Madison (Center for Financial Security Working Paper).

Choi, K., Kim, M., 2016. A study on the modus operandi of smishing crime for public safety. Converg. Security J. 16 (3), 3–12.

Collins, M.J., Urban, C., 2020. Measuring financial well-being over the life course. Eur. J. Finance 26 (4–5), 341–359.

Consumer Financial Protection Bureau (CFPB). (2017a). CFPB financial well-being scale – Scale development technical report. Retrieved from https://www.consumerfinance.gov/data-research/research-reports/financial-well-being-technical-report/.

Consumer Financial Protection Bureau (CFPB). (2017b). Financial well-being in America. Retrieved from https://www.consumerfinance.gov/data-research/research-reports/financial-well-being-america/.

Diener, E., Biswas-Diener, R., 2002. Will money increase subjective well-being? Soc. Indic. Res. 57, 119–169.

Dutt, B., 2023. Wellbeing amid digital risks: implications of digital risks, threats, and scams on users' wellbeing. Media Commun. 11 (2), 355–366.

Fan, L., Henager, R., 2022. A structural determinants framework for financial well-being. J. Fam. Econ. Issues 43 (2), 415–428.

Isaia, E., Oggero, N., 2022. The potential use of robo-advisors among the young generation: evidence from Italy. Finance Res. Lett. 48, 103046.

Jack, W., Suri, T., 2014. Risk sharing and transactions costs: evidence from Kenya's mobile money revolution. Am. Econ. Rev. 104 (1), 183–223.

Jang, Y., Kim, M., 2023. Effects of financial management capabilities on financial well-being: intergenerational comparison. Financ. Plan. Rev. 16 (1), 25–49.

Jhonson, B., Andriani, R., Noviana, I., Tamara, D., 2023. The influence of digital financial literacy on financial well-being through spending, saving, and investment behavior in Indonesia. J. Bus. Stud. Manag. Rev. 6 (2), 157–168.

Korean National Police Agency. (2023, July 4). Cyber investigation. Retrieved from https://www.police.go.kr/eng/statistics/statisticsSm/statistics04.jsp.

Kass-Hanna, J., Lyons, A.C., Liu, F., 2022. Building financial resilience through financial and digital literacy in South Asia and Sub-Saharan Africa. Emerg. Mark. Rev. 51, 100846.

Koskelainen, T., Kalmi, P., Scornavacca, E., Vartiainen, T., 2023. Financial literacy in the digital age—A research agenda. J. Consum. Affairs 57 (1), 507–528.

Lacombe, D.J., Khatun, N., 2023. What are the determinants of financial well-being? A Bayesian LASSO approach. Am. J. Econ. Sociol. 82 (1), 43–59.

Lee, J.M., Lee, J., Kim, K.T., 2020. Consumer financial well-being: knowledge is not enough. J. Fam. Econ. Issues 41 (2), 218–228.

Lo Prete, A., 2022. Digital and financial literacy as determinants of digital payments and personal finance. Econ. Lett. 213, 110378.

Long, T.Q., Morgan, P.J., Yoshino, N., 2023. Financial literacy, behavioral traits, and ePayment adoption and usage in Japan. Financ. Innov. 9 (1), 1–30.

Lusardi, A., Mitchell, O.S., 2014. The economic importance of financial literacy: theory and evidence. Am. Econ. J.: J. Econ. Lit. 52 (1), 5–44.

Lyons, A.C., & Fontes, A. (2021). Impacts of financial and digital literacy and social media on the financial health of U.S. households. Available at SSRN.

Lyons, A.C., Kass-Hanna, J., 2021a. A methodological overview to defining and measuring "digital" financial literacy. Financ. Plan. Rev. 4 (2), e1113.

Lyons, A.C., Kass-Hanna, J., 2021b. A multidimensional approach to defining and measuring financial literacy in the digital age. In: Nicolini, G., Cude, B. (Eds.), Handbook On Financial Literacy Research. Routledge, Taylor & Francis Group.

Lyons, A.C., Kass-Hanna, J., 2021c. The evolution of financial services in the digital age. In: Gable, J., Chatterjee, S. (Eds.), Handbook of Personal Finance. De Gruyter, pp. 405–429.

Morgan, P.J., 2021. Fintech, financial literacy and financial education. In: Cude, B.J., Nicolini, G. (Eds.), Routledge Handbook of Financial Literacy. Routledge, pp. 239–258.

Morgan, P.J., Long, T.Q., 2019. Fintech and Financial Literacy in The Lao PDR. Asian Development Bank Institute. ADBI Working Paper No. 933.

Morgan, P.J., Huang, B., & Long, T.Q. (2019). The need to promote digital financial literacy for the digital age. In *Realizing education for all in the digital age. T20 Report* (pp. 40–46). https://www.adb.org/sites/default/files/publication/503706/adbi-realizing-education-all-digital-age.pdf#page=56.

Muscanell, N.L., Guadagno, R.E., Murphy, S., 2014. Weapons of influence misused: a social influence analysis of why people fall prey to internet scams. Soc. Personal. Psychol. Compass 8 (7), 388–396.

N'dri, L.M., Kakinaka, M., 2020. Financial inclusion, mobile money, and individual welfare: the case of Burkina Faso. Telecomm. Policy 44 (3), 101926.

Netemeyer, R.G., Warmath, D., Fernandes, D., Lynch Jr, J., 2017. How am I doing? Perceived financial well-being, its potential antecedents, and its relation to overall well-being. J. Consum. Res. 45 (1), 68–89.

Organisation for Economic Co-operation and Development (OECD). (2020). OECD/INFE 2020 International Survey of Adult Financial Literacy. Retrieved from https://www.oecd.org/financial/education/launchoftheoecdinfeglobalfinancialliteracysurveyreport.htm.

Owen, T., Noble, W., Speed, F.C., 2017. The challenges posed by scammers to online support groups: the 'deserving' and the 'undeserving' victims of scams. In: McGuire, M., Holt, T., Zavos, E.C. (Eds.), New Perspectives on Cybercrime. Palgrave Macmillan, Cham, pp. 213–240.

Ozili, P., 2021. Financial inclusion research around the world: a review. Forum Soc. Econ. 50 (4), 457–479.

Pak, T.Y., Chatterjee, S., Fan, L., 2023. Financial socialization and financial well-being in early adulthood: the mediating roles of financial capability. Fam. Relat.

Panos, G.A., Wilson, J.O., 2020. Financial literacy and responsible finance in the FinTech era: capabilities and challenges. Eur. J. Finance 26 (4–5), 297–301.

Park, C.W., Yoon, C.S., 2018. A study on the legal policy for the prevention of telecommunications-based financial fraud. Hanyang Law Rev. 29-1 (61), 113–150.

Rahayu, R., Ali, S., Aulia, A., Hidayah, R., 2022a. The current digital financial literacy and financial behavior in Indonesian millennial generation. J. Account. Invest. 23 (1), 78–94.

Rahayu, R., Juita, V., Rahman, A., Fitriamiranti, S., Rafles, R., 2022b. The level of digital financial literacy and financial well-being of people in West Sumatra Indonesia. Oper. Manag. Inf. Syst. Stud. 2 (2), 66–76.

Ravikumar, T., Suresha, B., Prakash, N., Vazirani, K., Krishna, T.A., 2022. Digital financial literacy among adults in India: measurement and validation. Cogent Econ. Finance 10 (1), 2132631.

Seng, K., 2021. The mobile money's poverty-reducing promise: evidence from Cambodia. World Dev. Perspect. 22, 100310.
Suri, T., Jack, W., 2016. The long-run poverty and gender impacts of mobile money. Science 354 (6317), 1288–1292.
A. Utkarsh, Pandey, Ashta, A., Spiegelman, E., Sutan, A, 2020. Catch them young: impact of financial socialization, financial literacy and attitude towards money on financial well-being of young adults Int. J. Consum. Stud. 44 (6), 531–541.
Yoshino, N., Morgan, P.J., Long, T.Q., 2020. Financial Literacy and Fintech Adoption in Japan. Asian Development Bank Institute. ADBI Working Paper No. 1095.
Yue, P., Korkmaz, A.G., Yin, Z., Zhou, H., 2022. The rise of digital finance: financial inclusion or debt trap? Finance Res. Lett. 47, 102604.
Zavolokina, L., Dolata, M., Schwabe, G., 2017. FinTech transformation: how IT-enabled innovations shape the financial sector. FinanceCom 2016: Enterprise Applications, Markets and Services in the Finance Industry. Springer International Publishing, pp. 75–88.
Zhang, Y., Chatterjee, S., 2023. Financial well-being in the United States: the roles of financial literacy and financial stress. Sustainability 15 (5), 4505.