

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Finance Research Letters

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

Financial literacy, economic preferences, and adolescents' field behavior[☆]

Michael Razen^{*}, Jürgen Huber, Laura Hueber, Michael Kirchler, Matthias Stefan

University of Innsbruck, Department of Banking and Finance, Universitätsstrasse 15, Innsbruck 6020, Austria

ARTICLE INFO

JEL classification:

C93
D91
D81
G53
J13

Keywords:

Experimental finance
Financial literacy
Time preferences
Risk preferences
Adolescents

ABSTRACT

Financial literacy and economic preferences are considered to be important drivers of health, income, and general well-being. We bridge the gap between studies on financial literacy and research on economic preferences by investigating how they interplay with each other and with the field behavior of adolescents. First, we report that financial literacy scores are positively associated with patience, male gender, and educational level of the father. Second, we observe that risky field behavior like smoking and gambling is positively associated with various measures of risk-tolerance, and negatively associated with patience. Finally, we discuss implications for financial education programs.

1. Introduction

Financial literacy, i.e. the “combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and to ultimately achieve individual financial wellbeing”,¹ is an important skill for living a successful economic life. However, studies suggest that individuals and households have major problems in understanding simple financial concepts such as compound interest, diversification, and time value of money (Bucher-Koenen and Lusardi, 2011; Lusardi and Mitchell, 2011a). This lack of knowledge is found across age groups and appears to be a wide-spread phenomenon across industrialized and developing countries (Lusardi and Mitchell, 2014). There still is only little evidence about financial literacy skills of adolescent people, about

[☆] We thank Felix Holzmeister, Rene Schwaiger, seminar participants at the Stockholm School of Economics, as well as conference participants at the Workshop of the Austrian Working Group on Banking and Finance 2019, the Meeting of the Austrian National Economic Society 2019, the Experimental Finance Conference 2018 in Heidelberg, the Workshop on Experimental Finance at the Max Planck Institute Bonn 2018, the Organizations and Society Workshop 2018 in Innsbruck, and the Finance Research Day 2017 for very valuable comments on earlier versions of this paper. We especially thank the Arbeiterkammer Tirol (Chamber of Labor Tyrol) and particularly Ernst Haunholter, Michael Obermeier and the team of the “AK werkstatt” of the Arbeiterkammer Tirol for excellent research collaboration. The dataset and STATA do-files are available via the OSF-repository <https://osf.io/sg5wr/>. Financial support from the Austrian Science Fund (FWF START-grant Y617-G11, SFB F63) is gratefully acknowledged. This study was ethically approved by the IRB of the University of Innsbruck.

^{*} Corresponding author.

E-mail addresses: michael.razen@uibk.ac.at (M. Razen), juergen.huber@uibk.ac.at (J. Huber), laura.hueber@uibk.ac.at (L. Hueber), michael.kirchler@uibk.ac.at (M. Kirchler), matthias.stefan@uibk.ac.at (M. Stefan).

¹ <https://www.oecd.org/financial/education/2018-INFE-FinLit-Measurement-Toolkit.pdf>, retrieved April 2, 2020.

<https://doi.org/10.1016/j.frl.2020.101728>

Received 20 April 2020; Received in revised form 10 July 2020; Accepted 15 August 2020

Available online 18 August 2020

1544-6123/© 2020 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license

(<http://creativecommons.org/licenses/by/4.0/>).

drivers of adolescents' financial (il)literacy, and the interplay with economic preferences.

Economic preferences—in particular risk and time preferences—are important drivers of well-being in life as well. For instance, [Becker et al. \(2012\)](#) analyze data from the German SOEP and show that risk- and time preferences are related to life outcomes. More patience (i.e., the ability to delay gratification) and a higher willingness to take risks are positively related to better health levels and life satisfaction among a representative sample of German adults. [Moffitt et al. \(2011\)](#) and [Sutter et al. \(2013\)](#) analyze the impact of risk- and time preferences among kids and adolescents. [Moffitt et al. \(2011\)](#) show that more patient kids are healthier and better educated and have a lower propensity to commit a criminal act as adults compared to less patient kids. Moreover, [Sutter et al. \(2013\)](#) report that more patient adolescents consume less alcohol, smoke less and are in general healthier compared to less patient peers. In addition, these individual preferences are not stable, but develop over the course of childhood and adolescence, as, for instance, [Harbaugh et al. \(2002\)](#), [Buccioli et al. \(2010\)](#), and [Sutter et al. \(2013\)](#) show for risk and time preferences.

In this paper we connect these two strands of literature (on the determinants of financial literacy and on economic preferences and field behavior) by investigating the interplay between financial literacy, socioeconomic background, economic preferences, and self-reported field behavior of adolescents. In particular, we analyze (i) the relationship between socioeconomic characteristics on the one hand and financial literacy and economic preferences (risk and time preferences) on the other hand. Moreover, we analyze (ii) the relationship between financial literacy and economic preferences and, finally, we explore (iii) the impact of financial literacy and economic preferences on risky field behavior such as gambling and smoking.

2. Experimental design

The study was conducted in the classrooms of the participating school classes. The questionnaire administered to the students consisted of two parts. In the first part, we presented the participants with three incentivized experiments, eliciting (i) risk preferences (RISK) and (ii) time preferences (TIME I and TIME II). For the RISK experiment, we applied the approach by [Eckel and Grossman \(2002\)](#) and presented subjects with a set of six different lotteries. Each lottery comprised two equally likely payoffs ranging from € 10/€ 10 in Lottery 1 to € 0/€ 24 in Lottery 6 (see [Table 1](#) for an overview of all experiments and the supplementary material, online appendix for the experimental instructions). Subjects were asked to choose the lottery that best fitted their individual preferences. Here, our variable of interest is the number of the lottery the subjects chose. Hence, higher values of RISK indicate higher risk tolerance.

As outlined in columns 2 and 3 in [Table 1](#), time preferences were elicited using Multiple Price Lists (MPL) ([Angerer et al., 2015](#)). In Experiment TIME I, subjects decided between a payout today and a payout in one week. In particular, we showed 6 pairs of payoffs where one option ("Option A") paid out € 10 now across all decisions, while the payout of the other option in one week ("Option B") increased from € 11 to € 16 in steps of € 1 from decision 1 to 6. For each decision pair, we asked the subjects to select whether they preferred the payment now, or the payment in a week. Here, our variable of interest is the switching point from "payout today" to "payout in one week". Later switching points indicate a stronger preference for immediate gratification, as subjects need a higher compensation to be willing to wait one week for the payment. More precisely, we are looking at the first decision from which on subjects chose the later payment. It tells us the upper bound for the additional compensation required by the subject (the lower bound is the last decision where subjects chose the earlier payment). For a more intuitive interpretation of the regression output, we then reversed the list of observed switching points, such that higher values of TIME I indicate higher patience. Hence, TIME I ranges from 0 (never choosing to wait for the higher payment) to 6 (always choosing to wait for the higher payment). In Experiment TIME II, subjects had to go through the same six decisions, but the payout in Option A was implemented in one week and the payout in Option B in two weeks. We included this experiment to get a more comprehensive picture of adolescents' time preferences and to control for potential immediacy effects in Experiment TIME I. Analogous to TIME I, higher values of TIME II indicate higher patience.

Payouts were determined by a two-stage random draw: First, one of the three experiments was randomly selected. Second, the payout procedure for the corresponding experiment was implemented. If Experiment RISK was selected, another random draw revealed whether subjects would receive the high or the low payout of their chosen lottery. If Experiment TIME I or TIME II was selected, another random draw revealed which of the six decisions would be paid out. Depending on their choice in this decision, subjects received either the earlier or the later payment.² Accordingly, future payouts in Experiments TIME I or TIME II were paid out one or two weeks after the survey, respectively.

In the second part of the experiment – run directly after the first part –, we asked two basic financial literacy questions, testing adolescents' understanding of the concepts of compound interest and diversification ([Lusardi and Mitchell, 2017](#)). For our analysis, we use the variable FINLIT, which represents the total number of correct answers and, hence, can take on values from 0 to 2.³ Moreover, we

² The random draws were conducted by a volunteer from the class. For this purpose, we prepared a non-transparent bag with a set cards numbered from 1 to 3 for the first round. If Experiment RISK was selected, the second draw was conducted by replacing the three cards in the bag by one white and one orange ball (representing the high and the low payment). If Experiment TIME I or TIME II was selected, we conducted the second draw by placing a set of six cards ranging from 1 to 6 in the bag.

³ The questions are based on the questionnaire in [Lusardi and Mitchell \(2011b\)](#): Q1: "Assume, you have EUR 100 on your savings account and the interest rate is 2% per year. How much do you have after five years, if you do not withdraw any money from your savings account during this time?" (Answers: more than 110 Euro; exactly 110 Euro; less than 110 Euro; do not know). Q2: "If you want to invest, which of the following strategies usually provides the lower risk? An investment in ..." (Answers: a single stock; several stocks; do not know).

Table 1

Experimental tasks. This table outlines the choice lists for experiments on risk (RISK) and time preferences (TIME I and TIME II). In experiment RISK, subjects had to *select one* of the 6 lotteries presented in column 1. Note that the lotteries exhibit increasing expected returns and increasing risk. In Experiment TIME I, subjects had to choose between a payout today and a higher payout in a week for each of the 6 pairs. In Experiment TIME II, subjects had to decide between a payout in one week and a higher payout in two weeks for each of the 6 pairs.

Lottery/decision	RISK (1 decision)		TIME I (6 decisions)		TIME II (6 decisions)	
	50%	50%	Today	One week	One week	Two weeks
1)	€ 10	€ 10	€ 10	€ 11	€ 10	€ 11
2)	€ 13	€ 8	€ 10	€ 12	€ 10	€ 12
3)	€ 16	€ 6	€ 10	€ 13	€ 10	€ 13
4)	€ 19	€ 4	€ 10	€ 14	€ 10	€ 14
5)	€ 22	€ 2	€ 10	€ 15	€ 10	€ 15
6)	€ 24	€ 0	€ 10	€ 16	€ 10	€ 16

asked subjects about their GAMBLING, and SMOKING behavior,⁴ elicited subjects' ability to resist temptations using two questions (SELF_DISCIPLINE and SELF_DISCIPLINE_OTHERS),⁵ and measured their self-reported risk tolerance in general (SELF_RISK_GENERAL) and in financial matters (SELF_RISK_FINANCE) using the German SOEP questionnaire (Dohmen et al., 2011).⁶ See the supplementary material, online appendix for further details.

The experiment was conducted with a total of 627 students in 35 different classes at several schools in the Austrian province of Tyrol. The data collection of this study is part of a large, multi-year project on financial literacy/education among adolescents in Austria. Together with the Chamber of Labor in the province of Tyrol, we have developed a novel financial education program called *FiT – Financial Training*. This program features an online learning platform and combines workshop sessions in school with subsequent self-taught learning via the platform. *FiT – Financial Training* covers three aspects of financial education: practicing reflective and de-biased decision making, improving patience and savings behavior, and promoting financial literacy. The experiments presented in this study served as the test battery prior to the workshop to analyze the status-quo of financial literacy and economic preferences among adolescents.

The target group for this study were students in 9th and 10th grade. The average age of subjects was 15.8 years with a standard deviation of 1.9 years. The data collection process took place from October 2017 to June 2019. Concerning school type, 32 percent of all subjects attended a vocational school, 39 percent a high school, and 30 percent a polytechnic school (i.e., the final year of compulsory schooling in Austria).⁷ 60 percent of our subjects were female. The average payout from the experimental tasks was € 11 with a standard deviation of € 5. Table A.1 in the supplementary material, online appendix provides descriptive statistics and further details on the variables elicited in the experiment.

3. Results

Table 2 summarizes the results. In a systematic approach, we use FINLIT and the experimentally elicited economic preferences TIME I and TIME II and RISK as dependent variables in ordered logistic regression models (see columns 1–4). Here, socioeconomic background variables serve as explanatory variables. For the model with economic preferences, we additionally add FINLIT to measure the interplay between financial literacy and economic preferences, and add the corresponding self-reported levels of financial risk-taking and ability to resist temptations as validity checks. Moreover, we also use SMOKING and GAMBLING as dependent variables in columns 5 and 6, serving as proxies for risky field behavior. Those variables are explained by socioeconomic background variables, FINLIT to measure the impact of financial literacy on risky field behavior, and self-reported levels of ability to resist temptations and risk-taking. In what follows, we only discuss significant coefficients.⁸

Result 1. Financial literacy scores are positively associated with male gender, mathematics skills, and the educational level of the father.

⁴ GAMBLING: “How often do you gamble?” SMOKING: “How often do you smoke?”. For each question, answers were given on a 5-point scale (never; seldom; occasionally; often; very often).

⁵ “Please indicate for the following statements, to what extent they apply to you.” SELF_DISCIPLINE: “I can easily resist temptations.”; SELF_DISCIPLINE_OTHERS: “Other people would call me self-disciplined.” Answers were given on a 5-point scale (strongly disagree; rather disagree; neither agree nor disagree; rather agree; strongly agree).

⁶ SELF_RISK_GENERAL: “How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?” Answers were given on a 11-point Likert-scale (0: not at all willing to take risks; 10: very willing to take risks); SELF_RISK_FINANCE: “How do you see yourself: Are you a person who is fully prepared to take risks in investment decisions or do you try to avoid taking risks?” Answers were given on an 11-point Likert-scale (0: not at all willing to take risks; 10: very willing to take risks).

⁷ When comparing our sample with the distribution of school types in Austria, we find that our sample is fairly representative with a slight bias towards pupils from polytechnic and vocational schools. However, we do not consider this to be an issue, as we have a sufficiently large sample for each school type and we control for various socio-economic variables.

⁸ Note that the number of observations varies across regressions, as some participants were not able to answer all socioeconomic questions (e.g., educational level of their parents) or showed inconsistent behavior in the experiments. We treated these observations as missing values.

Table 2

Experimental findings. The table shows ordered logistic regressions for the dependent variables FINLIT, TIME I, TIME II, RISK, SMOKING and GAMBLING. FINLIT represents the number of correct answers in the financial literacy questions (0, 1 or 2). TIME I and TIME II measure subjects' experimentally elicited time preferences (integers from 0 to 6) with higher values implying more patience. RISK measures experimentally elicited risk attitudes (integers from 1 to 6) with higher values indicating more risk-taking. SMOKING and GAMBLING are integers between 1 and 5, with higher values indicating more frequent engagement. MALE is a binary dummy indicating gender. EDUCATION_MOTHER and EDUCATION_FATHER represent the highest education level of subjects' parents (1: Primary school, 2: Vocational school, 3: A-Levels, 4: University). CONFESSION=ISLAM and CONFESSION=OTHER are indicator variables for subjects' religious denomination, with the reference category being "Roman Catholic". SCHOOL=VOCATIONAL and SCHOOL=HIGHSCHOOL are indicator variables for subjects' current education type, with the reference category "Polytechnic school". MATH_SKILL denotes subjects' mathematics grade in their previous school report card, with higher numbers indicating better grades (we reversed the Austrian grade scale to make the interpretation of the coefficient more intuitive). SELF_DISCIPLINE reflects subjects' self-reported ability to resist temptations, while SELF_RISK_FINANCE and SELF_RISK_GENERAL reflects subjects' self-reported willingness to take risks in financial matters and in general, with higher values indicating higher ability to resist temptations and higher willingness to take risks, respectively. Standard errors, clustered on school class level, are in parentheses. *, **, and *** represent the 5%, 1%, and 0.1% significance level, respectively.

	FINLIT	TIME I	TIME II	RISK	SMOKING	GAMBLING
AGE	0.137* (0.061)	-0.144* (0.068)	0.001 (0.079)	0.106* (0.051)	0.238*** (0.057)	0.169*** (0.051)
MALE	0.547** (0.189)	-0.314 (0.219)	-0.279 (0.234)	0.777*** (0.203)	-0.465* (0.189)	0.517** (0.166)
EDUCATION_MOTHER	0.035 (0.105)	0.168* (0.082)	0.169 (0.093)	-0.093 (0.103)	0.024 (0.151)	-0.063 (0.132)
EDUCATION_FATHER	0.225* (0.114)	0.019 (0.112)	0.020 (0.118)	0.197 (0.113)	0.025 (0.126)	0.024 (0.144)
CONFESSION=ISLAM	-0.436 (0.321)	-0.479* (0.215)	-0.743*** (0.202)	0.170 (0.323)	-0.694 (0.418)	-0.253 (0.312)
CONFESSION=OTHER	-0.001 (0.225)	-0.692** (0.252)	-0.536 (0.408)	0.277 (0.246)	0.080 (0.174)	-0.192 (0.318)
SCHOOL=VOCATIONAL	0.077 (0.306)	0.302 (0.433)	-0.149 (0.403)	0.071 (0.291)	0.745* (0.308)	0.577* (0.287)
SCHOOL=HIGHSCHOOL	-0.017 (0.343)	0.374 (0.422)	0.161 (0.356)	0.389 (0.302)	-0.174 (0.271)	0.256 (0.233)
MATH_SKILL	0.200* (0.082)					
SELF_RISK_GENERAL					0.095 (0.056)	
FINLIT		0.342* (0.168)	0.409* (0.162)	-0.039 (0.125)	-0.155 (0.150)	0.208 (0.132)
SELF_DISCIPLINE		0.196* (0.095)	0.151 (0.097)	0.087 (0.094)	-0.328* (0.133)	-0.247* (0.112)
SELF_RISK_FINANCE				0.185*** (0.035)		0.166*** (0.047)
Observations	573	476	489	536	539	539
Pseudo R ²	0.036	0.028	0.026	0.039	0.075	0.060
Chi ²	55.870	32.359	41.408	108.754	74.788	84.625

As outlined in column 1 of Table 2, age, male gender, and math skills exhibit positive coefficients. Moreover, we show that the educational level of the father, but not of the mother, is positively related to adolescents' financial literacy scores—irrespective of subjects' gender. Taken together, these findings indicate that financial literacy is currently a male-dominated field.

Result 2. Experimentally elicited patience is positively associated with financial literacy scores and with adolescents' own perception of their ability to resist temptations.

We find that adolescents with high financial literacy scores are better in delaying gratification (see column 2 of Table 2). Note that the compensation for waiting one additional week for the payment is considerable in our experiment (ranging from at least 10 percent to 60 percent). Moreover, SELF_DISCIPLINE, i.e., the self-reported ability to resist temptation, is also positively associated with patience. Hence, subjects' own perception of their ability to resist temptations is in line with the experimentally elicited measures of patience. Of the socioeconomic variables, the adolescents' religious background partly explains patience, as those with Islamic confession show less patience compared to their Roman-Catholic peers. While existing literature suggests that it might not be religiousness *per se* that drives this effect (see, e.g., McCullough and Willoughby, 2009; Renneboog and Spaenjers, 2012), it still hints at a relevant target group for education policies. Importantly, the reported effects on time preferences are robust with respect to the dates of the earlier payment, and are not limited to the case where the earlier payment is in immediate prospect (see column 3 of Table 2).

Result 3. Experimentally elicited risk-taking is higher for male adolescents and is positively associated with self-reported risk-tolerance.

As can be seen in column 4 of Table 2, the coefficients for MALE subjects and self-reported risk-taking in financial matters (SELF_RISK_FINANCE) are positively associated with experimentally elicited risk-taking. The finding on gender differences in risk-taking is well established among student and general population samples (see e.g., Eckel and Grossman, 2008; Charness and Gneezy, 2012). We

support these findings by showing that these patterns are already prevalent at the age of 14–17 years.

Result 4. Risky field behavior is negatively associated with ability to resist temptations and positively related to self-reported risk-taking.

Columns 5 and 6 of [Table 2](#) outline the results. We find that male adolescents engage more frequently in GAMBLING (financial risk), but less frequently in SMOKING (health risk). This indicates that gender effects in risky field behavior are not uniform, but do depend on the activity. Note that the gender effect on GAMBLING also supports [Result 3](#) on experimentally elicited risk-taking, where the stakes are monetary. In addition, we show that older adolescents exhibit a higher tendency to engage in both types of risky field behavior. Moreover, we find that those adolescents with higher levels of self-reported SELF_DISCIPLINE smoke and gamble less than their peers. We further observe that self-reported risk-taking in financial matters is positively associated with gambling behavior.⁹ These findings are in line with [Sutter et al. \(2013\)](#) who report that more patient adolescents consume less alcohol, smoke less, and are healthier in general.

4. Conclusion

In this paper we bridged the gap between the literature on the determinants of financial literacy and the literature on economic preferences and field behavior. Our findings imply that financial literacy can positively impact behavior, and also that it is a male-dominated field (both on the adolescents' and the parents' side), which calls for financial education programs particularly tailored for female adolescents.

Taken together, our results also underline the importance of financial education as a family effort. This claim is supported by a comprehensive survey by [Gudmunson and Danes \(2011\)](#), who propose a conceptual framework of family financial socialization as a conclusion of reviewing financial literacy research from the past 40 years.

CRedit authorship contribution statement

Michael Razen: Conceptualization, Data curation, Writing - original draft, Writing - review & editing, Project administration, Investigation, Formal analysis, Software, Methodology. **Jürgen Huber:** Conceptualization, Writing - review & editing, Project administration, Funding acquisition, Investigation, Methodology. **Laura Hueber:** Conceptualization, Data curation, Project administration, Investigation, Formal analysis, Software, Methodology. **Michael Kirchner:** Conceptualization, Writing - original draft, Writing - review & editing, Project administration, Funding acquisition, Investigation, Methodology. **Matthias Stefan:** Conceptualization, Data curation, Writing - original draft, Writing - review & editing, Project administration, Investigation, Formal analysis, Software, Methodology.

Declaration of Competing Interest

None.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at [10.1016/j.fr.2020.101728](https://doi.org/10.1016/j.fr.2020.101728)

References

- Angerer, S., Lergepporter, P., Glätzle-Rützler, D., Sutter, M., 2015. How to measure time preferences in children: a comparison of two methods. *J. Econ. Sci. Assoc.* 1 (2), 158–169.
- Becker, A., Deckers, T., Dohmen, T., Falk, A., Kosse, F., 2012. The relationship between economic preferences and psychological personality measures. *Annu. Rev. Econ.* 4, 453–478.
- Buccioli, A., Houser, D., Piovesan, M., 2010. Willpower in children and adults: a survey of results and economic implications. *Int. Rev. Econ.* 57, 259–267.
- Bucher-Koenen, T., Lusardi, A., 2011. Financial literacy and retirement planning in Germany. *J. Pension Econ. Finance* 10 (4), 565–584.
- Charness, G., Gneezy, U., 2012. Strong evidence for gender differences in risk taking. *J. Econ. Behav. Organ.* 83 (1), 50–58.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., Wagner, G., 2011. Individual risk attitudes: measurement, determinants, and behavioral consequences. *J. Eur. Econ. Assoc.* 9 (3), 522–550.
- Eckel, C.C., Grossman, P.J., 2002. Sex differences and statistical stereotyping in attitudes toward financial risk. *Evol. Hum. Behav.* 23 (4), 281–295.
- Eckel, C.C., Grossman, P.J., 2008. Men, women and risk aversion: experimental evidence. *Handb. Exp. Econ. Results* 1, 1061–1073.
- Gudmunson, C., Danes, S., 2011. Family financial socialization: theory and critical review. *J. Fam. Econ. Issues* 32 (1), 644–667.
- Harbaugh, W.T., Krause, K., Vesterlund, L., 2002. Risk attitudes of children and adults: choices over small and large probability gains and losses. *Exp. Econ.* 5, 53–84.

⁹ We have also run a robustness check accounting for potential peer-effects in risky field behavior including leave-out means on a school class level – see Table A.2 in the Online Appendix. We find no peer-effects for MEAN_GAMBLING ($p = 0.266$) and MEAN_SMOKING ($p = 0.078$). Most importantly, controlling for peer behavior does not affect our main finding that risky field behavior is negatively associated with the ability to resist temptations and positively related to self-reported risk-taking. Likewise, the positive (negative) relationship between male gender and gambling (smoking) habits is robust when controlling for peer behavior.

- Lusardi, A., Mitchell, O.S., 2011a. Financial literacy and planning: implications for retirement well-being. In: Lusardi, A., Mitchell, O. (Eds.), *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*. Oxford University Press, pp. 17–39.
- Lusardi, A., Mitchell, O.S., 2011b. Financial literacy and retirement planning in the United States. *J. Pension Econ. Finance* 10 (4), 565–584.
- Lusardi, A., Mitchell, O.S., 2014. The economic importance of financial literacy: theory and evidence. *J. Econ. Lit.* 52 (1), 5–44.
- Lusardi, A., Mitchell, O.S., 2017. How ordinary consumers make complex economic decisions: financial literacy and retirement readiness. *Q. J. Finance* 7 (3), 1750008.
- McCullough, M., Willoughby, B., 2009. Religion, self-regulation, and self-control: associations, explanations, and implications. *Psychol. Bull.* 135 (1), 69–93.
- Moffitt, T.E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R.J., Harrington, H., Houts, R., Poulton, R., Roberts, B.W., Ross, S., Sears, M.R., Thomson, M.W., Caspi, A., 2011. A gradient of childhood self-control predicts health, wealth, and public safety. *Proc. Natl. Acad. Sci.* 108 (7), 2693–2698.
- Renneboog, L., Spaenjers, C., 2012. Religion, economic attitudes, and household finance. *Oxf. Econ. Pap.* 64 (1), 103–127.
- Sutter, M., Kocher, M.G., Glätzle-Rützler, D., Trautmann, S.T., 2013. Impatience and uncertainty: experimental decisions predict adolescents' field behavior. *Am. Econ. Rev.* 103 (1), 510–531.