School, parents, and financial literacy shape future financial behavior

By Antonia Grohmann and Lukas Menkhoff

Why do some people make better financial decisions than others do? The level of financial literacy plays an important role: Quality schooling that also deals with financial issues likewise leads to better financial decisions. However, many studies neglect how parenting also influences financial behavior. This report shows that parents also have an indirect effect on the financial literacy of their adult children; in general, specific financial training actually has less of an effect on financial behavior.

Competency in financial matters is extremely useful. This applies not only to businesses but increasingly to individuals, as well. Households have more financial assets than they used to. Many people have to service loans. More and more often, they have to use savings for their retirement and, when it comes to buying insurance, they are faced with a wide variety of products to choose from. Ideally, good financial decisions increase wealth, prevent over-indebtedness, finance retirement, and insure against major life contingencies.

Studies show, however, that many individuals make poor choices: some households invest all of their assets in a house (that they live in), hold stock primarily in the company where they work, or possess only savings deposits (with low interest). Others take out overpriced loans or are heavily indebted.

Interestingly, the quality of these financial decisions is closely related to the decision-maker's level of financial literacy, as shown by many studies.[1] This seems obvious, considering that relevant knowledge should lead to better decisions.[2] However, these studies also show that financial literacy levels are often very low.

The logic response from economic policy-makers has been to promote financial literacy. The OECD, for instance, published financial education guidelines in 2005.[3] In Germany, all *Länder* have now integrated elements of financial education in their school curricula, albeit with great variation in the type and intensity of the programs.[4] Although targeted educational programs ap-

1 Annamaria Lusardi and Olivia S. Mitchell, "The Economic Importance of Financial Literacy: Theory and Evidence," *Journal of Economic Literature* 52 (2014): 5–44.

2 Tabea Bucher-Koenen and Annamaria Lusardi, "Financial Literacy and Retirement Planning in Germany," *Journal of Pension Economics and Finance* 10 (4) (2011): 565–584.

3 OECD, "Recommendation on Principals and Good Practices for Financial Education and Awareness," July 2005.

4 Hans Kaminski and Stephan Friebel, "Finanzielle Allgemeinbildung als Bestandteil ökonomischer Bildung" (2012), accessed June 22, 2015, www.ioeb.de/sites/default/files/img/Aktuelles/120814_Arbeitspapier_Finanzielle_Allgemeinbildung_Downloadversion.pdf and Günther Seeber, "Ökonomische Bildung in der Schule, Notwendigkeit und Handlungsbedarfe" (2006), accessed June 23, 2015, https://www.uni-koblenz-landau.de/de/landau/fb6/sowi/iww/team/Professoren/seeber/WHL2006.

pear to be a fundamentally sensible approach, an evaluation of these programs has yielded disappointing results.[5] On average, the effect of improved knowledge on behavior was found to be limited and to diminish considerably over time.[6] There are numerous possible causes for this. The present article focuses primarily on the impact that family background and other childhood experiences may have on financial literacy and financial behavior.

The different channels of financial socialization

As mentioned above, targeted financial training has a surprisingly weak effect on financial behavior. One reason for this might be that financial socialization plays a key role in financial behavior. Financial socialization refers to the process by which individuals acquire not only theoretical knowledge of financial matters but also learn attitudes and behaviors that have an effect on their financial behavior.

Just as with other forms of socialization, financial socialization begins in childhood. For example, having children keep a bank account teaches them behaviors that may continue into adulthood. Financial socialization occurs through different channels; school, work, and family can all have an effect. Studies show that family has the strongest impact on financial socialization.[7]

How childhood experience shapes adult financial behavior

Economic studies on the impact of financial literacy on financial behavior tend not to address issues of family background such as parental teaching. There are three possible reasons for this. First, this information is usually not available . Second, financial training is seen as an exogenous effect (independent of family background). And third, the possibility of factoring in teaching and family is considered to be going too far, as the focus of these studies is on the effect of financial literacy on financial behavior.

While these limitations do generally apply, there are some studies that use information on the childhood experiences of their adult subjects.[8] This information is usually collected to facilitate the estimation of reliable coefficients, since while financial literacy presumably affects financial behavior, the reverse effect may also be true.[9] It is conceivable, for example, that people learn about finance when they use certain financial products.

The literature focuses primarily on five channels through which childhood experience may affect financial literacy: (1) parents' level of education, (2) parental teaching, (3) economics in school, (4) quality of education, and (5) learning through experiences with money in childhood. For example, one aspect of family background that is seen as relevant for financial literacy is

5 Melanie Lührmann, Maria Serra-Garcia, and Joachim Winter, "Teaching Teenagers in Finance: Does It Work?," *Journal of Banking and Finance* 54 (2015): 160–174.

6 Daniel Fernandes, John G. Lynch, and Richard G. Netemeyer, "Financial Literacy, Financial Education and Downstream Financial Behavior," *Management Science* 60 (2014): 1861–1883.

7 Soyen Shim, Bonnie L. Barber, and Noel A. Card, "Financial Socialization of First-year College Students: The Roles of Parents, Work, and Education," *Journal of Youth and Adolescence* 39 (2009/2010): 1457–1470.

8 Jere Behrman, Olivia S. Mitchell, Cindy Soo, and David Bravo, "Financial Literacy, Schooling, and Wealth Accumulation," *NBER Working Paper Series*, no. 16452.

9 A reverse effect can be ruled out, however, if the estimate uses what is called an instrument. These instruments are often variables that characterize childhood experience, since the instrument must be correlated with financial literacy but may not be correlated with financial behavior.

Box 1

Effect of childhood experiences on financial literacy – five factors

1. Parents' educational background

   What is the highest level of education completed by your mother?
   What is the highest level of education completed by your father?

2. Finance and parental teaching

   Did your parents encourage you to save money?
   Did your parents teach you how to budget?

3. Economics in school

   Did you take economics in school?

4. Quality of education

   Were you born in Bangkok?
   Did you complete your highest level of education in Bangkok?

5. Learning through experiences with money in childhood

   Did you have a job before the age of 15?
   Did you have a bank account before the age of 18?

the mother's education, specifically the highest level of education that she has completed (see Box 1).

How can financial literacy be measured?

Empirical studies of financial literacy require quantified measurements. It must be understood, however, that these measurements are only an approximation of actual literacy levels. Since collecting this kind of information is costly and respondents are often not eager to give long and complex answers, certain practical standards have been established. The simplest form of survey asks about three aspects of financial literacy, namely the respondent's understanding of interest, inflation, and diversification.

The present study is based on a survey conducted in Bangkok in December 2012. The questionnaire was developed, translated, and tested in cooperation with researchers from Mahidol University in Bangkok (see Box 2). The actual survey was conducted by a market research firm. It questioned 530 members of the middle class in Bangkok. More specifically, it included only individuals who earn a minimum income of approximately 400 euros per month and who are responsible or co-responsible for their own or their household's. Equal numbers of men and women aged 18 to 60 were surveyed. They were approached "on the street" in various neighborhoods in Bangkok.

Table 1

How is financial literacy measured?
Percentage of correct answers in percent

	Bangkok	Germany	USA
Question 1	79	82	65
Question 2	62	78	64
Question 3	23	61	52

Source: Xu, Lisa and Bilal Zia (2012): Financial Literacy around the World, World Bank Policy Research Working Paper 6107.

The survey results for Germany and the US are taken from other studies that were based on the same questions.[10] The results show that the percentage of correct answers for questions 1 and 2 was between 60 and 80 percent in all three countries. Question 3, on the other hand, was answered correctly by fewer than one in four respondents in Bangkok, while in Germany and the US it was answered correctly by 61 and 52 percent of the respondents, respectively (see Table 1).

In addition to these questions, which were asked in all three studies, the present study also tested the respondents' familiarity with foreign banks. The question "What foreign banks operate in Bangkok?" was developed as an indicator of specific institutional financial knowledge.

The financial literacy level of individual respondents was calculated based on the number of questions they answered correctly (see Figure 1). One to three points were awarded for the three standard answers; for every foreign bank that was named correctly in response to question 4, an additional quarter of a point was awarded, for a possible total of between zero and one point. Most of the respondents received a score of 2.5 points.

Box 2

Questions regarding financial literacy

1. You borrow 10,000 Thai baht at an interest rate of two percent per month. How much do you owe after three months?

   a) Less than 10,200 Thai baht
   b) More than 10,200 Thai baht
   c) Exactly 10,200 Thai baht

2. You have 10,000 Thai baht in a bank account. The interest rate for this account is one percent per year. The price of all goods and services increases by two percent per year. How much can you buy in one year?

   a) Less than I can buy today
   b) More than I can buy today
   c) Exactly as much as I can buy today

3. It is safer to buy one company stock than to buy a stock mutual fund.

   a) True
   b) False

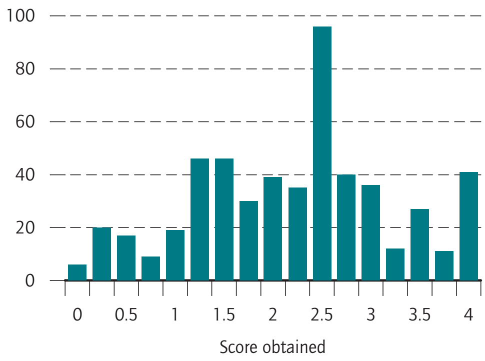
"I don't know" or "I refuse to answer" are admissible answers to all questions.

10 Lisa Xu and Bilal Zia, "Financial Literacy around the World," *World Bank Policy Research Working Paper* 6107 (2012). For each survey, the questions are modified to reflect the currency of the country where the survey is being conducted.

Figure 1

Financial literacy level

Number of respondents



Source: Own calculations.

Most respondents achieve 2.5 out of 4 points.

Table 2

Correlations between financial literacy, socio-demographic variables and financial behavior

	Financial literacy
Income (Individual income)	0.174***
Assets (Total financial assets)	0.104**
Education (Highest educational attainment)	0.281***
Age	−0.043
Numeracy (Number of numeracy questions answered correctly)	0.246***
Diversification of financial assets (Number of financial assets)	0.169***

*Significance levels: ***< 1 %, **< 5%, *< 10 %*

Source: Own calculations.

Educational attainment has the strongest link to financial literacy.

Diversification of assets is an indicator of good financial behavior

"Good behavior" is defined here as the diversification of assets across multiple investment types. As every type of investment has its own specific risk profile, it is generally advantageous to diversify assets across multiple investment types. This is, however, only a very rough indicator, as investors' specific portfolios and their personal preferences also play key roles.

The survey included six different forms of assets. Almost all respondents possessed one of these, namely a savings account. Other popular types of investment among the respondents include fixed deposits accounts, stocks (and funds), bonds, insurance products (for investment use), and gold. An indicator of good financial behavior was created by adding the number of investment types used by the respondents (not including savings accounts), resulting in answers with a possible score between 0 and 5. The average score was 0.75, meaning that most respondents have some form of investment aside from a savings account.

Financial behavior is also shaped by socio-economic factors

To filter out the effect of childhood experiences and financial education on financial behavior, other possible factors must also be taken into consideration. The literature contains a number of different variables:[11] financial literacy is higher and financial behavior tends to be better when respondents have higher incomes, greater assets, and higher levels of education. The extent to which age plays a major role is not as clear; however, middle-aged people tend to have the highest level of financial literacy. Numeracy is of particular significance, as people who have an affinity for numbers and calculating find it considerably easier to make financial decisions. This therefore raises the question of the extent to which financial literacy goes beyond basic numerical ability. The present study confirms these results (see Table 2), which indicate that higher income, greater assets, better education, and stronger numeracy are positively associated with financial literacy and financial behavior.

Parents' effect on financial literacy

This study of the middle class in Bangkok uses mediation analysis to show relationships between financial literacy, financial behavior, and other variables. Mediation analysis looks at more than just the effect of X on Y, as is done in more widely used regression analyses. It also takes other (intermediation) variables into account. For example, there may be a case in which X has an effect on M, which in turn has an impact on Y (at least in part). Mediation analysis makes it possible to examine these extended effects and relationships more precisely.

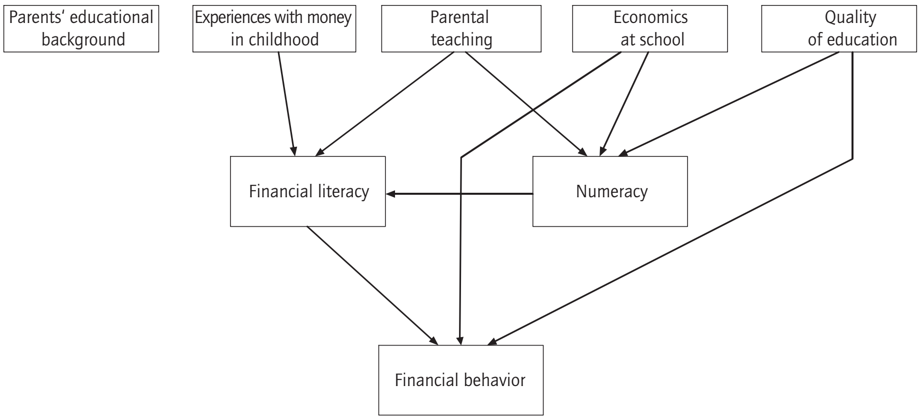
Results show that parental teaching, for instance, whether parents encouraged their children to save or taught them to budget , has a strong impact on financial literacy (see Figure 2).[12] There is also a correlation between

11 Lusardi and Mitchell, "Economic Importance."

12 Figure 2 shows the results of the regression analysis, available on request.

Figure 2

Factors[1] that influence financial literacy and financial behavior



1 Every arrow represents a significant relationship.

Source: Own illustration.

Only economics at school and quality of education influence financial behavior directly.

having experience with money in childhood and financial literacy in adulthood.

Interestingly, none of the other three childhood variables have a direct effect on financial literacy levels. There are, however, indirect relationships between these variables. Both economics in school and quality of education have a positive effect on numeracy. This, in turn, has a positive effect on financial literacy and thus indirectly impacts financial behavior. The results further show that parental educational background has no direct effect on financial literacy and financial behavior.

Financial literacy and school improve financial behavior

In line with results found in the literature, the dataset from Bangkok used here shows that higher financial literacy has a beneficial effect on financial behavior. As parental teaching has a positive impact on financial literacy, it also has an indirect effect on financial behavior of children when they reach adulthood.

Economics in school and educational quality show a direct positive relationship with financial behavior, represented here by greater diversification of assets. They also have an indirect effect since both of these childhood factors affect numeracy, which in turn improves financial literacy.

In conclusion, there are two channels through which financial behavior is impacted. The first is parental teaching, which boosts financial literacy, thus improving financial behavior, and the second is school. Economics in school and quality of education have a direct effect on financial behavior and also lead to improved numeracy, which in turn strengthens financial literacy.

Which of these channels has the greatest impact?

Mediation analysis also shows that parental teaching has the greatest impact on financial literacy. This effect is mediated slightly when numeracy is taken into account, but it remains significant. Parental teaching also has the strongest effect on numeracy of all the factors examined in the present study.

An examination of the factors that affect financial behavior reveals that diversification of assets (defined in this analysis as investments made in addition to savings deposits) increases by approximately 12 percent on average when respondents are able to correctly answer an additional financial literacy question. When respondents studied economics in school, diversification of assets increased by about 13 percent. Educational quality has an even stronger impact on diversification: respondents that were born in Bangkok and completed their highest level of education there have approximately 23 percent more assets on average than respondents who do not come from Bangkok and did not complete their highest level of education in this city.[13]

When examining the strength of the different effects, it becomes apparent that education and parental teaching have a considerable impact. Beyond that, we should be careful not to interpret the strength of the various effects too broadly, as they vary with the specific survey (group of respondents, variables used, etc.).

What policies are available?

Many OECD countries, as well as many developing and emerging countries, are making efforts to introduce financial education. This may appear to be an obvious way to improve financial literacy, but there are alternatives. It would be possible to reduce the number of decisions that people need to make, for example by introducing mandatory insurance, thus reducing the need for voluntary private insurance.

There are many ways to improve financial literacy. Based on the present study, there are at least four possible instruments worth considering:

1) Improving general numeracy in school proves useful in many areas of life and, among other things, helps to improve financial literacy (as it is typically measured).
2) From an even broader perspective, we can say that generally higher levels of education in society at large have positive side-effects: they boost financial literacy and thereby improve financial behavior.
3) One clearly effective approach to improving numeracy and consequently financial behavior is economics in school. The current trend is to favor measures that teach financial literacy directly, either by integrating the appropriate modules into school curricula, as in Baden-Württemberg, which now offers economics as a separate subject, or through special training. The special training courses, however, are currently being offered only in some schools as pilot programs and are not yet widespread. One of these initiatives is "My Finance Coach", which provides financial training in German schools.[14] In developing countries, financial training is provided by Freedom from Hunger, among other organizations.[15]
4) Another valuable approach would be to raise parents' awareness of the key role they can play in teaching their children about money. It should be noted that this does not require any advanced knowledge on the parents' part. Indeed, it is basic principles, such as saving and budgeting, that are most helpful. For example, family centers or initiatives such as the British PEEP (Peers Early Education Partnership) programs could be used to make parents aware of the advantages of teaching their children about money.

Conclusion

The present study shows that family background has a major impact on financial literacy levels and, through financial literacy, has a knock-on effect on financial behavior. In addition, certain school-related factors (quality of education and the teaching of economics in school) directly and indirectly promote broader diversification of assets and consequently sound financial behavior. Family and school complement each other in their effect on financial behavior.

On the whole, however, the current state of research does not give cause for great optimism. Introducing government policies to influence how parents raise their children is likely to be difficult. When we consider education, changes in schools generally, such as improving quality or introducing economics as a separate subject, are effective but also costly.

A more targeted approach is provided by financial literacy training programs, which were not part of this study. Unfortunately, the available evidence on the effect of these training programs tends to be disappointing.[16] The effectiveness of programs has been shown to vary widely.. A systematic evaluation of what leads to this variety in effectiveness is still in the early stages.[17] There is reason to believe that training programs can be designed successfully, even if we do not currently know enough to say exactly how best to approach this.

13 The variable "born in Bangkok/highest educational attainment in Bangkok" is used as a proxy for level of education, which is higher on average in Thailand's large cities than in its rural areas.

14 My Finance Coach, accessed June 22, 2015, http://www.myfinancecoach.de.

15 Freedom from Hunger, accessed June 22, 2015, https://www.freedomfromhunger.org/education-modules.

16 Fernandes et al., "Financial Literacy."

17 Margaret Miller, Julia Reichelstein, Christian Salas, and Bilal Zia, "Can You Help Someone Become Financially Capable? A Meta-Analysis of the Literature," *World Bank Research Observer* (forthcoming).

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