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HOW INFORMAL EDUCATION AFFECTS THE FINANCIAL LITERACY OF PRIMARY SCHOOL CHILDREN DEVELOPED IN A FORMAL EDUCATIONAL PROGRAM

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How informal education affects the financial literacy of primary school children developed in a formal educational program

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Abstract

This paper examines the role of informal financial education provided by parents in supplementing, and possibly improving the effect of formal financial education programs for primary school children in Italy. We report on a case study of the Money Learning (MOLE) project, an initiative of the Museum of Saving in Turin. In line with previous studies, we find that formal financial education has a positive effect on the financial literacy of primary school children. New empirical findings suggest that this effect of formal financial education can be reinforced by parents providing informal financial education (e.g. giving pocket money and freedom to spend it).

Keywords: Controlled field experiment, informal financial education, formal financial education, primary school children

J.E.L. Codes: A29, C93, G40

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1. INTRODUCTION

Economic literature has extensively documented the importance of economic and financial literacy in a wide range of adults' daily life decisions such as investments, retirement choices, participation in mutual and pension funds, and debt management (Lusardi & Mitchell 2008; Lusardi & Tufano 2009; Van Rooij, Lusardi & Alessie 2011a, b, 2012). Fernandes, Lynch and Netemeyer (2014) present a more cautionary view, arguing that interventions to improve financial literacy explain very little of the variation we find in financial behavior and that, therefore, financial education plays a limited role in determining such behavior. Other studies have found that economic and financial literacy learnt at a young age do improve the likelihood of saving, decreasing non-schooling related debt and improving repayment probabilities in adulthood (Lusardi & Mitchell 2014; Brown et al. 2016). Further, Ashby, Schoon, and Webley (2011) find that British adolescents' saving behavior at age 16 correlates positively with saving in adulthood at age 34.

In several countries, such as Australia and Canada, financial education is already included in the primary school curriculum. In Italy, the country considered in this paper, institutions are debating whether to include such content in the school's curriculum (Romagnoli & Trifilidis 2013). The main argument for financial education during the compulsory schooling years is that it prepares children for the many financial decisions they have to make in adulthood[1]. Although there is little disagreement on the need to have financially literate citizens, the body of empirical research on the effectiveness of financial education at primary schools is quite small. As discussed by Lusardi and Mitchell (2014), field experiments with control and treatment groups can shed light on which programs could work for which age groups. In an overview of financial literacy and education, Avery, de Bassa Scheresberg and Guiso (2016) suggest that school-based financial education can effectively improve qualitative financial knowledge and change behavior, but that it is less effective

[1] Additionally, evidence from psychological literature suggests that (upper) primary school children can be taught about personal finances as they are capable of understanding basic economic concepts and managing their money (Otto et al. 2006; Webley 2005).

in improving quantitative financial literacy skills. More specifically, a seminal study by Kourilsky (1977) shows that even children aged five and six can understand such economic concepts as cost-benefit analysis and scarcity. Similarly, Batty, Collins and Odders-White (2015), Berti and Monaci (1998), Coda Moscarola and Migheli (2017), Go et al. (2012), Kalwij et al. (2017) and Sherraden et al. (2011) provide empirical evidence on the effectiveness of formal financial education of primary school children on their level of financial literacy, savings intention or level of impatience.

It has been argued that besides formal financial education programs for children, either in curricular or extracurricular courses, informal financial education by the parents can play a prominent role. Informal education can be explicit, when parents enact initiatives to teach children basic economic and financial concepts, or implicit, when parents allow children to observe how they deal with taking household financial decisions. In support of these arguments, Bucciol and Veronesi (2014) found that parental financial education has a significant positive effect on their children's' propensity to save and the amounts they save as adults. Parental education can, in their study, be related to giving pocket money, controlling money affairs, and giving advice about budgeting and saving. In addition, Jorgensen and Savla (2010) found that parental influence had a significant positive effect on students' financial behaviors, mediated through positive financial attitudes. Related to the latter finding, Mandell and Schmid Klein (2007) show that student motivation increases financial literacy.

Our paper contributes to the literature by using information on both formal and informal financial education to empirically show that the effect of formal financial education on some aspects of financial literacy is larger for children whose parents provide informal financial education than for children whose parents do not provide this. The formal financial education program we investigated, is part of the Money Learning (MOLE) project, an initiative of the Museum of Saving in Turin, a well reputed Italian Institution for the dissemination of the financial literacy. In this program children living in villages in the mountainous areas around Turin and who are in the fourth and fifth grades of primary schools, are invited to visit the museum and guided along the so-called Money Path. During

the visits, financial literacy concepts such as compounded interest and inflation, as well as other basic concepts like the functioning of a loan, the history of money, and the suboptimality of a barter economy compared to a money exchange economy are addressed. For our field experiment, the participating children were randomly assigned to treatment and control groups, and their financial literacy was measured at two moments in time, which allowed us to control for any possible heterogeneity between the control and treatment groups. In addition, information was gathered on informal financial education provided by parents, which enabled us to estimate how it reinforces the effect of formal financial education on financial literacy.

The paper is structured as follows: Section 2 presents the experimental design, after which Section 3 describes the data. Section 4 briefly outlines the statistical models we used and presents the empirical results. Finally, Section 5 summarizes the main findings and discusses their implications.

2. THE EXPERIMENTAL DESIGN

Our controlled field experiment consisted of three phases during primary school children's visit to the Museum of Saving in Turin. This visit was part of an extracurricular financial education program, the Money Learning project (MOLE), tailored towards primary school children. Our study examined the short-term effects of the program on children's financial literacy (FL). The questionnaires used in the first and third phase, which we discuss below, are given in Appendix A.

In phase one, children, parents and teachers were requested to fill in questionnaires. While in class, children filled in a questionnaire under the supervision of their teachers. The children's questionnaire elicited information on their age, gender, and whether were interested in money matters, received pocket money or received money in exchange for basic household chores. In addition, their level of patience with respect to saving was elicited and FL questions covered knowledge of loans, coins, budget constraints, interest compounding, inflation and barter economy. Similar FL questions were

used before in Kalwij et al. (2017) when they assessed the effectiveness of a financial education program in Dutch primary schools.

Parents were asked about their citizenship, age and level of education, the number of older and younger siblings their child has, and the child's grade in mathematics. We deduced the nature of informal financial education (IFE) from whether their child received pocket money or had savings and, if so, the degree of freedom their child had to spend it. Further, we investigated whether day by day financial matters are topics of conversation parents shared with their children, and whether the mother was the principal financial decision maker in the household[2].

Finally, the questionnaire for teachers collected information on their self-perceived level of FL, as well as on their knowledge of inflation, risk and time-value of money. These were standard FL survey questions as used by, for instance, van Rooij, Lusardi, Alessie (2011a) and Lusardi and Mitchel (2008; 2011).

In the phase two, about one week after the set of questionnaires described above had been completed, children visited the Museum of Saving in Turin and were guided through the Money Path. During their visit, they watched four short cartoons (1-2 minutes each) in which the main characters are two museum mascots: two ants called For and Mica. The cartoons explain the origins of money, the principles of a loan, the implications of inflation, and barter versus monetary exchange economies[3]. Next, they watch two videos (3-4 minutes) that show them the history of the Templars, also explaining the concept of interest rate and the origin of the Euro[4]. Finally, children had access to the experimental hall in which they were allowed to play an interactive game called *job search*. In each

[2] The questionnaire contained additional questions to these, including ones on how parents evaluate the initiative, that we have not exploited in this analysis.

[3] Video 3D L'origine del nome moneta (Length: 01'07''); Video 3D L'uso della moneta dai babilonesi ai greci (Length: 01'38''); Video 3D Il valore della moneta legata al valore del metallo (Length: 02'10''); Video 3D Dal baratto alla moneta (Length: 01'34'').

[4] Intervista "impossibile" La nascita delle banconote e il ruolo dei cavalieri templari (Length: 06'46''); Documentario La nascita dell'Euro (Length: 02'27'').

round of the game, players accumulate a score in cash and they are asked whether they prefer to spend or save it. If they opt to save, they gain an interest rate of five percent. In this way the concept of interest compounding is brought home to them. After the various sessions, volunteers of the museum offered additional explanations and clarifications.

Phase three of the experiment consisted of eliciting participants' FL once again. This phase took place in the museum immediately before or after following the Money Path, depending on whether children were part of the control or of the treated group (as explained in more detail below). The same questionnaire as in the first phase was used, the only difference being that the ordering of the answers had been altered, and the names of the illustrative characters had been changed. Finally, we asked both children and teachers to evaluate their visit to the museum, while teachers had an additional question on whether they had taught any economic or financial concepts before. Unfortunately, the latter information was rarely provided with sufficient detail for our analysis, therefore we did not use it.

All the participating children were asked to go through the three abovementioned phases but, to create control and treatment groups, not all went through in the same order. The children were randomly assigned to one of these groups. To be more specific: When classes arrive at the museum, according to their arrival sequence, the first two classes were assigned to the treatment group, the third class was assigned to the control group, the next two classes would again join the treatment group, and the class thereafter the control group, and so forth. This assignment solely depends on the order of arrival at the museum the day of the visit. The children who were assigned to the treatment group followed phases one, two and three in that order. The children who were assigned to the control group, followed first phases one and three, in that order, doing phase two last. That is, children in the control group filled in the FL questionnaires of phases one and three, with one week between the two times, and only following that did they visit the museum (phase two). This way of constructing control and treatment groups ensured equal motivation of the groups, as children

assigned to the control group knew they would also visit the museum. Nevertheless, and in line with the treatment literature, in the remainder of this paper we sometimes refer to a *treatment effect* which more accurately would describe the effect of a visit to the museum on the treatment group only, although in our case the control group also visited the museum. Similarly, we often refer to pre- and post-tests which, for the control group, would be more accurately described as two pre-tests, as the second test for this group takes place before the visit to the museum.

3. THE DATA

An experiment conducted between May 2017 and February 2018 among primary school children in the mountainous areas of Piedmont Region (Northern Italy) provided data for this study. The rationale for focusing on schools situated in mountainous areas[5] was the distance between these schools and contexts in which FL courses or initiatives are more accessible, i.e. cities such as Turin. The raw sample consisted of 1486 children[6]. Our field experiment focuses on fourth and fifth graders. However, some schools in the mountainous areas have classes that group students from the first to fifth grades in one class, therefore these students (51 children) were dropped. We further restricted the sample to the children in the age range 8-11 years old (which excluded 21 children) to avoid our results being skewed by a few children who were, arguably, early starters with relatively high cognitive skills or late starters (or repeaters) with relatively low cognitive skills. The gender of nine children was not given, so these were excluded. A further 171 students who did not complete both the pre- and post-tests of phases one and three, were also excluded. The resulting sample consisted of

[5] Schools situated in mountainous areas are legally entitled to special funding and treatment. Mountainous areas are officially listed in an inventory established by law (657/1957).

[6] Towards the end of the project, some classes from the city of Turin and the surroundings were added to the experiment to consume the entire budget. We did not consider them (236 students) because we have reason to think that these schools differ from the schools of the mountain villages for many socio-economic aspects (as for example education, profession, income of parents) but most of all because their students usually have easy access to the Museum of Saving and other FL programs.

1234 fourth and fifth graders from 44 schools (86 classes). These schools were not a random sample of Italian primary schools as, being placed in mountainous areas, they have features that mark them as non-representative of the entire Italian population both in terms of socio-economic characteristics of students and parents, and their proximity to advanced educational initiatives.

Table 1 shows that the participants' gender composition was balanced and the average age was 9.2 years. About 48 percent of the children had an older brother or sister. The majority of parents had a high school diploma, while only 12 percent of the mothers and 8 percent of the fathers had a university degree. The parents of about 14 percent of the children were not born in Italy. Further, children's average math grade was 8.18 (on a 0-10 scale) with very little variation and, concerning attitudes, about 54 percent of the children indicated an interest in money matters.

Regarding informal financial education, our information was provided by the children themselves and by their parents. About 87 percent of the children reported to have their own savings, and 82 percent attested to receiving pocket money, although only 15 percent received it on a regular basis – hence, 67 percent are listed as occasionally receiving pocket money. The information on pocket money provided by the parents agreed with the children's information, excepting that more parents reported giving pocket money only occasionally (82 percent). Further, most parents reported that pocket money was not in exchange for chores (69 percent), and that children had only partial freedom in spending their own savings (65 percent). The latter means that children had to ask their parents' permission if they wanted to buy something from their own savings. Finally, in about 83 percent of the households parents talked openly about financial matters. In only 9 percent of the households, mothers were the primary financial decision makers.

About 67 percent of the children in the sample were allocated to the treatment group, hence 33 percent belonged to the control group. This accords with the assignment procedure: one out of every three classes that visited the museum were selected for the control group. Test statistics on the differences in means between the control and treatment group reveal that these are not significant (at

the five percent level) for all variables except the ones related to the child's age, father's level of education and teachers' financial education, as well as to children receiving pocket money (see Appendix Table B1). More importantly, and related to endogenous selection in the treatment group, the difference in average FL, in phase one, between the control and treatment group is not significant at the five percent level for all FL items (Table 2; last column). The answers to the six separate FL questions show that children perform best on the question about budget constraint (85 percent correct) and worst on the question about passive interest rate (44 percent correct). Table 2 further shows that in the first phase, on average, children answered 3.85 out of the six FL questions correctly[7]. Not shown here, the median FL score in this phase is 4, and about 17 percent of children answered all six questions correctly.

4. EMPIRICAL RESULTS

4.1 The determinants of financial literacy in phase one

Pre-treatment FL was elicited in phase one, and as a first analysis we examined the association between the FL score and the characteristics of the parents and children. For this, we estimated a linear regression model. The results reported in Table 3 show that the child's grade level and his/her grade in mathematics are two of the three statistically significant determinants of the FL score. Being in grade five instead of grade four increases the initial score of about 0.70 to 0.79 points on a scale from 0 to 6. A one-point increase in the grade in mathematics leads to an increase in the score of about 0.25 to 0.30 points. The importance of the mother's educational attainment on children's scholarly achievement in general, is emphasized by the finding that children whose mothers had

[7] We considered "don't know" as a wrong answer. The rate of "don't know" answers ranges from 6 to 21 percent in the pre-test, while it significantly decreases to a range of 2 to 15 percent in the post-test. An increase in the "don't know" answer rate is only observed for the question about the budget constraint. The observed reduction in "don't know" answers can be attributed to learning effect, while the treatment *per se* has a significant effect on the question about inflation. Results are available upon request.

completed high school had a significantly higher FL than children whose mothers had at most completed compulsory schooling (8 years of school). Interest in money matters is also positively correlated with the test's FL score, but its significance disappears once controlled for informal financial education.

Informal financial education is measured by the (dummy) variables related to financial responsibility of children (receiving pocket money, having own savings, and having at least some spending freedom), whether parents freely discuss of money issues (e.g. budget management and investment) at home, whether the mother is the principal financial decision maker in the domain of household finance (added in model 4) and, based on a principal component analysis, included as an index (IFE) in model 5. We refer to the first principal component as IFE (Information Financial Education); it ranges from -4.13 to 0.98 with mean value 0.6 and standard deviation equal to 1.11. Overall, IFE appears to be unrelated to children's initial FL scores.

Table 4 reports the regression results for the each of the six FL questions separately. The importance of the grade in mathematics is evident in all questions except the question related to inflation. Grade level is important for three of the six FL questions suggesting that in grade five (or at that age) children learn the concepts of loan, coins and budget constraint. The mother's educational level is positively correlated with a correct answer in questions on inflation and barter economy; while interest in money matters is linked to a higher probability of correctly answering the question on barter economy.

4.2 The effect of formal financial education on financial literacy

We used a difference-in-differences setup to estimate the average effect of formal financial education, as provided during the visit to the Museum of Saving in Turin, on children's FL (Angrist & Pischke 2009). As our experiment was a field experiment and not a fully controlled lab experiment, this approach ensured that we controlled for all individual heterogeneity that might have

influenced the estimated treatment effects, despite having randomized assignment[8]. The outcome variable (Y_{it}) is a dummy variable that captures whether the child i answered correctly to each of the six FL questions at time t where t is equal to zero in phase one and equal to one in phase three, $t \in \{0,1\}$. The number of children is denoted by n and $i \in \{1,..,n\}$. In particular, we estimate the following fixed-effects linear probability model[9]:

$$(1) \qquad Y_{it} = \alpha_i + \theta_1 t + \theta_2 Treatment_i + \beta Treatment_i \times t + \varepsilon_{it},$$

where the variable *Treatment* is equal to one if child i is in the treatment group and equal to 0 if in the control group. The child's specific fixed effect, that can potentially be correlated with the treatment effect, is denoted by α_i and the error term is denoted by ϵ_{it}. Model (1) is estimated using the sample of children who completed both the pre- and post-tests. The parameter θ_1 captures the learning effect from the repetition of the game. The group effect is captured by θ_2, i.e. the mean difference in Y_{it} between the control and treatment groups in the pre-test. The pure treatment effect is captured by β, that is the pure effect of the visit at the museum. Standard errors ϵ_{it} are corrected for heteroscedasticity and clustered by class. As mentioned above, in our difference-in-differences analysis we applied a fixed effect estimation technique to control for unobserved time invariant characteristics.

Table 5 reports the estimation results of Eq. (1) when using the FL score (the sum of the number of correct answers) or the six FL questions separately. The treatment increases the FL score with about 0.56 units (on a 0-6 scale). As for the understanding of a loan, inflation, and barter economy, the treatment increases the probability of correct answering with about 21, 17, and 11 percentage points respectively. Interestingly, the topics related to these questions were explicitly addressed during the visit to the museum. We do not find any significant effects of the treatment on the knowledge of

[8] See, for instance, the discussion at the end of Section 3 of Appendix Table B1. In theory, having a randomized controlled experiment would allow us to run the regression only on post-test outcomes.

[9] When using the FL score (the sum of the number of correct answers) as dependent variable, a linear regression model is estimated.

coins, the understanding of interest compounding and budget constraints. In other FL surveys the interest compounding question is asked to adults (e.g., Lusardi et al. 2015) and therefore might not be suited for fourth or fifth graders as it could be too difficult. In addition, it was addressed during the visit through the interactive game which could have distracted the children. As for the questions on coins and budget constraint, these topics were not explicitly addressed during the visit to the museum.

4.3 The role of informal financial education

As discussed in section 4.1, the index IFE (Information Financial Education) is based on the five dummy variables related to receiving pocket money, having own savings, having at least some spending freedom, whether parents (freely) discuss of money matters (e.g. budget management and investment) at home, and whether the mother is the principal financial decision maker in the household finance domain. Table 6, column 1, shows that overall, IFE does not significantly reinforce the effect of formal financial education on FL.

Concerning the FL questions separately, for two of the three FL questions on which formal financial education has a positive and significant (treatment) effect, informal financial education reinforces this effect, namely for the FL questions on understanding a loan and inflation. For barter economy, informal financial education does not reinforce the effect of formal financial education.

The results given in Table 7 provide further insight on the reinforcement effects of IFE and may suggest that for children who have their own savings, receive pocket money or have freedom in spending their money, the effect of formal financial education on FL is stronger than for children who, respectively, do not have their own savings, do not receive pocket money or who are not left to decide on their own spending. The changes in treatment effects on the understanding of a loan due to informal financial education as measured by having own savings, receiving pocket money and

spending autonomy give the right signal, but are often insignificant (see related tests for the reinforcement effect in Table 7). However, for understanding inflation there are strong and significant reinforcing effects. The variables whether parents (freely) discuss of money matters at home and whether the mother is the principal financial decision maker also count as part of IFE but individually they play no significant role in the reinforcement effect of formal financial education on FL.

5. CONCLUSIONS

Our analysis shows that the (initial) level of children's financial literacy depends on personal characteristics of the child, namely the grade level (age) and their grades in mathematics, as well as on the mother's level of education. Formal financial education is effectuated in our study by involving children in the Money Learning project (MOLE) of the Museum of Savings in Turin, and we show it is capable of increasing their level of financial literacy. However, and in line with findings in Kalwij et al. (2017), this increase is mainly due to increases in the likelihood of correctly answering the financial literacy questions that are related to topics that were explicitly addressed in the formal financial education program the museum offers.

Our findings concerning informal financial education could suggest that it reinforces the effect formal financial education has on financial literacy. The reinforcing effects appear to be mainly due to children having their own savings, receiving pocket money or having freedom in spending their money. One likely explanation for this is that informal financial education does not make children more literate *per se* as its effect on their capability to correctly answer the questions we posed is almost null, but it raises their interest in financial topics. Interest in and curiosity about financial topics can be triggered by handling and managing a (limited) sum of money, which could make the concepts explained in the treatment less abstract and more familiar. This argument would underscore

the importance of parents contributing to the financial education of children, even if not directly enlightening them on basic concepts of finance and economics. By simply making these notions more tangible, children are allowed to face concrete situations in which (e.g.) they have to manage a budget. What our results suggest agrees with the findings of Mandell and Schmid Klein (2007), as well as of educational psychology research (e.g., Sadosky 2001). However, to address the issue in more depth, new targeted field experimental evidence is required. In particular, we refer to field experimental evidence based not only on having randomly assigned formal financial education, but also randomly assigned informal financial education.

APPENDIX A

PRE-TREATMENT QUESTIONNAIRE

1. [School] What is the name of your school?
2. [Grade] In which grade are you?
3. [Name and surname] Please write down your name and surname or the identification code decided by the teacher.
4. [Year of birth] When were you born?
5. [Gender] Are you a boy or a girl?
6. [Pocket Money] Do your parents give you pocket money?
   - □ Yes, they regularly give me …. euro per month/week.
   - □ No, they don't do it on regular basis but only occasionally.
   - □ No, they don't do it.
7. [MoneyForChores] Do you sometimes do basic household chores in exchange for money?
   - □ Yes
   - □ No
8. [InterestInMoneyMatters] Have you ever shown interest in money matters?
   - □ Yes
   - □ No
9. [Patience] You would like to buy something nice but do not have the money for it. What would you do?
   - □ I buy something less nice that I can afford.
   - □ I save money so I can buy it later.
   - □ I ask money from my parents or some relatives.
   - □ I don't know.
10. [UnderstandingOfLoan] Giovanni borrows money from a bank. Which statement below is true?
    - □ Giovanni has to pay back the money he borrowed and he has to pay extra money (interest).
    - □ Giovanni has to pay back a part of the money he borrowed.
    - □ Giovanni has to pay back only the money he borrowed back.
    - □ Giovanni does not need to repay anything.
    - □ I don't know.
11. [KnowledgeOfCoins] What is the smallest number of euro coins needed to pay 1 euro and 25 cents without needing any change?
    - □ At least 2 coins
    - □ At least 3 coins
    - □ At least 4 coins
    - □ At least 5 coins
    - □ I don't know.
12. [BudgetConstraint] Carlotta has 100 euro in savings. With that amount of money she would like to buy a puzzle that costs 25.50 euro and a videogame that costs 65.90 euro. Can Carlotta buy both of them?
    - □ Yes, she can buy both of them. To buy them she needs …. euro.
    - □ No, she can't afford any of them.

- ☐ No, she can buy only one of them, either the puzzle or the videogame. To buy them both she needs …. euro.
- ☐ I don't know.

13. [InterestCompounding] Suppose Noemi has 100 euro in her savings account. If she leaves all the money on the bank account for one year, the bank rewards her with an interest rate of 3%. If Noemi decides not it withdraw money for two years, how much will she have on her bank account after two years?
    - ☐ More than 103 euro
    - ☐ Exactly 103 euro
    - ☐ Less than 103 euro
    - ☐ I don't know.
14. [Inflation] Last year, Alessio had 5 euro and was able to afford 2 kilos of his favorite bread. If inflation has been equal to 10 percent, how much bread can Alessio buy now with 5 euro?
    - ☐ More than last year
    - ☐ Less than last year
    - ☐ I don't know.
15. [BarterEconomy] The harvest was plentiful this year. Thus, Antonietta decided to keep only half of it for herself and take the other half of the harvest to the open-air market. For Antonietta it is better to
    - ☐ Sell the harvest in exchange for money, as with the money she can buy what she likes most, whenever she likes.
    - ☐ Barter the harvest with someone that supplies something she likes, for example exchange it for grapes.
    - ☐ I don't know.

POST-TREATMENT QUESTIONNAIRE

1. [School] What is the name of your school?
2. [Class] What class do you attend?
3. [Name and surname] Please write down your name and surname or the identification code decided by the teacher.
4. [DatePreTest] When did you answer the pre-treatment questionnaire?
5. [UnderstandingOfLoans] Pietro borrows money from a bank. Which of the following is true?
    - ☐ Pietro does not need to repay anything.
    - ☐ Pietro has to pay back a part of the money he borrowed.
    - ☐ Pietro has to pay back only the money he borrowed.
    - ☐ Pietro has to pay back the money he borrowed and he has to pay extra money (interest).
    - ☐ I don't know.
6. [Patience] You would like to buy something nice but do not have the money for it. What would you do?
    - ☐ I buy something less nice that I can afford.
    - ☐ I save money so I can buy it later.
    - ☐ I ask money from my parents or some relatives.
    - ☐ I don't know.
7. [Inflation] Last year, with 5 euro Anna was able to afford two bars of her favourite chocolate. If inflation has been equal to 12 percent, how many bars of her favourite chocolate can Anna buy now with 5 euro?
    - ☐ More than last year
    - ☐ Less than last year

- □ I don't know.

8. [KnowledgeOfCoins] What is the smallest number of euro coins needed to pay 2 euro and 70 cents without needing any change?
   - □ At least 2 coins
   - □ At least 3 coins
   - □ At least 4 coins
   - □ At least 5 coins
   - □ I don't know.
9. [BarterEconomy] The harvest was plentiful this year. Thus, Antonietta decided to keep only half of the barley for herself, and take the other half of the harvest to the open-air market. For Antonietta it is better to….
   - □ Sell the harvest in exchange for money, as with the money she can buy what she likes most, whenever she likes.
   - □ Barter the harvest with someone that supplies something she likes, as for example exchange it for grapes.
   - □ I don't know.
10. [InterestCompounding] Suppose Clara has 100 euro in her savings account. If she leaves all the money on the bank account for one year, the bank rewards her with an interest rate of 2 percent. If Noemi decides not to withdraw money for two years, how much will she have on her bank account after two years?
    - □ More than 102 euros
    - □ Exactly 102 euros
    - □ Less than 102 euros
    - □ I don't know.
11. [BudgetConstraint] Carlotta has 100 euro in savings. With that amount of money, she would like to buy a book that costs 36.50 euro and a board game that costs 66.90 euro. Can Carlotta buy both of them?
    - □ Yes, she can buy both of them. To buy them she needs …. euro.
    - □ No, she can't afford any of them.
    - □ No, she can buy only one of them, either the puzzle or the videogame. To buy them both she needs …. euro.
    - □ I don't know.
12. [LikeVisit] Did you enjoy the visit to the Museum?
    - □ Yes, very much.
    - □ Yes, well enough.
    - □ It was so-so.
    - □ I didn't enjoy it.
13. [LikeActivities] Did you enjoy the activities at the Museum?
    1. Cartoons with For and Mika:
       - □ very much □ well enough □ a little □ not at all
    2. Documentaries on Templars and the introduction of the Euro:
       - □ very much □ well enough □ a little □ not at all
    3. Interactive games in the Experimental Area:
       - □ very much □ well enough □ a little □ not at all
14. [LikeActivitiesMost] Which activity did you like most? Why?
15. [Learned] Do you believe you have learnt something from the visit? What?

16. [TalkedWithParents] Have you already spoken to your parents about the topics shown during the visit to the Museum? What did you talk about?

PRE-TREATMENT QUESTIONNAIRE FOR TEACHERS

1. [TeacherNameSurname] Name and surname: ……..
2. [Class and School] Class and school: …….
3. [TeacherSelfAssessedFLt] On a scale of 1 to 10, how would you evaluate your own economic and financial competence?

   (where 1= poor or null, …, 10 = excellent)
4. [TeacherInflation] Suppose that you have a bank account of 1000 euro without any cost that grants you a 1% interest rate. Imagine that the inflation rate is 2%. Do you think that if you withdraw money in one year's time, you will be able to buy the same amount of goods you can afford today with 1000 euro?
   - Yes
   - No, I will afford less goods.
   - No, I will afford more goods
   - I don't know.
   - I don't want to answer this.
5. [TeacherRisk] In your opinion, which of these investment strategies implies a higher risk of losing money?
   - Invest savings in shares of one company.
   - Invest savings in shares of many different companies.
   - I don't know.
   - I don't want to answer this.
6. [TeacherTimeValueOfMoney] Let's assume that a friend of yours receives 10.000 euro as an inheritance today, while her brother will also receive 10.000 euro, but in 3 years' time. Who is the richest as an effect of the inheritance?
   - The friend
   - The brother
   - Both of them in equal measure
   - I don't know
   - I don't want to answer this.

POST-TREATMENT QUESTIONNAIRE FOR TEACHERS

1. [TeacherNameSurname] Name and surname:……..
2. [Class and School] Class and school: …….
3. [TeacherLike] Did you like our initiative? Did you find it useful in enriching the competences of your students?
   - Yes, very much
   - Yes, well enough
   - A little
   - Not at all

4. [TeacherAppropriate] Do you think the way of presenting the arguments to the children was appropriate for their age?
   - Yes, very much
   - Yes, well enough
   - A little
   - Not at all

5. [TeacherEcoonomic] Have you spoken about any of these topics in class before? If yes, which topics did you discuss?

6. [TeacherLearn] Personally, do you feel you have learnt something from the visit? If yes, what did you learn?

7. [TeacherLikeActivities] Did you enjoy the activities proposed at the Museum?

   Cartoons with For and Mika:

   □ Very much □ well enough □ a little □ not at all

   Documentaries on Templars and the introduction of the Euro:

   □ Very much □ well enough □ a little □ not at all

   Interactive games in the Experimental Area:

   □ Very much □ well enough □ a little □ not at all

8. [TeacherLikeActivitiesMost] Which activity did you enjoy most? Why?

QUESTIONNAIRE FOR THE PARENTS

[ParentNameSurnameChild] Name and surname of your child or id code: .....

[ParentClassSchool] Class and school of your child: ……...

1. [ParentChildAge] Age of your child:
2. [ParentChildSex] Sex of your child *(M/F)*
3. [CitizenshipChild] Citizenship of your child: .....
4. [PostCode] Postcode of your child's residence……..
5. [N_OlderSiblings, ParentN_OlderSiblingsSex, ParentN_OlderSiblingsAge] Number of older siblings, sex and age.....
6. [N_YoungerSiblings, ParentN_YoungerSiblingsSex, ParentN_YoungerSiblingsAge] Number of younger siblings, sex and age.....
7. [MathGrade] Your child's math grade reported in the last term:
8. [PocketMoney] Does your child receive money from parents, grandparents, or other siblings?

   □ Yes, regularly. He/She receives some pocket money almost every …… (specify monthly/weekly/annually).

   □ Yes, regularly. He/She receives some pocket money almost every …… (specify monthly/weekly/annually) but only if he/she does some simple home chores.

   □ Yes, occasionally.

   □ Yes, occasionally, but only if he/she does some simple home chores.

   □ No.

9. [AmountPocketMoney] Can you tell me how much he/she receives in pocket money per month? .....
10. [Savings] Does the child have his/her own savings (in a moneybox, bank account)? *(Yes/No)*
11. [AutonomySpendingMoney] Can the child freely decide whether and how to spend his/her money to buy things or do activities he/she likes?

    □ Yes, in complete autonomy.

    □ Yes, but he/she has to ask (one of) the parents for approval.

    □ No, he/she is too young and for the moment he/she cannot use his/her savings.

    □ Other…….

Questions related to parent 1:

1. [Parent1Age] Age: .....
2. [Parent1Sex] Sex: .....
3. [Parent1Citizenship] Citizenship: .....
4. [Parent1Edu] Parent 1 education:
   - ☐ none
   - ☐ primary school certificate
   - ☐ lower secondary school certificate
   - ☐ vocational secondary school diploma (3 years of study) – specify ……
   - ☐ upper secondary school diploma – specify…….....
   - ☐ 3-year university degree/higher education diploma – specify…….....
   - ☐ 5-year university degree – specify……..
   - ☐ postgraduate qualification – specify……...
5. [Parent1EvaluationInitiative] What do you think about our initiative?
   - ☐ Very useful
   - ☐ Useful enough
   - ☐ Limitedly useful
6. [Parent1Interests] What aspect of the initiative did you find most interesting? (More than one choice is possible)
   - ☐ School trip to Turin
   - ☐ Visit to a museum
   - ☐ Topic of the initiative (innovative because it is not part of the standard primary school curriculum)
   - ☐ Other (specify)…….
7. [Discussion of money matters at home] Do you openly talk about budget management and possible investments at home? *(Yes/No)*……...
8. [Parent1DecisionMaker] Who is in charge of the principle financial decisions in the household?
   - ☐ You
   - ☐ Your spouse/partner
   - ☐ We take decisions jointly

Questions related to parent 2:

9. [Parent2Age] Age: .....
10. [Parent2Sex] Sex: .....
11. [Parent2Citizenship] Citizenship: .....
12. [Parent2Edu] Parent 2 education:
    - ☐ none
    - ☐ primary school certificate
    - ☐ lower secondary school certificate
    - ☐ vocational secondary school diploma (3 years of study) – specify……
    - ☐ upper secondary school diploma – specify…….....
    - ☐ 3-year university degree/higher education diploma – specify…….....
    - ☐ 5-year university degree – specify……..
    - ☐ postgraduate qualification – specify……...

APPENDIX B

Table B1 - Comparison between the treatment group and the control group, at phase one

	Control group			Treated group			H0: Diff=0
	N	Mean	Std. dev.	N	Mean	Std. dev.	P-value
Socio-demographic variables							
Male	407	0.53	0.50	827	0.49	0.50	0.15
Age	407	9.28	0.76	827	9.16	0.72	0.01
Grade five	407	0.50	0.50	827	0.57	0.50	0.02
Parent(s) born abroad	388	0.16	0.37	767	0.13	0.33	0.12
Mother at most compulsory schooling	394	0.29	0.45	781	0.29	0.46	0.82
Father at most compulsory schooling	380	0.48	0.50	751	0.40	0.49	0.01
Mother completed at most high school	394	0.57	0.50	781	0.60	0.49	0.47
Father completed at most high school	380	0.47	0.50	751	0.51	0.50	0.16
Mother obtained a university degree	394	0.14	0.35	781	0.11	0.32	0.15
Father obtained a university degree	380	0.06	0.23	751	0.09	0.29	0.05
Older siblings	407	0.47	0.50	827	0.48	0.50	0.63
Individual attitudes							
Grade in mathematics	367	8.23	1.10	748	8.15	1.12	0.28
Interest in money matters	406	0.57	0.50	821	0.53	0.50	0.23
Informal financial education: self-assessed							
Own savings	388	0.88	0.32	768	0.87	0.34	0.45
Pocket money	405	0.83	0.38	825	0.81	0.39	0.46
Pocket money – regularly (self-assessed)	405	0.12	0.32	825	0.17	0.37	0.02
Pocket money – occasionally (self-assessed)	405	0.71	0.45	825	0.64	0.48	0.02
Informal financial education: assessed by parents							
Pocket money – regularly (parents)	395	0.08	0.28	793	0.11	0.31	0.16
Pocket money – occasionally (parents)	395	0.84	0.37	793	0.80	0.40	0.12
Pocket money – no work (parents)	395	0.67	0.47	793	0.71	0.46	0.18
Pocket money – work (parents)	395	0.14	0.35	793	0.13	0.34	0.57
Full autonomy in spending own savings	393	0.03	0.17	778	0.03	0.17	0.93
Partial autonomy in spending own savings	393	0.65	0.48	778	0.65	0.48	0.99
Discussion of money matters at home	386	0.83	0.38	772	0.83	0.37	0.83
Mother financial decision maker	393	0.10	0.30	782	0.08	0.28	0.44
Teachers' financial education							
Average by class FL score	224	2.40	0.53	598	2.13	0.75	0.00
Average by class auto-evaluation	224	3.64	1.75	598	4.33	1.71	0.00

REFERENCES

Angrist, J.D. and Pischke, J-S., 2009. *Mostly harmless econometrics*, Princeton University Press, New Jersey.

Avery, M., de Bassa Scheresberg, C., and Guiso, F., 2016, *Understanding what works: Case studies in financial education*, report, Global Financial Literacy Excellence Center.

Batty, M., Collins, M.J., and Odders-White, E., 2015. Experimental evidence on the effects of financial education on elementary school students' knowledge, behavior, and attitudes, *Journal of Consumer Affairs*, 49(1), 69-96.

Berti, A.E., and Monaci, M.G., 1998. Third graders' acquisition of knowledge of banking: Restructuring or accretion?, *British Journal of Educational Psychology*, 68, 357-371.

Brown, M., Grigsby, J., van der Klaauw, W., Wen, J., and Zafar, B., 2016, Financial education and the debt behavior of the young, *Review of Financial Studies,* 29(9), 2490–2522.

Bucciol, A., and Veronesi, M., 2014. Teaching children to save: What is the best strategy for lifetime savings? *Journal of Economic Psychology*, 45(C),1-17.

Coda Moscarola, F., and Migheli, M., 2017. Gender differences in financial education: Evidence from primary school, *De Economist*, 165 (3), 321–347.

Fernandes, D., Lynch Jr., J.G., and Netemeyer, R.G., 2014. Financial literacy, financial education, and downstream financial behaviors, *Management Science*, 60(8), 1861-1883.

Go, C.G., Varcoe, K., Eng, T., Pho, W., and Choi, L., 2012. Money savvy youth: Evaluating the effectiveness of financial education for fourth and fifth graders, FRBSF Working Paper No. 2012-02, Federal Reserve Bank of San Francisco, San Francisco.

Jorgensen, B.L., and Savla J., 2010. Financial Literacy of Young Adults: The Importance of Parental Socialization, *Family Relations*, https://doi.org/10.1111/j.1741-3729.2010.00616.x

Kourilsky, M., 1977. The kinder-economy: A case study of kindergarten pupils' acquisition of economic concepts, *Elementary School Journal*, 77(3), 182-191.

Lusardi, A. and Tufano P., 2009. Debt literacy, financial experiences, and overindebtedness", *Journal of Pension Economics and Finance*, 14(04),332-368.

Lusardi A. and Mitchell, O.S.,2008, "Planning and Financial Literacy: How Do Women Fare?" American Economic Review 98 (2), 413–17.

Lusardi A. and Mitchell, O.S.,2011, "Financial Literacy and Planning: Implications for Retirement Well-Being." In Financial Literacy: *Implications for Retirement Security and the Financial Marketplace*, edited by Olivia S. Mitchell and Annamaria Lusardi, 17–39. Oxford and New York: Oxford University Press.

Lusardi, A., and Mitchell, O., 2014. The economic importance of financial literacy: Theory and evidence, *Journal of Economic Literature*, 52(1), 5-44.

Lusardi, A., Mitchell, O., and Curto, V., 2010. Financial literacy among the young, *Journal of Consumer Affairs*, 44(2), 358-380.

Kalwij A., Alessie R., Dinkova M., Schonewille G., van der Schors A., and van der Werf M., 2017, The impact of financial education on financial literacy and saving behavior: Evidence from a controlled field experiment at Dutch primary schools, *U.S.E. Discussion paper series*, 17-05, Utrecht University School of Economics

Mandell, L., and Schmid Klein, L., 2007. Motivation and Financial Literacy, *Financial Services Review*, 16(2), 105–116

Otto, A.M.C., Schots, P.A.M., Westerman, J.A.J., and Webley, P., 2006. Children's use of saving strategies: An experimental approach*, Journal of Economic Psychology*, 27, 57-72.

Romagnoli, A., and Trifilidis, M., 2013. Does financial education at school work? Evidence from Italy, *Questioni di Economia e Finanza* (Occasional Papers) 155, Bank of Italy, Economic Research and International Relations Area.

Sadoski M., 2001. Resolving the Effects of Concreteness on Interest, Comprehension, and Learning Important Ideas From Text, *Educational Psychology Review*, 13(3), pp 263–281.

Sherraden, S.M., Johnson, L., Guo, B., and Elliot, III, W., 2011. Financial capabilities in children: Effects of participation in a school-based financial education and savings program, *Journal of Family Economics Issues*, 32, 385-399.

van Rooij M.C.J., Lusardi A. and Alessie R.J.M., 2011a, Financial literacy and stock market participation, *Journal of Financial Economics*, 101(2), 449-472.

van Rooij M.C.J., Lusardi A. and Alessie R.J.M., 2011b, Financial literacy and retirement preparation in the Netherlands, *Journal of Pension Economics and Finance*, 10(4), 527-545.

van Rooij M.C.J., Lusardi A. and Alessie R.J.M., 2012, Financial Literacy, Retirement Planning and Household Wealth, *Economic Journal, Royal Economic Society*, 122(560), 449-478.

Webley, P., 2005. Children's understanding of Economics. In M. Barrett & E. Buchanan-Barrow (Eds). *Children's understanding of Society* (pp. 43-67). Hove: Psychology Press.

Table 1 Sample statistics of children's and parents' characteristics in phase one

Variable	Obs	Mean	Std. Dev.	Min	Max
Socio-demographic variables					
Male	1,234	0.50	0.50	0	1
Age	1,234	9.20	0.74	8	11
Grade five	1,234	0.55	0.50	0	1
Parent(s) born abroad	1,155	0.14	0.34	0	1
Mother at most compulsory schooling	1,175	0.29	0.45	0	1
Father at most compulsory schooling	1,131	0.42	0.49	0	1
Mother completed at most high school	1,175	0.59	0.49	0	1
Father completed at most high school	1,131	0.50	0.50	0	1
Mother obtained a university degree	1,175	0.12	0.33	0	1
Father obtained a university degree	1,131	0.08	0.27	0	1
Older siblings	1,234	0.48	0.50	0	1
Individual attitudes/experience					
Grade in mathematics	1,115	8.18	1.11	1	10
Interest in money matters	1,227	0.54	0.50	0	1
Informal financial education: self-assessed					
Own savings	1,156	0.87	0.33	0	1
Pocket money	1,230	0.82	0.39	0	1
Pocket money – regularly (self-assessed)	1,230	0.15	0.36	0	1
Pocket money – occasionally (self-assessed)	1,230	0.67	0.47	0	1
Informal financial education: assessed by parents					
Pocket money – regularly (parents)	1,188	0.10	0.30	0	1
Pocket money – occasionally (parents)	1,188	0.82	0.39	0	1
Pocket money – no work (parents)	1,188	0.69	0.46	0	1
Pocket money – work (parents)	1,188	0.13	0.34	0	1
Full autonomy in spending own savings	1,171	0.03	0.17	0	1
Partial autonomy in spending own savings	1,171	0.65	0.48	0	1
Discussion of money matters at home	1,158	0.83	0.38	0	1
Mother decision maker	1,175	0.09	0.28	0	1
Teachers' financial education					
Average by class FL score	822	2.21	0.70	0	3
Average by class auto-evaluation	822	4.14	1.75	1	7
MdR treatment					
Treated	1,234	0.67	0.47	0	1

Table 2 Financial literacy, phase 1

	All			Control group			Treated group			Equality of means [a)]
Variable	**Obs.**	**Mean**	**Std. Dev.**	**Obs.**	**Mean**	**Std. Dev.**	**Obs.**	**Mean**	**Std. Dev.**	**p-value**
FL score	1,234	3.85	1.54	407	3.92	1.56	827	3.82	1.53	0.29
Understanding of a loan	1,234	0.44	0.50	407	0.45	0.50	827	0.43	0.50	0.38
Knowledge of coins	1,234	0.66	0.48	407	0.62	0.49	827	0.67	0.47	0.07
Budget constraint	1,234	0.85	0.35	407	0.86	0.35	827	0.85	0.36	0.64
Compounding interest	1,234	0.66	0.47	407	0.69	0.46	827	0.64	0.48	0.11
Inflation	1,234	0.57	0.49	407	0.60	0.49	827	0.56	0.50	0.15
Barter economy	1,234	0.68	0.47	407	0.69	0.46	827	0.67	0.47	0.39

Notes: The FL score is defined as the sum of the number of correct answers to the six FL questions. [a)] The null-hypothesis is that the mean (or proportion) is the same in the control and treatment groups.

Table 3 The determinants of the financial literacy score (FL) in phase 1

	Model 1 b/se	Model 2 b/se	Model 3 b/se	Model 4 b/se	Model 5 b/se	Model 6 b/se
Man	0.105	0.106	0.097	0.132	0.157	0.121
	(0.094)	(0.093)	(0.095)	(0.094)	(0.117)	(0.095)
Grade five	0.700***	0.763***	0.769***	0.791***	0.763**	0.795***
	(0.220)	(0.213)	(0.208)	(0.207)	(0.333)	(0.209)
Parent(s) born abroad	-0.206	-0.079	-0.121	-0.114	0.016	-0.093
	(0.185)	(0.162)	(0.164)	(0.173)	(0.196)	(0.182)
Mother high school degree	0.386***	0.215**	0.232**	0.279**	0.246**	0.264**
	(0.103)	(0.107)	(0.106)	(0.106)	(0.109)	(0.111)
Father high school degree	0.090	-0.001	0.016	0.024	0.108	0.002
	(0.081)	(0.088)	(0.085)	(0.081)	(0.100)	(0.083)
Mother university degree	0.278*	0.027	0.043	0.069	0.102	0.055
	(0.161)	(0.168)	(0.173)	(0.186)	(0.210)	(0.179)
Father university degree	0.309**	0.204	0.234	0.214	0.147	0.203
	(0.155)	(0.153)	(0.152)	(0.162)	(0.190)	(0.156)
Older siblings	0.032	0.039	0.045	0.080	0.098	0.085
	(0.077)	(0.080)	(0.079)	(0.080)	(0.115)	(0.077)
Grade in mathematics		0.258***	0.249***	0.253***	0.303***	0.254***
		(0.044)	(0.045)	(0.050)	(0.069)	(0.050)
Interest in money matters		0.219**	0.232**	0.244**	0.175	0.242**
		(0.106)	(0.109)	(0.112)	(0.115)	(0.109)
Pocket money			0.189	0.204	0.223	
			(0.143)	(0.150)	(0.187)	
Own savings			0.081	0.105	0.002	
			(0.120)	(0.131)	(0.147)	
Spending freedom			0.087	0.106	0.175	
			(0.097)	(0.106)	(0.133)	
Mother decision maker				0.268	0.291	
				(0.209)	(0.270)	
Discussion of money matters at home				-0.211	-0.149	
				(0.136)	(0.163)	
Average by class FL score					-0.153	
					(0.244)	
Average by class auto-evaluation					0.033	
					(0.067)	
Informal Financial Education (IFE)						0.016
						(0.039)
Constant	3.125***	1.055***	0.820**	0.823*	0.571	1.007**
	(0.186)	(0.392)	(0.407)	(0.421)	(0.929)	(0.428)
R-squared	0.073	0.113	0.120	0.129	0.163	0.121
N	1,114	1,036	1,001	973	662	973

Notes: Linear regression models are estimated. FL score is the sum of the number of correct answers to the six FL questions. IFE is an index for informal financial education is obtained as principal component of the following variables: *Own savings*, *pocket money*, *spending freedom*, *discussion of money matters at home*, and *mother decision maker*. Clustered standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

Table 4 The determinants of the probability of providing a correct answer in each financial literacy question in phase 1

	(1) Understanding of a loan b/se	(2) Knowledge of coins b/se	(3) Budget constraint b/se	(4) Interest compounding b/se	(5) Inflation b/se	(6) Barter economy b/se
Man	0.019	0.026	0.004	0.031	0.057*	-0.017
	(0.037)	(0.030)	(0.023)	(0.032)	(0.030)	(0.025)
Grade five	0.214***	0.242***	0.070**	0.099	0.086	0.083*
	(0.066)	(0.053)	(0.034)	(0.060)	(0.052)	(0.046)
Parent(s) born abroad	0.081	-0.072	-0.041	-0.073	-0.047	0.059
	(0.049)	(0.057)	(0.031)	(0.063)	(0.056)	(0.050)
Mother high school degree	-0.006	0.046	0.022	0.048	0.065**	0.089**
	(0.034)	(0.035)	(0.030)	(0.038)	(0.032)	(0.037)
Father high school degree	-0.015	-0.013	0.022	-0.016	0.024	0.001
	(0.032)	(0.031)	(0.019)	(0.035)	(0.031)	(0.032)
Mother university degree	-0.055	-0.046	0.049	0.068	0.045	-0.006
	(0.067)	(0.059)	(0.040)	(0.050)	(0.061)	(0.064)
Father university degree	0.078	0.025	-0.011	-0.023	0.065	0.070
	(0.053)	(0.051)	(0.044)	(0.047)	(0.066)	(0.046)
Older siblings	0.026	-0.031	0.015	0.020	0.045*	0.010
	(0.032)	(0.031)	(0.022)	(0.027)	(0.023)	(0.026)
Grade in mathematics	0.059***	0.044***	0.047***	0.052***	0.013	0.040***
	(0.018)	(0.015)	(0.012)	(0.013)	(0.017)	(0.013)
Interest in money matters	0.065*	0.020	0.033	0.053	-0.008	0.079***
	(0.037)	(0.034)	(0.029)	(0.040)	(0.039)	(0.027)
IFE [a)]	0.023*	0.002	0.007	-0.004	-0.011	-0.001
	(0.013)	(0.013)	(0.009)	(0.014)	(0.015)	(0.016)
Constant	-0.200	0.167	0.391***	0.115	0.324**	0.210*
	(0.145)	(0.136)	(0.102)	(0.123)	(0.156)	(0.120)
R-squared	0.071	0.085	0.050	0.037	0.021	0.035
Number of children	973	973	973	973	973	973

Notes: Linear probability models are estimated. Clustered standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01.

[a)] Information Financial Education (IFE) is an index in between -4.13 and 0.98 based on the first principal component from a PCA of the following variables: *Own savings*, *pocket money*, *spending freedom*, *discussion of money matters at home*, and *mother decision maker*.

Table 5 The effects of the treatment on the FL score and on the probability of providing a correct answer for each financial literacy question

	(1) FL score	(2) Understanding of a loan	(3) Knowledge of coins	(4) Budget constraint	(5) Interest compounding	(6) Inflation	(7) Barter economy
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
t	-0.037	0.079*	0.177***	-0.199***	-0.017	-0.054*	-0.022
	(0.106)	(0.043)	(0.050)	(0.044)	(0.035)	(0.030)	(0.028)
Treated*t	0.558***	0.212***	-0.055	0.053	0.061	0.174***	0.114***
	(0.161)	(0.058)	(0.056)	(0.055)	(0.045)	(0.053)	(0.040)
Constant	3.853***	0.437***	0.656***	0.853***	0.657***	0.573***	0.677***
	(0.052)	(0.020)	(0.013)	(0.010)	(0.013)	(0.014)	(0.013)
R-squared	0.022	0.064	0.023	0.039	0.000	0.012	0.008
Number of children	1,234	1,234	1,234	1,234	1,234	1,234	1,234

Notes: in column 1 a linear regression model is estimated. In columns 2-7 linear probability models are estimated. FL score is the sum of the number of correct answers to the six FL questions. The time trend is denoted by t and the treatment (Treated*t) is a visit to the museum for the treatment group. Clustered standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01.

Table 6 Reinforcing effects of informal financial education(IFE).

	(1) FL score	(2) Understanding of a loan	(3) Knowledge of coins	(4) Budget constraint	(5) Interest compounding	(6) Inflation	(7) Barter economy
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
t	-0.014	0.088**	0.170***	-0.183***	-0.014	-0.053	-0.012
t* IFE	(0.107)	(0.044)	(0.047)	(0.043)	(0.038)	(0.034)	(0.024)
	-0.069	-0.063***	-0.005	-0.020	0.029	-0.029	0.006
	(0.071)	(0.018)	(0.025)	(0.026)	(0.031)	(0.026)	(0.020)
Treatment*t	0.541***	0.209***	-0.056	0.037	0.061	0.176***	0.098***
	(0.163)	(0.060)	(0.057)	(0.055)	(0.047)	(0.055)	(0.027)
Treatment*t* IFE	0.082	0.055**	-0.033	0.036	-0.030	0.061**	0.014
	(0.082)	(0.025)	(0.029)	(0.031)	(0.039)	(0.030)	(0.024)
Constant	3.899***	0.447***	0.664***	0.859***	0.667***	0.578***	0.684***
	(0.053)	(0.021)	(0.013)	(0.010)	(0.013)	(0.014)	(0.014)
R-squared	0.024	0.065	0.018	0.038	0.002	0.012	0.009
Number of children	1,103	1,103	1,103	1,103	1,103	1,103	1,103

Notes: in column 1 a linear regression model is estimated. In columns 2-7 linear probability models are estimated. FL score is the sum of the number of correct answers to the six FL questions. The time trend is denoted by t and the treatment (Treated*t) is a visit to the museum for the treatment group. Information Financial Education (IFE) is an index in between -4.13 and 0.98 based on the first principal component from a PCA of the following variables: *Own savings*, *pocket money*, *spending freedom*, *discussion of money matters at home*, and *mother decision maker*. Reinforcing effects are modelled using interactions between time, treatment effects and IFE. Clustered standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01.

Table 7 Reinforcing effect of informal financial education (IFE): The different components.

	(1) FL score	(2) Understanding of a loan	(3) Knowledge of coins	(4) Budget constraint	(5) Interest compoudi ng	(6) Inflation	(7) Barter economy
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Treated*t*own savings	0.600***	0.231***	-0.060	0.048	0.063	0.200***	0.117***
	(0.168)	(0.060)	(0.056)	(0.054)	(0.046)	(0.052)	(0.044)
Treated*t* no own savings	0.171	0.097	-0.059	0.009	0.037	0.005	0.082
	(0.252)	(0.095)	(0.151)	(0.139)	(0.101)	(0.110)	(0.082)
H_0: no reinforcement [a)]	0.0847*	0 .1114	0.9942	0.7697	0.7977	0.0506**	0.6973
Treated*t*pocket money	0.554***	0.218***	-0.077	0.078	0.088*	0.148***	0.098**
	(0.165)	(0.061)	(0.062)	(0.059)	(0.046)	(0.055)	(0.040)
Treated*t* no pocket money	0.574*	0.186**	0.047	-0.076	-0.053	0.290***	0.181**
	(0.299)	(0.086)	(0.110)	(0.096)	(0.085)	(0.085)	(0.087)
H_0: no reinforcement [a)]	0.9422	0.6913	0.3068	0.1317	0.0887*	0.0877*	0.3492
Treated*t*discussion of money matters at home	0.559***	0.235***	-0.065	0.064	0.034	0.178***	0.114***
	(0.170)	(0.063)	(0.059)	(0.058)	(0.048)	(0.056)	(0.041)
Treated*t* no discussion of money matters at home	0.365	0.120	-0.002	-0.050	0.099	0.107	0.091
	(0.253)	(0.072)	(0.097)	(0.071)	(0.089)	(0.099)	(0.074)
H_0: no reinforcement [a)]	0.4355	0.1335	0.5306	0.1272	0.4732	0.4746	0.7642
Treated*t* mother is the financial decision maker	1.028***	0.222**	0.029	0.092	0.411***	0.130	0.145
	(0.336)	(0.102)	(0.123)	(0.098)	(0.139)	(0.121)	(0.115)
Treated*t* mother is not the financial decision maker	0.485***	0.217***	-0.066	0.044	0.019	0.171***	0.101**
	(0.167)	(0.063)	(0.057)	(0.056)	(0.046)	(0.055)	(0.040)
H_0: no reinforcement [a)]	0.1158	0.9632	0.4434	0.5886	0.0053**	0.7254	0.7082
Treated*t* spending freedom	0.617***	0.247***	-0.081	0.047	0.040	0.234***	0.130***
	(0.167)	(0.057)	(0.063)	(0.061)	(0.043)	(0.057)	(0.046)
Treated*t*no spending freedom	0.432*	0.141	-0.027	0.054	0.119	0.056	0.088
	(0.218)	(0.085)	(0.074)	(0.073)	(0.090)	(0.078)	(0.060)
H_0: no reinforcement [a)]	0.3588	0.1366	0.4846	0.9254	0.3957	0.0230**	0.5561

Notes: in column 1 a linear regression model is estimated. In columns 2-7 linear probability models are estimated. Reinforcing effects are modelled using interactions between time, treatment effect and the dummy capturing whether each informal financial education channel (*own savings*, *pocket money*, *spending freedom*, *discussion of money matters at home*, and *mother decision maker)* is active or not. The list of explanatory variables used in each linear regression includes the time dummy (t), its interaction with the informal financial literacy channel and the constant, here not reported for sake of brevity. Clustered standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01; [a)] p-values reported.

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