Culture, Financial Literacy and Self-Control

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Abstract

We study the effect of culture on financial literacy and self-control by comparing students along the Swiss language border, sharply separating French and German speakers. We find that students at French-speaking schools have a sizeably lower level of financial literacy and tend to consume more impulsively compared to students at German-speaking schools. In a mediation analysis, we provide evidence that the effect is mainly mediated by financial socialization and attitudes towards money and consumption. Overall, our findings underline the importance of the cultural background of the target group in financial education programs.

Keywords: culture, preferences, norms, financial literacy, self-control

JEL classification numbers: D03, D14, Z1

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1 Introduction

A growing body of research documents that financial literacy and self-control are associated with better personal financial decision making. Individuals with a higher level of financial literacy perform better in retirement planning (Lusardi & Mitchell, 2007), are less prone to overindebtedness (Lusardi & Tufano, 2015) and participate more often (van Rooij, et al., 2011) and with better diversified portfolios in financial markets (Gaudecker, 2015). The lack of self-control is reported to be positively related to the use of high cost borrowing (Gathergood (2012) and Meier and Sprenger (2010)) and the co-holding of high cost credit with low yield liquid savings (Gathergood & Weber, 2014). Financial literacy is also related to returns on deposit accounts (Deuflhard, et al., 2015) and the propensity to withdraw deposits from distressed banks (Brown, et al., 2016).

These findings have triggered substantial investments by public and private institutions in financial education programs - often targeting the youth population - that aim to improve financial literacy and foster self-control (see Fernandes et al. (2014), Miller et al. (2015), and Kaiser and Menkhoff (2016) for meta-studies on financial education programs). While some programs are tailor-made for specific target groups (e.g. low income households or migrants), many others aim at improving financial behaviour of a heterogeneous pool of subjects (e.g. programs in public schools). In order to improve the design of programs, it is essential to understand how the cultural background of subjects may influence financial literacy and self-control and through which channels this influence occurs.

This paper studies the effect of culture on financial literacy and self-control among the youth. Following Guiso et al. (2006), we define culture as the set of beliefs, norms and preferences that are shared among the members of a cultural group and that transmit fairly unchanged from generation to generation. From an economics perspective, culture may thus affect financial decision making through systematic variation in time and risk preferences

(Falk, et al., 2015) or variation in social norms regarding the incurrence and repayment of debt and informal insurance for households in financial distress (Lindbeck, 1997). From a psychological perspective, culture may further influence financial decision making through differences in attitudes towards money, e.g. the importance of money and consumption for achieving social prestige (Yamauchi & Templer, 1982). Our aim is thus twofold: First, we examine the magnitude of differences in financial literacy and self-control across well-defined cultural groups. Second, we examine to what extent these differences may be accounted for by systematic variation in preferences, social norms and money attitudes across these groups.

We examine the impact of culture on financial literacy and self-control at the French-German language border within Switzerland. Two institutional features make the setting ideal to study questions related to culture. First, the language border prevents cultural differences from diffusing and allows differences in norms and preferences to coexist over time within a small geographic area.[1] Second, the language border runs through cantons, the first administrative division of Switzerland. Since most laws and policies are set either on national or cantonal level, there is no major change in institutions or policies at the language border. The setting allows to mitigate the two-way interaction between culture and institutions (Alesina & Giuliano, 2015) since a homogeneous set of institutions is applied to both groups independent of their respective culture. No geographic barriers are present at the language border and the transport system is fully integrated across the language border. As a consequence, institutional and economic conditions that potentially influence financial literacy and self-control hardly change at the language border.

We study survey data which covers 655 students attending French- or German-speaking secondary schools at the language border in the canton of Fribourg. The survey data covers students from all educational levels. Besides measures of financial literacy and self-control,

[1] The differences in norms and preferences can be observed in the voting behaviour. There is a clear cut in support for example for work-time regulations (Eugster, et al., 2016) or left-of-center referenda (Eugster & Parchet, 2013).

our survey captured detailed information on economic preferences, social norms as well as the socio-economic background. We study three research questions:

(i) Do differences in financial literacy and self-control exist between students from the two language groups?

(ii) Do differences in related economic preferences and social norms exist between students of the two language groups?

(iii) To what extent can differences in norms and preferences explain observed differences in financial literacy and self-control?

We document substantial differences in financial literacy and self-control between the two language groups. In responding to ten questions on financial literacy, students at German-speaking schools scored on average 1.3 points (25 percent) higher than students at French-speaking schools. Students at French-speaking schools are also 16 percentage points (36 percent) more likely to find financial matters confusing. With respect to self-control, one-third of students at French-speaking schools report that they regret recent purchase, more than double the share of students at German-speaking schools. Moreover, students at German-speaking schools save 14 percentage points (32 percent) more of their available monthly funds than students at French-speaking schools. Supporting our conjecture that locally embedded culture influences financial literacy and self-control, we find that differences between the language groups are particular strong among Swiss students, and negligible among students with a recent immigration history.

We further document strong differences across the language border in financial socialization by parents and current money attitudes. Students at French-speaking schools display a lower level of financial freedom (pocket money at a later age, no bank account or no independent access to a bank account) and more often associate money and consumption with a successful and self-determined lifestyle. French-speaking students are also more willing to

take risks. However, we find no significant difference in time preferences between the two cultural groups. Finally, in a mediation analysis we show that observed differences in financial literacy and self-control across the language border are rather driven by differences in financial socialization and money attitudes than differences in risk or time preferences. Financial socialization is the strongest mediator of financial literacy. Money attitudes have the strongest average mediation effect on self-control.

Our empirical findings contribute to three main strands of literature:

First, we contribute to the recent literature on the determinants of financial literacy by taking into account cultural heterogeneity. Lusardi et al. (2010) analyse how sociodemographic characteristics and family financial sophistication influence the level of financial literacy among the youth. Further studies document the importance of parental background and parental financial socialization (Furnham (2001) Webley and Nyhus (2006); Norvilitis and MacLean (2010); Van Campenhout (2015); Kim et al. (2015); Grohmann et al. (2015); Brown and Taylor (2016)) as well as the interest in money and consumption (Sohn, et al., 2012) for financial literacy and financial behaviour. More recently, financial literacy accumulation by adults has been modelled as an endogenous choice (Jappelli and Padula (2013) and Lusardi et al. (forthcoming)). Meier and Sprenger (2013) show that participation in voluntary financial education programs is strongly related to patience. In this paper we document that "initial" level of financial literacy - e.g. among 15-year olds - varies strongly across social groups and is related to cultural differences in financial socialization.

Second, we add to the literature which studies the determinants of self-control and its role in financial decision making. Patience and self-control have been identified as important non-cognitive skills influencing individuals' decisions such as consumption and saving (Sutter, et al., 2013). The linguistic savings hypothesis by Chen (2013) argues that future orientation of language influences individuals' time preferences. Sutter et al. (2015) and

Becker et al. (2015) provide empirical evidence for the hypothesis. Focusing on primary-school children, Alan and Ertac (2014) document that forward-looking behaviour can be fostered through educational programmes using case studies, stories and class room activities. We contribute to this literature by documenting significant differences in self-control of the youth across cultural groups. Moreover, in contrast to the previous findings our analysis suggests that money attitudes rather than time preferences is an important cultural determinant of self-control.

Finally, we contribute to the broader literature on the role of culture in economic and financial decision making. Christelis et al. (2013) document cross-country differences in households' asset allocation. Using survey information from 76 countries, Dohmen et al. (2015) show that observed cross-country differences in saving rates are associated with differences in time preferences. Exploiting differences in the cultural origins of immigrants to Canada and the U.S., Carroll et al. (1994; 1999) argue that culture has little impact on household savings. More recently, Haliassos et al. (forthcoming) document substantial cultural differences in the financial behaviour of immigrants to Sweden, but also how exposure to Swedish intuitions leads to an assimilation to Swedish behaviour. Closely related to our study, Guin (2015) studies household savings behaviour at the language border within Switzerland. He documents a substantially higher propensity to save among German-speaking households. We extend this strand of literature by documenting substantial cultural differences in financial literacy and self-control which affect financial decision making.

The remainder of the paper is organized as follows. Section 2 describes the institutional background. Section 3 introduces the survey design and the dataset. Section 4 presents the empirical methodology. Section 5 shows empirical results and section 6 concludes.

2 Institutional Background

Switzerland has four official languages: German, French, Italian and Romansh, whereby by the overwhelming majority of the population speak either German (63.3%) or French (22.7%) as their main language.[2] The historical language border between the French-speaking and German-speaking regions is clear cut leading to a sharp change in the main language spoken from one municipality to the next one. This language border has allowed differences in norms and preferences to persist over time within a small geographic area.[3] In line with the change in language, social norms and values abruptly change.[4] Thus, the French-German language border within Switzerland is equivalent to a cultural border. While recent studies (Chen (2013) and Sutter et al. (2015)) focused on how language itself influences preferences and behaviour, we use language as a proxy for cultural group membership.

Large parts of the German – French language border do not feature a geographical barrier or a major administrative border. Importantly, the language border runs through cantons, the first administrative subdivision of Switzerland. Since the institutional framework is mainly set on national and cantonal level, there is little change in policies and institutions at the language border and it provides an optimal laboratory to explore cultural heterogeneity.

Several studies exploit the clear cut between cultural groups within one institutional setting at the Swiss language border. Focusing on the effect of culture on the demand for social insurance, Eugster et al. (2011) document a persistent, strong difference in the demand between the Latin and German language region. In addition, work attitudes and unemployment durations sharply change at the language border (Eugster, et al., 2016). Both studies show that the differences persist even within groups with the same economic fundamentals. Guin (2015) documents that German-speaking households are more likely to

[2] 8.1% declared Italian, 0.5% Romansh and 6.8% other languages as their main language. Source Swiss federal statistics office

[3] Eugster et al. (2011) provide a detailed discussion of languages in Switzerland and historical language borders.

[4] This finds for example expression in the voting behaviour. Eugster and Parchet (2013) document a clear cut in support for left-of-center referenda at the language border.

save and less prone to spend excessively compared to French-speaking households. The three[5] mentioned studies exploit within-canton variation provided by the French-German language border running through the three cantons Berne, Fribourg and Valais.

Our study narrowly focuses on the language border region, which runs through the bilingual canton of Fribourg. Fribourg has a francophone majority (125 municipalities with a total population of 235,769) in the west and a German-speaking minority (38 municipalities with a total population of 67,608[6]) in the east. Most municipalities have a distinct majority speaking one language and can therefore be clearly assigned to one language region (see figure 1). There are few bilingual municipalities where the share of native French speakers is not below 20% or not above 80%.[7]

[Figure 1]

3 Data

3.1 Sample selection and procedure

Our analysis is based on a survey covering secondary school students on both sides of the language border. The students are on average 15 years old and in their final year of compulsory schooling. We selected four German-speaking schools and three French-speaking schools in the canton of Fribourg based on the number of students and the schools' location close to the language border Figure 2 displays the location of the selected schools and the students' home municipality. The study was supported by the cantonal department of education which encouraged all selected schools to participate in the survey.

[5] Other studies exploit the language border to investigate inter-jurisdictional tax competition (Eugster & Parchet, 2013) or fertility and labour force participation (Steinhauer, 2013).
[6] The number of municipalities and population information refer to December 2014; Source: Federal statistics office permanent resident population by municipality
[7] One notable exception is the cantonal capital of Fribourg. We run a robustness check focusing on municipalities with a distinct majority language.

The public secondary school system in Fribourg features three levels with increasing difficulty.[8] The aim was to obtain roughly 50 students for both genders on each of the three school levels for each language region. Among the school classes at selected schools, we randomly selected classes within each school level. Overall, 786 students in 40 classes were selected for the survey. Due to non-attendance 63 students could not be surveyed. There is no indication that non-attendance was related to the survey.[9]

[Table 1]

[Figure 2]

The survey was conducted in November 2015 during regular school hours with paper and pen. The setting was similar to an exam situation and students were not allowed to communicate.[10] There was no reward for the completion of the survey and questions were not incentivized. The order of the questions was for all students the same. On average, it took students 30 minutes, with a minimum of 15 and a maximum of 45 minutes, to complete the survey.

3.2 Survey design

The custom-made survey contains 67 questions covering financial behaviour, financial literacy, norms and preferences and socioeconomic background. Survey questions were chosen with respect to the suitability for this particular age group. Given the bilingual setting, the translation of survey questions received particular attention. Students on both sides of the language border should perceive and understand questions with the same meaning. In order to obtain a high quality of translation, several bilingual translators assessed the translation of the

[8] In 2015 35% of students in the canton of Fribourg were in classes on the highest level that prepare for high school. 44% on the medium level and 19% on the lowest school level. Thus, the survey over-samples students from the lowest level.

[9] 12 students were participating in a program that allows them to retake the final year on a higher level or in a different language. These students are excluded from the sample.

[10] The survey was conducted by the authors and research assistants. They introduced the survey and replied to general questions. During the completion of the survey no questions were answered and students were told to leave questions blank if they do not understand them. The teachers were present in the classroom but did not intervene in the process.

survey. Many questions originate from similar studies that were conducted in English. Some questions were first translated to German and then to French while others were first translated to French and then to German. An English version of the survey is enclosed in Appendix B.[11]

3.2.1 Financial literacy and self-control

We define financial literacy as the degree to which students have acquired the knowledge and skills to make sound financial decisions. The survey contains 10 financial literacy questions which are based on comparable studies and adjusted to the Swiss environment as well as to the students' age. The financial literacy questions cover the topics: Simple interest, compound interest, percentage calculation of purchase decision, budgeting, understanding of bank statement, graphical understanding of stock price development, inflation, and diversification. Appendix 1 provides an overview of the source of questions. The financial literacy score reflects the number of correct responses to the 10 questions. In addition, students gave a subjective assessment of their own financial literacy (see e.g. Gathergood (2012)). They stated on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree) how strongly they agree to the statement: *Financial matters are complicated and confusing to me.*

We define self-control among students as the degree to which they make time-consistent consumption choices. Self-control is measured by the question: *How often do you regret a purchase the day after?* Students responded on a 4-point scale ranging from 1 (never) to 4 (often). The question captures past spending that is perceived as suboptimal what is an indicator for impulsive consumption and self-control problems. The question is also used as a measure of self-control among adults (Parker, 2015). In addition, we elicit information on the students' available financial resources and savings in the last month. We use the share of financial resources which were saved as an alternative measure of self-control. Arguably, the

[11] The French and German versions are available upon request.

intertemporal choices of the youth are governed by the trade off between short term consumption (e.g. spending for refreshments and entertainment) and saving for durable goods (e.g. clothes, electronic devices). Most students in our sample can freely allocate their available funds so that lower savings can be seen as giving in to temptation goods more often and thus as a proxy for a lack of self-control.

3.2.2 Time and risk preferences

We assess risk and time preferences of students with qualitative and quantitative questions. Falk et al. (2013) suggest non-incentivized survey questions for the assessment of time and risk preferences that provide the best measure compared to values obtained from incentivized experiments. We use the suggested general attitude questions addressing the subjectively perceived willingness to take risks and the attitude towards allocating consumption and work between present and future. For risk preferences, students state on a 6-point scale how strongly they agree with the statements: *I am a person who is willing to take risks.* For the time preference measure, we use three questions: *1. I rather go without something today in order to be able to afford more tomorrow. 2. I tend to procrastinate tasks even though it would be better to get them done immediately. 3. I am prepared to spend now and let the future take care of itself.*

Since the students are only 15 years old, we apply the framework used in Sutter et al. (2015) to obtain a quantitative measure of time and risk preferences instead of the suggested staircase measures or questions assessing the certainty equivalent. In contrast to Sutter et al. (2015), responses are elicited by a pen and paper survey and are not incentivize. The qualitative and quantitative measures are then combined with equal weights.

3.2.3 Money Attitudes and Financial Socialisation

Evidence from the psychology literature suggests the personal attitude towards money, e.g. the importance of money as a mean to achieve power and prestige is associated with

impulsive consumption (Roberts & Jones, 2001) as well as with financial literacy (Sohn, et al., 2012) of adolescents. Differences in money attitudes across the language groups in our study may therefore be one driver of observed differences in financial literacy and self-control.

We elicit money attitudes by measuring how strongly students agree to the following two statements: 1. *For me, money is a tool to accomplish goals.* 2. *I am living according to the motto: Money gives me the freedom to do what I feel like.* Students rated the statements on a 6-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). Our indicator of money attitudes thus captures to what extent students connect having money to a successful (prestigious) and self-determined life.

Parents play an important role in financial socialization (Van Campenhout, 2015). Through their norms and the teaching of financial concepts, they influence financial decisions (Norvilitis & MacLean, 2010) as well as financial literacy (Lusardi, et al., 2010). Financial norms that pass from one generation to the next through parental financial socialization could be an important factor of how culture influences financial literacy and self-control. Our measure of parental financial socialisation relates to observable actions of parents in fostering financial independence of their children. We construct a measure that captures the age at which the student first received pocket money, whether a student has a bank account and whether a student can independently access her bank account.

In order to simplify the interpretation of regression results, all measures of preferences, money attitudes and financial socialization are normalized to the scale 0 to 1.

3.2.4 Socioeconomic background

We collect a broad set of information on the socioeconomic background of students. Besides personal characteristics such as gender and birth year we further elicit religion and citizenship. Citizenship provides a proxy of how long a family has been resident in the

country. Religion is reported to influence social norms and preferences (Basten & Betz, 2013). Further, we try to capture the economic background of students through several proxies. Having an own room at home, the parental housing tenure choice and the weeks spent away from home on holidays with the parents approximate parental wealth and income.[12]

3.3 Data description

We obtain responses from 711 students. Due to missing values, we restrict the sample to 655 students. Table A2 provides summary statistics and variable descriptions for this full sample. Univariate statistics in table 2 show that students at French-speaking schools have on average a lower financial literacy score and perceive financial matters as more confusing. Further, French-speaking students state that they more often buy impulsively and save a lower share of their available funds. These descriptive results suggest that there is a significant difference in financial literacy and self-control across the language groups. Importantly, the differences across the language groups are most pronounced for students with Swiss citizenship while they are negligible for non-Swiss students. This finding suggests that the observed differences in financial literacy and self-control may well be rooted in a historical cultural divide between the two groups.

Figure 3 displays histograms by school language of the two continuous outcome variables: FL_score and Saving. The share of French-speaking students is clearly higher for very low financial literacy scores. The difference in average savings stems mainly from students who did not save at all. 23% of students at French-speaking schools state that they spent all available funds in the previous month compared to only 8% at German-speaking schools.

[12] We further gather information on parental education and parental cultural activities (cinema, theatre, classical music concerts and museums). For these variables students often ticked the *Do not know* option or left them blank. Hence, controlling for these variables comes at the cost of losing many observations. Controlling for these variables, however, has no effect on our main results.

[Table 2]

[Figure 3]

Considering our measures of economic preferences, money attitudes and financial socialisation, the most striking differences between the two language groups are observed for the financial socialization and money attitude variables (see Table A2). Students at French-speaking schools report that they receive first pocket money at a later age, have less often a bank account and can access less often the account independently. Thus, parents of French-speaking students seem to give less financial independence to their children. French-speaking students also connect money more strongly with obtaining goals and freedom. Table A2 also documents differences for time preferences and risk preferences between the two groups: Students at French-speaking schools are on average less patient and less risk averse.

Summary statistics of control variables show that household characteristics vary across the language border. Students at French-speaking schools are less often Swiss citizens and are more likely to grow up in an urban municipality. Significant differences also exists in the economic well being as captured by the likelihood that all children of the family have a single room and the propensity of their parents to own a house or an apartment.

Due to missing values, in certain specifications the number of observations significantly drops. In our main specification estimating the effect on financial literacy, our sample contains 655 observations.

4 Identification and Estimation

4.1 Differences in financial literacy and self-control

Identification

In the first step of our analysis, we examine how exposure to a language group influences financial literacy and self-control. We aim at estimating the Average Treatment

Effect (ATE) for the population where the exposure to the French-speaking language group is defined as treatment.[13] We use the school language as the mutually exclusive treatment variable. Our strategy focuses on the ATE since the definition of the treatment could be easily reversed.

$$ATE = E[Y_i(1) - Y_i(0)]$$

Each student in the sample is indexed by i = 1, ..., N. The variable T_i is a dummy variable. $T_i = 1$ indicates that a student attends a French-speaking school and is treated. T_i is equal to 0 for students of German-speaking schools. $Y_i(1)$ indicated the potential outcome of student *i* if she is exposed to the French-speaking region while $Y_i(0)$ indicates the potential outcome if she is exposed to the German speaking region. The survey data allow only for the observation of the average difference in the actual outcomes for students exposed to the French-speaking and German-speaking language region.

$$E[Y_i(1) \mid T_i=1, X=x] - E[Y_i(0) \mid T_i=0, X=x]$$

Our treatment variable - the language of the school which the student attends – deserves particular discussion. We argue that by defining treatment as the school language we assign students to the cultural group they are most connected to. First, we note that for most students the school language is exogenously determined by the majority spoken language in the municipality where the family resides domicile. However, in some bilingual municipalities parents can actively choose which school their children attend. In these municipalities, most parents choose the school according to the language spoken at home.[14] Moreover, where parents are bilingual or speak a third language it is reasonable to assume that they choose the

[13] The treatment effects literature suggests that only mutable characteristics should be considered as treatment (e.g. Holland (1986)). Even though culture is nearly immutable post-birth, the exposure to a language group is a treatment that can be manipulated.

[14] The parental language for Swiss students is highly correlated with the school's language. Only 4 students in the sample attend French-speaking school while they speak to their parents predominantly in German (And 14 students attending French-speaking schools vice versa). 31% of students from German-speaking schools state that they speak sometimes or often in French to their parents (6% of students at French-speaking schools sometimes or often speak in German to their parents). The exposure to both cultural groups leads to a downward bias of our estimate.

school language they feel is closer to their own cultural values. Finally, it should be noted that for our subject pool of 15-year-old students school is an important location of socialisation.

Our empirical strategy differs from the spatial regression discontinuity design applied by other studies exploiting the language border[15]. We argue that using school language as treatment allows for a more precise classification of cultural group membership than the classification by the majority language of the home municipality which is typically used in RDD analyses. This is especially important since students in our sample reside in municipalities very close to the language border.[16] Our approach, however, comes at the cost that we primarily capture the exposure to culture in school and the parental home and may not fully capture the effect from the neighbourhood's culture. In a robustness tests we redefine the treatment based on the majority language in the municipality of residence and yield similar results (Appendix 6)

Our identification strategy relies on the conditional independence assumption (CIA) and thus assume that, after controlling for observable confounders X, potential outcomes are not correlated with the treatment. What could violate the conditional independence assumption in our setting and thus bias the estimate?

First, any characteristics that cause a student with higher (or lower) potential financial literacy or self-control to attend a French-speaking rather than a German-speaking school may bias our results. As discussed above, for the overwhelming majority of students in our sample school language is exogenously determined. To rule out that endogenously chosen school language bias our results we run a robustness check only for students whose home municipality has a clear majority language (Appendix 5).

[15] For the spatial RDD, distance to the language border is used as the forcing variable. At 0 – the language border – the treatment status suddenly changes (e.g. Eugster et al., (2011) and Guin, (2015). We perform this strategy in a robustness check.

[16] Related studies typically use a radius of 50km (e.g. Eugster et al., (2011)) around the language border while 99% of students in our sample reside not more than 10km away from the language border.

Second, we assume that the vector of observable confounders X captures all differences in socioeconomic characteristics of students, as well as institutions, policies and broader economic conditions across the language border which influence financial literacy and self-control but are not caused by the treatment.

Which student-level and household-level control variables should be considered in our setting? The CIA requires to control for any X mutually influencing Y and T but not for variables influenced by T (endogenous control variables). Controlling for household characteristics could lead to endogenous controls since they are influenced by local culture (for example discussed in Rosenbaum (1984) and applied to the case of gender in Huber (2015)). Thus, observed differences in household characteristics between the two language groups may simply reflect the influence of culture. For example, the exposure to a language region potentially influenced the parents' preferences for housing tenure choice. Whether the family owns or rents could then influence financial literacy and self-control.

Institutions and policies are in many cases endogenous and influenced by local culture (Alesina & Giuliano, 2015). Thus, potential heterogeneity should be considered in detail. One major advantage of our chosen sample is that we are comparing students across language groups, but within the same institutional setting. In particular, relevant policies such as the school curriculum are set at the cantonal level. There are, however, two administrative subdivisions, one for each language region, which are responsible for the detailed curriculum. This may cause a marginal curriculum differences between the two language regions within the canton of Fribourg. The two school curricula marginally cover the topic of financial literacy. The decisions to cover the topic in class is given to the teachers. In our sample, 39% of French-speaking students and 25% of German-speaking state that topics related to financial

education were covered in class.[17] However, again it is unclear whether local differences in institutions and policies – such as the details of the school curriculum – should be controlled for as these may be endogenous and influenced by local culture (Alesina & Giuliano, 2015).

Descriptive statistics of economic condition by municipality in table 3 reveal that there are clear differences between the municipalities in the two language regions. Students attending a French-speaking school are more often from larger municipalities with a higher share of non-Swiss residents. Further, there are differences in the sector allocation of employees, the number of cars per inhabitant, the number of bank branches as well as in religious affiliation. The financial situation measured by the tax potential index is very similar. This suggests that schools' financial resources are comparable across the language border. While certain characteristics just reveal given differences, others may again display the influence of culture. For example, the level of tax could simply reflect differences in preferences resulting in stronger support for redistribution and social services (Eugster & Parchet, 2013).

Given the potential for endogenous confounders at the household and municipal level we perform our empirical analysis with two main specifications. In a first estimation, control variables are limited to student-level variables which are clearly independent of culture (age, gender and citizenship) and size of municipality (Urban). In a second estimation, we include student and household characteristics potentially influenced by culture.

[Table 3]

Finally, a bias may arise from measurement error related to the language region. Many qualitative questions ask the students to assess how often they perform an action or how strongly they agree. These are relative measures and the choice could be influence by the

[17] The measure is vague, since for example interest rate calculations discussed in math classes can be considered as part of financial literacy. The coverage of financial literacy in class is not significantly related to the financial literacy score.

reference point determined by the social environment. This may potentially cause a downward bias of our estimate.

Estimation

We estimate the following equation in an OLS model:

$$Y_i = \alpha + \beta \, French_i + \gamma \, X_i + \varepsilon_i$$

where French is a dummy that is equal to one for students from French-speaking schools and vector X contains a set of control variables. Y represents the outcome variables. As a robustness check, we apply a semi-parametric propensity score matching estimation.

4.2 Differences in economic preferences and social norms

In a second step of our analysis, we examine how exposure to a language group influences economic preferences and social norms. We apply the methodology discussed in 5.1 to the outcome variables time preference, risk preference, financial socialization and money attitude. The previously discussed assumption equally apply to this estimation.

4.3 Mediation analysis

In a third step, the study aims at disentangling the previously estimated ATE (Total effect) into a direct effect and an indirect effect going through mediators by applying a mediation analysis. The analysis tests to what extent observed differences in financial literacy and self-control are explained through differences in observed economic preferences and social norms.

[Figure 4]

Identification

The identification of the mediation effect is based on Imai et al. (2011). In addition to the outcome Y_i and the treatment T_i we observe the value of the mediator M_i for student i. M_i

(1) denotes the potential mediator value for treated students while $M_i(0)$ denotes the potential mediator value in case of non-treatment. $Y_i(t,m)$ denotes the potential outcome under treatment status t and mediator value m. We can now define the Direct effect and the mediation effect (defined as ACME: Average Causal Mediation Effect).

$$\text{Direct effect} = E[Y(1,M(t)) - Y(0,M(t))]$$

$$\text{ACME} = E[Y(t,M(1)) - Y(t,M(0))]$$

The direct effect is based on the idea of exogenously varying the treatment, the exposure to a language region, under fixed values for the mediator variable. For the ideal estimation of the ACME, an exogenous variation in the mediating variable is required while the treatment status is kept constant. In our setting, it would require an exogenous change in economic preferences of students that remain in their native language region.

The sum of the two effects equals to the previously observed ATE or the total effect.

$$\text{ATE} = \text{Total effect} = \text{Direct effect} + \text{ACME} = Y_i(1,M_i(1)) - Y_i(0,M_i(0))$$

We are able to estimate the average causal mediation effect assuming sequential ignorability (Imai, et al., 2010). The first component of sequential ignorability requires an unbiased estimation of ATE for Y and for M (as previously discussed in 4.1). The second underlying assumption requires that:

$$Y_i(t,m) \perp M_i \mid T_i = t\ ,\ X_i = x$$

Any factor mutually influencing Y and M may bias our result. Since mediators potentially influence other mediators, this might be a source of bias. We apply the methodology suggested by Imai and Yamomoto (2013) to control for other mediators that could potentially influence the mediator of interest and the outcome Y in a robustness check.

Estimation

In order to distinguish between a direct and a mediation effect, we estimate the following two linear regressions:

$$M_i = \alpha_2 + \beta_2 T_i + \xi_2 X_i + \varepsilon_{i2}$$

$$Y_i = \alpha_3 + \beta_3 T_i + \gamma M + \xi_3 X_i + \varepsilon_{i3}$$

The mediation effect is defined as ACME= β_2 x γ while the Direct effect = β_3 .

5 Results

5.1 Differences in financial literacy and self-control

Table 4 presents results of the OLS regression relating school language to financial literacy and self-control of students. Students at French-speaking schools obtained on average one point less on the financial literacy score. They are also 10 percentage points more likely to state that financial matters are confusing. Estimates are only slightly lower than the average mean difference displayed as univariate statistics. Thus, even though there are considerable differences in observed control variables, they hardly account for the observed differences in financial literacy between students of the two language regions.

In line with univariate statistics in Table 2, results show that students at French-speaking schools are 11 percentage points more likely to regret a purchase (Impulsive_buy). Further, students at French-speaking schools saved on average about 10% less of their available financial funds. The OLS estimates suggest that there is a significant difference in self-control between the two language groups.

For all outcome variables, the selection of control variables does not strongly influence the estimated effect. Results of a semi-parametric propensity score matching estimation support estimates of the parametric model (Appendix 3). We also apply a probit model to binary outcome variables (Fin_confusing and Impulsive_buy) and a tobit model to FL_score

and Savings to adjust for possible censoring.[18] All results are in line with the OLS estimations.

[Table 4]

The subsample analysis in Appendix 5 confirms that there is considerable heterogeneity in the effect of school language on financial literacy and self-control between native students (e.g. Swiss nationals) and those with an immigrant background (i.e. non-Swiss nationals). As suggested by our univariate comparisons in Table 2 we find a large and statistically significant treatment effect among natives, while the treatment effect is small and insignificant among immigrants. This finding again suggest that the observed differences in financial literacy and self-control are rooted in a historical cultural divide between the two language groups. By comparison, subsample comparisons by gender or rural /urban location show significant treatment effects in all subsamples, albeit with differences in the magnitude and precision of the effects.

5.2 Preferences, money attitudes and financial socialisation

Results in Table 5 presented the estimated differences in time and risk preferences, money attitudes and financial socialisation between the two language groups.

Results show only small differences in relevant economic preferences. Students at French-speaking schools are more willing to take risks, but our estimates do not show any significant difference for time preferences. In line with the linguistic-savings hypothesis (Chen, 2013), Sutter et al. (2015) report significant differences in time preferences among students of a bilingual town in Sothern Tirol. German-speaking students are reported to be significantly more patient. Our findings do not support the linguistic-savings hypothesis that originates from a difference in time preferences. Our measure for time preference as well as

[18] Results are available upon request.

our sample, however, clearly differs from the Sutter et al. (2015) study. Thus, results are not fully comparable.

The OLS estimates show a strong and significant effect for financial socialization and money attitudes. Students at French-speaking schools obtain on average a by 0.15 lower value in financial socialisation, which corresponds to one-half of the standard deviation and nearly one-third of the mean in the full sample. Students at French-speaking schools also report money as more important in money attitude questions. The estimated effect of 0.21 again represents one half of the standard deviation in the full sample.

[Table 5]

Results obtained from propensity score matching estimations are in line with OLS estimates in terms of magnitude as well as statistical significance (see Appendix 4).

5.3 Mediation analysis

Our analysis so far documents significant differences in financial literacy and self-control across the language groups: Students at German-speaking schools are more financially literate and have more self-control (Table 4). To what extent may these differences be associated with culture, i.e. systematic variation in preferences, norms and attitudes? The Table 5 results document only small differences in time and risk preferences between the two groups, while differences in money attitudes and parental financial socialization are more pronounced. Students at German speaking schools attach less importance to money and report stronger financial independence at a younger age. Together these findings would suggest that – in our context - culture impacts on financial literacy and self-control through money attitudes and financial socialisation rather than through differences in economic preferences.

Pairwise correlation presented in Table 6 suggest that money attitudes and parental financial socialization may indeed be a relevant mediator of culture on financial literacy and self-control: Financial socialization is strongly correlated with both our measures of financial

literacy. The attitude towards money, on the other hand, is strongly correlated with our measures of self-control. In line with the previous literature Table 6 also shows time preferences are strongly associated with financial literacy and self-control: More patient students are more literate, less confused, make less impulsive purchases and save more. More risk loving students also have a higher propensity to consume impulsively. However, as there are only small differences in time and risk preferences across the two language groups it is unlikely that economic preferences, in particular the patience of the students is a major driver of the documented differences in financial literacy and self-control.

[Table 6]

In the following, we conduct a formal mediation analysis to identify the role of economic preferences, money attitudes and financial socialization in explaining observed differences in financial literacy and self-control between the two language groups. Table 7 reports for each of the four outcome variables and our four dimensions of culture the average causal mediation effect (ACME) and the direct effect as well as the proportion of the estimated total effect that is mediated. Figures 5 – 8 graphically present the composition of the estimated total effect.

For our indicators of financial literacy, we find that financial socialization is the only significant mediator of differences between the language groups. For our objective measure of financial literacy (Fin_literacy) financial socialization can accounts for 12% of the observed difference in financial literacy between the language groups. For our subjective measure of financial literacy (Fin_confusing), financial socialization can account for 20% of the total treatment effect.

Applying the mediation analysis to our indicators of self-control reveals that language group exposure influences impulsive consumption mainly through money attitudes. For our second indicator of self-control – saving - , money attitudes also has a significant mediation

effect. The estimates suggest that for both indicators of self-control, the variation in attitudes towards money account for roughly 30 percent of the treatment effect

[Table 7]

[Figure 5 - 8]

The mediation analysis presented above may suffer from a potential violation of the sequential ignitability assumption since it implicitly assumes that the multiple mediators are causally independent of another. We apply the methodology suggested by Imai and Yamamoto (2013) to control for potential causal effects between mediators. Results from this analysis suggest that there is no major bias caused by alternative mediators that causally influence the mediator of interest (see Appendix 8).

6 Discussion and Conclusion

This paper studies to what extent and through which channels culture influences financial literacy and self-control among the youth. Our study employs detailed survey data of secondary school students located on two sides of the German-French language boarder within the Swiss canton of Fribourg. Previous studies have documented significant differences in economic and financial behaviour of the adult population across this language border.

We find substantial differences in financial literacy and self-control comparing students attending French-speaking schools to students from German-speaking schools. Students at German-speaking schools are more financially literate as revealed by their responses to a standard set of financial literacy questions as well as their own subjective assessment. Students at German schools are also less likely to regret consumption purchases and save more of their monthly financial resources, both indicating stronger self-control. A mediation analysis reveals that systematic variation in money attitudes and financial socialization account for the effect of culture on financial literacy and self-control rather than variation in

time or risk preferences. We find that financial socialization is the predominant mediator through which culture translates into a difference in financial literacy. For self-control, we find that money attitudes are the strongest mediator of culture.

Financial literacy, financial attitudes and financial behaviour of the youth has gained considerable awareness among policy makers in recent years. Substantial investments in financial education initiatives have been made by the public and private sector with many countries implementing financial education initiatives on a countrywide scale, e.g. in public schools. The findings of our study could be especially relevant for such programs targeting a very heterogeneous group of students. Our findings point towards the important role of cultural background in determining financial literacy and self-control. Awareness of these cultural determinants may help design more effective programs especially in countries with a culturally diverse population, e.g. as a result of a large migrant population.

Our results further point towards the importance of money attitudes and parental financial socialization for enhancing financial literacy and self-control. This finding suggests that financial education programs targeting the youth should not focus only on improving financial skills and encouraging forward-looking behaviour. It seems also important to highlight attitudes towards money and consumption, e.g. the importance of consumption for social statues and related peer pressure. Financial education initiatives for children and the youth may also seek to integrate parents into their activities in order to foster financial socialisation at home.

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Figure 1. Municipalities of the canton of Fribourg

The colors in the map display the share of the population that states French as the main language. Individuals who state other languages than French and German as their main language are excluded.

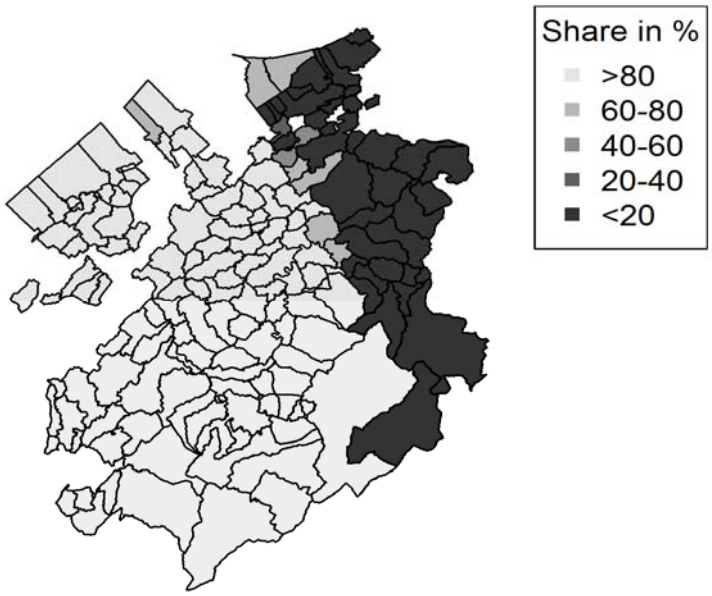


Figure 2. Students' home municipalities in the sample

The map displays home municipalities of students in the sample. White colored municipalities are not in the sample and the share of French speakers in the municipality. Red dots mark locations of schools.

In the French region, there are 6 students from 6 municipalities further away from the language border. The exclusion of these students does not influence our results.

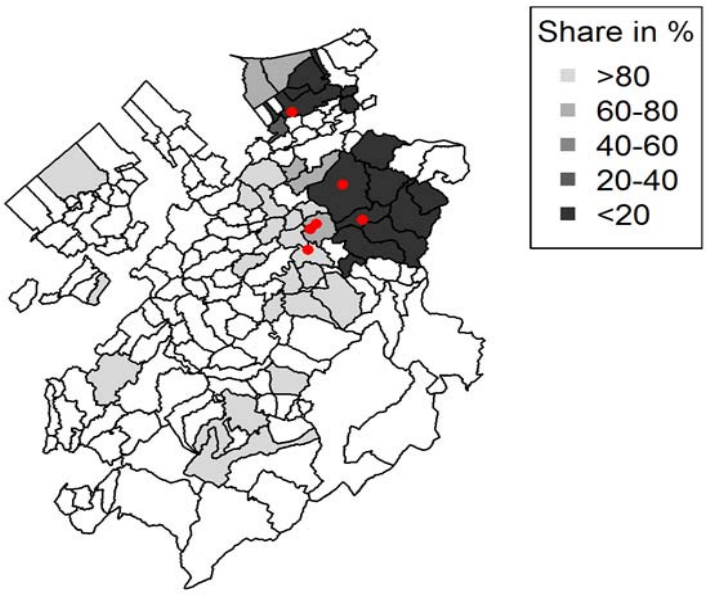


Table 1. Sample composition: Number of observations

	German-speaking		French-speaking		Total
School level	Male	Female	Male	Female	
Basic	41	36	66	43	186
Medium	78	45	55	54	232
High	53	57	57	70	237
Total	172	138	178	167	655

Table 2. Outcome variables; Difference in mean

	FL_score				Fin_confusing			
	Mean				Mean			
	German	French	Diff	p-value	German	French	Diff	p-value
Total sample	6.20	4.94	1.26	0.00	0.44	0.60	-0.16	0.00
by gender								
Male	6.54	5.25	1.29	0.00	0.31	0.53	-0.22	0.00
Female	5.78	4.62	1.16	0.00	0.61	0.68	-0.07	0.23
by school level								
Basic	4.16	3.80	0.36	0.25	0.51	0.68	-0.17	0.02
Medium	6.12	4.41	1.71	0.00	0.47	0.60	-0.13	0.06
High	7.72	6.39	1.33	0.00	0.36	0.54	-0.18	0.01
by citizenship								
Swiss	6.32	5.22	1.09	0.00	0.42	0.59	-0.17	0.00
Non-Swiss	4.74	4.48	0.26	0.59	0.74	0.62	0.12	0.26

	Impulsive_buy				Saving			
	Mean				Mean			
	German	French	Diff	p-value	German	French	Diff	p-value
Total sample	0.16	0.33	-0.17	0.00	0.57	0.43	0.14	0.00
by gender								
Male	0.13	0.29	-0.16	0.00	0.56	0.45	0.10	0.01
Female	0.20	0.37	-0.17	0.00	0.58	0.41	0.17	0.00
by school level								
Basic	0.25	0.38	-0.14	0.05	0.45	0.32	0.13	0.02
Medium	0.11	0.37	-0.26	0.00	0.55	0.42	0.13	0.01
High	0.15	0.24	-0.09	0.08	0.67	0.52	0.14	0.00
by citizenship								
Swiss	0.13	0.30	-0.17	0.00	0.58	0.47	0.12	0.00
Non-Swiss	0.48	0.37	0.11	0.33	0.39	0.37	0.02	0.79

Figure 3. Histogram of FL_score and Saving

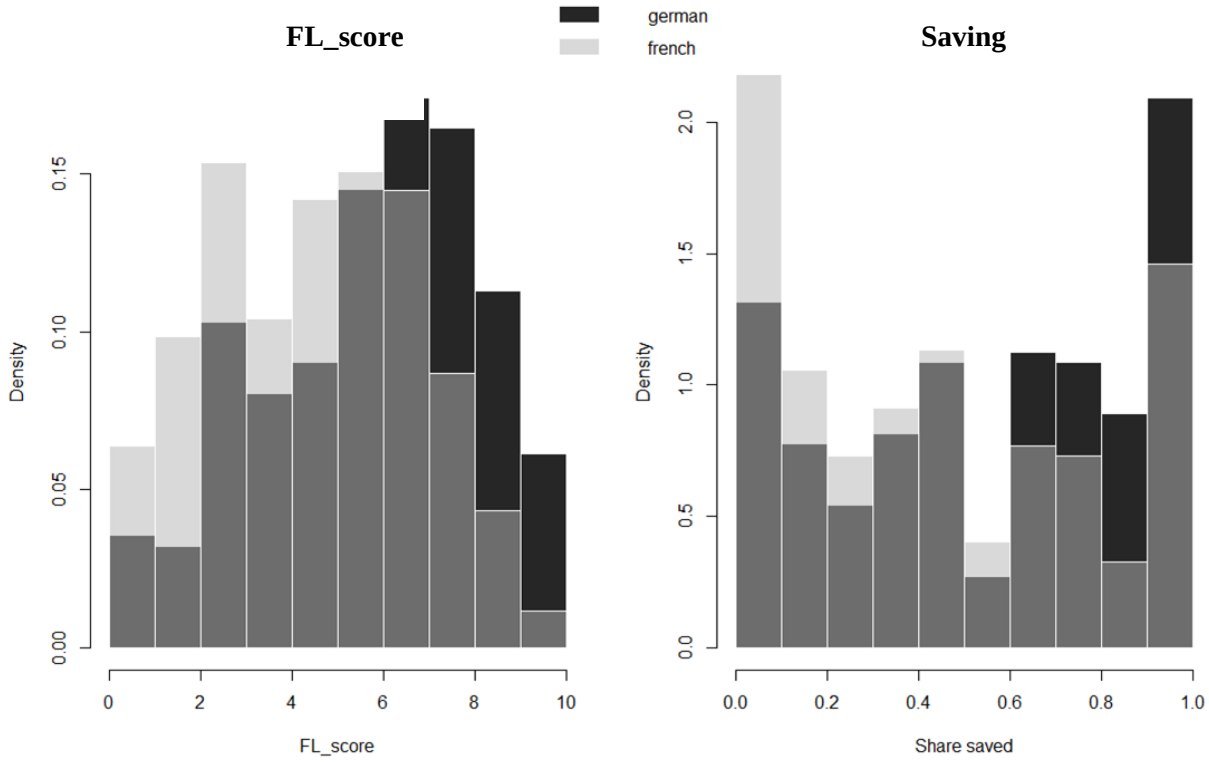


Table 3. Heterogeneity of home municipalities

The table displays the mean by language group of certain municipality characteristics in our sample. The variables are weighted by the number of students in the sample from the respective municipality.

Variable	German-speaking	French-speaking	Diff	p-value t-test
Nr of students	310	345		
Nr of municipalities	27	19		
Main language spoken				
Share German	0.66	0.17	0.49	0.00
Share French	0.26	0.72	-0.46	0.00
Share other language	0.08	0.11	-0.02	0.00
Population				
Population in 1000	8.98	16.99	-8.01	0.00
Urban municipalities (>=10000 residents)	0.17	0.39	-0.21	0.00
Share of non-Swiss residents	0.18	0.29	-0.10	0.00
Economic activity				
Share employed in primary sector	0.09	0.04	0.05	0.00
Share employed in secondary sector	0.29	0.21	0.08	0.00
Share employed in tertiary sector	0.63	0.75	-0.12	0.00
Nr of cars per 1000 inhabitants	568.9	517.5	51.4	0.00
Nr of bank branches in municipality	4.76	7.99	-3.23	0.00
Municipalities without bank branch	0.17	0.12	0.04	0.12
Tax on income and wealth as share of cantonal tax	0.79	0.81	-0.02	0.00
Municipal tax potential; Index cantonal average: 100	102.9	102.4	0.50	0.78
Religion				
Share catholic	0.66	0.78	-0.12	0.00
Share protestant	0.23	0.10	0.13	0.00
Share other	0.05	0.05	-0.00	0.94
Share not religious	0.06	0.07	-0.01	0.00

Source: StatA Fribourg; bank branch information from Brown and Hoffmann (2016)

Figure 4. Mediation Framework

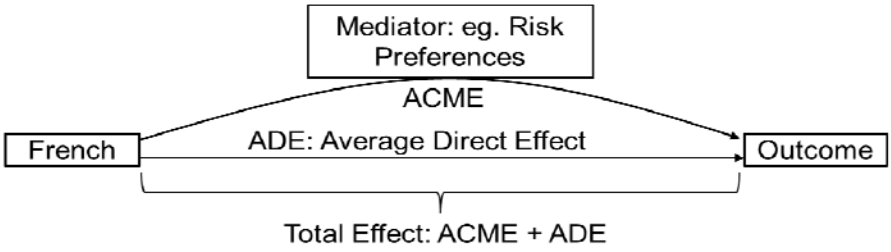


Table 4. Multivariate regression OLS: Difference in financial literacy and self-control

This table reports results of the OLS regression French on financial literacy and self-control. Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. Standard errors are clustered at class level and are reported in brackets. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

	Financial literacy				Self-control			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FL_score	FL_score	Fin_confusing	Fin_confusing	Impulsive_buy	Impulsive_buy	Saving	Saving
French	-0.893**	-1.127***	0.112**	0.107**	0.110**	0.108**	-0.096**	-0.114***
	(0.435)	(0.211)	(0.048)	(0.045)	(0.044)	(0.042)	(0.041)	(0.037)
Constant	5.092***	4.721***	0.457***	0.551***	0.217***	0.265**	0.469***	0.418***
	(0.388)	(0.490)	(0.076)	(0.108)	(0.062)	(0.115)	(0.065)	(0.099)
Observations	655	594	646	585	651	591	532	489
R-squared	0.126	0.359	0.086	0.102	0.067	0.091	0.069	0.145
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls	No	Yes	No	Yes	No	Yes	No	Yes

Table 5. Multivariate regression OLS: Difference in economic preferences and social norms

This table reports results of the OLS regression French on norms and preferences. Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. Standard errors are clustered at class level and are reported in brackets. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

	Economic preferences				Social norms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Risk_pref	Risk_pref	Time_pref	Time_pref	Financial socialization	Financial socialization	Money attitude	Money attitude
French	0.045**	0.039*	-0.004	-0.013	-0.155***	-0.140***	0.211***	0.211***
	(0.021)	(0.020)	(0.021)	(0.016)	(0.030)	(0.035)	(0.031)	(0.035)
Constant	0.371***	0.338***	0.657***	0.652***	0.560***	0.653***	0.500***	0.444***
	(0.030)	(0.045)	(0.032)	(0.046)	(0.049)	(0.081)	(0.050)	(0.090)
Observations	586	533	590	541	604	552	647	588
R-squared	0.024	0.047	0.041	0.140	0.097	0.123	0.122	0.144
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls	No	Yes	No	Yes	No	Yes	No	Yes

Table 6. Pairwise correlations of outcome variables and mediators

This table reports pairwise correlations. ***, **, * denote significance of the correlation coefficient at the 0.01, 0.05 and 0.10-level.

	FL_score	Fin_confusing	Impulsive_buy	Saving	Risk_pref	Time_pref	Financial socialization	Money attitude
FL_score	1							
Fin_confusing	-0.31***	1						
Impulsive_buy	-0.09**	0.14***	1					
Saving	0.18***	-0.09*	-0.16***	1				
Risk_pref	-0.10**	-0.01	0.18***	-0.12**	1			
Time_pref	0.26***	-0.20***	-0.21***	0.29***	-0.18***	1		
Financial_socialization	0.23***	-0.17***	-0.05	0.08*	-0.03	0.08*	1	
Money_attitude	-0.08**	-0.04	0.16***	-0.14***	0.17***	-0.03	-0.04	1

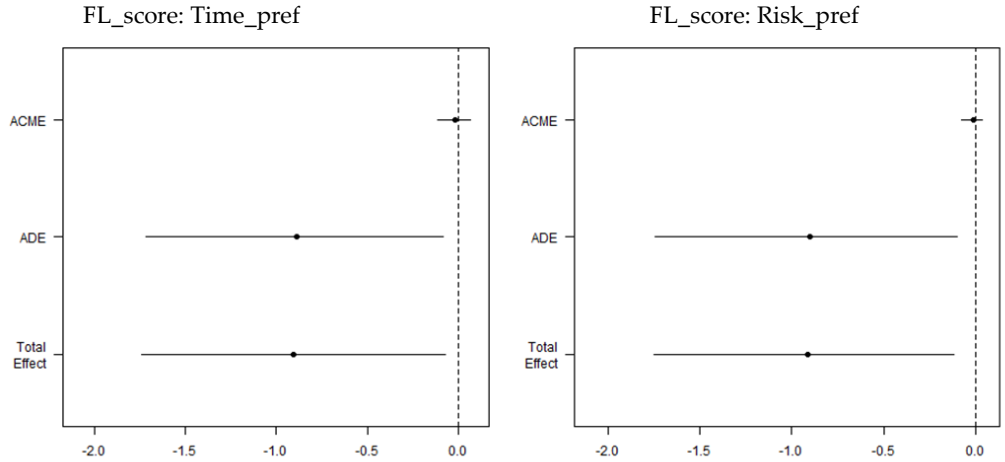
Table 7. Mediation analysis

This table reports results of the mediation analysis. The R package *mediation* (Tingley et al. 2014) was used to implement the analysis. Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. Standard errors are clustered at class level. The p-value indicates the level of significance.

		Financial Literacy								Self-control							
		FL_score				Fin_confusing				Impulsive_buy				Saving			
		Estimate	95%-CI		p-value	Estimate	95%-CI		p-value	Estimate	95%-CI		p-value	Estimate	95%-CI		p-value
	ACME	-0.01	-0.08	0.04	0.58	-0.01	-0.03	0.00	0.21	0.02	0.00	0.04	0.05	-0.01	-0.02	0.00	0.25
Risk_pref	Direct effect	-0.90	-1.76	-0.08	0.03	0.12	0.02	0.21	0.03	0.09	0.01	0.18	0.03	-0.07	-0.15	0.01	0.07
	Total effect	-0.91	-1.77	-0.10	0.06	0.11	0.01	0.21	0.06	0.11	0.02	0.19	0.06	-0.08	-0.16	0.01	0.06
	Prop. Mediated	0.01	-0.07	0.18	0.59	-0.07	-0.57	0.08	0.24	0.15	0.00	0.64	0.06	0.07	-0.16	0.55	0.29
	ACME	-0.01	-0.11	0.07	0.73	0.00	-0.02	0.03	0.68	0.00	-0.01	0.02	0.67	-0.01	-0.03	0.01	0.49
Time_pref	Direct effect	-0.86	-1.62	-0.06	0.04	0.12	0.03	0.21	0.01	0.11	0.03	0.19	0.00	-0.07	-0.15	0.00	0.05
	Total effect	-0.88	-1.65	-0.12	0.06	0.13	0.03	0.22	0.06	0.11	0.03	0.20	0.06	-0.08	-0.15	-0.01	0.06
	Prop. Mediated	0.01	-0.12	0.22	0.71	0.03	-0.17	0.28	0.68	0.03	-0.18	0.22	0.67	0.10	-0.34	0.67	0.48
Financial	ACME	-0.12	-0.24	-0.03	0.01	0.03	0.00	0.05	0.01	0.00	-0.02	0.01	0.78	0.00	-0.03	0.02	0.70
socialization	Direct effect	-0.85	-1.66	-0.05	0.04	0.09	-0.01	0.19	0.09	0.12	0.03	0.21	0.01	-0.07	-0.15	0.02	0.11
	Total effect	-0.98	-1.77	-0.15	0.06	0.11	0.02	0.21	0.06	0.11	0.03	0.20	0.06	-0.08	-0.16	0.01	0.06
	Prop. Mediated	0.12	0.02	0.59	0.03	0.22	0.02	1.19	0.03	-0.02	-0.29	0.19	0.79	0.04	-0.57	0.84	0.72
	ACME	0.00	-0.11	0.11	1.00	-0.03	-0.06	0.00	0.05	0.03	0.01	0.06	0.00	-0.02	-0.05	0.00	0.02
Money_attitude	Direct effect	-0.95	-1.73	-0.13	0.03	0.14	0.04	0.24	0.02	0.07	-0.02	0.17	0.12	-0.05	-0.14	0.03	0.23
	Total effect	-0.95	-1.75	-0.11	0.06	0.11	0.02	0.21	0.06	0.11	0.02	0.19	0.06	-0.07	-0.16	0.00	0.06
	Prop. Mediated	0.00	-0.21	0.16	0.99	-0.22	-1.22	0.04	0.07	0.31	0.07	1.48	0.02	0.28	-0.47	2.44	0.09
Nr Obs.		520				517				519				435			
Basic controls		Yes				Yes				Yes				Yes			
Extended controls		No				No				No				No			

Figure 5. Mediation effects for FL_score

Figures 5 - 8 graphically express the results of the mediation analysis in table 7.



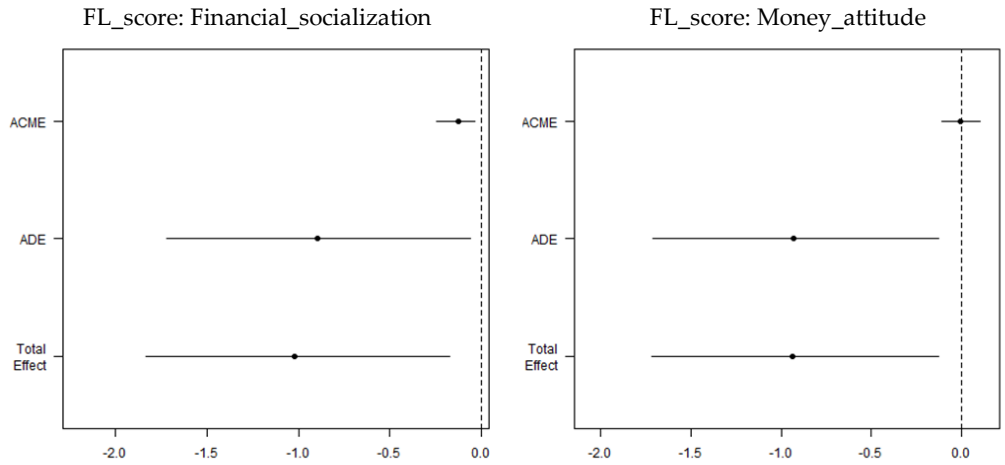
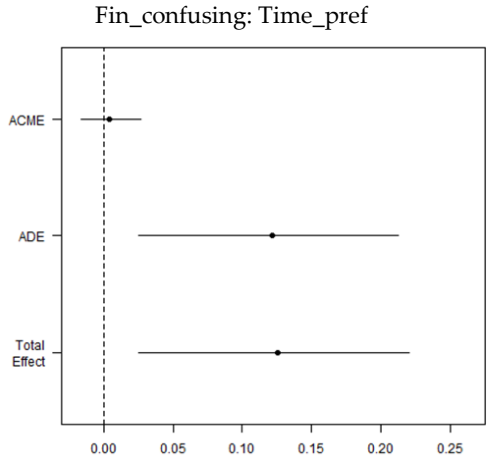
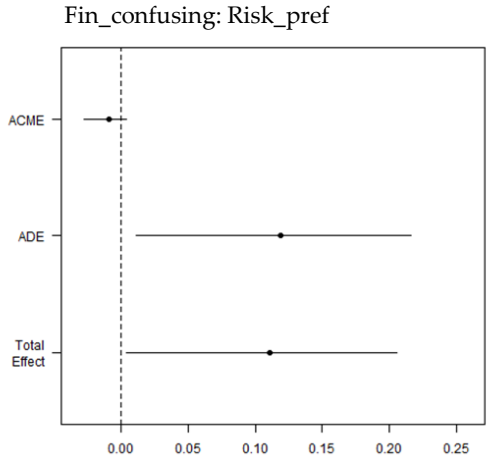
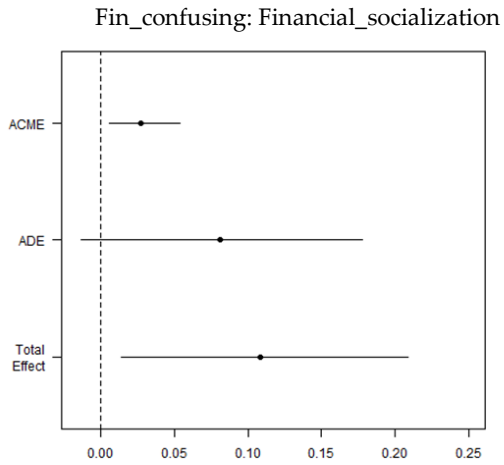


Figure 6. Mediation effects for Fin_confusing







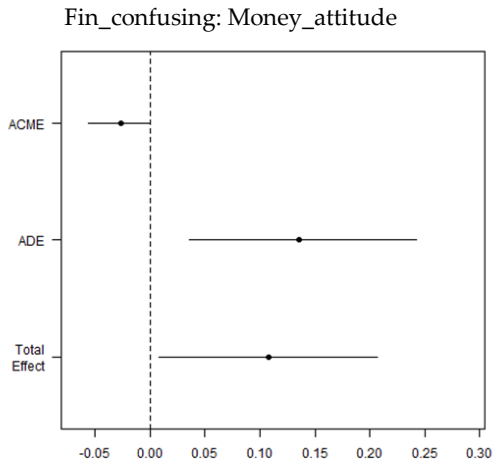


Figure 7. Mediation effects for Impulsive_buy

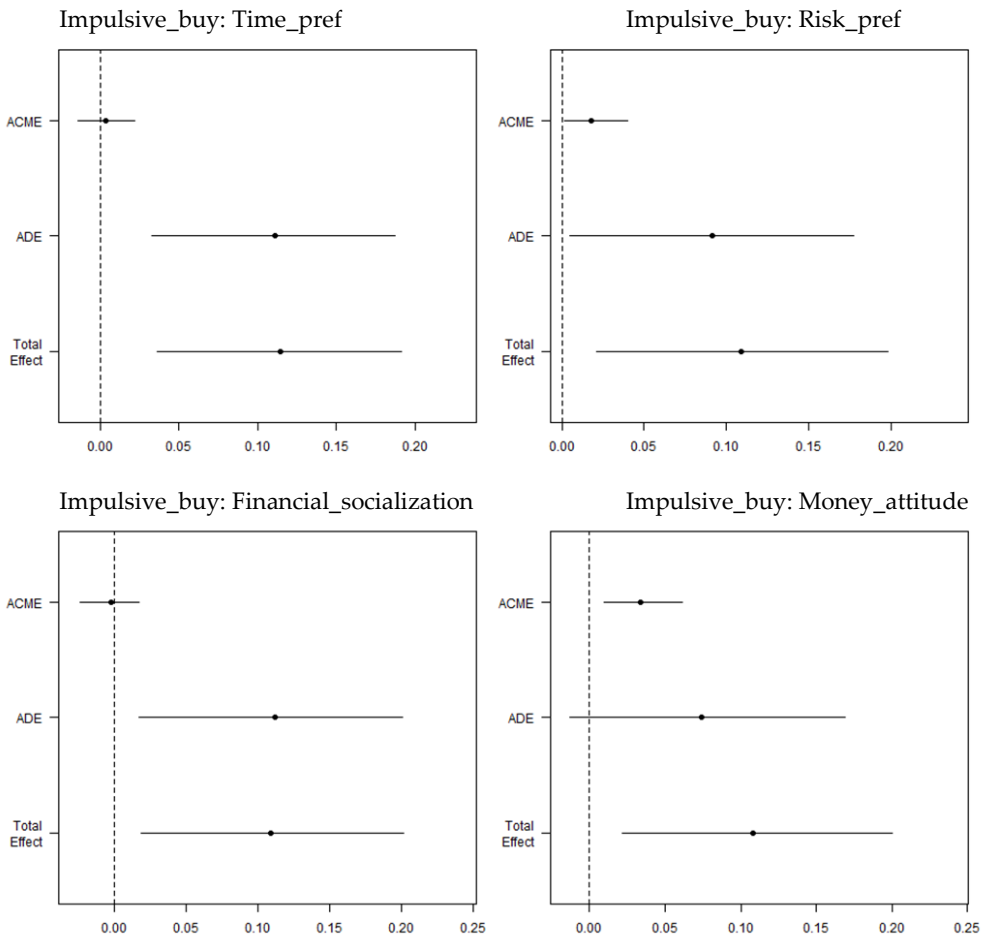
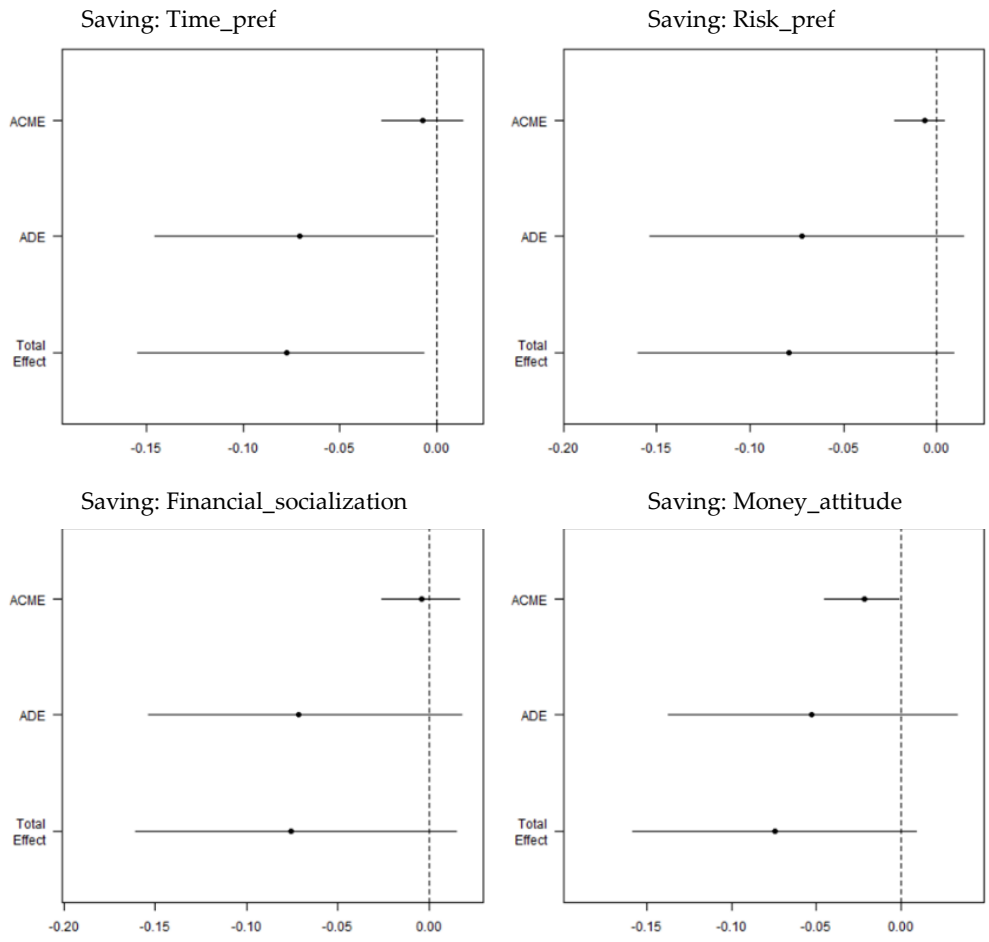


Figure 8. Mediation effects for Saving



Appendix 1. Source of financial literacy questions

Question	Concept	Question adapted from:	Share correctly answered		
			German-speaking	French-speaking	Total
2.1	Simple interest	Atkinson and Messy (2012)	0.76	0.42	0.58
2.2	Compound interest	Lusardi and Tufano (2015)	0.37	0.22	0.29
2.3	Percentage calculation of purchase decision	FSA (2006)	0.80	0.71	0.75
2.4	Budgeting	OECD (2013)	0.51	0.43	0.46
2.5 a)	Understanding of bank statement	OECD (2013)	0.63	0.58	0.60
2.5 b)	Understanding of bank statement	OECD (2013)	0.70	0.54	0.62
2.6 a)	Graphical understanding of stock price development	OECD (2013)	0.65	0.71	0.68
2.6 b)	Graphical understanding of stock price development	OECD (2013)	0.62	0.47	0.54
2.7	Inflation	Lusardi and Mitchell (2011)	0.37	0.25	0.31
2.8	Diversification	Lusardi and Mitchell (2011)	0.80	0.62	0.71

Appendix 2. Summary statistics and variable definitions

Variable	Obs	Mean	SD	Min	Max	Mean German	Mean French	Diff	P-value t-test	Description	Question
Financial Literacy											
FL_score	655	5.54	2.44	0.00	10.00	6.20	4.94	1.26	0.00	Financial literacy score; 10 = highest FL	2.1-2.8
Fin_confusing	646	0.53	0.50	0.00	1.00	0.44	0.60	-0.16	0.00	Financial matters are confusing; Binary variable = 1 if agree	3.1 i)
Self-Control											
Impulsive_buy	651	0.25	0.43	0.00	1.00	0.16	0.33	-0.17	0.00	Regret purchase afterwards; Binary variable = 1 if often or sometimes	1.9
Saving	532	0.50	0.35	0.00	1.00	0.57	0.43	0.14	0.00	Share in % saved of available money last month (Missing if no funds available)	1.4
Preferences											
Time_pref	590	0.67	0.16	0.07	1.00	0.69	0.66	0.03	0.05	Average of quantitative and qualitative time preference measure	
Time Preferences quant. measure	605	0.74	0.25	0.00	1.00	0.77	0.70	0.07	0.00	Share allocated to patient choice in time preference game	3.4
Time Preferences qual. measure	639	0.61	0.18	0.07	1.00	0.60	0.61	-0.02	0.27	General qualitative patience questions. High if more patient	3.1 b)-d)
Risk_pref	586	0.41	0.18	0.00	1.00	0.39	0.43	-0.05	0.00	Average of quantitative and qualitative risk preference measure	
Risk Preferences quant. measure	598	0.26	0.23	0.00	1.00	0.25	0.27	-0.01	0.49	Share allocated to risky choice in risk preference game	3.5
Risk Preferences qual. measure	641	0.64	0.21	0.17	1.00	0.60	0.67	-0.06	0.00	General risk attitude from qualitative question; High if high willingness to take risks	3.1a)
Social Norms											
Financial_socialization	604	0.52	0.32	0.00	1.00	0.61	0.43	0.18	0.00	Average over next 3 variables	
Bank account	648	0.75	0.43	0.00	1.00	0.89	0.63	0.25	0.00	Binary variable = 1 if student has a bank account	1.1
Independent bank account	644	0.33	0.47	0.00	1.00	0.40	0.27	0.13	0.00	Binary variable = 1 if can independently use bank account	1.1
Dummy pocketmoney	617	0.45	0.50	0.00	1.00	0.55	0.37	0.18	0.00	Binary variable = 1 if first pock money received <12 years old (median 12 years)	1.5
Money_attitude	647	0.48	0.41	0.00	1.00	0.36	0.59	-0.23	0.00	Average over next 2 variables; high = money important	
Tool to obtain goals	647	0.56	0.50	0.00	1.00	0.45	0.65	-0.20	0.00	Binary variable = 1 if student agrees or tends to agree that money is a tool to obtain goals	3.1 e)
Provides freedom	652	0.39	0.49	0.00	1.00	0.26	0.51	-0.25	0.00	Binary variable = 1 if student agrees or tends to agree that money provides freedom to do what I feel like	3.1 f)
Basic controls: Variables independent of language group membership											
Female	655	0.47	0.50	0.00	1.00	0.45	0.48	-0.04	0.32	Binary variable = 1 if female	4.3
Swiss	655	0.77	0.42	0.00	1.00	0.93	0.63	0.30	0.00	Binary variable = 1 if Swiss citizen	4.6
Born in 2000	655	0.62	0.48	0.00	1.00	0.65	0.61	0.04	0.30	Binary variable = 1 if born in year 2000	4.1
Born after 2000	655	0.21	0.41	0.00	1.00	0.23	0.19	0.04	0.17	Binary variable = 1 if born after year 2000	4.1
Urban	655	0.28	0.45	0.00	1.00	0.17	0.39	-0.21	0.00	Binary variable = 1 if home municipality has >=10,000 inhabitants	
Extended controls: Variables potentially influenced by language group membership											
School level	655	2.08	0.80	1.00	3.00	2.11	2.05	0.05	0.39	School level; 3 =highest (progym)	
Single room	621	0.86	0.35	0.00	1.00	0.91	0.81	0.10	0.00	Binary variable = 1 if student has own room	4.16
Rent home	639	0.42	0.49	0.00	1.00	0.27	0.56	-0.29	0.00	Binary variable = 1 if family rents home	4.14
Holidays	646	3.02	1.56	0.00	5.00	3.08	2.97	0.11	0.37	Weeks of holidays together with parents this year	4.15
Catholic	643	0.59	0.49	0.00	1.00	0.55	0.62	-0.08	0.05	Binary variable = 1 if catholic	4.18
Protestant	643	0.14	0.35	0.00	1.00	0.22	0.06	0.16	0.00	Binary variable = 1 if protestant	4.18
Other religion	643	0.13	0.34	0.00	1.00	0.10	0.17	-0.07	0.01	Binary variable = 1 if other religion	4.18
Not religious	643	0.14	0.35	0.00	1.00	0.13	0.15	-0.02	0.49	Binary variable = 1 if not religious	4.18

Appendix 3 a) Propensity score matching: Difference in financial literacy and self-control

This table reports the ATE of the propensity score matching model. The propensity score model is estimated in a probit model. The table reports three matching procedures: NN(2) refers to 2 nearest neighbours; NN(5) refers to 5 nearest neighbours; IPW refers to inverse probability weighting. Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. The p-value indicates the level of significance.

		Financial literacy				Self-control			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		FL_score	FL_score	Fin_confusing	Fin_confusing	Impulsive_buy	Impulsive_buy	Saving	Saving
NN(2)	ATE	-0.74	-1.15	0.08	0.10	0.08	0.08	-0.08	-0.10
	SE	0.21	0.21	0.04	0.05	0.05	0.04	0.03	0.03
	p-value	0.00	0.00	0.05	0.04	0.09	0.04	0.02	0.00
NN(5)	ATE	-0.89	-1.09	0.10	0.08	0.08	0.07	-0.09	-0.09
	SE	0.21	0.26	0.04	0.04	0.04	0.04	0.03	0.03
	p-value	0.00	0.00	0.02	0.08	0.05	0.06	0.01	0.01
IPW	ATE	-0.86	-1.11	0.08	0.09	0.08	0.09	-0.08	-0.09
	SE	0.20	0.18	0.04	0.04	0.04	0.04	0.03	0.03
	p-value	0.00	0.00	0.04	0.06	0.05	0.03	0.02	0.01
Observations		655	594	646	585	651	591	532	489
Pscore estimation:									
Basic controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls		No	Yes	No	Yes	No	Yes	No	Yes

Appendix 3 b)

Propensity score matching: Balancing properties for (1) and (2)

The tables below display the balancing properties of variables used in the propensity score estimation.

Specification (1)

	Mean			t-test	
Variable	Treated	Control	%bias	t	p>| t |
Nr obs	345	310			
Female	0.48	0.47	3.5	0.46	0.65
Swiss	0.63	0.63	0.0	0.00	1.00
Born in 2000	0.61	0.65	-10.1	-1.32	0.19
Born after 2000	0.19	0.22	-6.7	-0.89	0.37
Urban	0.39	0.39	-1.6	-0.19	0.85

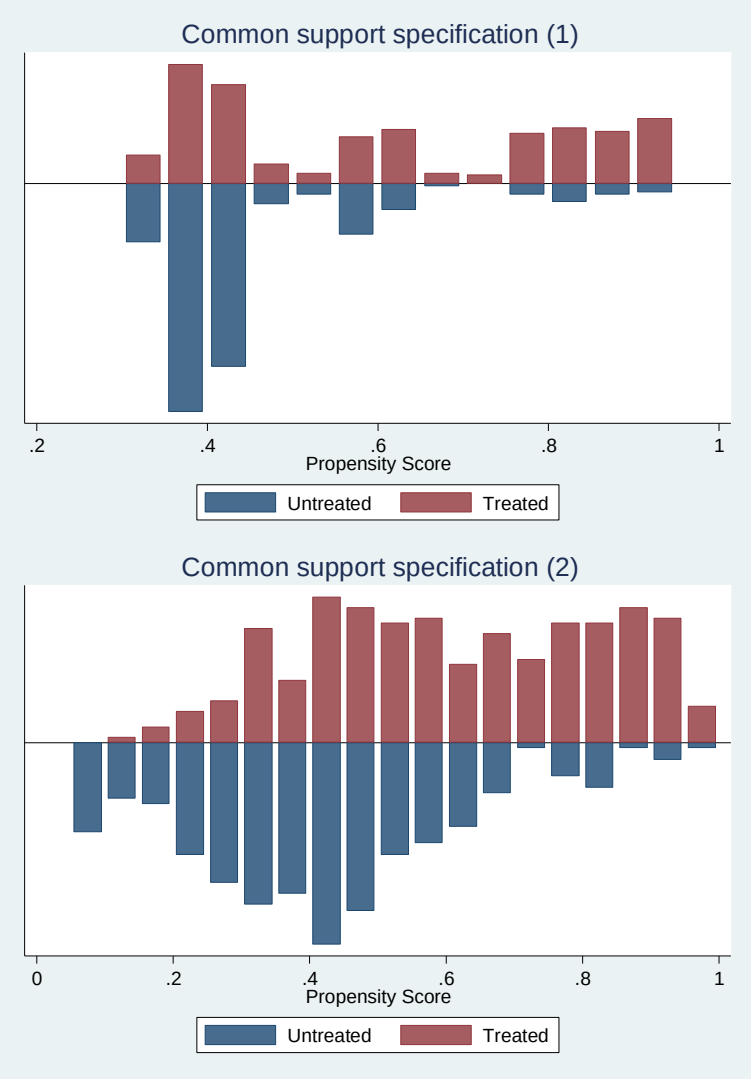
Specification (2)

	Mean			t-test	
Variable	Treated	Control	%bias	t	p>| t |
Nr obs	308	286			
Female	0.50	0.52	-3.2	-0.40	0.69
Swiss	0.64	0.63	1.7	0.17	0.87
Born in 2000	0.60	0.60	0.7	0.08	0.94
Born after 2000	0.20	0.21	-4.1	-0.52	0.61
Urban	0.36	0.33	8.0	0.90	0.37
Rent home	0.54	0.51	6.3	0.74	0.46
Single room	0.81	0.82	-3.5	-0.39	0.70
Holidays	2.98	2.95	2.0	0.24	0.81
School level 2	0.33	0.33	0.5	0.07	0.95
School level 3	0.37	0.35	3.2	0.40	0.69
Catholic	0.62	0.60	3.8	0.48	0.63
Not religious	0.15	0.17	-8.1	-0.94	0.35
Protestant	0.06	0.04	7.1	1.37	0.17
Other religion	0.17	0.18	-4.4	-0.49	0.63

Appendix 3 c)

Propensity score matching: Common support for (1) and (2)

The two figures show the distribution of propensity scores of the treated (French-speaking) and untreated(german-speaking) group.



Appendix 4. Propensity score matching: Difference in preferences and norms

This table reports the ATE of the propensity score matching model. The propensity score model is estimated in a probit model. The table reports three matching procedures: NN(2) refers to 2 nearest neighbours; NN(5) refers to 5 nearest neighbours; IPW refers to inverse probability weighting. Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. The p-value indicates the level of significance.

		Economic preferences				Social norms			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Risk_pref	Risk_pref	Time_pref	Time_pref	Financial socialization	Financial socialization	Money attitude	Money attitude
NN(2)	ATE	0.047	0.030	-0.006	-0.020	-0.161	-0.155	0.218	0.185
	SE	0.016	0.018	0.016	0.015	0.029	0.034	0.032	0.040
	p-value	0.004	0.095	0.709	0.181	0.000	0.000	0.000	0.000
NN(5)	ATE	0.046	0.037	-0.007	-0.014	-0.165	-0.139	0.192	0.199
	SE	0.017	0.016	0.015	0.014	0.031	0.029	0.032	0.034
	p-value	0.006	0.023	0.670	0.336	0.000	0.000	0.000	0.000
IPW	ATE	0.044	0.045	-0.007	-0.013	-0.162	-0.150	0.203	0.210
	SE	0.016	0.017	0.014	0.014	0.027	0.028	0.038	0.040
	p-value	0.005	0.007	0.640	0.361	0.000	0.000	0.000	0.000
Observations		586	533	590	541	604	552	647	588
Pscore estimation:									
Basic controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls		No	Yes	No	Yes	No	Yes	No	Yes

Appendix 5. Subsample analysis: Difference in financial literacy and self-control

The table shows OLS estimates of the French dummy variable for subsamples. (1) - (4) show estimates for subsamples by cititzenship. (5) - (8) show estimates for subsamples by gender. (9) - (12) shows estimates for home municipality characteristics. Not other language refers to the subsample of students that do not speak the other region's language with parents. Clear majority refers to students from municipalities with less than 20% or more than 80% French speakers. Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. Standard errors are clustered at class level and are reported in brackets. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

	Swiss only		Non-Swiss		Female		Male		Urban		Rural		Not other language		Clear majority	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dep var: FL_score																
French	-0.947**	-1.216***	-0.289	-0.568	-0.955**	-1.158***	-0.822*	-1.109***	-1.610**	-1.388***	-0.652	-0.953***	-1.114**	-1.446***	-0.733	-1.010***
SE	(0.460)	(0.219)	(0.616)	(0.554)	(0.472)	(0.278)	(0.463)	(0.279)	(0.718)	(0.356)	(0.457)	(0.219)	(0.436)	(0.261)	(0.462)	(0.222)
Obs	503	460	152	134	305	283	350	311	186	161	469	433	506	457	367	338
Dep var: Fin_confusing																
French	0.141***	0.162***	-0.120	-0.156	0.036	-0.011	0.180**	0.204***	0.020	-0.035	0.135**	0.135**	0.208***	0.204***	0.212***	0.213***
SE	(0.050)	(0.047)	(0.111)	(0.100)	(0.061)	(0.059)	(0.069)	(0.068)	(0.084)	(0.069)	(0.053)	(0.050)	(0.054)	(0.057)	(0.050)	(0.047)
Obs	498	455	148	130	298	276	348	309	184	159	462	426	498	449	363	334
Dep var: Impulsive_buy																
French	0.138***	0.142***	-0.103	-0.159*	0.132**	0.140**	0.090	0.092*	0.063	0.038	0.118**	0.113***	0.123***	0.119***	0.114**	0.117***
SE	(0.049)	(0.047)	(0.085)	(0.080)	(0.062)	(0.061)	(0.054)	(0.052)	(0.127)	(0.127)	(0.045)	(0.040)	(0.044)	(0.043)	(0.047)	(0.041)
Obs	501	458	150	133	305	283	346	308	185	161	466	430	502	454	363	335
Dep var: Saving																
French	-0.100**	-0.120***	-0.028	-0.063	-0.145**	-0.167***	-0.052	-0.052	-0.111	-0.142	-0.080	-0.100**	-0.097**	-0.096**	-0.097	-0.116**
SE	(0.042)	(0.038)	(0.058)	(0.058)	(0.057)	(0.049)	(0.042)	(0.047)	(0.079)	(0.106)	(0.049)	(0.040)	(0.046)	(0.040)	(0.058)	(0.046)
Obs	412	383	120	106	254	238	278	251	146	128	386	361	405	371	298	280
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Appendix 6. Treatment by municipal majority language: OLS regression

This table reports results of the OLS regression French municipality on financial literacy and self-control. The framework corresponds to the RDD framework applied in other studies exploiting the language border (e.g. Eugster et al. 2011, Guin 2015). Since our observations stem from municipalities very close to the language border we do not apply a Local Border Contrast. The French municipality dummy takes on value 1 for 419 students and 0 for 215 students. A home municipality is defined as French speaking if more than 50% of its inhabitants state French as their mainly language. The cantonal capital Fribourg is classified as a French-speaking municipality since 64% of the population state French as their first language. Consequently, 98% of students at the German-speaking school in Fribourg are classified as French speaking according to the majority language definition. We further loose 21 observations for which the home municipality was not stated.Basic control variables, considered as unaffected by culture, include: Female, Swiss, Born in 2000, Born after 2000, Urban. Extended controls include: School level, Single room, Rent home, Holidays, Catholic, Protestant, Other religion, Not religious. Standard errors are clustered at class level and are reported in brackets. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OLS regression	FL_score	FL_score	Fin_confusing	Fin_confusing	Impulsive_buy	Impulsive_buy	Saving	Saving
French municipality	-0.569	-0.950***	0.191***	0.206***	0.127***	0.131***	-0.084*	-0.114***
	(0.421)	(0.232)	(0.052)	(0.049)	(0.038)	(0.036)	(0.048)	(0.041)
Constant	4.762***	4.267***	0.411***	0.448***	0.218***	0.230**	0.457***	0.349***
	(0.433)	(0.546)	(0.075)	(0.107)	(0.061)	(0.110)	(0.070)	(0.092)
Observations	634	575	625	566	630	572	518	477
R-squared	0.100	0.333	0.101	0.124	0.064	0.092	0.059	0.130
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extended controls	No	Yes	No	Yes	No	Yes	No	Yes

Appendix 7. Summary statistics by sample

The tables provides summary statistics of the varying samples in the analysis. Due to missing variables the samples differ depending on the outcome variable and set of control variables.

	Specification in Table 4							
	(1)		(2)		(7)		(8)	
Variable	German	French	German	French	German	French	German	French
Female	0.45	0.48	0.45	0.50	0.44	0.51	0.44	0.53
Swiss	0.93	0.63	0.92	0.64	0.92	0.64	0.92	0.65
Born in 2000	0.65	0.61	0.64	0.60	0.64	0.59	0.63	0.59
Born after 2000	0.23	0.19	0.23	0.20	0.23	0.20	0.23	0.21
Urban	0.17	0.39	0.17	0.36	0.18	0.36	0.18	0.35
Rent home	0.27	0.56	0.27	0.54	0.27	0.54	0.27	0.52
Single room	0.91	0.81	0.91	0.81	0.91	0.82	0.91	0.82
Holidays	3.08	2.97	3.11	2.98	3.12	2.97	3.14	2.97
School level 2	0.40	0.32	0.40	0.33	0.40	0.34	0.40	0.36
School level 3	0.35	0.37	0.35	0.37	0.35	0.37	0.35	0.38
Catholic	0.55	0.62	0.55	0.62	0.56	0.62	0.56	0.63
Not religious	0.13	0.15	0.13	0.15	0.12	0.17	0.12	0.17
Protestant	0.22	0.06	0.22	0.06	0.24	0.06	0.24	0.06
Other religion	0.10	0.17	0.10	0.17	0.09	0.15	0.09	0.15
Obs	310	345	286	308	258	274	243	246

Appendix 8. Mediation analysis of causally dependent multiple mechanisms

This table reports results of the mediation analysis taking into account causally dependent multiple mechanism as described in Imai & Yamamoto (2013). The R package mediation (Tingley et al. 2014) was used to implement the analysis. The Diff column reports the difference of the estimate to estimate reported in Table 7. Alternative mediators included in the analysis are listed in the rightmost column.

		FL_score				Fin_confusing				Impulsive_buy				Saving				Alternative Mediators
		Estimate	95%-CI		Diff	Estimate	95%-CI		Diff	Estimate	95%-CI		Diff	Estimate	95%-CI		Diff	used as controls
	ACME	-0.03	-0.09	0.03	-0.02	-0.01	-0.02	0.01	0.00	0.02	0.00	0.03	-0.00	-0.01	-0.02	-	0.00	Time_pref
Risk_pref	Direct effect	-0.74	-1.17	-0.31	0.16	0.11	0.02	0.20	-0.01	0.09	0.01	0.17	-0.00	-0.06	-0.13	0.01	0.01	Financial socialization
	Total effect	-0.77	-1.20	-0.36	0.14	0.10	0.02	0.19	-0.01	0.11	0.03	0.18	-0.00	-0.06	-0.13	0.01	0.02	
	Prop. Mediated	0.04			0.03	-0.06			0.01	0.15			0.00	0.08			0.01	
	ACME	-0.01	-0.10	0.08	-0.00	0.00	-0.01	0.02	0.00	-0.00	-0.01	0.01	-0.00	-0.00	-0.02	0.02	0.01	Financial socialization
Time_pref	Direct effect	-0.76	-1.18	-0.34	0.10	0.10	0.01	0.20	-0.02	0.11	0.02	0.19	-0.01	-0.06	-0.13	0.01	0.01	
	Total effect	-0.77	-1.17	-0.31	0.11	0.10	0.01	0.19	-0.03	0.11	0.02	0.19	-0.01	-0.06	-0.13	0.01	0.02	
	Prop. Mediated	0.02			0.01	0.02			-0.01	-0.00			-0.03	0.02			-0.08	
Financial	ACME	-0.16	-0.27	-0.05	-0.04	0.03	0.00	0.05	-0.00	-0.00	-0.02	0.02	-0.00	-0.00	-0.02	0.01	-0.00	Time_pref
socialization	Direct effect	-0.61	-1.02	-0.20	0.24	0.08	-0.02	0.17	-0.01	0.11	0.03	0.19	-0.01	-0.06	-0.13	0.01	0.01	Money_attitude
	Total effect	-0.77	-1.17	-0.36	0.21	0.10	0.02	0.20	-0.01	0.11	0.03	0.18	-0.00	-0.06	-0.13	0.00	0.02	
	Prop. Mediated	0.21			0.09	0.25			0.03	-0.03			-0.01	0.05			0.01	
	ACME	-0.06	-0.19	0.07	-0.06	-0.02	-0.05	0.00	0.01	0.03	0.01	0.06	0.00	-0.03	-0.05	0.00	-0.01	Financial socialization
Money_attitude	Direct effect	-0.71	-1.15	-0.26	0.24	0.13	0.04	0.22	-0.01	0.07	-0.01	0.16	0.00	-0.04	-0.11	0.03	0.01	Time_pref
	Total effect	-0.77	-1.19	-0.35	0.18	0.10	0.01	0.19	-0.01	0.11	0.03	0.18	-0.00	-0.06	-0.14	0.00	0.01	
	Prop. Mediated	0.08			0.08	-0.23			-0.01	0.32			0.01	0.41			0.13	
Nr Obs.		520				517				519				435				
Basic controls		Yes				Yes				Yes				Yes				
Extended controls		No				No				No				No				

Appendix B: Survey

UNIVERSITÉ DE FRIBOURG
UNIVERSITÄT FREIBURG

Universität St.Gallen

School	
Class	

Survey on financial behaviour, attitudes and financial literacy

Dear students,
This survey collects information on the financial behaviour and knowledge of students in the canton of Fribourg for a research study. The research study is supported by the school's principal and by the cantonal ministry of education.
All your information is anonymous and will be handled with care. Nobody will be able to see your responses. Also in the presentation of results, nobody will be able to see your answers.

In case you do not know an answer, you can leave the question blank. In case you do not feel comfortable answering the question, you can also leave it blank and move on to the next question.

Thank you very much for your support! This will help to improve the understanding of financial literacy and financial behaviour among students.

Section 1: Financial Behaviour

1.1 Please respond to the questions by ticking Yes or No:

Do you have a bank account (e.g. youth account, savings account, Postfinance account)?

☐ Yes
☐ No

	Yes	No
• Can you access your bank account independently without asking your parents?	☐	☐
• Are you regularly using a bankcard to pay or to withdraw money?	☐	☐

1.2 Please respond to the questions by ticking Yes or No:

Are you buying online (e.g. apps, iTunes, games, clothes etc.)?

☐ Yes
☐ No

	Yes	No
• Are you paying online with your own credit card (e.g. Master Card, Visa Card, Cash Service Card etc.)?	☐	☐
• Are you paying online with your parents' credit card?	☐	☐

1.3 How much money could you use independently last month?

Fr. _____

How much was from:

Pocket money	Fr. _____
Side job	Fr. _____
Other sources (e.g. presents)?	Fr. _____

1.4 How much of the amount stated in 1.3 did you save in the last month?

Fr. _____

1.5 At what age did your receive your first pocket money?

Age_____

☐ I have never received pocket money.

1.6 Which expenses do you cover with your available money? Which expenses cover your parents? Which expenses do you share? Please tick the answer that applies.

	I cover it	My parents cover it	We share the expense	I do not have the expense
Mobile phone	☐	☐	☐	☐
Clothes	☐	☐	☐	☐
Lunch meals	☐	☐	☐	☐
Transportation (e.g. bus and train)	☐	☐	☐	☐
Expenses for school (e.g. books)	☐	☐	☐	☐
Sport activities	☐	☐	☐	☐
Other activities (going out, cinema, concerts etc.)	☐	☐	☐	☐

1.7 Last month, I did not have enough money to cover all my expenses. Yes or no?

- ☐ Yes
- ☐ No (go to question 1.9)

1.8 What did you do if you did not have enough money last month?

- ☐ I used my savings.
- ☐ I borrowed from family members.
- ☐ I borrowed from friends.
- ☐ I spent money that was initially allocated to other expenses (food, transportation).
- ☐ I did nothing.
- ☐ I earned additional money by doing a side job.
- ☐ I stole.

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1.9 How often do you regret a purchase the day after?

never	seldom	sometimes	often
☐	☐	☐	☐

1.10 How often to you spend money on the following things?

	never	seldom	sometimes	often
Sweets	☐	☐	☐	☐
Magazines	☐	☐	☐	☐
Music	☐	☐	☐	☐
Cigarettes	☐	☐	☐	☐
Alcohol	☐	☐	☐	☐

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1.11 Did you borrow any money last month?

☐ Yes
☐ No

If yes, from who did you borrow money? (Several answers possible)

☐ Parents
☐ Siblings
☐ Friends
☐ Others

How much did you borrow last month? _____ Fr.

1.12 Did you lend any money last month?

☐ Yes
☐ No

If yes, to whom did you lend money? (Several answers possible)

☐ Parents
☐ Siblings
☐ Friends
☐ Others

How much did lend last month? _____ Fr.

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Section 2: Financial Literacy

2.1 Suppose you put in the beginning of the year 100 Francs into a savings account with a guaranteed interest rate of 2% per year. You do not make any further payments into this account and you do not withdraw any money. How much would be in the account at the end of the first year, once the interest payment has been paid?

☐ Less than 100 Francs
☐ 100 Francs
☐ More than 100 Francs
☐ Do not know

2.2 Suppose you have 100 Francs on a savings account. On this savings account, you receive an annual interest rate of 5%. No fees occur. How much do you have on the savings account after 2 years?

☐ More than 110 Francs
☐ Exactly 110 Francs
☐ Less than 110 Francs
☐ Do not know

2.3 Imagine you saw the same television on sale at a discount in two different shops. The original purchase price of the television was 500 Franken. One shop is offering a discount of 60 Francs off the original price. The other is offering a discount of 10% off the original price. Which of the two is the better deal?

☐ 60 Francs discount
☐ 10% discount
☐ Both are the same
☐ Do not know

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2.4 Natasha works in a restaurant 3 evenings each week. She works for 4 hours each evening and she earns 20 Francs per hour. Natasha also earns 60 Franken each week in tips. Natasha saves exactly half of the total amount of money she earns each week. Natasha wants to save 600 Francs for a holiday. How many weeks will it take Natasha to save 600 Francs?

- ☐ 3 weeks
- ☐ 4 weeks
- ☐ 6 weeks
- ☐ 12 weeks
- ☐ Do not know

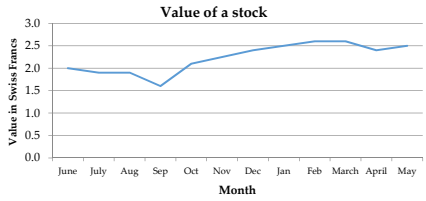
2.5 The bank statement below displays in-payments and out-payments at a bank account in January 2015.

Date	Note	Withdrawals	Deposits	Balance	Valuta
01.01.2015	Previous balance			4500	
08.01.2015	Rent	1200		3300	08.01.2015
12.01.2015	Cash withdrawal	200		3100	12.01.2015
20.01.2015	Health insurance	300		2800	20.01.2015
22.01.2015	Cash withdrawal	350		2450	12.01.2015
29.01.2015	Salary		4500	6950	29.01.2015
Total turnover		2050	4500		
31.01.2015	Closing balance			6950	

Please indicate whether the following statements are true or false:

	true	false	Do not know
By the end of January 2015, there were 4500 Francs on the account.	☐	☐	☐
More money was deposited in the account than was withdrawn.	☐	☐	☐

2.6 The figure below displays the value of a stock of company XYZ over 12 months.



Please indicate whether the following statements are true or false:

	true	false	Do not know
September was the best month to buy this stock.	☐	☐	☐
The value of the stock increased 50% over the 12 months displayed in the graph.	☐	☐	☐

2.7 Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, would you be able to buy more than, exactly the same as or less than today with the money in this account?

- ☐ Less
- ☐ The same
- ☐ More
- ☐ Do not know

2.8 Please indicate whether the following statement is true or false: „It is more likely to lose all of one's money if it is invested in only one stock than if it is invested in different stocks."

☐ True
☐ False
☐ Do not know

Section 3: Attitudes and importance of money

3.1 Please indicate how strongly you agree or disagree with the statements below:

	Strongly agree	Agree	Tend to agree	Tend to disagree	Disagree	Strongly disagree
I am a person who is willing to take risks.	☐	☐	☐	☐	☐	☐
I rather go without something today in order to be able to afford more tomorrow.	☐	☐	☐	☐	☐	☐
I tend to procrastinate tasks even though it would be better to get them done immediately.	☐	☐	☐	☐	☐	☐
I am prepared to spend now and let the future take care of itself.	☐	☐	☐	☐	☐	☐
For me, money is a tool to accomplish goals.	☐	☐	☐	☐	☐	☐
I am living according to the motto: Money gives me the freedom to do what I feel like.	☐	☐	☐	☐	☐	☐
For me, money is a tool to make friends.	☐	☐	☐	☐	☐	☐
I am prepared to everything it takes to get money.	☐	☐	☐	☐	☐	☐
Financial matters are complicated and confusing to me.	☐	☐	☐	☐	☐	☐

3.2 Please indicate how often your parents told you the following:

	never	seldom	occasionally	sometimes	often	very often
«You have to put money aside.»	☐	☐	☐	☐	☐	☐
«You should use money for joy and entertainment.»	☐	☐	☐	☐	☐	☐
«You should not spend more than what you have.»	☐	☐	☐	☐	☐	☐
«You should not make any debt.»	☐	☐	☐	☐	☐	☐

3.3 How often do you perform the following actions?

	never	seldom	occasionally	sometimes	often	very often
Biking without helmet	☐	☐	☐	☐	☐	☐
Betting with friends	☐	☐	☐	☐	☐	☐
Gambling	☐	☐	☐	☐	☐	☐
Smoking	☐	☐	☐	☐	☐	☐

3.4 You receive 30 Francs and you can allocate the money to the following two options:

1. Money you allocate to the circle, you will receive today.
2. Money you allocate to the square, you will receive doubled in 4 weeks.

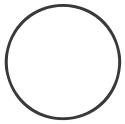
You can allocate to money as you wish. If you for example allocated 20 France to the circle and 10 France to the square, you will receive 20 today and 20 (2 x 10 Fr.) in 4 weeks.

How do you allocate the 30 Francs?

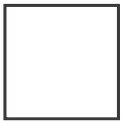
Please fill in the amount to each of the two fields below. The two amounts should sum up to 30 Francs.

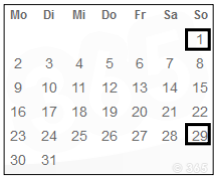
(There is no true or false)

This amount I would like today:



This amount I would like doubled in 4 weeks





3.5 You receive 30 Francs and you can allocate the money to the following two options:

1. Money you allocate to the circle, you will receive with certainty.
2. With money you allocate to the square, you will play heads or tail.

If it is head, you will receive the double amount of the money in the square.

If it is tail, you will lose the money in the square.

You can allocate to money as you wish. If you for example allocated 10 France to the circle and 20 France to the square, you will receive 10 with certainty and with 50% probability either 40 Fr. (2 x 20 Fr.) or nothing.

How do you allocate the 30 Francs?
Please fill in the amount to each of the two fields below. The two amounts should sum up to 30 Francs.

(There is no true or false)

This amount I would like today with certainty

50% head: Amount will be doubled
50% tail: Amount will be lost

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Section 4: Socioeconomic Background

4.1 When were you born?

Year: _____

4.2 Were you born in Switzerland?

☐ Yes
☐ No

4.3 Gender

☐ Male
☐ Female

4.4 Where do you live?

Postcode: _____

City/village: _____

4.5 Where did you attend kindergarten?

City/village: _____

☐ I went to kindergarten in another country (not Switzerland).

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4.6 Which citizenships do you have? (if several, please fill in all of them)

- ☐ Swiss
- ☐ Other: _____

4.7 Do you have siblings?

- ☐ Yes
  - How many? _____
  - How many siblings live with you in your household? _____
- ☐ No

4.8 Which language do you speak to your parents? (If it applies, you can indicate several)

- ☐ Swiss-German
- ☐ German
- ☐ French
- ☐ Italian
- ☐ Serbo-Croatian
- ☐ Albanian
- ☐ Portuguese
- ☐ Spanish
- ☐ Other: _____

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4.9 Which language do you speak to your siblings? (If it applies, you can indicate several)

- ☐ Swiss-German
- ☐ German
- ☐ French
- ☐ Italian
- ☐ Serbo-Croatian
- ☐ Albanian
- ☐ Portuguese
- ☐ Spanish
- ☐ Other: _____
- ☐ Do not have siblings

4.10 Did your **mother** pursue an apprenticeship?

- ☐ Yes
- ☐ No
- ☐ Do not know

4.11 Did your **mother** pursue a university degree?

- ☐ Yes
- ☐ No
- ☐ Do not know

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4.12 Did your **father** pursue an apprenticeship?

- ☐ Yes
- ☐ No
- ☐ Do not know

4.13 Did your **father** pursue an university degree?

- ☐ Yes
- ☐ No
- ☐ Do not know

4.14 Where are you currently staying with your family?

- ☐ We rent a house or apartment
- ☐ We own a house or apartment
- ☐ Other

4.15 For how many weeks did you go on holiday with your parents since January 1st?

- ☐ We did not go on holiday
- ☐ 1 week
- ☐ 2 weeks
- ☐ 3 weeks
- ☐ 4 weeks
- ☐ 5 or more weeks

4.16 Do you and your siblings all have your own room?

- ☐ Yes
- ☐ No

4.17 Do your parents attend the following events?

	Yes	No	Do not know
Cinema	☐	☐	☐
Sport events (e.g. football or ice hockey games)	☐	☐	☐
Theatre	☐	☐	☐
Museums or exhibitions	☐	☐	☐
Concerts of classical music or opera	☐	☐	☐

4.18 What religion do you belong to?

- ☐ Roman-catholic
- ☐ Protestant
- ☐ Muslim
- ☐ Orthodox
- ☐ Jewish
- ☐ Other religion
- ☐ No religion

4.19	What are your plans for the future after the mandatory school years?

☐ I am planning to pursue an apprenticeship.
☐ I am planning to attend high school.
☐ I am planning to attend another secondary school.
☐ I am planning to start working without pursuing an apprenticeship.
☐ I do not know.

4.20	In which profession would you like to work in 10 years?

Profession: _____
☐ Do not know

4.21	Which grade did you obtain in math in your last grade certificate?

☐ below 4
☐ 4 or 4.25
☐ 4.5 or 4.75
☐ 5 or 5.25
☐ 5.5 or 5.75
☐ 6

4.22	Have you attended a course in school that has covered financial topics and topics related to the handling of money?

☐ Yes
☐ No

Thanks for your participation!

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