Children's use and understanding of money: evidence from Italy.

Guerriero C.*; Cairns J.

* Corresponding Author: Carla Guerriero Università di Napoli Federico II and CSEF. Postal address: Department of Economics and CSEF, Università di Napoli Federico II, Via Cintia (Monte S. Angelo), 80126 Napoli, Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, Tavistock Place WC1H 9SH London UK (e-mail:Carla.Guerriero@lshtm.ac.uk); Prof John Cairns: Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, WC1H 9SH Tavistock Place London UK (e-mail:John.Cairns@lshtm.ac.uk

Abstract

We investigate, using two separate studies, the use and understanding of money among young Italian children (aged 6-13 years). In the first study, testing children's understanding of money-related concepts, we find that the ability of children to understand economic concepts improves with age. In particular, the ability to grasp some monetary concepts, such as budget constraint and ordering notes and coins in terms of value, improves significantly when children are 8-9 years compared with the younger age group (6-7 years). Although there are no differences between genders in the overall ability to understand money-related concepts, girls show a better understanding of the different value of notes and coins than boys. The second study investigates Italian children's source of income and spending habits. Our results suggest that majority of children receive money from their parents as a regular allowance (76%) and the amount children receive and birthday and festive presents increases significantly as children get older. Only a small proportion of children borrow money and the probability of borrowing is higher for boys compared with girls. Only 38% said they would lend money while 78% regularly save money. The majority of respondents save money to "buy things they need in the future". The implications for household decision making models are discussed.

1. Introduction

According to Calvert, children influence family buying decisions over a broad range of goods and services, including cars, vacations, and meals [1, 2].Young children regularly receive money from their parents; they earn money; and, especially in low income countries, they contribute significantly to household income [3-5]. Despite children's influence within the household, economists have paid sporadic attention to young people's role as active economic agents [6-8].

In the household behavioral model, young children are considered bystanders [7]. Even where collective models are used in place of a unitary model to account for individual household members' preferences, the role of children is incorporated in the model through parents' "caring preferences", or in respect to the public goods children consume [7, 9, 10]. Economists justify this exclusion in three ways: children lack preferences for their own consumption, they do not understand the value of money and even if they understand it they lack the financial autonomy to buy what they prefer [7, 11]. To date, however, only Dauphin et al. test this hypothesis and show that children aged 16 and over contributed significantly to household decision making processes, and were decision makers within the household [7].

The understanding of money is an essential prerequisite for children to be considered active and rational economic agents. Without knowing what money is and its value children cannot understand more specific concepts such as budget constraint and profit [2]. As suggested by Furnham, compared to the past, nowadays young people have access to various amounts of money coming from different sources such as pocket money, presents and work [2]. It is well known for big companies and advertisers that children are a very powerful consumer group [2, 12]. However, children's degree of financial freedom varies significantly by country and, within country by social class. Compared to developing countries, the financial freedom of children in western countries is rather limited [2]. In the former children have much more involvement in day-to-day economic activities and since younger ages can contribute to the family income [2]. In the latter, children often participate to family shopping and they gradually acquire autonomy in different spheres of economic activity (e.g. buying clothes, toys etc.)[13]. Even within countries, evidence suggests that there is a wide gap in parental attitudes towards regular allowance and children's spending behaviors. Studies conducted in UK, for instance, found that middle class children receive less and saved more than working class children [14, 15].

The objective of the present paper is to update and expand existing knowledge on the understanding and use of money by children aged 6-13 years. The paper consists of two studies. The first study updates the findings of previous

research and it tests whether children are fully aware of the basic economic notions required to function as an active economic agent. Specifically, we investigate the capacity of children aged 6-13 years to understand money-related concepts, such as the value of different coins and banknotes and the ability to estimate the change following a transaction.

According to Webley, pocket money is uncommon in Italy [13]. However, there is limited knowledge on children's use of money in this country[16]. To fill part of this gap in the literature, in the second study, we investigate the use of money at younger ages by analyzing Italian children's income sources and their saving, borrowing and lending habits.

2. Study A: the association between age, gender and school class and children's understanding of monetary concepts.

2.1 Background

According to Piaget's theory, the development of economic notions in children follows a predefined stage framework [17,13]. When children are aged 3-7 years, also referred to as the pre-operational period, they learn basic economic phenomena by observing adult behavior. Between the ages of 7 and 12 years, children move to the so called 'concrete operations' period, at which point they make connections between different aspects of money use [17]. As the children move into adolescence, Piaget suggests that they become aware of parental economic activity at the systemic level. For example, they begin to understand the nature and purpose of banks, motivations for selling and buying, the concept of goods and resource scarcity, together with the ideas of supply and demand [18].

Confirming Piaget's hypothesis, Schuessler and Strauss in 1950 showed that children need to pass through different stages before achieving an adult understanding of money [19, 20]. At stage 1 (3-4 ½ years), children know that coins are different from other objects; but they are not able to make a distinction between the different types of money [21, 22]. At stage 2, when children become 4-5 years old, they know that money can buy things; but they are unable to make a distinction between different denominations of cash, believing that any coin can buy anything. According to Schuessler and Strauss, children acquire mathematical notions at primary school, where they become aware of the importance of the exact value of money in transactions. However, it is only when they reach 8-10 years old that they acquire a capacity to estimate the amount of change received in a transaction. At this age, they also gain an understanding that money is required to purchase goods, and that money is earned through work [19, 20]. Berti and Bombi explored children's understanding of economic ideas [23, 24]. Studying children between the ages of 3 and 8, Berti and Bombi suggest that there are six possible stages through which children acquire an understanding of money.

In stage one, children have a vague understanding of the relationship between money and buying [24]. In stage two, children understand that money is used to buy goods. In stage three children understand the different denominations of money. In the fourth stage, children acquire the concept of a budget, that often enough they lack sufficient money to buy goods. Up to this point, Bombi and Berti suggest that a child's ability to progress from one stage to another depends on the depth and level of the child's experience, and on their ability to draw conclusions. In stage five, children acquire the ability to understand the correspondence between objects and prices, and also the ability to understand the receipt of change following a transaction. Finally, in stage six, the child's arithmetic abilities and aptitude allow them to grasp the relationship between prices, the available budget, and the amount of change they will receive following the transaction [24].

There is an emerging recognition that the ability of children to understand economic concepts does not follow a strictly Piagetian stage-wise approach and that the understanding of the different economic concepts may advance simultaneously and it depends on a child's social context. Many authors indeed suggest that the development of the economic knowledge cannot be separated from the context into which the child is socialized. According Sonuga-Barke and Webley. for instance, children's economic actions are different from those of adults because they are constructed within their social group which is composed of their parents, siblings and friends [25]. Knowledge of the economic world of grown-ups is not necessary for children's economic actions as children can be very active economic agents in their own economic world [25].

2.2 Participants

The objective of study A is to examine whether age and gender influence knowledge of money for children aged 6-12. The study involved 112 children, 63 females and 49 males, from a state school in Naples (Italy). All children included in the study belong to lower-class families and were eligible for free school meals. None of the children involved in the study had any intellectual, visual or auditory impairment. The study was conducted after receiving ethical approval from the London School of Hygiene and Tropical Medicine ethics committee. Informed consent was obtained from parents and children before the study commenced.

2.3 Instrument

An eight-item questionnaire, based on the study conducted by Berti and Bombi, was administered to each child to test their understanding of four economic notions: the ability to assign different values to money, the ability to identify a correspondence between an object's price and the money necessary for the transaction, the notion of a budget constraint, and the correct use of change during transactions [24].

2.4 Procedure

The questionnaire was completed in a classroom setting. Each child was asked to complete the questionnaire independently. Pupils were assured that their answers were anonymous and strictly confidential, and would not be assessed by their teacher, or recorded by the school. Overall, children found the instructions for the questionnaire easy to follow. There was no time limit for its completion and on average each class did not take longer than 15 minutes to complete the questionnaire.

2.5 Analyses

A descriptive analysis was performed to provide an overview of the sample, and to estimate the mean score for each of the four tasks across the overall sample, and also the mean score for overall understanding of money by age groups. A correlation analysis was carried out to assess the relationship between the scores obtained in the four money related domains. ANOVAs were computed to assess whether there were age and gender differences in the understanding of economic concepts. Possible interactions between age and gender were also investigated. A regression analysis was performed using STATA Statistical Software, Release 11.0.15 Confidence intervals and P values (significant at the $P<0.05$ level) were calculated with adjustment for clustering effects (each class was assumed to be a separate cluster).

2.6 Results

Table 1 provides a description of the sample included in the first study. The mean overall score by age and gender is reported in Table 2. Table 3 reports the results of the descriptive analysis for each of the four domains of money-related knowledge explored in the study. Independent of age and gender, the mean score for each question was high. The lowest average score was with respect to the value of different banknotes and coins. The highest mean score was for questions that tested ability to identify the price of different objects. As seen in Figure 1, a highly significant correlation was found between the score for the ability to identify the correspondence between an object and its price, and the score related to the budget constraint.

ANOVAs testing the effect of age and gender on the total score revealed that age was significantly associated with money-related knowledge ($F(10, 13)=2.67$ $p=0.018$). Conversely, gender and interactions between gender and age were not significant. When considering the four domains separately, older children have a significantly higher understanding of the value of coins and banknotes ($F(1, 8)= 5.30$ $p=0.000$). In youngest age group (6-7 years), the average score for questions testing this ability was 1.11 (SD: 0.17). In the oldest group, the average score was 1.8 (SD: 0.13). Neither age nor gender was predictive of the ability to understand the correspondence between prices and objects, and the evaluation of budget constraints. Even the youngest subjects demonstrated an ability to identify the approximate value of different types of goods (mean score 6-7 years individuals: 2.8 SD: 0.11) and to identify the budget constraint in

transactions (mean score for the youngest group: 2.11 SD: 0.25). There were no significant age/gender interactions. Further confirming these results, the regression analysis suggests that the overall understanding of monetary concepts is greater for older children (8-9 years) compared with the younger age group (6-7 years) (Table 4). In particular, children older than 7 years showed a higher level of ability in ordering banknotes and coins by value, and a greater ability to understand the budget constraint in a monetary transaction. The overall ability to understand monetary notions doesn't differ by gender, however, girls have a better understanding than boys of the value of different coins and banknotes.

Table 1. Profile of Sample A

Age	***Boys***	***Girls***	***Total***
6-7	6	11	17
8-9	22	25	47
10-11	14	24	38
12-13	7	3	10
Total	49	63	112

Table 2. Descriptive statistics. Average score by age and gender.

Variables	***Scale***	***Mean***	***S.D.***
Age			
6-7	0-10	7.94	0.42
8-9	0-10	8.70	0.17
10-11	0-10	9.07	0.23
12-13	0-10	9.30	0.39
Gender			
Female	0-10	8.87	0.17
Male	0-10	8.63	0.20

SD:Standard Deviation

Table 3. Descriptive statistics. Average score by type of question.

Variables	***Scale***	***Mean***	***S.D.***
Value of money	0-2	1.14	0.65
Price-object comprehension	0-3	2.91	0.42
Budget	0-3	2.55	0.74
Change	0-2	1.83	0.48

SD:Standard Deviation

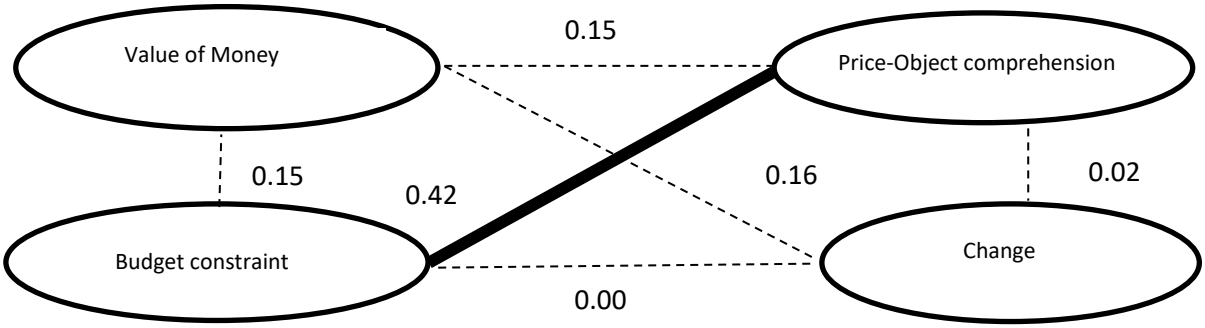

Figure 1. Correlation between the scores of the four economic notions tested. Heavy solid line indicates significant relationship (p<0.000), dotted line indicates correlations that were not significant (p>0.05).

Table 4. Regression Analysis. Total and specific task score.

	All Questions	*Ordering notes & coins by value*	*Correspondence Price & objects*	*Budget*	*Change*
Age					
6-7 versus 8-9	0.79(0.37)*	0.33(0.16)*	0.07(0.12)	0.43(0.20)*	-0.05(0.13)
8-9 versus 10-11	0.23(0.27)	0.16(0.12)	-0.03(0.09)	0.09(0.14)	0.00(0.07)
10-11 versus 12-13	0.37(0.49)	0.25(0.21)	-0.13(0.18)	0.07(0.24)	0.18(0.11)
Gender					
Female	-0.31(0.25)	-0.40(0.11)***	0.01(0.08)	0.18(0.14)	0.09(0.09)

Coefficient (Standard Error) *p<0.05; **p<0.01; ***p<0.001

3. Study B. Children's use of money.

3.1 Background

Over the last few decades, the availability of spending money, together with the spending and saving habits of young individuals, has received increasing attention [26-28]. Previous studies investigating parental attitudes towards pocket money highlighted that nationality, age of child and social class significantly influence allowance attitudes, such as: frequency and amount of money, and agreeing in advance what the money should cover [3, 29]. According to these studies, parents introduce the allowance system quite early (on average when the child is 6 years old) and increase the amount given as the child grows up. Cross-country comparisons have also shown differences in parental attitudes towards money. For example, as many as 77% of Britons and only 40% of Germans believe that children should be given money on special occasions [27].

In 1984, Furnham and Thomas investigated the saving and spending habits of young people in the UK finding no gender and class differences in respect to the source of income, but numerous age differences in money usage for children between 7 and 12 years. In 1999, a subsequent study conducted among adolescents found that young people aged between 11 and 16 years were very active economic agents [30]. The majority of those interviewed had a regular source of income (mainly an allowance from their parents), received money on special occasions and saved money to buy something special. Unlike previous studies, Furnham also found significant gender differences, indicating that females received less money, were less economically active and were often more economically conservative than males [3].

Among adults, saving, lending and borrowing habits are related to individual traits and social networks. For example, saving is related to more optimistic attitudes, and debts to moral issues. Livingston and Lunt studied the relationship between individual saving and borrowing among adults and found that savers are more likely to see debt (borrowing) as a failure, while people who borrow and save at the same time were found to be optimistic and felt in control of their lives [31]. In line with these findings, studies investigating parental attitudes towards the saving, lending and borrowing habits of their children found that parents tried to promote saving and were against children lending and borrowing money from others [27, 32]. In the UK, three quarters of the parents interviewed believed that children should start saving a proportion of their pocket money as soon as the allowance regime was introduced. Only 1.4% and 3.3 % of the parents interviewed believed that children should be encouraged to borrow and lend money respectively [27, 32]. Studies investigating children's beliefs about saving have shown that while younger children see saving as an opportunity to realize short term goals, children aged 6 to 12 years display more abstract economic reasoning, and are able to understand the importance of saving money towards long term goals. In this way, older children have a better understanding of the trade-off between future and current consumption [33-36].

There are few Italian studies that explore children's attitudes towards pocket money, the use of their allowance and their spending/savings/borrowing and lending attitudes [32, 37].

Our second study investigates the use of money by a sample of Italian children aged 6 to 13 years. In particular, it aims to examine whether gender, age and the number of siblings influenced how much and how often young children received money from adults (e.g. pocket money or as festive presents) together with their saving, borrowing and lending habits.

3.2 Participants

The study involved 103 children, 58 girls and 45 boys, aged between 6 and 13 years. Children were recruited from the same school of the first study, as in the first study all participants were eligible for free school meals. The research received ethical approval from the London School of Hygiene and Tropical Medicine ethics committee. Informed consent was obtained from parents and children before starting the experiment.

3.3 Instrument

Each child was given a 13-item questionnaire concerning pocket money received from parents, and their saving, borrowing and lending habits. The questions included in the survey were derived and adapted from previous studies conducted among similar age groups [38, 39]. A pre-test was conducted on a small sample of children to ensure that they understood the questionnaire items.

3.4 Procedure

As for the first study, children completed the questionnaire during class time. The average time taken to complete the questionnaire ranged from 15 to 35 minutes in the younger age group, to about 10 minutes for the oldest groups. Only 2 out of 105 children did not complete the questionnaire. Trained interviewers ensured that children understood the questions and encouraged them to reply honestly and accurately..

3.5 Analyses

A descriptive analysis was conducted for the purpose of summarizing responses to the questionnaire. A series of ANOVAs were run to investigate the effect of gender, age and the interaction of gender and age on the questionnaire's items. The mean and median amount of money by source was estimated both by age group and by class attended. A correlation analysis was carried out in order to assess the relationship between the pocket money, birthday and festivity presents and the amount of savings. Potential factors influencing the probability of receiving pocket money, and money as birthday and festivity presents were explored using logistic regression. A Tobit regression was used to assess the factors influencing the amount of money received as pocket money and the overall amount of money received each month (including recurrent presents) the frequency, the amount of pocket money allowance and the amount of savings.

3.6 Results

Table 5 describes the characteristics of the sample of children. The numbers are balanced by age group with the exception of the oldest age group (12-13 years) which accounts for 33% of the overall sample. The first two columns of Table 6 show the results of the descriptive analysis for each item included in the questionnaire. 78% of children said they received pocket money, the majority of them (56%) received pocket money every week, 25% once every day and

almost 20% once every month. The amount most commonly received was €5 (35%). As expected, it was unlikely that they received more than €20 (only 8% of the sample). Over 80% of children said they received money for birthdays or on festive occasions. The amount received during festivities was less than €20 for 25% of children, between €20 and €50 for 41% of the sample and more than €50 for the remaining 31% of children. Only 10% of children borrowed money from friends. However, this proportion tripled in terms of lending money to others. 78% of participants reported that they were currently saving money. The amount saved ranged from €5, among 15% of respondents, to €200 in 23% of cases. The most popular reason to save money was "Because if I need to buy something I will have money available" while only 6% of children saved because their parents told them that saving is important. Logit analyses reveal no association between age and gender and saving.

ANOVAs analysis was used to assess the effects of gender, age and age gender interactions on the items of the questionnaire (results are presented in Table 1 of the appendix). Gender was not a predictor of the use of money. Age, however, was found to affect the amount of money received as pocket money and as birthday presents. Older children were also more likely to lend money. Saving and borrowing attitudes were also influenced by age while age-gender interactions were not significant for the items considered. Table 6 reports the mean and median amount of money children have available by age and by class attended. This figure increases significantly as children grow older and move to higher classes. The last columns of each table show the overall monthly income. Figure 2 shows the correlations between the amount of money from different sources and the amount of savings. Consistently positive and highly significant correlation is found between the money received from pocket allowance and money received as birthday and festivity presents. No correlation was found between the amount of saved and the money received as pocket money each month. However, savings were highly dependent on money received as festivity and birthday presents.

Logistic regression analyses were performed to identify potential factors influencing the probability of receiving pocket money as either a birthday and/ or a festivity present (Table 7). The probability of receiving pocket money for a birthday present increases with age. Compared with children aged 6-7 years, older children are approximately 5 times more likely to receive a regular pocket money allowance. As expected, the presence of siblings decreases the probability of receiving money both as birthday and a festive present. The second regression investigated whether the child's characteristics influenced the probability of saving, lending and borrowing money. Neither age nor the presence of siblings was a predictor for saving and borrowing habits among children. Compared with boys, however, girls were less likely to borrow money. The probability of lending money decreases with age. However, it also seems to increase among the oldest age group (11-12 years). Table 8 reports the results of the Tobit regressions. Both the amount of

monthly pocket money and the overall monthly income (including presents and savings) increases with age; and, in particular, when children arrive at pre-adolescence (turn 12 years old). Table 8 shows that age and gender do not influence the amount of savings. The frequency with which children receive money increases compared to the younger age group. The sums received as pocket money increase consistently by age group, and do not vary by gender.

Table 5. Profile of Sample B

Age	***Boys***	***Girls***	***Total***
6-7	9	14	23
8-9	12	9	21
10-11	6	20	26
12-13	18	15	33
Total	45	58	103

Table 6. Mean and median amount of money children have available by age and by class.

	Monthly Pocket Money	***Savings***	***Birthday present***	***Festive Presents***	***Monthly Income***
6-7 years					
Mean (S.D.)	€10.45 (31.4)	€43.85(56.78)	€24.53(32.67)	€26.30(45.55)	€16.52(24.08)
Median	€0	€10	€10	€10	€10.08
8-9 years					
Mean (S.D.)	€42.06(89.4)	€32.78(67.89)	€47.85(62.71)	€21.66(30.99)	€59.59(132.47)
Median	€20	€20	€20	€10	€21.25
10-11 years					
Mean (S.D.)	€27.5(`5.67)	€67.90(90/81)	€85.39(23.67)	€70.77(73.13)	€74.29(91.52)
Median	€20	€20	€75	€50	€43.33
12-13 years					
Mean (S.D.)	€143.57(201.33)	€49.39(72.42)	€96.06(72.97)	€88.33 (73.87)	€166.35(211.50)
Median	€40	€5	€100	€100	€65
3rd Primary grade					
Mean (S.D.)	€9.39 (20.4)	€48.91(66.86)	€23.91(33.85)	€26.47(45.43)	€15.76(24.18)
Median	€0	€10	€10	€10	€7.5
4th Primary grade					

Mean (S.D.)	€37.42(69.4)	€37.14(58.81)	€47.85(62.19)	€21.85(30.43)	€45.02(71.71)
Median	€20	€20	€20	€10	€21.25
5th Primary grade					
Mean (S.D.)	€22.5(19.6)	€84.42(87.91)	€85.38(73.27)	€41.92(35.07)	€44.01(44.24)
Median	€20	€20	€75	€50	€32.33
1st Intermediate grade					
Mean (S.D.)	€34.11(41.84)	€47.35(75.02)	€84.70(57.78)	€51.17 (72.09)	€42.01(31.72)
Median	€20	€10	€100	€50	€43
2nd-3rd Intermediate grade					
Mean (S.D.)	€259.87(237.9)	€51.56(71.94)	€124.37(75.62)	€127.81(73.51)	€291.54(245.95)
Median	€150	€5	€100	€150	€200

Table 7. Logistic Regression Results.

Variable	***Pocket Money (Yes/ No)***	***Money as Birthday Present(Yes/No)***	***Money as Festive present (Yes/No)***	***Saving money (Yes/ No)***	***Borrowing money (Yes/No)***	***Lending money (Yes/No)***
	OR(S.E.)	***OR(S.E.)***	***OR(S.E.)***	***OR(S.E.)***	***OR(S.E.)***	***OR(S.E.)***
Age						
8-9 vs. 6-7 years	3.83(2.49)*	2.06(1.52)	.70(.50)	0.85(0.63)	0.246(0.30)	0.21(0.05)**
10-11 vs. 6-7 years	5.32(3.39)**	3.56(2.59)*	2.39(1.79)	2.70(2.47)	1.18(1.09)	0.05(0.03)**
12-13 vs. 6-7 years	4.85(2.93)**	8.65(7.23)**	3.71(2.91)	0.50(0.34)	0.66(0.619)	2.24(1.28)
Siblings	0.96(0.20)	0.51(0.12)**	0.50(0.12)**	1.10(0.23)	0.59(0.25)	0.97(0.225)
Gender Female vs. Male	1.15(0.53)	1.64(0.95)	2.21(1.29)	0.60(0.32)	4.55(0.51)*	1.18(0.59)
Constant	0.56(0.47)	2.50(2.37)	2.64(2.46)	6.58(6.11)*	0.028(0.043)**	0.622(0.535)
Log-Likelihood	-58.21	-43.52	-45.19	-51.25	-29.14	-50.16
Pseudo R2	0.08	0.14	0.13	0.06	0.11	0.24

OR: Odds Ratio; S.E.standard Error;*p<0, 05; **p<0, 01; ***p<0,001

Table 8. Tobit Regression Results

Variable	*Monthly Pocket Money*	*Monthly Income*	*Amount of money saved*	*Frequency of pocket money*	*Amount received as pocket money*
	Coefficient(S.E.)	*Coefficient(S.E.)*			
Age					
6-7 vs. 8-9 years	98.47(51.73)	42.39(39.66)	-8.42(26.29)	1.03(0.45)*	1.69(0.68)*
6-7 vs. 10-11 years	96.44(50.02)	43.93(37.72)	45.82(24.74)	1.07(0.43)*	2.04(0.65)**
6-7 vs. 12-13 years	213.54(47.63)***	158.88 (36.26)***	-0.63(24.18)	0.84(0.41)*	2.05(0.62)***
Siblings	9.90(14.59)	4.73(12.17)	-13.06(8.04)	-0.01(0.13)	-0.06(0.19)
Gender	32.27(32.82)	21.51(26.66)	4.07(17.90)	0.10(0.29)	0.40(0.44)
Constant	-155.82(65.41)	-38.83(49.25)	49.26(32.85)***	0.22(0.56)	-0.72(0.85)
Log-Likelihood	-470.39	-613.08	-492.69	-155.11	-179.40
Pseudo R2	0.026	0.019	0.009	0.024	0.048

*p<0.05; **p<0.01; ***p<0.001

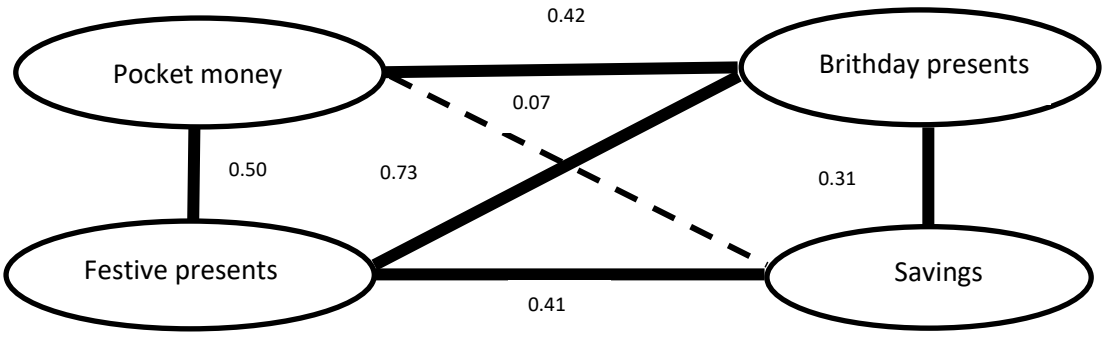

Figure 2. Correlation between sources of income and the amount of money saved. Heavy solid lines indicate a significant relationship with p<0.0000, continuous lines indicate a relationship with p< 0.05, dotted line indicate correlation that were not significant (p>0.05).

4. Discussion

This paper provides further evidence regarding the use and understanding of money at younger ages. In the first study, we investigate 6-13 year old children's understanding of money, finding that overall comprehension of money was high even at younger ages. The first study suggests that children are able to understand the relationship between objects and prices, and to estimate the change resulting from transactions, independently of their age. The ability to perform other tasks, such as identifying the value of different denominations of money together with understanding budget constraints, improves significantly as children reach 8-9 years.

Our study complements the existing body of knowledge as set out in the longitudinal study of Berti and Bombi [24]. Consistent with Berti and Bombi, our results suggest that children's understanding of money improves with age. Our study also failed to find any gender-related differences in the overall ability to understand money. However, it found statistically significant gender differences in the ability to understand the value of money, in which girls performed better than boys independently of their age. Compared to Berti and Bombi, and Pollio and Gray our results indicate that even very young children are able to give correct change following a transaction. In Pollio's and Gray's study, for instance, it was not until the age of thirteen that an entire age group was able to give correct change [40]. A possible explanation for this different finding is that, as suggested by Dickinson and Emler (1996), the understanding of the different economic notions does not have to follow necessarily a fixed sequence of development as it is highly influenced by children's social context[41]. Children's ability to grasp the different economic notions, even in the youngest group, may be explained by their socioeconomic context. Compared with the children of 'white collar workers' in the Berti and Bombi study who may have lacked exposure to economic realities of adult life, children involved in this study come from lower socio-economic groups [2]. According to previous studies children from a poorer background acquire understanding of money-related concepts faster than wealthier children because they are involved in the economy at younger ages e.g. they buy their own food, and they spend more time outside the home without adult supervision.

Children's ability to understand economic concepts does not necessarily imply that they are independent economic agents with some degree of financial autonomy. According to Webley, pocket money is uncommon in Italy [18]. However, to the best of our knowledge, no previous study has been conducted in this setting to specifically investigate young children's disposable income. The results of our second study suggest that the majority of children had a regular source of personal income, and that more than half received regular weekly allowances from their parents. These results are in line with previous studies regarding parental attitudes toward pocket money conducted in other countries [27, 32, 42]. Consistently with the results of similar studies conducted in western countries with children from lower

socioeconomic status we find that our respondents receive a significant amount of pocket money even at younger ages and that the majority receive money on a weekly or even daily basis rather than using a monthly system [2, 27, 43]. Previous studies investigating parental attitudes to pocket money suggest that parents treat females and males equally in relation to pocket money [29, 32, 43]. However, Furham and Walls also found that boys were more likely to receive more pocket money than girls in terms of birthday presents and payment for household chores [3, 44]. Our study finds that parents do not discriminate between boys and girls with respect to giving pocket money or the amount given for both birthdays and during festivities. As expected, the presence of siblings reduces the probability of receiving money for festive and birthday presents [43]. As in earlier studies, increasing age is positively associated with an increased likelihood of receiving pocket money and also with the probability of receiving money as a birthday present [3, 5, 29]. Similarly, the amount of money received as an allowance and also the overall income, including festive and birthday presents, increase significantly with age. As with Furnham, our second study suggests that neither age nor gender influences levels of saving [3]. A majority reported that they saved money regularly. However, the amount saved varied significantly across the children. Interestingly, the amount saved had little relation to the amount of money received as pocket money. Conversely, the proportion of children borrowing money was low. Consistent with previous studies on student attitudes towards debt, it was found that girls were less likely to accumulate debts than boys [45]. Age seems to influence only the likelihood of lending money, which decreased from the younger to the older end of the age bracket, increasing again when children turn 12 years old [45, 46].

This study updates and expands previous knowledge regarding the degree of child and pre-adolescent understanding and use of money. However, interpretation of the findings should be made considering some caveats. First, the study is not longitudinal and does not assess the improved understanding of money-related concepts among the same subjects over time. Second, the sample was homogenous, involving children all from lower class families. Consequently, it could not assess potential socio-economic differences involved in the understanding and use of money. More recent findings suggest that children's savings might also be influenced by parental teaching strategy and parental attitudes towards money [47]. Other studies conducted with children aged 12-18 years have also shown that monetary attitudes such as saving are related to school performance and in particular mathematics achievements [48, 49]. The present study, however, did not gather such attitudinal measures and it did not collect information about individual mathematical achievement, which may have influenced the study results. Further research is required to investigate how these factors affect the use and the understanding of money at younger ages (children 6 year old and younger).

5. Conclusions

As Dauphin et al. have suggested that a collective household model of family decision making excluding children involves some important limitations. It ignores household investments in secondary education. And it also has the potential to produce incorrect analyses of intra-household welfare by failing to consider the role of children in contributing to family income and in manufacturing household demands [7]. Consistent with the findings of Berti and Bombi, our study suggests that the ability to understand money-related concepts increases with age. Moreover, by way of complementing their work, we found that children at even young ages, 6-7 years, scored high in all the different domains of money understanding. Furthermore, in line with earlier work in the field, the results of the second study described in this paper show that the majority of children aged 6 to 13 received pocket money from their parents and that the amount of money received increase with age. In conclusion the results from the two complementary studies show that children are active economic agents in their own economic world [25]. Even the younger children have different sources of money such as presents and parental allowances; they manage their budget, borrow, lend and save money. For the future, researchers might consider investigating possible contributing factors to the ability of children to understand and to use money; in particular, future research should investigate the role of family characteristics such as family income and family structure on young children's ability to be rational and independent economic agents.

References

1. Calvner S., *Children as Consumer: Advertising and Marketing*, www.futureofchildren.org, Editor. 2008. p. 205-234.
2. Furnham A., *The economic socialization of young people*, ed. T.S.A. Units. 2008.
3. Furnham A., *The saving and the spending habits of young people.* Journal of Economic Psychology, 1999. **20**(1999): p. 677-697.
4. Rubin R. *Kids vs. Teens: Money and Maturity Guide to Online Behaviour*. eMarket, 2004.
5. Mortimer J., et al., *Economic socialisation in the American Family: The prevalence, distrbution and consequences of financial Arrangements* Family Relations 1994. **43-23-29**.
6. Barnet-Verzat C. and W. F., *Motives for pocket money allowance and family incentives* Journal of Economic Psychology, 2002(23): p. 339-366.
7. Dauphin A. et al., *Are Children Decision-Makers Within the Household?* Economic Journal, 2011. **121** (553): p. 871–903.
8. Otto A., *Saving in childhood and adolescence: Insights from developmental psychology.* Economics of Education Review 2013. **33**(C): p. 8-18.
9. Blundell R. and Robin J.M., *Estimation in Large and disaggregated demand systems: an estimation for conditionally linear systems.* Journal of Applied Econometrics 1999. **14**: p. 209-232.
10. Chiappori P. and Donni O., *Non-Unitary Models of Household Behaviour: A survey of the literature*. 2009, Alberto Molina (ed.), Household Economic Behaviors, Berlin: Springer, 2011, 1 - 40.
11. OECD, *Economic evaluation of environmental health risks to children. OECD Publishing 2006.* OECD Paris, 2006.
12. Furnham A. and Gunter B., *Children as Consumers (International Series in Social Psychology)*. 1997: Butterworth-Heinemann Ltd (9 July 1997).
13. Webley P., et al., *The economic psychology of everyday life*, ed. U.P.P. Hove. 2001.
14. Furnham A. and Thomas A., *Pocket Money: A study of economic socialization of children* British Journal of Developmental Psychology 1984. **2**: p. 205-212.
15. Newson J. and Newson E., *Seven year olds in their home environment* 1976, London: Allen & Unwin.
16. Bucciol A. and Veronesi M., *Teaching children to save: What is the best strategy for lifetime savings?* Journal of Economic Psychology 2014. **45**(C): p. 1-17.
17. Beard R.M., *An outline of Piaget's develomental psychology for children and teachers.* London: Routledge & Kegan Paul, 1970.
18. Webley P., *Chidlren's understanding of economics*, ed. In M. Barrett & E Buchanan-Barrow (Eds). Children's understanding of Society. Hove: Psychology Press. 2005.
19. Strauss A., *The Development and Transformation of Monetary Meanings in the Child.* American Sociological Review 1952. **17**(275-286).
20. Strauss A., *The Development of Conceptions of Rules in Children.* Child Dev, 1954. **25**: p. 193-208.
21. Schuessler K. and Strauss A., *A study of concept learning by scale analysis.* American Sociological Review, 1950. **15**: p. 752-762.
22. Strauss A., *The development and transformation of monetary meanings in the child.* American Sociological Review, 1952. **17**(275-286).
23. Berti A. E. and Bombi A. S., *Where does money come from?* Archivio di Psicologia, 1979. **40**(53-77).
24. Berti A. E. and Bombi A. S., *The development of the concept of money and its value: A longitudinal study.* Child Dev, 1981. **52** p. 1179-1182.
25. Sonuga-Barke E.J.S. and Webley P., *Children's saving: A study in the development of economic behaviour.* , ed. N.L.E. Hillsdale. 1993.
26. Furnham A. and Cleare A., *School children's conceptions of economics: prices, wages, investments and strikes.* Journal of Economic Psychology, 1988. **9**: p. 467-479.
27. Furnham A. and Kirkcaldy B., *Economic socialization: German parents' perception and implementation of allowances to educate children.* . European Psychologist, 2000. **5**: p. 202-215.

28. Furhnam A. and Thomas A., *Adult perception of the ecnomic socializaiton of children.* Journal of Adolescence, 1984b. **7**(217-231).
29. Furnham A. and Thomas P., *Pocket Money: A study of Economic Education* British Journal of Developmental Psychology, 1984. **2**(205-212).
30. Furnham A., *The saving and spending habits of young people.* Journal of Economic Psychology,, 1999. **20**: p. 677-697.
31. Livingstone S. J. and Lunt P., *Savers and borrowers: strategies of personal financial management.* Human Relations, 1993. **46**: p. 963-85.
32. Furnham A., *Parental attitudes to pocket money/allowance for children.* Journal of Economic Psychology, 2001. **22**(397-422).
33. Beutler I. and Dickson L., *Consumer economic socialization* In J.J. Xiad Eds. Handbook of consumer finance reserach, , ed. Springer. 2008.
34. Webley et al., *The psychology of everyday life.* Hove:Psychology Press. , 2001.
35. Webley et al., *A study in economic psychology: Children's saving play in economy.* Human Relations, 1991. **44**(2): p. 127-146.
36. Otto A.M.C., et al., *Children's use of saving strategies: An experimental approach.* Journal of Economic Psychology, 2006. **27**(57-72).
37. Lasarre D., *Consumer education in French Families and Schools. In P. Lunt & A.Furhnam Eds Economic socialisaiton (pp: 130-148). Cheltenham: Edward Elgar* 1996.
38. Miller J. and Young S., *The role of allowance in adolescent socialization.* 1990, Youth and Society. **22**(137-159).
39. Warnaar M. and Van Praag B., *How Dutch Teenagers spend their Money.* De Economist, 1997. **145**: p. 367-397.
40. Pollio H. and Gray T., *Change-making strategies in children and adults.* Journal of Psychology, 1973. **36**: p. 173-179.
41. Dickinson J. and Emler N., *Developing ideas about distribution of wealth.*, in *Economic Socialization*, Lunt P. and Furnham A., Editors. 1996, Edward Elgar. p. 47-78.
42. Warnaar, M.F. and B. Van Praag, *How Dutch teenagers spend their money.* De Economist, 1997. **145**: p. 367-397.
43. Furnham A., *Economic Socialisation: A study of adults' percpetions and uses of allowances (pocket money) to educate their children.* British Journal of Developmental Psychology, 1999.
44. Walls, *The walls (pocket money) monitor. The autoritative survey on British children pocket money,. Walton-on-Tahmes, Surrey. Furnham A. The savings and the spendings habit of young people* Journal of Economic Psychology 1996. **20**: p. 677-697.
45. Davis E. and Lea SEG., *Students attitudes to student debt* Journal of Economic Psychology 1995. **16**: p. 663-669.
46. Davis K. and Lea S., *Students Attitudes to student debt.* Journal of Economic Psychology, 1995. **10**: p. 663-679
47. Brown S. and Taylor K., *The Saving Behaviour of Children: Analysis of British Panel Data.* Journal of Banking and Finance, 2016. **62**: p. 1-14.
48. Elliott W., Jung H., and Friedline T., *Math achievement and children's savings: implications for child development account* J Fam Eco Issue, 2010. **31**: p. 171-184.
49. Elliott W., *Children's college aspirations and expectation: the potential role of college development accounts (CDAs).* Children and Youth Services Review 2008. **21**: p. 274-283.

Appendix

Table 1. Mean and percentage for each question of the questionnaire. The last three columns report results from the analysis of variance. (Gender*Age) and siblings.

Variable	*Yes*	*No*	*Gender* [1]	*Age* [1]	*Gender *Age* [1]
Do you regularly receive pocket money?	78%	28%	0.51	2.44	2.44
If yes please state how often you receive pocket money			0.02	1.26	2.04
Every day	25%				
Every week	56%				
Every month	19%				
How much do you receive each time?			1.03	5.44**	1.69
€2	15%				
€5	35%				
€10	24%				
€20	18%				
€50	4%				
€100	4%				
Do you receive money for festivities (e.g. Christmas and Easter)?	80%	20%	0.94	1.70	0.40
If yes please state how much money will you receive on average during festivities?			0.36	9.09***	1.16
€5	12%				
€10	13%				
€20	19%				
€50	20%				
€100	21%				
€200	15%				
Do you receive money as birthday present?	81%	19%	0.94	2.37	1.37
If yes please state how much money you will receive on average for your birthday?			0.65	6.78**	0.98
€5	8%				
€10	4%				
€20	23%				
€50	18%				
€100	27%				
€200	19%				
Do you usually borrow money?	10%	90%	0.57	0.56	0.15
Do you usually lend money to friends?	34%	66%	0.17	9.04***	0.61
Do you usually save money?	78%	22%	0.85	1.06	0.96
If yes what are your current savings?			0.65	2.19	0.39
€5	15%				
€10	16%				
€20	21%				
€50	15%				
€100	10%				
€200	23%				
Why do you save money ?					
For emergencies	21%				
To buy a toy	19%				
For holidays	14%				
Because they told you it is important to save money	6%				
Because if I need to buy something I will have money available	41%				

1: F levels from two way ANOVAs; *p<0.05; **p<0.01; ***p<0.001