Financial Literacy and Gender in U.S. High Schools

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Abstract

In a recent study published in this journal, Butters and Asarta (2011) documented a gender gap in economic education at the high school level. Building on this research, we use a normed test of financial literacy to examine the overall and gender specific financial knowledge of U.S. high school students. Our findings support previous research documenting a lack of basic financial knowledge at the high school level and the presence of a gender gap favoring male students. The gap is found to be persistent across the overall, standard and concept areas of the test.

Introduction

The importance of promoting financial literacy among high school students cannot be understated. National surveys, however, have shown that the average American teenager is financially illiterate (ACEC, 2001; ASEC, 1999; Jump$tart, 1997, 2000, 2002, 2004 in Varcoe et al. 2005; Mandell, 2008). In fact, high school students and young adults have been shown to lack even the most basic understanding of topics such as interest rates, inflation, and risk diversification (Mandell, 2008 in Lusardi, 2008; Lusardi, Mitchell, and Curto, 2010). These findings are especially troubling in light of the fact that students need adequate financial preparation and awareness in order to successfully handle credit cards, loans, investments, retirement planning, and insurance.

Implementation of high school financial education curricula and research on the effectiveness of financial education programs has grown in recent years with the goal of improving financial literacy in the United States (Danes and Haberman, 2007; Varcoe et al. 2005; Walstad, Rebeck, and MacDonald 2010). Current research documents student characteristics that affect financial literacy. Variables such as age, personal income, college of study, ethnicity and gender have been examined in the literature (Borden et al. 2008; Hanna, Hill, and Perdue, 2010).

A large body of research focuses on gender as an important determinant of financial literacy and has documented a persistent gender gap (Hanna, Hill, and Perdue, 2010). For example, Danes and Haberman (2007) found that before receiving financial instruction, male students had a greater understanding of credit, auto insurance, and investments than female students. The authors also show that the financial curriculum reinforced the existing knowledge of male students while female students learned a great deal about areas that they were unfamiliar with prior to their instruction. Additionally, Danes and Haberman found that male students were more confident in making money based decisions than female students.

Varcoe et al. (2005) examined the "Money Talks: Should I Be Listening?" high school curriculum and found that financial knowledge scores improved dramatically after instruction. However, male students experienced a significantly greater increase in financial knowledge than female students. The authors also found that male students were more likely to have a savings account than female students (70.5% and 52.6%, respectively). On the other hand, Walstad, Rebeck, and MacDonald (2010) examined the "Financing Your Future" curriculum and found this program to significantly increase students' financial

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literacy by an equal extent regardless of gender. Pre- and post-testing showed almost identical improvements for male and female students.

The National Jump$tart Coalition Survey, which was conducted 6 times in the past 15 years, finds a slight gender gap in financial knowledge. The knowledge advantage, however, switches between male and female students depending on the year of the survey, and the differences are small and insignificant. In 1997, and 2002, female students scored, on average, higher than male students. In 2000, 2004, 2006, and 2008 male students exhibited a higher mean score than female students (Mandell, 2008).

We build on previous research by using a normed exam of financial literacy to examine the overall level of financial literacy in U.S. high schools and, more specifically, whether a gender gap is present at the test, standard, and concept area levels. We employ a significantly larger data set (6,665 students providing 199,950 question responses) than that used by similar studies, allowing us to provide a more contemporary and inclusive perspective of the overall level of financial literacy of high school students in the United States.

Literacy Measure and Student Data

The data used in this study was collected during the Spring 2011 as part of the National Finance Challenge competition. The testing for the challenge was administered online through each state's Council of Economic Education (The Nebraska Council on Economic Education, 2011).

The Financial Fitness for Life (FFFL) High School Test was used to evaluate the level of financial literacy of participating high school students. The FFFL Test was developed by the National Council on Economic Education and is a 50 question standardized test with 4 multiple-choice distractors per question. The National Standards in Personal Finance were used in order to establish the content validity of the test (Jump$tart Coalition, 2002). This document identifies which financial topics K-12 students should understand and includes four standards consisting of 26 overall concepts. The four standards are Income (3 concepts), Money Management (8 concepts), Spending and Credit (8 concepts), and Saving and Investing (7 concepts). The FFFL High School exam content is highly correlated with these standards and concepts. Only three concepts are not included (*Information on products, Managing financial difficulties, and Government and saving and investment*). Financial Fitness for Life test questions are divided between standards with the following distribution: Income (24%), Money Management (32%), Spending and Credit (22%), and Saving and Investing (22%). As such, the FFFL High School exam covers most of the national standards and concepts in personal finance as designated by content experts (Walstad & Rebeck, 2005).

The FFFL High School Test's coefficient alpha is .86, indicating that the test contains good internal consistency and measures financial literacy with accuracy. The test was also examined for construct validity. Walstad and Rebeck (2005) found that students with higher levels of financial knowledge scored significantly better on the test than students with lower financial knowledge. The significant difference in performance was consistent across various demographics, such as gender, grade level, and ethnicity.

Our sample of participating high school students were enrolled in consumer science, personal finance, or similar courses in the Spring of 2011. Teachers were responsible for assembling teams of 3 or 4 students. Each student took the FFFL High School Test in late March 2011 independently, and then the individual results of each team member were totaled to calculate a team score. Students were tested over 30 randomly selected questions from the 50 questions available in the FFFL High School Test. Each student was given 35 minutes to complete the exam, and the team as a whole was required to finish the exam within 3 hours. The time limit provided adequate time for the participants to complete the questions. The top teams in each state were given the opportunity to move on and compete for the title of "State Champion." Each state champion team moved on to compete for the national championship. Unlike other testing events, students in our sample were expected to demonstrate their actual understanding of financial topics because of the competitive incentives available to them (Wehrs, 1978). Incentives were provided throughout the process, including cash prizes for students and a gift card drawing for teachers based on the number of teams they registered (The Nebraska Council on Economic Education, 2011). While our sample is not random, it presents a "best case" scenario for measured financial literacy.

Table 1 reports the overall number of participating students by participating state, as well as their distribution by gender. A total of 11 states participated in the Challenge, with Kansas contributing the largest number of students at 1,178. Delaware exhibited the lowest student representation in the sample at 242. A total 6,665 students took part in the competition. The overall participation by gender was remarkably similar, with 3,244 male and 3,421 female participants.

Table 1: Participation by State and Gender

State	Total	Male	Female
Alabama	906	495	411
Arkansas	359	175	184
Delaware	242	98	144
Illinois	518	215	303
Kansas	1178	551	627
Minnesota	272	124	148
Mississippi	334	198	136
Missouri	930	451	479
Nebraska	684	325	359
Tennessee	657	336	321
Texas	585	276	309
Total	**6665**	**3244**	**3421**

Results

Table 2 presents the overall, standard and concept specific average performance on the FFFL High School Test for the students in our sample, as well as the total number of times a question was answered. The average overall score, computed using 199,950 answered questions, was 52.36 percent. This average is close to the 55.68 percent average score reported for the 2003-2004 norming of the FFFL High School Test. The norming student sample, however, was significantly smaller than our sample at 524 students.

Students achieved the highest average score in the Income standard (56.86%) and the lowest average score in the Spending and Credit standard (45.52%). Furthermore, student performance at a more disaggregate level shows that the Savings and Investment concept entitled *Reasons for saving and investing* exhibits the highest student performance with an average score of 85.99 percent correct. Other high scores include the Money Management concepts entitled *Opportunity cost* (77.65%) and *Personal financial responsibility* (77.44%).

Students struggled in many concept areas on the exam, averaging below 50 percent correct on 10 of the 23 areas available to them. The lowest average score, with a 20.88 percent correct, belongs to the Money Management standard and is entitled *Inflation and investing*. Other low scores include the Spending and Credit concept entitled *Rights and responsibilities of buyers, sellers, and creditors* (26.31%) and the Saving and Investing concepts entitled *Rate of returns on investment* (31.56%).

Table 2: Overall Student Performance by Standard and Concept

	Items	Overall	N
A. INCOME		**56.86**	**47913**
1. Sources of income	1, 11, 12, 13	55.61	16012
2. Determinants of income	9, 14, 15, 16, 17	57.64	19971
3. Taxes and transfer payments	18, 19, 20	57.23	11930
B. MONEY MANAGEMENT		**54.86**	**64011**
1. Limited resources and choice	5, 8	44.18	8024
2. Opportunity cost	7	77.65	3969
3. Personal financial responsibility	6	77.44	4030
4. Financial decision making	10	38.22	4008
5. Inflation and investing	28	20.88	3979
6. Insurance, risk management	46, 47, 48, 49, 50	52.73	20101
7. Budgeting	41, 42, 43	55.96	11944
8. Use of money management tools	44, 45	71.92	7956
C. SPENDING AND CREDIT		**45.52**	**44002**
1. Benefits and cost of spending	3, 4	48.96	8011
2. Information on products			
3. Costs and benefits of payment methods	31, 32	58.09	7944
4. Risk and credit	35, 36	55.65	7988
5. Sources of credit	37, 40	41.46	7974
6. Credit history and records	33, 34	33.30	8063
7. Managing financial difficulties			
8. Rights and responsibilities of buyers, sellers, and creditors	38	26.31	4022
D. SAVING AND INVESTING		**50.68**	**44024**
1. Saving and investing	21, 23	38.12	8019
2. Reasons for saving and investing	2	85.99	4010
3. Risk, return and liquidity investment	25, 26, 27	49.89	11996
4. Buy and sell investments	29, 30	63.59	7963
5. Rate of return on investments	22, 24	31.56	8061
6. Sources of investment information	39	55.67	3975
7. Government and saving and investment			
Total		**52.36**	**199950**

Note: Standards and Concepts were obtained from William B. Walstad and Ken Rebeck, Financial Fitness for Life: High School Test Examiner's Manual, 1st ed. (New York, NCEE, 2005).
N denotes the total number of responses for the items in each standard and concept grouping.

Table 3 reports the overall, standard and concept specific average FFFL High School Test scores by gender for the students in our sample. The ratio of male and female students was almost even, with male students accounting for 48.67 percent of the sample and female students accounting for 51.33 percent. The average scores show that male students achieve significantly higher scores than female students in 20 of the 23 concepts available. Female students, however, scored significantly better than male students in 2 of the 23 concept areas. Overall, male students score significantly higher than female students by 4.37 percentage points, demonstrating the unfortunate persistent presence of a financial literacy gender gap in U.S. high schools.

Table 3: Differences in Student Performance by Gender

	Items	Male	N	Female	N	Difference
A. INCOME		58.75	24689	54.84	23224	3.92***
1. Sources of income	1, 11, 12, 13	56.21	8247	54.96	7765	1.25**
2. Determinants of income	9, 14, 15, 16, 17	60.52	10269	54.59	9702	5.94***
3. Taxes and transfer payments	18, 19, 20	59.21	6173	55.10	5757	4.11***
B. MONEY MANAGEMENT		56.29	32787	53.36	31224	2.93***
1. Limited resources and choice	5, 8	46.15	4156	42.06	3868	4.09***
2. Opportunity cost	7	78.78	2059	76.44	1910	2.34**
3. Personal financial responsibility	6	76.58	2067	78.35	1963	-1.77*
4. Financial decision making	10	37.04	2049	39.46	1959	-2.42**
5. Inflation and investing	28	23.75	2017	17.94	1962	5.81***
6. Insurance, risk management	46, 47, 48, 49, 50	54.02	10256	51.39	9845	2.63***
7. Budgeting	41, 42, 43	58.51	6083	53.32	5861	5.19***
8. Use of money management tools	44, 45	73.05	4100	70.72	3856	2.33***
C. SPENDING AND CREDIT		47.90	22553	43.02	21449	4.89***
1. Benefits and cost of spending	3, 4	50.42	4119	47.40	3892	3.02***
2. Information on products						
3. Costs and benefits of payment methods	31, 32	61.59	4085	54.39	3859	7.20***
4. Risk and credit	35, 36	58.32	4112	52.81	3876	5.50***
5. Sources of credit	37, 40	44.76	4046	38.06	3928	6.70***
6. Credit history and records	33, 34	34.63	4126	31.90	3937	2.73***
7. Managing financial difficulties						
8. Rights and responsibilities of buyers, sellers, and creditors	38	27.75	2065	24.78	1957	2.97***
D. SAVING AND INVESTING		53.80	22601	47.39	21423	6.41***
1. Saving and investing	21, 23	41.22	4129	34.83	3890	6.39***
2. Reasons for saving and investing	2	86.18	2040	85.79	1970	0.39
3. Risk, return and liquidity investment	25, 26, 27	53.33	6128	46.30	5868	7.03***
4. Buy and sell investments	29, 30	68.08	4094	58.85	3869	9.22***
5. Rate of return on investments	22, 24	33.41	4152	29.60	3909	3.81***
6. Sources of investment information	39	61.08	2058	49.87	1917	11.21***
7. Government and saving and investment						
Total		**54.49**	**102630**	**50.12**	**97320**	**4.37***

Note: Standards and Concepts were obtained from William B. Walstad and Ken Rebeck, Financial Fitness for Life: High School Test Examiner's Manual, 1st ed. (New York, NCEE, 2005).
N denotes the total number of responses for the items in each standard and concept grouping.
*** Difference of means is statistically significant at the 1% level, ** at the 5% level, * at the 10% level.

At the standard level, male students outperform female students to the greatest extent on concepts under the Savings and Investing standard. The average male student score on that standard was 6.41

percentage points higher than that of female students. The gap was the smallest under the Money Management standard, with male students averaging 2.93 percentage points higher than female students.

Examining gender differences at the concept level provides greater insight into the financial literacy gender gap. The concepts entitled *Sources of investment information* and *Buy and sell investments* exhibited the largest significant performance differential by gender, with male students outperforming female students by an average of 11.21 and 9.22 percentage points, respectively. Male students also demonstrated a greater understanding of the Spending and Credit concepts entitled *Costs and benefits of payment methods* (7.20 percentage points) and the Savings and Investment concept entitled *Risk, return and liquidity investment* (7.03 percentage points).

Female students outperformed their male peers in only 2 concepts, both belonging to the Money Management standard. These concepts are *Personal financial responsibility* (1.77 percentage points) and *Financial decision making* (2.42 percentage points). Finally, the only insignificant difference in performance by gender was found in the concept *Reasons for saving and investing* under the Savings and Investing standard.

While our data suggests the existence of a gender gap in financial literacy favoring male students at the high school level, the 2003-2004 norming student sample for the FFFL High School Test found the opposite direction for this gap (Walstad and Rebeck, 2005). Among students with previous financial education, female students exhibited significantly higher overall average scores than male students by 2.28 percentage points. This reversal may be due to differences in sample selection. It is important to note that our sample size is significantly larger than that of the norming sample (6,665 versus 524 students, respectively). Furthermore, all 524 students used in the norming sample received directed instruction from the FFFL curriculum, while there is no uniform personal finance curriculum used in our study. Since our sample is larger, geographically more diverse, and potentially represents many different curricula, we believe our results are more representative of the nation at large.

Conclusion

In this study we report the overall, standard and concept average performance of over 6,500 U.S. high school students on the FFFL High School Test. We further disaggregate the results to examine student performance by gender. Our results reinforce past findings of poor high school financial literacy, with average student performance in all four standards below 60 percent, an F letter grade for most high school grading scales.

Our findings seem to clearly indicate that several topics need special emphasis at the high school level. As mentioned above, *Inflation and investing, Rights and responsibilities of buyers, sellers, and creditors,* and *Rate of returns on investment* post the lowest scores of any concept area on the test. More generally, concepts related to Spending and Credit exhibit the worst scores as a group in contrast to the relative high scores in the Income category. The disparity between the two may illustrate the current pitfalls that students are experiencing: They understand financial literacy topics poorly as a rule, but understand issues associated with spending behaviors even worse than those associated with income. Thus, they understand how to earn money, but not how to spend it or manage it. Rectifying the deficit between the two will help alleviate some of the financial difficulties we observe young adults experience in their lives.

Additionally, we identify a gender gap favoring male U.S high school students. This gap in financial literacy suggests that the question of gender and financial education in U.S. high schools is not settled. Possible explanations for this phenomena include a greater percentage of male finance instructors and its resulting role model effect, a lower level of female interest and confidence in personal finance, social factors such as male dominance in the financial industry and the resulting instinctive bias towards women, and greater quantitative skills among male students developed in part by their involvement in more math courses during high school than females students (Rask and Bailey, 2002; Henebry and Diamond, 1998; Chen and Volpe, 2002; Bauer and Dahlquist, 1999; Goldsmith and Goldsmith, 1997; Hanna, Hill, and Perdue, 2010; Worthington and Higgs, 2003).

Bauer Jr. and Dahlquist (1999) provide a list of strategies designed to help bridge the gender gap identified in this paper. Some examples include calling on male and female students equally to answer questions, asking male and female students questions of comparable difficulty, presenting examples in class and on exams which feature women in leadership roles, and providing male and female students with equal

mentoring and encouragement to pursue a financial career. What seems important is the fact that educators should address this financial literacy gap among students at a young age because it has been found to persist well into adulthood (Borden et al. 2008; Hanna, Hill, and Perdue, 2010; Fonseca et al. 2010). Unfortunately, most financial educational programs and materials have been aimed at adults, with limited development of high school based curricula (Hilgert, Hogarth, and Beverly, 2003). Regardless of the reasons for the gender gap, its presence requires further attention from educators and policy makers in an attempt to eliminate it.

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