

Why are women less motivated to become financially literate?

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Abstract

Research suggests women know and care less about personal finance than men but offers no explanations. Women in our sample score lower on basic finance questions and report lower motivation to learn personal finance. Men and women report higher motivation when they say finance is “Very Important.” However, women who expect to make decisions with a spouse report lower motivation than do women who expect to make decisions alone. Men’s motivation does not vary with such expectations. Our results suggest women are less motivated to become financially literate when they lack confidence and when they expect to share financial responsibilities. © 2022 Academy of Financial Services. All rights reserved.

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1. Introduction

Prior research indicates that women are less knowledgeable about and less interested in personal finance than men and less likely to invest in the stock market. Why? Do they think finance less important than men do? Do they feel less confident in their abilities to understand it? Are they more likely to expect that their parents or spouses will help them make financial decisions?

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The women in our sample score lower than the men on average on a series of questions designed to test basic financial knowledge. The women also report lower motivation levels on average. They do not rate it as less important, but they are less confident in their answers to our questions and in their ability to make future financial decisions. Statistically, the women and men in our sample have similar expectations regarding who will make their future financial decisions. About 30% of women and men chose the response “I will” and about 70% of women and men chose “My spouse and I will.” No one chose either remaining response “My spouse will” or “My parents will.” However, women who report that they expect to make financial decisions with a spouse also report lower motivation to learn personal finance than do women who expect to make financial decisions alone. Men’s motivation levels do not appear to vary with their expectations regarding whether they will make decisions alone or with a spouse. If our sample results are representative of the larger female population, the high expectation among women that they will have a spouse with whom to make financial decisions coupled with the dampening effect that expectation appears to have on women’s motivation to learn about finance could help explain why in study after study women tend to know less and care less about personal finance.

2. Literature review

Much empirical evidence exists that financial literacy is relatively low, particularly among women, and that low financial literacy reduces financial well-being (see, e.g., Lusardi & Mitchell, 2007; Mandell, 2006; The National Council on Economic Education, 2005; Tzu-Chin, Bartholomae, Fox, & Cravener, 2007; Van Rooij, Lusardi, & Alessie, 2011; Xiao, Serido, & Shim, 2010). Despite evidence that college students and college graduates are more knowledgeable than other high school graduates (Mandell & Klein, 2009), the average college student demonstrates relatively little financial knowledge, and the average female student is less knowledgeable than the average male student (Volpe, Chen, & Pavlicko, 1996). Chen and Volpe (1998) find that female college students and students who are not business majors, are in the lower class ranks, under age 30, and have little work experience have lower levels of financial knowledge, and that students who display less financial knowledge are more likely to assign little importance to financial matters and to make incorrect financial decisions. Chen and Volpe (2002) find that female college students are less knowledgeable than their male counterparts on personal finance topics, that they exhibit less enthusiasm, lower confidence, and less willingness to learn about personal finance topics than male students, and that they are less likely to rank personal finance, math, economics, and science courses as important. Mandell and Klein (2007) focus on the importance of one’s motivation to be financially literate. Using data from the national Jump\$tart survey of high school seniors, they find that students who believe financial difficulty results from poor decisions, that it is important to have enough money to pay bills, and that Social Security alone provides insufficient retirement income tend to earn higher scores on the financial literacy questions in the survey. Level of aspiration is another important determinant of financial literacy in their data. Students bound for a four-year college, a professional job, or a higher starting salary earned higher scores, on average, than students with lower aspirations.

Beierlein and Neverett (2013) find that female undergraduates are less likely than male undergraduates to take an elective personal finance course. Tang and Peter (2015) examine how young adults acquire financial knowledge and find that their financial education and experience and the financial experience of their parents are important factors. Tokar Asaad (2015) finds that financial confidence is also an important component of literacy. Harrington and Smith (2017) find that students are more interested in financial education when they perceive a higher return from financial education and when they are financially independent.

In summary, the literature tells us that financial education and experience, the financial experience of one's parents, confidence, interest, motivation, and educational and professional aspirations are important determinants of financial literacy and that, compared with men, women tend to be less knowledgeable, less confident, and less motivated to learn personal finance. Yet, extant literature offers little insight into why women may be less motivated to become financially literate. This is the question we explore in our research.

Expectancy theory of motivation, notably Vroom's (1964) model of motivational force, indicates that motivation is determined by expectancy, instrumentality, and valence. Expectancy is the belief that an action will result in an outcome. Instrumentality is the belief that the outcome will lead to an appropriate reward, and also perhaps that the outcome is necessary to earn the reward. Finally, valence is the importance placed on the reward. Thus, in our context, one's motivation to learn personal finance depends on how much one believes that one's efforts to learn will improve understanding of personal finance, how much one expects to rely on one's own knowledge to make good financial decisions, and how important one believes it is to make good financial decisions. As we are specifically interested in women's motivation, we take note of Claudia Goldin's (2006) address to the American Economic Association, "The Quiet Revolution that Transformed Women's Employment, Education, and Family." In it, she explains that as women's estimates of the time they would spend in the labor force increased, their investments in education and interest in more professional majors also increased. Therefore, it seems reasonable to expect that when a woman believes that she will be responsible for making financial decisions, she will be more motivated to become financially literate.

The literature reviewed above suggests several hypotheses to be tested:

1. The women in our sample are less knowledgeable about personal finance, less confident in their abilities related to finance, and less motivated to learn it than the men.
2. Motivation to learn personal finance is positively related to one's confidence (expectancy), whether one expects to be responsible for financial decision-making (instrumentality), and the importance one assigns to personal finance decisions (valence).
3. Women are less motivated to learn personal finance because they are less confident, they think it is less important, or they expect to have less responsibility for making financial decisions.

3. Methodology and data

The link to an online Qualtrics survey approved by the University's Institutional Review Board was emailed to undergraduate students at East Carolina University (ECU). Additionally, the link was posted on social media pages open only to students, and flyers were hung around

campus. Emails and other advertising for the survey noted that respondents would be entered in a drawing for gift cards to increase interest. The survey is composed of 64 questions. Students could exit the survey at any time. We analyze only completed surveys.

The entire survey and answer choices are in the Appendix. The first 11 survey questions address demographics, including verifying that the respondent was an undergraduate at East Carolina and asking for age, gender, class (e.g., freshman), race, employment status, parents' income range, and whether either parent works in the financial services industry. The next seven questions address students' awareness of the personal finance course offered at ECU, whether they had taken it or any other finance or economics courses or attended any related seminars and if so, where, and whether they planned to take the personal finance course or attend a related seminar. There are also four follow-up questions that appeared only for those who responded that they had taken the course. These address why they took the course, how it affected their opinions, whether they expected to use what they learned in the future, and the grade earned. For those who responded that they had not taken it, one follow-up question asks why not, and another asks if they plan to take it. The next question asks, "How important do you think personal finance is?" and then a free response follow-up question depending on the answer that asks "Why do you find personal finance (un)important?" The next question asks, "How motivated are you to learn about personal finance?" Then, there are 16 questions that ask how strongly the following had influenced the respondent's knowledge of personal finance and their financial decisions: parents, other relatives, instructors, peers, media, online resources, own experiences, and religion. The next question asks respondents to indicate where they might go for advice in the future when they had questions regarding personal finance. Then, a series of eight questions asks whether they had heard of or currently had the following financial products: a credit card, renters' insurance, a retirement account, and other types of investment accounts. The next question asks if they planned to invest in the stock market, and why or why not. The next seven questions are financial test questions adapted from the OECD/International Network on Financial Education pilot study (Atkinson & Messy, 2012).¹ These questions cover division of money, time value of money, inflation, interest (two questions), risk and return, and diversification. They do not require a calculator to complete and are either multiple choice or true/false. For the multiple-choice questions involving simple math, the choice "I don't know" is an option in addition to three numerical options. The next two questions asked how confident they were in their answers to the financial literacy questions and in their ability to make financial decisions in the future. The final question asked, "In the future, who do you expect to make your financial decisions?" Some of the questions described above were of interest to us beyond our hypotheses regarding women's motivation to become financially literate. The questions relevant to our hypotheses include several of the demographic questions, the financial test questions, the confidence, motivation, and importance questions, and the question regarding who would make their future financial decisions. The distributed survey collected 194 responses from undergraduate students at ECU. Of these, 176 participants finished the survey. This is approximately 0.8% of the University's undergraduate population. Descriptive statistics are in Table 1. Age ranges from 18 to 23 and averages 19.49 years. The majority (70%) of the respondents were female. Twenty-five percent of the students identified themselves as freshmen, 24% as sophomores, 31% as juniors, and 20% as seniors. A large number of respondents (53%) indicated they were Honors College students, who may have been more likely to attend to the email

Table 1 Descriptive statistics

Variables	N	Mean	Median	Standard deviation	Min.	Max.
Panel A: Means and medians						
Age	176	19.49	19.50	1.19	18	23
Total correct	176	5.70	6.00	1.15	2	7
Allied health	176	0.05	0.00	0.21	0	1
Business	176	0.15	0.00	0.36	0	1
Education	176	0.03	0.00	0.17	0	1
Engineering	176	0.07	0.00	0.26	0	1
Fine arts	176	0.06	0.00	0.23	0	1
Health	176	0.19	0.00	0.39	0	1
Nursing	176	0.18	0.00	0.38	0	1
Arts and sciences	176	0.27	0.00	0.45	0	1
Male	176	0.30	0.00	0.46	0	1
White	176	0.81	1.00	0.40	0	1
African American	176	0.07	0.00	0.26	0	1
Hispanic	176	0.03	0.00	0.18	0	1
Asian	176	0.04	0.00	0.20	0	1
Other race	176	0.05	0.00	0.21	0	1
Work during school year	176	0.56	1.00	0.50	0	1
Parents in finance	176	0.22	0.00	0.42	0	1
Importance of finance	176	0.79	1.00	0.41	0	1
Finance education	176	0.80	1.00	0.40	0	1
Honors college	176	0.53	1.00	0.50	0	1
Panel B: Frequencies (%)						
Class	176	1	2	3	4	5
Parents' income	176	14.77	6.25	9.66	18.75	25.57
Motivation	176	17.61	48.30	34.09		25.00

Note. Descriptive statistics for the full sample of 176 undergraduate students who responded to a survey invitation and completed the survey. Indicator variables are coded 1 if respondent selected that attribute, 0 otherwise. Means and frequencies for the indicator variables represent the percentage of respondents who selected that attribute. Importance of finance is coded 0 if respondents selected “Important” and 1 if “Very Important.” No other choices were selected. Finance education is coded 1 if respondents indicated any prior instruction in finance or economics, 0 otherwise. Class rank is coded 1 for freshman, 2 for sophomores, 3 for juniors, and 4 for seniors. Parents’ income is coded 0 if respondent chose “Unsure,” 1 if <\$30,000, 2 if \$30,000-\$59,000, 3 if \$60,000-\$89,000, 4 if \$90,000-\$119,000, and 5 if >\$120,000. Motivation is coded 0 if respondent chose “Neither motivated nor unmotivated,” 1 if “Somewhat motivated,” and 2 if “Very motivated.” No other choices were selected.

because the survey was distributed by Honors College students for their thesis research. As shown in Table 2, compared with the University, our sample contains a higher proportion of females, Asians, Hispanics, and Business majors, and a lower proportion of African Americans. Compared with 2019 U.S. population estimates, our sample contains a higher proportion of females and Whites, and a lower proportion of African Americans, Asians, and Hispanics.

4. Analysis and results

To address our first hypothesis, we consider whether the patterns found so often in previous research persist in our sample. Do our female respondents exhibit less financial literacy,

Table 2 Comparison to university demographic data

Variables	University data	Our sample	U.S. population
Female	61%	70%	51%
African American	14%	7%	13%
Asian	3%	4%	6%
Hispanic	2%	3%	19%
White	80%	79%	60%
Business	9%	14%	N/A

Note. Comparison of University demographic data to that of full sample of respondents who finished the survey. Shows percentages of students/respondents who selected that attribute on enrollment materials/in the survey. U.S. demographic estimates dated July 1, 2019 are available at <https://www.census.gov/quickfacts/fact/table/US/PST045219>.

confidence, and interest in personal finance than the men do? Using *t*-tests, we compare the women's and men's scores on our financial literacy test questions and their reported levels of motivation to learn about personal finance. Each respondent's score is number of correct answers, which could range from 0 to 7. The respondent's motivation level is coded as 0 for "Neither motivated or discouraged," 1 for "Slightly motivated," and 2 for "Very motivated." None of the survey respondents chose either of the remaining two choices for this question: "Slightly discouraged" or "Strongly discouraged." Results in Table 3, Panel A suggest that our female respondents are less knowledgeable about and less motivated to learn personal finance. On average, the women score about half a point lower than the men on our seven finance questions, scored at one point each. This difference is significant at less than 1%. Women were less likely to correctly answer questions about the time value of money, interest, saving, diversification, and risk and return, but equally likely to correctly answer questions about division of money and the definition of inflation. When asked, "How motivated are you to learn about personal finance?", a higher percentage of women than men said, "Neither motivated or discouraged" or "Slightly motivated," and a higher percentage of men than women said, "Very motivated." Women's mean motivation values are 26% lower than men's, on average, and this difference is significant at less than 1%.

In Panel B of Table 3, we examine why women might be less motivated to learn finance. We ask how confident they are in their test answers and in their abilities to make future financial decisions, who they expect to make their financial decisions in the future, and how important finance is. Using a Likert scale from 1 to 5 to indicate confidence levels from *not at all confident* to *very confident*, respondents rated their confidence in their answers on our finance questions and their confidence in their abilities to make financial decisions in the future. In both cases, women reported significantly lower confidence levels than men. When we asked, "In the future, who do you expect to make your financial decisions?" more than 60% of male and female respondents said, "My spouse and I together" and the remainder said, "I will." No one chose the other options, "My parents," or "My spouse." A slightly but insignificantly higher percentage of women than men said, "My spouse and I" while the reverse is true of "I will." More than 70% of respondents said personal finance is "Very Important" and the remaining respondents said, "Important." No one chose the other options, "Neither important or unimportant," "Unimportant," or "Very Unimportant." We assigned a

Table 3 Differences in means by reported gender

	0 = female 1 = male	N	Mean	Standard deviation	t	Sig. (two- tailed)	Mean difference F- M	Standard error difference
Panel A: Are women less knowledgeable and motivated?								
Total correct	0	124	5.54	1.199	-3.161	0.002	-0.537	0.170
	1	52	6.08	0.947				
Inflation	0	124	0.42	0.495	-1.921	0.056	-0.158	0.082
	1	52	0.58	0.499				
Interest	0	124	0.97	0.177	-2.025	0.045	-0.032	0.016
	1	52	1.00	0.000				
Saving	0	124	0.89	0.318	-2.722	0.007	-0.094	0.034
	1	52	0.98	0.139				
Diversification	0	124	0.67	0.472	-1.987	0.049	-0.138	0.070
	1	52	0.81	0.398				
Risk and return	0	124	0.77	0.420	-4.044	0.000	-0.187	0.046
	1	52	0.96	0.194				
Division of money	0	124	0.95	0.215	0.254	0.800	0.009	0.037
	1	52	0.94	0.235				
Inflation definition	0	124	0.87	0.337	1.077	0.283	0.063	0.059
	1	52	0.81	0.398				
Motivation	0	124	1.06	0.678	-3.247	0.001	-0.367	0.113
	1	52	1.42	0.696				

(continued on next page)

Table 3 (Continued)

	0 = female 1 = male	N	Mean	Standard deviation	t	Sig. (two- tailed)	Mean difference F- M	Standard error difference
Panel B: Why are women less knowledgeable and motivated?								
Importance	0	124	0.77	0.425	-1.187	0.237	-0.080	0.067
	1	52	0.85	0.364				
Confident answers	0	124	3.34	0.892	-5.563	0.000	-0.738	0.133
	1	52	4.08	0.763				
Confident decisions	0	124	3.52	0.821	-4.170	0.000	-0.514	0.123
	1	52	4.04	0.713				
Decisions with spouse	0	124	0.69	0.463	0.513	0.608	0.040	0.077
	1	52	0.65	0.480				
Decisions myself	0	124	0.31	0.463	-0.266	0.791	-0.020	0.077
	1	52	0.33	0.474				
Questions parents	0	124	0.90	0.297	1.754	0.081	0.096	0.054
	1	52	0.81	0.398				
Questions books	0	124	0.10	0.297	-2.313	0.024	-0.153	0.066
	1	52	0.25	0.437				
Stock market too risky	0	124	0.19	0.397	5.433	0.000	0.194	0.036
	1	52	0.00	0.000				

Note. Independent sample *t*-tests reported. The sample is 176 undergraduate students who responded to a survey invitation and completed the survey.

value of 1 to Very Important and 0 to Important. Women's mean importance value was slightly but not significantly below the men's mean.

Additional questions we asked to explore other possible differences between men and women included where they would turn when they had questions about personal finance, whether they were currently invested in or planned to invest in the stock market, and why or why not.² These questions are motivated by Van Rooij et al. (2011) and Cheng, Lin, and Liu (2011). Van Rooij et al find that those with low basic financial literacy are less likely to invest in the stock market and to use newspapers, financial magazines, guides, and books, financial information on the Internet, and professional financial advisers and more likely to rely on informal sources of information like family and friends than those with higher literacy. They also find that women score lower on their literacy measure and are less likely to be invested in the stock market but do not otherwise report findings by gender. Similarly, Cheng et al. find that women are more likely to choose a mortgage lender based on family and friends' recommendations, while men are more likely to search for lenders offering the lowest rates, with the result that women pay significantly higher mortgage rates, on average, after controlling for other interest rate determinants.

In our sample, more than 80% of men and women said they would go to their parents when they had questions about personal finance. Women were slightly more likely than men to choose this response, but this difference is only significant at 10%. In contrast, men were significantly more likely than women to say they would look in books when they had questions, but only 25% of men and 10% of women chose this option. When asked about current or future investments in the stock market, 20% of women said no because it is too risky, while none of the men chose that response. This difference is significant at 1%. Additional results showing no significant differences were excluded from the table for brevity. About 50% of men and women said they would look online when they have financial questions, 50% said they would consult a financial advisor, 30% said they would ask friends, and 20% said other relatives. No more than 20% of men and women said they were currently invested in stock market, and only about 50% of men and women said they planned to invest in the stock market.

Overall, our univariate results are consistent with prior literature and our first hypothesis. With respect to personal finance, the women in our sample appear to be less knowledgeable, less motivated to learn, less confident, and more risk averse, on average, than the men. They may be more likely to turn to parents when they have questions and less likely to turn to books than men are. Yet, like the majority of men in our sample, the majority of women think finance is very important and expect to make financial decisions with their spouses. Does their lower confidence and greater tendency to rely on others when making financial decisions help explain why they are less motivated to learn about personal finance? We turn to multivariate analysis to examine this question, focusing first on our second hypothesis to examine the determinants of motivation.

We use OLS regression and ordinal regression with the respondents' chosen level of motivation to learn personal finance as the dependent variable.³ For measures of confidence (expectancy), we use each respondent's rankings of how confident he or she feels about the answers to the financial knowledge questions and how confident he or she feels about having to make financial decisions in the future. Both rankings are on a 1 to 5 scale to indicate "Not

at all confident” to “*Very confident*,” respectively. For an indicator of whether one expects to be responsible for financial decision-making (instrumentality), we use each respondent’s answer to the question, “In the future, who do you expect to make your financial decisions?” Because all respondents answered either “My spouse and I together” or “I will,” we set Decisions with spouse to 1 for the former and 0 for the latter answer. For importance, we use an indicator set to 0 if the respondent selected Important or to 1 if Very Important when asked to rate the importance of personal finance. The other answer choices: Neither important nor unimportant, Unimportant, or Very Unimportant were not selected by any of the respondents. We also include demographic variables that may affect one’s interest in finance. We include age and whether the respondent works during the school year because older students and those who work may see finance as more relevant to their lives than do younger students or those that do not work. We include parents’ income because it may impact how students have experienced financial behaviors such as budgeting, borrowing, and investing. We include a dummy coded 1 if the respondent reported at least one parent who works in a finance-related field as an additional indicator of the student’s exposure to finance or as an indication that the student has a close relationship with someone well-qualified to offer financial advice. Finally, we include gender set to 1 if the respondent self-identified as male, 0 as female to capture any remaining gender-related traits that could be affecting motivation. The results in Table 4 are consistent with Hypothesis 2. The respondent’s confidence in his or her answers and how highly the respondent rates the importance of finance are significantly and positively associated with increased motivation to learn, while expecting to make decisions with a spouse significantly decreases motivation to learn. Motivation is also weakly associated with age. Gender is not significantly associated with motivation after controlling for other possible determinants, suggesting that the average differences between men and women that affect motivation to learn about personal finance are captured in the other independent variables. Though confidence in one’s answers is a significant determinant of motivation, confidence in one’s ability to make future financial decisions is not. To examine whether the first measure of confidence is masking the influence of the second, we repeated the regression without the confidence in one’s answers variable. Both the coefficient and the *t*-statistic of the second confidence measure increased, but the *p*-value was still above 10% and the adjusted *R*-square of the regression fell slightly. In contrast, when we ran the regression with confidence in one’s answers and without confidence in one’s ability to make future decisions, the coefficient and *t*-statistic of the variable and the adjusted *R*-square of the regression all increased. Perhaps confidence in one’s answers is a better measure of expectancy because it does not require respondents to speculate on their future abilities. Alternatively, confidence in one’s future decisions may have a weaker relationship with motivation because it reflects both expectancy and the likelihood of sharing the responsibility for decision-making with a spouse, which tend to have opposite effects on motivation.

Two potentially important questions we failed to ask in our survey are what income level respondents expected to earn in the future and whether they expected to be financially dependent on a spouse or anyone else. High (low) expected income and independence may simultaneously increase (decrease) motivation to learn finance and decrease (increase) one’s

Table 4 Factors associated with motivation

	B	Standard error	t	Sig.
Panel A: OLS				
(Constant)	-1.250	0.835	-1.497	0.136
Gender	0.174	0.110	1.573	0.118
Age	0.074	0.041	1.822	0.070
Work	-0.029	0.095	-0.307	0.759
Parents' income	0.016	0.027	0.583	0.560
Parents in finance	-0.116	0.115	-1.009	0.315
Importance	0.612	0.114	5.368	0.000
Confident answers	0.138	0.059	2.320	0.022
Confident decisions	0.032	0.063	0.502	0.616
Decisions with spouse	-0.254	0.102	-2.498	0.013
Adjusted R ²	0.263			
F (Sig.)	7.922 (0.000)			
Panel B: Ordinal regression				
	Estimate	Standard error	Wald	Sig.
Gender = 0	-0.526	0.370	2.025	0.155
Age	0.283	0.138	4.221	0.040
Work = 0	0.061	0.317	0.038	0.846
Parents' income	0.066	0.092	0.509	0.475
Parents in finance = 0	0.298	0.387	0.591	0.442
Importance	1.976	0.410	23.201	0.000
Confident answers	0.470	0.200	5.521	0.019
Confident decisions	0.181	0.212	0.732	0.392
Decisions with spouse = 0	0.775	0.345	5.058	0.025
Cox and Snell	0.295			
χ ² (Sig.)	61.411 (0.000)			

Note. Reports results of OLS and Ordinal regression with Motivation as the dependent variable. Motivation is coded 0 if respondent chose “Neither motivated nor unmotivated,” 1 if “Somewhat motivated,” and 2 if “Very motivated.” No other choices were selected. Gender is 1 if the respondent self-identified as male, 0 as female. Work is coded 1 if respondent works part- or full-time during the school year, 0 otherwise. Parents' income is coded 0 if respondent chose “Unsure,” 1 if <\$30,000, 2 if \$30,000-\$59,000, 3 if \$60,000-\$89,000, 4 if \$90,000-\$119,000, and 5 if >\$120,000. Parents in finance is coded 1 if respondent reports at least one parent who works in a finance-related field. Importance of finance is coded 0 if respondent selected “Important” and 1 if “Very Important.” No other choices were selected. Confident answers is the respondent's ranking of how confident he or she felt when answering the financial knowledge questions from 1 to indicate “Not at all confident” to 5 to indicate “Very confident.” Confident decisions is the respondent's ranking of how confident he or she feels about having to make financial decisions in the future on the same 1 to 5 scale. Decisions with spouse is coded 1 if respondent expected to make future financial decisions with a spouse, 0 if respondent expected to make future financial decisions alone. OLS coefficient estimates for binary variables estimate the impact on the dependent variable, Motivation, when the response is coded 1. Ordinal regression coefficient estimates for binary variables estimate the impact on the dependent variable, Motivation, when the response is coded 0.

intention to make decisions with someone else. We cannot rule out this alternative explanation of the negative association we find between motivation and decisions with spouse.

To investigate whether the likely determinants of motivation affect women and men differently and test our third hypothesis, we split our sample into female and male subsamples and run the motivation regressions, excluding the gender independent variable, on each subsample. The results in Table 5 indicate that, among our female respondents, motivation to

Table 5 Factors associated with motivation by reported gender

	Female				Male			
	<i>B</i>	Standard error	<i>t</i>	Sig.	<i>B</i>	Standard error	<i>t</i>	Sig.
Panel A: OLS								
(Constant)	−1.047	1.044	−1.003	0.318	−1.413	1.385	−1.020	0.313
Age	0.079	0.050	1.587	0.115	0.045	0.068	0.669	0.507
Work	−0.109	0.115	−0.948	0.345	0.261	0.168	1.550	0.128
Parents' income	0.025	0.032	0.783	0.435	−0.037	0.051	−0.726	0.472
Parents in finance	−0.319	0.148	−2.159	0.033	0.201	0.173	1.159	0.253
Importance	0.473	0.130	3.629	0.000	1.063	0.231	4.610	0.000
Confident answers	0.125	0.066	1.895	0.061	0.098	0.143	0.689	0.495
Confident decisions	0.024	0.071	0.343	0.733	0.157	0.147	1.065	0.293
Decisions with spouse	−0.369	0.124	−2.969	0.004	−0.096	0.170	−0.564	0.576
Adjusted R^2	0.208				0.359			
<i>F</i>	5.030				4.570			
Significance	0.000				0.000			
Panel B: Ordinal								
Regression	Estimate	Standard error	Wald	Sig.	Estimate	Standard error	Wald	Sig.
Age	0.315	0.169	3.493	0.062	0.191	0.288	0.440	0.507
Work = 0	0.388	0.386	1.008	0.315	−1.403	0.740	3.595	0.058
Parents' income	0.090	0.109	0.692	0.405	−0.201	0.232	0.753	0.385
Parents in finance = 0	1.128	0.504	5.004	0.025	−1.405	0.826	2.889	0.089
Importance	1.536	0.457	11.316	0.001	4.289	1.199	12.801	0.000
Confident answers	0.426	0.223	3.657	0.056	0.443	0.616	0.518	0.472
Confident decisions	0.139	0.237	0.343	0.558	0.721	0.656	1.209	0.272
Decisions with spouse = 0	1.221	0.426	8.210	0.004	0.181	0.719	0.063	0.802
Cox and Snell	0.255				0.445			
χ^2	36.549				30.583			
Significance	0.000				0.000			

Note. Reports results of OLS and Ordinal regression with Motivation as the dependent variable and sample split by reported gender. Motivation is coded 0 if respondent chose “Neither motivated nor unmotivated,” 1 if “Somewhat motivated,” and 2 if “Very motivated.” No other choices were selected. Work is coded 1 if respondent works part- or full-time during the school year, 0 otherwise. Parents' income is coded 0 if respondent chose “Unsure”, 1 if <\$30,000, 2 if \$30,000-\$59,000, 3 if \$60,000-\$89,000, 4 if \$90,000-\$119,000, and 5 if >\$120,000. Parents in finance is coded 1 if respondent reports at least one parent who works in a finance-related field. Importance of finance is coded 0 if respondent selected “Important” and 1 if “Very Important.” No other choices were selected. Confident answers is the respondent's ranking of how confident he or she felt when answering the financial knowledge questions from 1 to indicate “Not at all confident” to 5 to indicate “Very confident.” Confident decisions is the respondent's ranking of how confident he or she feels about having to make financial decisions in the future on the same 1 to 5 scale. Decisions with spouse is coded 1 if respondent expected to make future financial decisions with a spouse, 0 if respondent expected to make future financial decisions alone. OLS coefficient estimates for binary variables estimate the impact on the dependent variable, Motivation, when the response is coded 1. Ordinal regression coefficient estimates for binary variables estimate the impact on the dependent variable, Motivation, when the response is coded 0.

learn finance increases weakly with age and confidence and significantly with how highly they rate the importance of finance. It decreases significantly when female respondents have at least one parent who works in a finance-related field and when they expect to make financial decisions with a spouse. In stark contrast, the only significant determinant of our male

respondents' motivation to learn finance is how highly they rate the importance of finance. Together, the results shown in Tables 3 and 5 are partially consistent with hypothesis three. The *t*-tests indicated that the only significant difference between men and women among the hypothesized determinants of motivation is in confidence. Women were less confident in their test answers and in their abilities to make future financial decisions than men were. But women did not rate personal finance as less important. Women were not more likely than men to say they would make decisions with their spouse; however, only among the women did the expectation that they would make decisions with their spouse decrease their motivation to learn personal finance. Thus, our results suggest that women tend to be less motivated to learn personal finance because they tend to be less confident. Their motivation also decreases when they expect to rely on a spouse or a parent to help them make their decisions.

5. Conclusion

Study after study indicates that women, with and without college educations, from high schoolers to retirees, are less financially literate, less interested in personal finance, and less confident in their financial knowledge and decision-making abilities than are men of similar education and age. Other studies show that these relative weaknesses in knowledge and interest have negative impacts on women's financial well-being, particularly with respect to how much retirement savings they accumulate and how much they pay for loans.

Our results are consistent with our hypotheses derived from expectancy theory of motivation and related literature. The women in our sample of undergraduate students appear to be less knowledgeable, less interested, less confident, and more risk averse, on average, than the men. Motivation to learn personal finance increases with confidence and how highly one rates the importance of finance. The majority of both men and women in our sample rated personal finance as Very Important and said that they expect to make future financial decisions with their spouse. None of the respondents indicated that they expected their parents or spouse to make decisions for them. Nevertheless, the women appear to be less motivated to learn about personal finance when they have at least one parent who works in a finance-related field or when they expect to make financial decisions with a spouse. This suggests that today's young women still expect to rely on parents or spouses when managing household finances. We know of no other recent evidence that this rather old-fashioned notion persists.

The principal limitation to our study is our low response rate and subsequently small sample size, particularly with respect to the number of male participants. Women and Whites are over-represented compared with the general population, and our survey participants are all college students aged 18-23. Another important limitation is the potential for measurement error that comes with self-reported data. We rely on our respondents to rate how confident and motivated they are and how important personal finance is. One respondent's definition of confidence, motivation, or importance may vary from others. Similarly, how one determines the magnitudes of these attributes can also vary. Notably, if the women in

our sample tend to define these attributes differently than men do, or if they are less likely to describe themselves or their beliefs using extreme modifiers, such as Very Confident or Very Motivated, this general tendency could explain some of our results in Tables 3 and 4. A third limitation is that two key questions rely on respondents' future expectations. We ask them to rate their "Confidence in their abilities to make financial decisions in the future," and "In the future, who do you expect to make your financial decisions?" Finally, we must acknowledge that our respondents are unmarried, financially dependent, college students with no children. Their motivation to learn finance could vary greatly from that of others with children, spouses, financial independence, and varying levels of income and education. For example, having children may increase one's motivation to take personal responsibility for financial decisions regardless of gender, marital status, age, or income. Similarly, data in Tables 4 and 5 indicate that parents' income does not affect reported motivation to learn personal finance, but one's own income could affect motivation and reliance on a spouse.

Nevertheless, every study must start somewhere, and college is the place where many people start to experience independence and financial responsibility. It may also be the easiest time of one's life to learn about personal finance, since education and preparing for the future is a key theme of college life. Furthermore, our results are consistent with prior literature and with the expectancy theory of motivation. Thus, we believe our key results that one's motivation to learn personal finance varies with how important one rates personal finance and that women tend to be less motivated to become financially literate when they are less confident in their financial knowledge and when they expect to make financial decisions with their spouse will generalize to larger, more representative samples and across education and income levels and ages. Further exploration to confirm and expand on our results is warranted.

Notes

1. Atkinson and Messy (2012) had eight financial knowledge questions. We chose not to include their compound interest question because they awarded a point for the correct answer only if another question on interest calculation was answered correctly. We also changed three open-ended questions requiring simple math to multiple choice because we felt students would be more likely to answer if choices were provided.
2. The question was, "When you have questions regarding personal finance in the future, where do you think that you will go to for advice? (Choose all that apply)."
3. As the motivation rating is an ordinal variable, ordinal regression is likely to be a more appropriate regression technique than OLS. See Norusis (2012).

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Appendix

Appendix: Survey

The following survey questions were administered electronically via Qualtrics. Open-ended questions are indicated by *Open* following the question. Otherwise, answer choices are italicized following the question.

1. What is your Pirate (school) ID? *Open*
2. Are you an undergraduate student at East Carolina University? *Yes, No*
3. What college or school do you fall into? *Engineering and Technology, Arts and Sciences, Nursing, Business, Health and Human Performance, Allied Health Sciences, Education, Fine Arts and Communication, Other*
4. What is your age? *Open*
5. What is your class rank? *Freshman, Sophomore, Junior, Senior*

6. What is your gender? *Male, Female, Other*
7. What is your race? *Asian, White/Caucasian, African American, Hispanic, Pacific Islander, Other*
8. What is your employment status? *I do not work, I work part time, I work full time.*
9. What is your/your parents total household income? *Not sure, less than \$30,000, \$30,000 to \$59,999, \$60,000 to \$89,999, \$90,000 to \$119,999, \$120,000 or more.*
10. Do either of your parents work in the financial services industry? *No; Not anymore, but one or both used to; Yes, one of my parents; Yes, both of my parents.*
11. Is English your primary language? *Yes, No*
12. Do you know about the personal finance course (FINA 1904) offered at ECU? *Yes, No*
13. Have you taken the personal finance course (FINA 1904) at ECU? *Yes, No*
14. If answer to Q13 is yes, why did you choose to take the course? *I thought it would be valuable to my future, I heard good reviews about the professor(s), I needed an elective course, I heard the class was easy.*
15. If answer to Q13 is yes, after taking the course do you feel that personal finance is more important or less important than before you took the course? *Less important, Neither more nor less important, Slightly more important, More important*
16. If answer to Q13 is yes, what grade did you receive in the course? *A, B, C, D, F*
17. If answer to Q13 is yes, how valuable do you feel what you learned will be in the future? *Not at all valuable, somewhat invaluable, neither valuable nor invaluable, somewhat valuable, very valuable*
18. If answer to Q13 is no, why did you choose not to take this course? *I did not think it would be worthwhile, I did not have any room in my schedule, I heard the class was hard, Other.*
19. If answer to Q13 is no, do you plan to take the personal finance course (FINA 1904) at ECU? *Yes, No*
20. Have you ever attended a personal finance seminar/informational session? *Yes, No*
21. Where have you ever studied personal finance? *I have never studied personal finance, High school personal finance class, College level personal finance class, Other.*
22. Do you plan to attend a personal finance seminar/informational session? *Yes, No*
23. Have you ever taken a finance course besides personal finance? *Yes, in high school; Yes, in college; No*
24. Have you ever taken an economics course? *Yes, in high school; Yes, in college; No*
25. How important do you think personal finance is? *Very unimportant, Unimportant, Neither unimportant nor important, Important, Very important.*
26. If answer to Q24 is Very Unimportant or Unimportant, why do you find personal finance unimportant? *Open*
27. If answer to Q24 is Very Important or Important, why do you find personal finance important? *Open*
28. How motivated are you to learn about personal finance? *Very discouraged, slightly discouraged, neither motivated nor discouraged, slightly motivated, very motivated.*
29. How strongly have your parents influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
30. How strongly have other relatives (besides your parents) influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
31. How strongly have instructors influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
32. How strongly have your peers influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
33. How strongly has the media influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
34. How strongly have online resources influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
35. How strongly have your own experiences influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
36. How strongly has your religion influenced your knowledge of personal finance? *1- Not at all, 2, 3, 4, 5 - A great deal.*
37. How strongly have your parents influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
38. How strongly have your other relatives (besides your parents) influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*

39. How strongly have your instructors influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
40. How strongly have your peers influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
41. How strongly have online resources influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
42. How strongly has the media influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
43. How strongly have your own experiences influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
44. How strongly has your religion influenced your financial decisions? *1- Not at all, 2, 3, 4, 5 - A great deal.*
45. When you have questions in regard to personal finance in the future, where do you think that you will go to for advice? (Choose all that apply). *Friends, Parents, Other Relatives, Online, Books, Financial Advisor.*
46. For the following financial products, please indicate if you have heard of the product - Credit Card. *Yes, No*
47. For the following financial products, please indicate if you have heard of the product - Renters Insurance. *Yes, No*
48. For the following financial products, please indicate if you have heard of the - Retirement Account. *Yes, No*
49. For the following financial products, please indicate if you have heard of the product - Investment Account (529 College Savings Plan, Trust, etc.) . *Yes, No*
50. For the following financial products, please indicate if hold this type of account - Credit Card. *Yes, No*
51. For the following financial products, please indicate if you hold this type of account - Renters Insurance. *Yes, No*
52. For the following financial products, please indicate if you hold this type of account - Retirement Account. *Yes, No*
53. For the following financial products, please indicate if you hold this type of account - Investment Account (529 College Savings Plan, Trust, etc.) . *Yes, No*
54. Do you plan to invest in the stock market? Why or why not? *Yes, I plan to invest in the stock market in the future; Yes, I a.m. currently invested in the stock market; No, the stock market is too risky; No, I will not make enough money to invest; Other.*
55. Imagine that five brothers are given a gift of \$1,000. If the brothers have to share the money equally how much does each one get? *100, 200, 250, I don't know.*
56. Now imagine that the brothers have to wait for one year to get their share of the \$1,000 and inflation stays at 3%. In one year's time will they be able to buy: *Less than they could buy today, The same amount as they could buy today, More than they could buy today, I don't know.*
57. You lend \$25 to a friend one evening and he gives you \$25 back the next day. How much interest has he paid on this loan? *100%, 50%, 0%, I don't know.*
58. Suppose you put \$100 into a no fee savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account, and you don't withdraw any money. How much would be in the account at the end of the first year once the interest payment is made? *98, 100, 102, I don't know.*
59. High inflation means that the cost of living is increasing rapidly. *True, False.*
60. It is usually possible to reduce the risk of investing in the stock market by buying stocks in many different companies. *True, False.*
61. An investment with a high return is likely to be low risk. *True, False.*
62. How confident are you in your answers to the above financial literacy questions? *1 - Not Confident At All, 2, 3, 4, 5 - Extremely Confident.*
63. How confident are you in your ability to make financial decisions in your future? *1 - Not Confident At All, 2, 3, 4, 5 - Extremely Confident.*
64. In the future, who do you expect to make your financial decisions? *Yourself, You and Your Spouse Together, Your Parents, Other*