Gender Differences in Financial Decision-making and Behaviors in Single and Joint Households

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Abstract:

This study investigates gender differences in household financial behavior using data from the 2018 National Financial Capability Study, a large and nationally representative survey about adults' financial behavior, knowledge, and attitudes. The behaviors include paying your credit card in full each month, having a 3-month emergency fund, having non-retirement investments, and having a non-employer retirement account. Results showed that single females were significantly less likely to engage in any of the financial behaviors compared to men. Additionally, females in joint households were also significantly less likely to engage in the behaviors compared to males. These results are robust when splitting the single and joint household samples by age, level of financial literacy, and using a sample from a prior year. Therefore, females may not be well-prepared for financial decision-making in single or joint households, which can have adverse consequences for managing current personal finances and building wealth for the future.

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This study investigates the gender differences in financial decision-making in single and joint households and its likely effects on the financial behaviors of these households. The reason that this gendered decision-making in single and joint households is important to investigate is that it may influence financial behaviors in these households in unknown and unexpected ways. In single households, females may be at a disadvantage relative to males if they are less prepared for successful management of their personal finances and planning their financial futures (Lusardi and Mitchell 2008). In married or cohabitating households, it has long been thought that the partners share financial decision-making to maximizing household utility and resources, but recent research suggests that households often do not make shared financial decisions (Kim, Gutter, and Spangler 2017). With investing and saving, for example, females are more likely to delegate the financial decision-making to their male partner (Meier, Kirchler, Hubert 1999; UBS 2019). Such a gender gap in joint decision-making is likely to have adverse financial consequences for females over time as they typically outlive their male partners, thus potentially subjecting them to lower living standards, more financial anxiety, and fewer beneficial financial options.

For the analysis, the study focuses on four financial behaviors that are commonly discussed by financial planners (McGee 2021) and often analyzed in studies of financial literacy (Allgood and Walstad 2016; Hilgert, Hogarth, and Beverly 2003; Lusardi and Mitchell 2014; Wagner and Walstad 2019). Two of the financial behaviors are associated with sound management of personal finances. They include regularly paying a credit card bill in full to avoid high costs from interest payments and having an emergency fund to handle adverse financial shocks to household assets. The other two financial behaviors are associated with taking positive actions to build wealth for the future. They include making personal investments in stocks, bonds, or mutual funds and having individual retirement accounts outside of employment. The four financial behaviors serve as a broad-based set of indicators for studying whether gender differences in single and joint household are likely to influence major financial behaviors.

The data for the study come from the latest release of the National Financial Capability Study (NFCS) (FINRA Foundation 2019; Lin et al. 2019). This tri-annual survey offers cross-sectional data on the financial behaviors, knowledge, and attitudes of a nationally representative sample (n=27,091) of U.S.

adults who are 18 years of age or older. The 2018 NFCS data are used for the study to estimate a probit model for each of the four financial behaviors, first with the sample of single households (n=6,462) and then with the sample of joint households (n=12,399). The explanatory variables for each estimation control for the main demographic characteristics of the households, and most importantly for the study, gender differences in financial decision-making. In single households, the gender of the financial decision-maker is easy to identify as only one individual (female or a male) makes the financial decisions. In joint households, however, the gender analysis becomes more complex as the key financial decision-maker can be female or male, or the partners could equally share the decision-making responsibility.

The results from the analysis of single households show that females are significantly more likely to engage in riskier or less prudent financial behaviors compared with males related to paying a credit card bill in full each month, keeping an emergency or "rainy day" fund as protection for negative financial shocks, investing in financial assets (stocks, bonds, or mutual funds) outside of employment, and establishing an individual retirement account not connected to employment. The results in joint household mirror the gender gap found in single households. Households in which females are presumably the main financial decision-maker are significantly more likely to engage in these riskier and less sound financial behaviors compared to households in which males serve in the main decision-making role. The same result is found, although of somewhat less magnitude, when equal decision-making within households is compared to households in which the male is the main decision-maker.

The description of the study is divided into several sections. The literature review that follows discusses some of the more relevant pieces of extensive literature on gender differences within households. Several short sections then describe the sample, discuss the financial decision-making variables, and define the four financial behaviors. The model and results section presents the probit model and offers the main findings from the profit analysis. The robustness section reports the finding from alternative specifications and estimation by splitting NFCS sample based on differences in age or differences in the level of financial literacy. The analysis with the 2018 NFCS data also is re-conducted with the NFCS sample from 2015 to assess any changes over time. The final section discusses the implications and highlights some conclusions.

Literature Review

Two stands in the research literature on gender differences related to financial decision-making are most relevant to this study and provide context. The first strand focuses studies of gender differences in financial literacy and risk-taking that generally apply to women regardless of their household status (single or joint). The second strand focuses on joint household decision-making and offer insights into this more complex dynamic. The review begins with the first strand and then turns to the second strand.

A major problem that seems to affect the financial decision-making of adult women is their level of financial literacy. Research studies indicate that financial literacy for women is generally lower than for adult men. One early study found that only 29 percent of women could correctly answer three basic financial literacy questions (Lusardi and Mitchell 2008). A more recent study finds that financial illiteracy among women is severe, and even worse among single women and widows (Bucher-Koenen et al. 2017). A low level of financial literacy has consequences for consequence for women as it can lead to poor financial outcome such as inadequate preparation for retirement (Lusardi and Mitchell 2014).

Another research topic related to gender differences in financial decision-making is the risk-taking. Research on this topic generally indicates that in women are more risk averse than men in managing finances and in making financial decisions (Bajtelsmit and Bernasek 1996; Bannier and Neubert 2016; Carr and Steele 2010; Eckel and Grossman 2008). One study, for example, finds that this risk aversion leads women to make more conservative investments, which in turn often results in less accumulation of wealth and funding for retirement compared with males (Bajtelsmit and Bernasek 1996).

One other study is worth noting for this first strand as it has implications for improving financial conditions for women. It found that that a gender gap exists for women with respect to *both* financial literacy and risk tolerance, which in turn appear to negatively affect investing by women (Bannier and Neubert 2016). The findings imply that increasing the financial literacy of women and raising their willingness to assume risk may reduce part of the gender gap affecting investment decision, and perhaps those affecting other financial decisions. In this respect, financial education may be important as it could improve financial

literacy and decision-making skills, thus giving women more knowledge, skills, and confidence to make challenging financial decisions.

The review now turns to the second strand on research on joint decision-making in households, which has substantially changed over the years. The classical model for financial decision-making in joint households in early research was that couples in households share in the financial decision-making to maximize joint utility and income (Dew 2008; Kim, Gutter, & Spangler 2017). This classical model, however, has been discarded and updated in more recent research to recognize that spouses within households have different preferences. One study found that females were more likely to delegate financial decision-making to their male counterparts, especially in the areas of investing and saving (Meier, Kirchler, Hubert 1999). A more recent study (UBS 2019) found that women worldwide deferred long-term financial decisions to their spouse, and that millennial women were even more likely to do so. This preference for deferral may be affected by gender differences in risk-taking as previously discussed. Making a financial decision for a household often means the assumption of risk in the form of responsibility for the outcome. If women are more risk-adverse, they may prefer to opt out of making challenging financial decisions or limit their participation in making them.

Preferences also can affect the other half of joint households. Some evidence suggests that men may have a stronger preference for making financial decision and have more experience with household finance (Skogrand et al. 2011). This finding, however, may be conditional on the household conditions. A study from Italy, for example, found that men were more likely to be the financial decision-makers but that as a woman's age, income, and education were closer to their husbands (or greater) they were more likely to be the main decision-maker (Bertocchi, Brunetti, & Torricelli 2014). The same study however, found that women were less likely to be the decision-maker if they were employed after controlling for the work status of the female. The reason suggested was that the household followed more of a specialization pattern for household duties and families divided labor and household tasks more when both partners worked.

Research on joint household decision-making also finds that other factors beyond preferences or household conditions may affect joint decision-making, such as financial literacy, numeracy, and education

(Fonseca, et al. 2012; Kim, Gutter, & Spangler 2017; Smith McArdle, & Willis 2010). One likely reason why women may delegate financial decision-making to men in joint households is that women tend to have less financial literacy, thus influencing women's ability or confidence in handling the financial affairs (Bucher-Koenen et al. 2017; Lusardi and Mitchell 2014). In this respect, a study of Austrian couples noted that spouses with higher expertise in saving and investing exerted more dominance in the financial decision-making process (Meier, Kirchler, & Hubert 1999). Another study found that if married millennial women reported being the primary financial decision maker it was because they are more financially knowledgeable than their partners (Ameriprise Financial 2016). Finally, the gender imbalance in joint households due to financial literacy and other factors may have long-term adverse consequences as women are more likely to outlive their male partners (Laughlin 2019). These consequences may include a lower standard of living, more financial anxiety and distress, and a less-funded retirement.

Sample and Descriptive Statistics

The data set used for the study came from the 2018 National Financial Capability Study (NFCS), a tri-annual survey U.S. adults' financial knowledge, behaviors, and attitudes, and behaviors (FINRA Foundation 2019; Lin et al. 2019).[3] The 2018 survey was developed from the surveys used in previous years—2009, 2012, and 2015. All NFCS surveys have been administered online to a nationally representative sample of adults (ages 18 or older). The 2018 survey collected useable data on 27,091 adults.

The sample size for this study was 18,861 adults as it only included those respondents who provided complete data for all the variables. The analysis that follows, however, divides this full sample into single household sample (n=6,462) and a joint household sample (n=12,399). The reason for this split is that financial decision making differs substantially for each sample as in single household there is one financial decision-making whereas in joint household there can be more than one. Although it is possible to further divide joint households into two groups based on whether partners were married (88.68 percent) or cohabitating (11.32 percent), the main analysis for the study was conducted with the combined group. The

[3] Publicly available data, tables, survey questions, methodology, and preliminary reports for the 2009, 2012, 2015, and 2018 surveys can be found at http://www.usfinancialcapability.org

reason for this combined analysis was for brevity as the results from a separate analysis of cohabitating couples or married couple were quite similar (see Appendix A).

Table 1 reports the descriptive statistics for the all the variables used in the study as they relate to the sample for single households and the sample for joint households. The study holds constant the number of observations across all the variables within each sample so that direct comparisons can be made in later analysis across the four financial behaviors. The demographic variables include gender for the single household and gendered decision-making (DM) breakdowns for the joint household sample (as subsequently will be defined). The other demographic variables include age, race, having dependent children, educational attainment, employment status, and income. For the joint household sample, marital status is included as a demographic variable to distinguish between the households in which partners are married versus simply cohabitating. One reason for make the marital distinction is that a review of relevant literature on marriage and finances found that married couples are more likely to pool their income and savings compared to households who are co-habituating (Dew 2008). Additionally, state dummy variables are included to control for possible geographical differences among respondents in each sample, but the state differences are not reported in the later analysis.[4]

[Insert Table 1 about here]

Gender and Financial Decision-Making

A key variable for the study was the gender of the financial decision-maker in a household. For single households the gender of the survey respondent determined the gender of the financial decision-maker in the household. Of course, other parties such as parents, relatives, or friends, may influence decision-making in single households, but the ultimate responsibility for small or large financial decisions

[4]The full NFCS (n=27,091) is a nationally representative sample based on the demographic variables and NFCS methodology (FINRA Foundation 2019; Lin et al. 2019). The sample for this study (n=18,861) smaller as it eliminates some observations that did not answer some of financial behavior and decision-making variables used for the study. Nevertheless, a comparison of the means for the demographics of the full sample and the more restricted sample use for the study are about the same.

that influence financial behaviors rests with the female or male in a single household. The data in Table 1 indicate that about 51 percent are female and about 49 are male in single households.

The gender identification of financial decision-makers joint households is more complicated as partners live together in a household and are responsible for making financial decisions. The decision-making can either be handled separately by one partner (self-identified in the NFCS data as male or female) or it can be shared equally by the partners.[5] The NFCS survey, unfortunately, does not include questions about who or how financial decisions are made in joint households by gender. To address this limitation, the study draws on findings from prior research to identify and make the case for an alternative question in the NFCS data that can be used to classify decision-makers within joint households based on gender.

As previously discussed, research on decision-making in joint households indicates that the relative level of financial literacy among partners probably exerts a major influence who makes the financial decisions (Ameriprise Financial 2016; Fonseca, et al. 2012; Kim, Gutter, and Spangler 2017; Meier, Kirchler, & Hubert 1999; UBS 2019). In addition, individuals who are more financially literate or had more relative knowledge about finances were more likely to be more dominant in the decision-making process (Meier, Kirchler, & Hubert 1999). Another study found that numeracy was a key component for decision-making—males were found to have more numeracy knowledge and were also key for who made the financial decisions in the household (Smith, McArdle, & Willis 2010). A reasonable assumption from this line of research is the partner with most financial knowledge within a joint household is most likely to be the financial decision-maker rather than one with less financial knowledge. In addition, it also is quite common for partners in joint households to divide their labor and allocate household duties based on who has more skills, preparation, or experience with the tasks (Bertocchi, Brunetti, & Torricelli 2014). Of course, if the financial knowledge of the partners is about equal, financial decision-making is probably shared equally, but this occurs less often with most couples so an allocation of financial decision-making responsibilities to one partner is more likely to be the case.

[5] The NFCS data do not identify with partners in joint households are different genders or the same gender, and because of this no assumption was made in this study about the gender of the partner.

This study, therefore, uses a NFCS survey question asking partners in joint households about the relative financial knowledge of partners within the household as a proxy measure that appears to be a valid one for classifying financial decision-making by gender within a joint household. The NFCS question asks, "Who in the household is the most knowledgeable about saving, investing and debt?", with the relevant answers of "you", "someone else", or "you and someone else are equally knowledgeable".[6] Male respondents to the NFCS survey who said they were the most financially knowledgeable are reasonably assumed to be the main financial decision-maker (DM), so they were coded as Male-DM. Female respondents who said they were the most financially knowledgeable in the joint household are reasonably assumed to be the main financial decision-makers, so they were coded as Female-DM.[7]

The other two categories (Equal-DM and Other-DM) are included for the completeness in sorting households into all possible groups. They are, however, of less interest for the comparison of gender differences in financial decision-making within household and the likely effects on financial behaviors than the two main categories of Female-DM and Male-DM. With Equal-DM, female and male participation in financial decision-making is assumed to be equal so there is no gender difference. For Other-DM, the gender identity of "someone else" as the financial decision-maker is uncertain or unknown. Given these concerns, and to simplify the analysis and reporting, the female and male answers for each category are combined and not separately analyzed for the Other DM.

Table 1 reports the descriptive statistics for the DM classifications for joint households. Male-DMs account for 35 percent while female-DMs account for 22 percent of the sample. This gender difference was as expected as prior research has indicated that females may be less likely to assume financial decision-making responsibilities within joint households (Bucher-Koenen et al. 2017; Meier, Kirchler, Hubert 1999;

[6]Respondents giving "Don't know" and "Prefer not to say" answer were excluded from the study as they could not give a useful response for this analysis.

[7]This assumption is not without its limitations as noted by a reviewer of this study. The most financially knowledgeable partner in a joint household may have an absolute advantage in making household financial decisions, but it is comparative advantage that ultimately determines who in the household makes the financial decisions. Although it is highly likely that the partner with the absolute advantage is the main financial decision-maker, it may not always be the case. No NFCS data are available to address this issue.

Lusardi and Mitchell 2014; UBS 2019). The Other-DM category (9 percent) indicates that financial decision-making in the joint households is delegated to someone else, although that gender is not known. The combined results (Female-DM, Male-DM, or Other-DM) indicate that about two-thirds (66 percent) of financial decision-making within joint households appeared to be handled by one person, which is consistent with the prior expectation that specialization and division of labor related to financial decision-making probably operates within many joint households (Bertocchi, Brunetti, & Torricelli 2014). Equal sharing of financial decision-making also is present within joint households, but less often (34 percent). This lower outcome for equal decision-making is to be expected as equal sharing of financial decision making is limited to partners who have a similar level of financial acumen, or think they do.

Financial Behavior Variables

The study includes four different financial behaviors or practices, two related to the management of personal finances and two related to building wealth for the future. Each one may have adverse consequences if prudent or careful financial actions are not taken with respect to the financial behaviors. Together the four financial behaviors provide broader insights than would be the case for focusing on one behavior. They also provide insights about the degree of consistency (or inconsistency) in prudent or positive financial actions across all four behaviors.

As related to managing personal finances, the first financial behavior is the practice of paying your credit card bill in full each month. Failure to do so can result in paying high interest rates on the accumulated credit card debt or perhaps being denied credit later if a household get too deep into debt. The second financial behavior is setting aside emergency or "rainy day" fund to cover expenses for three months in the case of illness, job loss, an economic downturn in the economy or some other financial shock. Saving funds for the possible emergencies indicates that a person the financial discipline to plan for unexpected and negative events in the future, and thus insure themselves against financial loss from those events.

The third and fourth financial behaviors are related to wealth building and financial planning. The third financial behavior is having investments in stocks, bonds, or mutual funds, or other financial securities that are outside of retirement accounts. Investing is an important tool used to build household wealth. It

requires a certain degree of risk-taking, consistency, and patience for it to produce positive and meaningful returns. It is important to build wealth in non-retirement investments so it can be used to pay for large consumer purchases such as a down payment for a house or financing a college education. The fourth financial behavior is setting up and funding individual retirement accounts that are outside of employment. Individuals who have retirement accounts outside of employment are demonstrating their ability to plan for more a distant future and accumulate sufficient financial assets to fully fund that retirement.

For the study, survey responses about each financial behavior are coded as a 1 for yes if a decision-maker reports engaging in a prudent or positive action and coded as zero for no. The proportions for these yes indicators of financial actions with these four financial behaviors are shown at the bottom of Table 1 for single and joint households. In single households where 47 is the average age, 54 percent state they pay their credit card in full each month,53 percent report having a three-month emergency fund, 35 percent indicate they have non-retirement investments, and 35 percent replied that they have non-employer retirement accounts. The respective percentages for joint households are higher as that sample is older (mean age: 50.5), and thus probably have more experience with financial matters. With this sample, 57 percent pay their credit card in full each month, 64 percent have an emergency fund, 46 percent have non-retirement investments, and 50 percent have non-employer retirement accounts.

Model Estimation and Results

The basic specification of the probit model for each estimation with single or joint households is:

$$FB_i = f(GD_i, DC_i,)$$

where *i* is the individual respondent to the NFCS survey. FB_i represents a financial behavior, which is coded as 1 or 0 depending on whether a prudent or positive financial behavior is indicated (1=yes; 0=no). The same probit model is estimated for each of the four financial behaviors.

GD_i is gendered decision-maker for single and joint households. For single households, GD_i is the gender of the individual in the household as only one person is responsible for financial decision in a single household. For the same reason, it should be noted that this individual is the most financially knowledge person within the household. For the probit coefficient comparisons with single households, males serve as

the omitted category. The analysis with joint household is more complex as a female could be the main financial decision maker (Female-DM), a male could be the main financial decision-maker (Male-DM), someone else could be the main financial decision-maker (Other-DM), or financial decision-making could be equally shared for the female and male within a household (Equal-DM). For the probit estimation and the coefficient comparisons, Male-DM serves as the omitted category.

DC_i represents a set of demographics characteristics. They include a continuous variable for age. The other demographics are dummy variables include the individual's race or ethnicity, whether they have children or not, educational attainment, employment, and income. The omitted categories for these demographic characteristics are non-white, employed, no dependents, income between $75,000-100,000, and college graduate. Marital status is included in the joint household estimations to account for possible differences between households with married couples and cohabitating couples.

Table 2 reports the results for single households (n=6462). The findings consistently show that females in single households are significantly less likely to engage in any of the four financial behaviors compared with males in single households. The differences are sizable. Females are 13 percentage points less likely to pay off their credit card in full each month, 10 percentage points less likely to have an emergency fund, 14 percentage points less likely to have non-retirement investments, and 10 percentage points less likely to have a non-employer retirement account.

[Insert Table 2 about here]

The findings indicate that single females apparently are less likely to follow prudent or positive financial practices related to managing their personal finances. They are less likely to pay off their credit cards in full each month, which means they are more likely to accumulate high-cost consumer debt. They are less likely to protect their financial assets and lifestyles by establishing a three-month emergency fund to help them manage the financial loss from job loss, illness, economic downturn, major auto or household repairs, or some other negative financial shock. At the same time, females in single household are less likely to take financial actions to build wealth for the future by investing in financial assets (stocks, bond, mutual

funds, or other security) or funding a retirement by establishing and funding an individual retirement account that is outside of any employment accounts for retirement.

Table 3 shows results for joint households (n=12,399). The main variables of interest are how Female-DM, Equal-DM, and Other-DM compare with the omitted group, Male-DM. The results show that females who are most likely the financial decision-maker in joint households are 15 percentage points less likely to pay their credit card in full, 11 percentage points less likely to have an emergency fund, 15 percentage points less likely to have non-retirement investments, and 9 percentage points less likely to have non-employer retirement accounts compared to joint households in which males who are most likely the main financial decision-maker.

[Insert Table 3 about here]

What is further revealing is that estimates for the percentage point differences between female and male decision-makers within single households compared joint households are about the same for each financial behavior (respectively: 13 and 15 for credit cards; 10 and 11 for emergency fund; 14 and 15 for non-retirement investments; and 10 and 9 for having an individual retirement account outside of employment). These outcomes suggests that financial practices found with female decision-makers in single households may not be that much different from the financial practices in joint households in which females are the main decision-maker. The strong similarity in the findings also lends support to the study's working assumption that females in joint households who report being the most financially knowledgeable also are likely to be the main financial decision-maker as that is the case for the female sample in single households.

Another surprising finding is that joint households with equal sharing the financial decision-making responsibility between females and males are significantly less likely to practice prudent or positive financial behaviors relative to ones in which males are most likely the main financial decision-maker. Although the size of these coefficient differences are smaller for Equal-DM than those found for Female-DM compared with Male-DM, they also are sizable. In this comparison, equal decision-makers are 10 percentage points less likely to pay their credit card in full, 6 percentage points less likely to have an

emergency fund, 10 percentage points less likely to have non-retirement investments, and 8 percentage points less likely to have non-employer retirement accounts than male decision-makers.

Although it is possible to make comparisons between households in which someone else is the decision-maker (Other-DM) and the other three categories for decision-makers (Male-DM, Female-DM, or Equal-DM), the results from such comparisons are difficult to interpret with any degree of confidence as the gender composition of Other-DM is unknown. For example, in the Other-DM versus Male-DM comparison, the differences are mixed: significant for male decision-makers for two behaviors and insignificant for two other behaviors. Why this difference occurs seems to be a matter of pure speculation, so accordingly any further discussion of Other-DM comparisons is avoided.

Robustness Checks

Several robustness checks were conducted to investigate whether these results changed based on analysis with different subsamples of the 2018 NFCS sample. The first one split the sample into different age cohorts. The second one split the sample based on a low or high level of financial literacy. Further investigation was conducted using the same analysis but with an NFCS sample from a prior year (2015) to assess whether the basic findings remained stable over time and were not unique to the 2018 survey year. For brevity, the appendix tables reporting the results only include the main variables of interest for single household (gender) and joint households (gendered decision-maker).

To study how if financial decision-making by gender appeared to change by age, the data were split into three different age cohorts: (1) 18-34 to examine how younger adults behave; (2) 35-54 to understand how middle-aged adults behave, and (3) 55+ to see how older adults behave. The results are generally consistent with the full sample of single households (Table 2) that show single females at a significant disadvantage relative to single males. Among female 18-34 years-old, the difference in financial behaviors ranges from 9 to 19 percentage points. Among females 35-54 years old, the difference is somewhat worse as the difference in financial behaviors ranges from 13 to 18 percentage points. The gender gap, however, across all four behaviors appears to decrease substantially in size when females move into the 55+ cohort,

but the difference remains significant for two of them (paying a credit card bill in full and having an emergency fund).

Appendix C shows the results from the probit analysis of joint households based on the three age cohorts. The results for each age cohort are similar to what was reported with the full joint household sample (Table 3). They show that the main financial decision makers in a joint household, regardless of their age cohort, appear likely to practice prudent financial behaviors compared with men in the same age cohort. Younger women (18-24) are 15-25 percentage points less likely to positively engage in any of the financial behaviors, an outcome that is surprising given more women at that age would have taken financial education in high school (CEE, 2020). Among the 35-54 cohort, the adverse difference in financial behaviors the difference is 8 and 14 percentage points. For older women (55+), the adverse difference is between 5 and 9 percentage points.

The second robustness check involved splitting the single and joint household samples based on the level of financial literacy. This split would permit an assessment of whether the findings for each sample still hold for those financial decision-makers who appear to have a low level of financial literacy or a high level of financial literacy. The assessment is an important one to conduct as prior research indicates that there are sizable differences in the financial literacy of women compared with men (Lusardi and Mitchell 2014). Financial literacy was measured with the summated score for the correct responses to six objective test questions included on the NFCS survey. Individuals with a score of 3 or below were in the low financial literacy group and those with a score of 4 or more we in the high financial literacy group.

For single households, the results for either the low or high financial literacy group (Appendix E) are like those for the full single household sample (Table 2). For the split sample with lower financial literacy scores, females are 10-15 percentage points less likely to engage in any of the financial behaviors compared to single males. The results for the split sample with higher financial literacy scores is about the same, as it ranges from 10 to 14 percentage points. The findings from the two sample splits suggest that regardless of financial literacy single women appear to struggle with make prudent financial decision relative to single men.

In joint households, female financial decision-makers also are at a disadvantage relative to male financial decision-makers, regardless of the lower or higher level of financial literacy (Appendix E). This result is consistent with what was found with the analysis with the full joint sample (Table 3). However, the split analysis does show some difference based on the level of financial literacy. Female-DM with low financial literacy were 12-21 percentage points less likely to engage positively in the four financial behaviors compared to Male-DM, but Female-DM with higher financial literacy were only 4-11 percentage points less likely to engage positively in the financial behaviors compared to male-DM. While women seemed to be at a disadvantage in both sample splits for joint households it appears that increasing financial literacy through financial education would be beneficial for women.

The third robustness check was to evaluate whether the findings appear to be stable over time and are not largely influenced by the year in which the survey data were collected. The data for the study came from the most recent NFCS survey (2018). Since the NFCS is conducted tri-annually, it was possible to obtain the 2015 NFCS data and conduct the same analysis with it to check for the stability of the findings at two points in time (Appendix F). The results for single households with the 2015 NFCS data also show that single females are at a disadvantage in their financial behavior relative to single males as was report with the 2018 NFCS data (Table 2). The results using 2015 data also show that female financial decision-makers in joint households are at a disadvantage in their financial behavior relative to male financial decision-makers as found with the 2018 NFCS data (Table 3). Taken together, the 2015 and 2018 results appear to indicate a continuing problem in financial decision-making for females in either single or joint households.

Implications and Conclusion

The findings indicate that females appear to be at a distinct disadvantage in their financial behaviors related to paying their credit cards in full, having an emergency fund, having non-retirement investments, and a retirement account independent of their employer. Single women were 9-14 percentage points less likely to engage positively in the four financial behaviors analyzed in this study compared to men. Women in joint households who were the financial decision-makers showed similar outcomes. They were 9-15

percentage points less likely to practice the behaviors compared to males who reported being the financial decision-maker.

These results are concerning for women's financial well-being. Failure to practice sound credit card behaviors can have lasting consequences. They include paying more fees and expenses, having a poor credit rating, or even being blocked them from obtaining credit later in their life. Neglecting to plan for financial shocks by having an emergency fund can put household finances at risk with one unexpected and costly expense. Not making investments to build wealth can adversely affect the standard of living in the future. Inadequate planning and saving for retirement make a household is ill-prepared for the time in life that depends on accumulated financial assets as the source of household income. Each of these financial problems can likely be avoided with prudent financial management of household resources and careful consideration of household financial decisions.

Finding ways to address this serious problem for women will be a continuing challenge in the coming decades. Several studies show that financial literacy is important and may be a key indicator to improving financial behaviors (Allgood and Walstad 2016; Huston 2012; Lusardi 2012; Lusardi and Mitchell 2014). Financial education is one way to improve financial literacy and appears to be especially effective in improving financial behaviors that involve decision-making and planning for the future (Kaiser et al. 2021; Wagner 2018; Wagner and Walstad 2019). Another avenue of support for women could come from receiving financial advice or counseling (Bucher-Koenen et al. 2017). One survey found that women who worked with financial advisors were more likely to feel confident making financial decisions (Prudential 2015). Building financial confidence can be especially important for making sound financial decisions and improving investing and saving behaviors. Technology also can help by providing useful information and online resources that help women manage their personal finances and avoid financial problems before they become a crisis.

Ultimately, closing the gender gap that affects financial behaviors of women will require a broad collaboration and participation among many groups: researchers, educators, business leaders, social workers, parents, and other interest parties. More research is especially important for identifying the

economic, social, or psychological factors that explain why the gender gap occurs and which ones contribute most to its development. The research insights will be useful for improving practices in education and technological innovations that can best counter or ameliorate those key factors. Addressing the gender gap in financial behavior will require more research and creative experimentation to find innovative methods and venues that work for women and are shown to be effective in financial practice.

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Table 1. Descriptive Statistics

	(1) Single		(2) Cohabitating/Married	
	Mean/prop.	sd	Mean/prop.	sd
Gender				
Female	0.5131	0.4999		
Male-DM			0.3494	0.4768
Female-DM			0.2181	0.4130
Equal-DM			0.3435	0.4749
Other-DM			0.0890	0.2848
Demographics				
Age	47.0201	18.0192	50.5284	15.7790
Less than high school	0.0133	0.1146	0.0122	0.1097
High School	0.2376	0.4256	0.2448	0.4300
Some College	0.3062	0.4609	0.2563	0.4366
College	0.3209	0.4668	0.3319	0.4709
Post Grad Education	0.1221	0.3274	0.1548	0.3617
Married	0	0	0.8868	0.3169
Living with Partner	0	0	0.1132	0.3169
Single	1	0	0	0
Has Children	0.2037	0.4028	0.4328	0.4955
Less than $25k	0.2902	0.4539	0.0559	0.2297
$25-50k	0.3268	0.4691	0.2020	0.4015
$50-75k	0.1915	0.3935	0.2278	0.4195
$75-150k	0.1685	0.3744	0.4008	0.4901
$150k+	0.0230	0.1499	0.1135	0.3172
Self Employed	0.0799	0.2711	0.0684	0.2524
Employed	0.6147	0.4867	0.6007	0.4898
Not in Labor Force	0.1169	0.3213	0.1160	0.3202
Unemployed	0.0403	0.1966	0.0190	0.1364
Retired	0.2281	0.4196	0.2644	0.4410
White	0.6007	0.4898	0.7145	0.4517
Financial Behaviors				
Pays CC in Full	0.5377	0.4986	0.5669	0.4955
Emergency fund	0.5314	0.4991	0.6417	0.4795
Has Non-Retirement Investments	0.3523	0.4777	0.4628	0.4986
Retirement accounts	0.3439	0.4750	0.4950	0.5000
Observations	6462		12,399	

Table 2. Financial behaviors for single households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
Female	-0.1251***	-0.1013***	-0.1396***	-0.0975***
	(0.015)	(0.015)	(0.014)	(0.014)
White	0.0149	0.0145	0.0282*	0.0655***
	(0.017)	(0.016)	(0.015)	(0.015)
Self Employed	0.0151	0.0476*	0.0536**	0.0103
	(0.028)	(0.027)	(0.026)	(0.025)
Not in Labor Force	0.0086	-0.0649**	-0.0842***	-0.1035***
	(0.025)	(0.026)	(0.024)	(0.026)
Unemployed	0.0376	-0.0365	-0.1018***	-0.0772**
	(0.039)	(0.041)	(0.034)	(0.035)
Retired	0.0701***	0.0888***	0.0231	-0.0062
	(0.024)	(0.024)	(0.023)	(0.022)
Has Children	-0.0160	-0.0074	0.0553***	0.0685***
	(0.019)	(0.019)	(0.019)	(0.019)
Age	-0.0341***	-0.0149***	-0.0142***	-0.0036
	(0.002)	(0.003)	(0.002)	(0.002)
Age^2	0.0003***	0.0002***	0.0002***	0.0001***
	(0.000)	(0.000)	(0.000)	(0.000)
Less than $25k	-0.2517***	-0.3751***	-0.3046***	-0.3002***
	(0.022)	(0.020)	(0.017)	(0.017)
$25-50k	-0.2189***	-0.2357***	-0.2251***	-0.2206***
	(0.020)	(0.019)	(0.016)	(0.016)
$50-75k	-0.1019***	-0.1347***	-0.1325***	-0.1164***
	(0.023)	(0.022)	(0.017)	(0.018)
$150k+	0.1991***	0.1448***	0.1299***	0.0253
	(0.051)	(0.051)	(0.050)	(0.044)
Less than high school	-0.1268**	-0.2275***	-0.2020***	-0.0986*
	(0.061)	(0.060)	(0.049)	(0.059)
High School	-0.0027	-0.0636***	-0.0674***	-0.0625***
	(0.020)	(0.019)	(0.018)	(0.018)
Some College	-0.0466***	-0.0750***	-0.0336**	-0.0583***
	(0.017)	(0.017)	(0.015)	(0.015)
Pseudo R^2	.0916	.1140	.1294	.1250
Observations	6462	6462	6462	6462

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 3. Financial behaviors for joint households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
Female-DM	-0.1467***	-0.1085***	-0.1478***	-0.0920***
	(0.014)	(0.014)	(0.013)	(0.014)
Equal-DM	-0.0990***	-0.0641***	-0.1034***	-0.0762***
	(0.012)	(0.012)	(0.012)	(0.012)
Other-DM	-0.0653***	-0.0456**	-0.0152	-0.0055
	(0.019)	(0.019)	(0.019)	(0.019)
Married	0.0594***	0.0359**	0.0006	0.0310*
	(0.018)	(0.017)	(0.017)	(0.017)
White	0.0049	-0.0005	0.0076	0.0309**
	(0.013)	(0.013)	(0.013)	(0.013)
Self Employed	0.0730***	0.1091***	0.1151***	0.0999***
	(0.019)	(0.017)	(0.020)	(0.020)
Not in Labor Force	-0.0184	-0.0149	-0.0266	-0.0313*
	(0.017)	(0.016)	(0.017)	(0.017)
Unemployed	-0.0470	-0.0549	-0.1219***	-0.0829**
	(0.039)	(0.038)	(0.039)	(0.037)
Retired	0.1321***	0.1204***	0.1085***	0.0849***
	(0.017)	(0.016)	(0.017)	(0.017)
Has Children	-0.0598***	-0.0738***	-0.0171	-0.0104
	(0.012)	(0.012)	(0.012)	(0.012)
Age	-0.0282***	-0.0133***	-0.0188***	-0.0069***
	(0.002)	(0.002)	(0.002)	(0.002)
Age^2	0.0003***	0.0002***	0.0002***	0.0001***
	(0.000)	(0.000)	(0.000)	(0.000)
Less than $25k	-0.1400***	-0.2909***	-0.2363***	-0.2307***
	(0.025)	(0.025)	(0.022)	(0.024)
$25-50k	-0.1297***	-0.1867***	-0.2133***	-0.2121***
	(0.015)	(0.015)	(0.013)	(0.014)
$50-75k	-0.0946***	-0.1016***	-0.1263***	-0.1347***
	(0.013)	(0.013)	(0.012)	(0.012)
$150k+	0.0991***	0.1030***	0.1510***	0.1005***
	(0.017)	(0.016)	(0.017)	(0.017)
Less than high school	-0.1288***	-0.2159***	-0.2597***	-0.2182***
	(0.050)	(0.052)	(0.043)	(0.046)
High School	-0.0393***	-0.0469***	-0.0853***	-0.1163***
	(0.013)	(0.013)	(0.013)	(0.013)
Some College	-0.1071***	-0.0688***	-0.0922***	-0.0829***
	(0.013)	(0.012)	(0.012)	(0.012)
Pseudo R^2	.0951	.1150	.1173	.1242
Observations	12,399	12,399	12,399	12,399

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix A: Financial behaviors for married households and cohabitating households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
Married Households				
Female-DM	-0.1402***	-0.1056***	-0.1345***	-0.0841***
	(0.015)	(0.015)	(0.014)	(0.015)
Equal-DM	-0.0888***	-0.0616***	-0.0938***	-0.0736***
	(0.013)	(0.013)	(0.012)	(0.013)
Other-DM	-0.0624***	-0.0396**	-0.0173	0.0028
	(0.020)	(0.020)	(0.020)	(0.020)
Pseudo R^2	.0965	.1138	.1157	.1106
Observations	11,108	11,108	11,108	11,108
Cohabitating Households				
Female-DM	-0.1637***	-0.1154***	-0.1969***	-0.1087***
	(0.038)	(0.040)	(0.034)	(0.034)
Equal-DM	-0.1626***	-0.0724*	-0.1699***	-0.0824**
	(0.039)	(0.041)	(0.033)	(0.032)
Other-DM	-0.0700	-0.0864	0.0315	-0.0392
	(0.056)	(0.061)	(0.058)	(0.057)
Pseudo R^2	.1159	.1147	.1581	.1910
Observations	1291	1291	1291	1291

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix B. Financial behaviors split by age for single households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
18-34				
Female	-0.1339***	-0.0878***	-0.1889***	-0.1094***
	(0.027)	(0.028)	(0.025)	(0.024)
Observations	1855	1855	1855	1855
35-54				
Female	-0.1787***	-0.1301***	-0.1703***	-0.1357***
	(0.027)	(0.026)	(0.024)	(0.025)
Observations	1924	1924	1924	1924
55+				
Female	-0.0535**	-0.0504**	-0.0255	-0.0176
	(0.023)	(0.022)	(0.021)	(0.022)
Observations	2682	2682	2682	2682

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix C. Financial behaviors split by age for joint households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
18-34				
Female-DM	-0.2464***	-0.1797***	-0.2354***	-0.1471***
	(0.028)	(0.030)	(0.026)	(0.026)
Equal-DM	-0.1984***	-0.1263***	-0.2292***	-0.1780***
	(0.028)	(0.030)	(0.026)	(0.026)
Other-DM	-0.1573***	-0.0926**	-0.0863**	-0.0528
	(0.039)	(0.041)	(0.037)	(0.037)
Observations	2420	2420	2418	2420
35-54				
Female-DM	-0.1415***	-0.1212***	-0.1431***	-0.0841***
	(0.022)	(0.023)	(0.021)	(0.022)
Equal-DM	-0.1082***	-0.0995***	-0.1179***	-0.0833***
	(0.021)	(0.022)	(0.019)	(0.020)
Other-DM	-0.0985***	-0.0916***	-0.0093	0.0072
	(0.033)	(0.034)	(0.032)	(0.032)
Observations	4327	4327	4327	4327
55+				
Female-DM	-0.0846***	-0.0464**	-0.0905***	-0.0454**
	(0.022)	(0.020)	(0.021)	(0.021)
Equal-DM	-0.0446***	-0.0083	-0.0359**	-0.0197
	(0.017)	(0.015)	(0.017)	(0.017)
Other-DM	-0.0089	0.0037	0.0077	-0.0014
	(0.027)	(0.023)	(0.028)	(0.027)
Observations	5652	5652	5652	5652

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix D. Financial behaviors split by financial literacy for single households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
Lower financial literacy (score<3.5)				
Female	-0.1369***	-0.1324***	-0.1503***	-0.0953***
	(0.021)	(0.020)	(0.018)	(0.018)
Observations	3575	3575	3575	3575
Higher financial literacy (score>3.5)				
Female	-0.1251***	-0.1013***	-0.1396***	-0.0975***
	(0.015)	(0.015)	(0.014)	(0.014)
Observations	6462	6462	6462	6462

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix E. Financial behaviors split by financial literacy for joint households

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
Lower financial literacy (score < 3.5)				
Female-DM	-0.2067***	-0.1429***	-0.1597***	-0.1168***
	(0.020)	(0.022)	(0.019)	(0.020)
Equal-DM	-0.1634***	-0.1106***	-0.1216***	-0.1057***
	(0.020)	(0.020)	(0.018)	(0.019)
Other-DM	-0.1248***	-0.0811***	-0.0119	-0.0101
	(0.026)	(0.027)	(0.025)	(0.026)
Observations	5387	5387	5387	5387
Higher financial literacy (score > 3.5)				
Female-DM	-0.0888***	-0.0734***	-0.1097***	-0.0437**
	(0.019)	(0.018)	(0.019)	(0.018)
Equal-DM	-0.0418***	-0.0140	-0.0615***	-0.0242
	(0.016)	(0.015)	(0.016)	(0.015)
Other-DM	0.0020	-0.0004	0.0113	0.0265
	(0.029)	(0.026)	(0.029)	(0.028)
Observations	7012	7012	7012	7012

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix F: Financial behaviors for single and joint households using 2015 NFCS data

	(1) CC paid in full	(2) Has emergency fund	(3) Has non-retirement Investments	(4) Has non-employer Retirement
Single households				
Female	-0.1033***	-0.0653***	-0.0785***	-0.0399***
	(0.014)	(0.014)	(0.013)	(0.013)
Observations	6512	6512	6512	6512
Joint households				
Female-DM	-0.1046***	-0.0771***	-0.0881***	-0.0495***
	(0.014)	(0.013)	(0.013)	(0.013)
Equal-DM	-0.0645***	-0.0518***	-0.0871***	-0.0576***
	(0.012)	(0.012)	(0.011)	(0.012)
Other-DM	-0.0237	-0.0429**	-0.0011	-0.0094
	(0.021)	(0.020)	(0.020)	(0.020)
Observations	12,881	12,881	12,881	12,881

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

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