

The Context and Effects of Financial Literacy in Canada

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ABSTRACT

The Context and Effects of Financial Literacy in Canada

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In the era of increasingly complex financial product-offerings, consumers face difficulty when it comes to making financial decisions. There is a plethora of options when it comes to choosing a bank, credit card, mortgage, or other financial offering. Financial literacy is a crucial element in not only making these decisions easier, but also in ensuring the consumer's confidence in his/her financial decisions and financial wellbeing. This study explores the context and effects of financial literacy using data from three consumer omnibus surveys collected by Leger 360 on behalf of Equifax Canada Co. (hereafter "Equifax"). Study 1 focuses on the effect of socio-demographic variables. Age is found to have an inverted quadratic relationship with financial literacy, and men tended to score higher in financial literacy. Positive linear relationships were also uncovered between financial literacy and income, education level, and self-graded financial literacy score. Study 2 looks into the relationship between financial uncertainty, savings/debt inclination, and home ownership. Financial uncertainty from both job insecurity and lack of financial education is found to have a negative linear effect on savings-inclination, which then has a negative effect on home-ownership. Study 3 investigates three aspects of financial behaviour: saving, retirement, and having adequate financial information. Three linear relationships are uncovered between these three aspects and financial situation, job concern, and parental financial teaching. Collectively, these studies connect financial literacy to home ownership and financial behaviour, demonstrating the importance of these variables to individual consumers, financial institutions, and the economy in a Canadian context.

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INTRODUCTION

The Great Recession of the late 2000s exposed the need for financial literacy, with several researchers finding that the subprime mortgage crisis was partially triggered by “erroneous financial decisions made at the household level” (Henager and Cude, 2016; cited by Alhenawi and Elkhail, 2013, p. 212). Simultaneously, financial products are described by the Canadian government as “more complex than ever” (Anon A, 2015, p. 5). In the modern era, there is a need for consumers to gain a better understanding of financial products in order to make better financial decisions.

Starting in 2009, the Canadian government embarked on a number of initiatives to address financial literacy. In 2009, the Task Force on Financial Literacy was established, leading to the 2012 designation of a “Financial Literacy Month” every November. In 2014, the Financial Literacy Leader Act appointed Jane Rooney as Canada’s Financial Literacy Leader, with the goal of helping Canadians “enhance their financial knowledge and skills and increase confidence in dealing with money matters” (Anon A, 2017, p. 3). Released in June of 2015, the National Strategy for Financial Literacy – Count me in “supports [the Canadian] government’s top priority of creating jobs, growth and long-term prosperity by ensuring that all Canadians have the knowledge, skills and confidence to make responsible financial decisions” (Anon A, 2017, p. 2).

The strategy has three goals: to help Canadians “manage money and debt wisely; plan and save for the future; and prevent and protect against fraud and financial abuse” (Anon A, 2017, p. 7). To achieve these goals, the strategy identified four stakeholder groups: (1) the Financial Literacy Leader, (2) the National Steering Committee on Financial Literacy, (3) public, non-profit, and private sector organizations, and (4) Canadian citizens (Anon A, 2017).

Equifax represents one of the private sector stakeholders. According to its website, Equifax is “a global information solutions company that uses unique data, innovative analytics, technology and industry expertise to power organizations and individuals around the world by transforming knowledge into insights that help make more informed business and personal decisions” (Anon B, 2017). At Equifax Canada, the Director of Consumer Advocacy position was created in 2018, representing a corporate shift towards consumer-orientation. Part of that role included supporting consumer research in the form of a 2018 Financial Literacy Month survey, following a 2017 Generational survey, and a 2018 Generational survey. This thesis will build on these surveys in order to understand the context and effects of financial literacy and to

develop theoretical and managerial implications based on consumer data collected in a Canadian context.

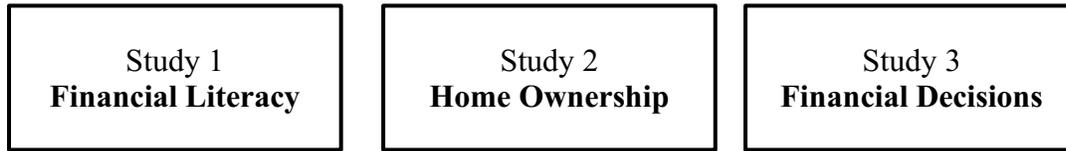
This research offers several theoretical contributions. In Study 1, with the 2018 Financial Literacy Month Survey, an index is generated to measuring financial literacy, expanding on the work of Remund (2010), Bajo (2015), Chen and Volpe (2002), Lusardi and Mitchell (2007), and Alhenawi (2013), who previously developed their own scales. The importance of financial literacy translates into positive financial behaviour, like saving (Maudin et al., 2016). For this reason, financial literacy will be the focus of the first study. It uncovers relationships between consumers' financial literacy score and socio-demographic behavioural variables.

Study 2, utilizing the 2017 Generational Survey, focuses on home ownership. A new model links financial uncertainty to savings and debt inclination, and savings and debt inclination to home ownership. It provides insight into the obstacles of home ownership. Home ownership has been linked to positive wealth accumulation (Cox and Followill, 2018; Rohe et al., 2002b; Flavin and Yamashita, 2002). However, home ownership also implies a restricted cash flow (Beracha et al., 2017). With linear regression, a relationship is uncovered between financial uncertainty, savings/debt inclination, and home ownership.

Study 3, incorporating the 2018 Generational Survey, addresses multiple types of financial behaviour: saving tendencies, retirement expectations, and financial information access. Three linear relationships are supported: negative or unstable financial situation has a negative effect on saving tendencies, job insecurity has a negative effect on retirement expectations, and parental financial teaching has a positive effect on an adult having adequate financial information. This model expands upon that of Mahdzan et al. (2017), who linked future financial expectations to retirement. Furthermore, it builds on the save/spend life-cycle theory from Mitchell and Utkus (2003), as well as the saving behaviour finds of Shefrin and Thaler (1998) and Sussman and O'Brien (2016).

This paper is structured so that the conceptual development and hypotheses, methodology, results, and discussion are embedded in each of the three study sections. For the R code used in this study, please see the Appendix.

Figure 1. Conceptual Model of 3 Studies



GENERAL METHODOLOGY

This study utilized existing data from three of Equifax’s surveys: the 2018 Financial Literacy Month Survey, 2017 Generational Study, and 2018 Generational Study. These surveys were co-authored by Equifax and Select PR, who then utilized a third-party, Leger 360, in order to distribute the surveys as part of an omnibus. In each of the omnibus surveys, approximately 1500 participants per survey were screened for age, gender, region, and ethnicity, in order to proportionately reflect the Canadian population. Leger 360 adhered to The World Association for Public Opinion Research standards. Participant data was anonymized so that no personally identifiable information would be shown. This study’s research protocol was also approved by Concordia University Human Research Ethics Committee (UHREC) and followed the University’s guidelines for research involving human participants.

STUDY 1 –FINANCIAL LITERACY (2018 Literacy)

CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Financial Literacy

Definition

Financial literacy includes both financial knowledge and decision making (Remund, 2010). The U.S. Jump\$tart Coalition for Personal Financial Literacy proposed the following definition, later adopted by the U.S. government, "Financial literacy is the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being" (Schwab, 2009, p. 10). This definition outlines a path: financial knowledge, management, and then well-being. It represents the U.S. government's approach to clarify what financial literacy means. Remund (2010) proposed the following definition, "Financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions" (p. 284). Unlike the first definition, Remund (2010) highlights different aspects: financial understanding, ability, confidence, but also being forward-thinking, planning ahead, and remaining adaptable when the financial situation shifts. In 2011, The Organisation for Economic Co-operation and Development (OECD) noted that "The definition [of financial literacy] may focus solely on the personal use and management of money and the impacts of financial decisions on the lives of individuals or it may include a broader perspective that takes account of the interaction between personal financial decision-making and wider society and environment" (cited by McGregor, 2016, p. 606). Through this statement, OECD highlights that finances extend beyond personal matters. Both individuals and societies are responsible when it comes to financial literacy.

Importance

Financial literacy has a tremendous effect on individual financial decisions. Brown et al. (2015) found that there is a "direct correlation between financial literacy and financial well-being" (p. 2491). Bajo (2015) provided two explanations for this correlation: assets and liabilities. In regards to assets, Bajo (2015) found that "poor financial literacy affects saving and investment decisions, accumulation of wealth, access to financial markets, and portfolio choices"

(p. 158). Lusardi and Mitchell (2007) found that savings are also negatively affected by low financial literacy. Therefore, someone who has low levels of financial literacy will not only have low levels of savings, but also have difficulty gaining wealth, as they may make poor portfolio choices. Looking at liabilities, Bajo (2015) writes, “Poor financial literacy influences financing decisions in terms of funding costs, refinancing choices, and risk of over-indebtedness and financial distress” (p. 158). In essence, the degree to which a person is financially literate will influence their financial state, as they will have difficulty emerging out of financial distress because they have limited financing options.

Measurement

When it comes to measurement of financial literacy, the most common method consists of surveys. Questions from government, private, and academic surveys range from testing financial knowledge/awareness to measuring financial behaviours like budgeting, saving, borrowing, and investing (Remund, 2010). In the case of private corporate surveys, like that of the European Markets in Financial Instruments Directive (MiFID), the questions are aimed to “assess the client’s financial knowledge and experience” (Bajo, 2015, p. 5). This information, as well as information on the clients’ risk tendencies, are used by Italian banks to determine whether or not a retail client should be approved for a financial instrument (Bajo, 2015). Chen and Volpe (2002) utilized a scoring system to assign values to correct answers for General Knowledge, Saving and Borrowing, Insurance, and Investments. Lusardi and Mitchell (2007) measures financial literacy through two sets of questions, labeled “Basic” and “Sophisticated” (p. 6-7). In the “Basic” set, participants are asked to answer a series of computation questions using percentages. In the “Sophisticated” set, participants are asked a series of knowledge-based questions regarding stocks, mutual funds, and financial risk. Alhenawi (2013) utilizes a different set of questions to test financial literacy, asking about long-term financial choices and situational decisions regarding interest rates, liquidity, and credit scores. Remund (2010), Bajo (2015), Chen and Volpe (2002), Lusardi and Mitchell (2007), and Alhenawi (2013) demonstrate that the specific measurement of financial literacy can vary extensively throughout public, private, and academic research.

Demographics

Over the last decade, many researchers have investigated the role of socio-demographic variables on financial literacy. Lusardi and Mitchell (2014) and Bajo et al. (2015) observed variable of age. Chen and Volpe (2002), Wagland and Taylor (2009), and Hung et al. (2009) looked into gender. Alhenawi and Lusardi and Mitchell (2007b) delved into income. Worthington (2006) and Monticone (2010) explored education level. Agnew and Szykman (2005) and Lusardi and Mitchell (2014) investigated the effect of self-assessed knowledge. In a societal context, the Canadian Financial Literacy Database also addresses socio-demographics by providing financial information for fifteen groups of people, including educators, seniors, students, unemployed/underemployed, women, and young adults (Anon C., 2018). These government resources demonstrate that, while sometimes politically controversial, age, gender, income, and education level are all socio-demographic factors that are important for researchers to investigate.

Age

Previous research has uncovered a quadratic relationship between age and financial literacy. Lusardi and Mitchell (2014) looked at a 2014 U.S. Health and Retirement study module on financial literacy and found that high school/college students have low investment and saving knowledge, as do people above the age of 50. The results project a “hump-shaped” financial literacy life cycle, with the lowest scores found in the young and old (Lusardi and Mitchell, 2014). Bajo et al. (2015) examined 38,000 MiFID questionnaires from an Italian bank in order to test a sample in Southern Italy. While mapping out the results of awareness of financial instruments in relation to age, Bajo et al. (2015) uncovered a non-linear effect in that 21-29 year olds have the lowest financial awareness, and 43-45 year olds are at the peak, decreasing significantly by age 67. One possible explanation for this inverted quadratic relationship between age and financial literacy is that younger people are new to the workforce and may not have much financial experience. Middle-aged people in their forties and fifties may need to acquire more financial knowledge in order to make decisions regarding home purchases. Once people hit retirement, the financial planning turns into execution, and there is less concentration on acquiring financial knowledge. The fact that these same results hold true in multiple countries suggests that the results may also be mirrored in this Canadian study.

H1: Age has an inverted quadratic relationship with financial literacy.

Gender

Studies examining financial literacy have also found differences between men and women. Chen and Volpe (2002) issued a 36-question survey on personal finance knowledge, savings and borrowing, insurance, and investments, finding that men scored 57% of the questions correctly, while women scored 51% correctly. Lusardi and Mitchell (2014) found that men answered a greater percentage of correct answers in all age groups, in the U.S., Germany, Netherlands, and Sweden. Lusardi and Mitchell (2014) explained this trend by citing a study of a female U.S. liberal arts college by Mahdavi and Horton (2012). Despite the participants of the study being well-educated, their financial literacy scores were low. Fonesca et al. (2012) used data from the Research and Development (RAND) American Life Panel to find a correlation coefficient that they connect to household specialization; “men specialize in making household financial decisions thereby acquiring financial knowledge and women specialize in other household functions” (p. 105). Fonesca et al. (2012) propose that this finding suggests that the acquisition and production of financial literacy itself is different depending on gender. Hsu (2011) uncovered a similar finding, in a study using empirical data from a U.S. sample of people above the age of 51, also uncovering a trend that women acquire more financial literacy once they encounter widowhood. Similar to Fonesca et al. (2012), Hsu (2011) attributed this trend to a difference in division of labor and finance management between men and women. Another explanation for different financial literacy between genders is the role of self-confidence. In a study looking at gender differences and willingness to guess in an Italian University sample, Cipriani (2018) found that women tend to leave more questions blank, rather than guess. By choosing to not answer, women in this study demonstrated risk-aversion, which could be a reason for lower financial literacy when the scores are measured based on the number of correct answers. This study will test whether these findings hold in a Canadian sample.

H2: Men (vs. women) will score higher in financial literacy.

Income

Using data from a 2006 Italian survey, Monticone (2010) found a small, positive correlation between wealth and financial knowledge. Monticone (2010) explains this correlation by citing Ben-Porath (1967)'s concept of human capital. Wealthy people may see financial literacy as an investment of human capital, which will then generate monetary capital and turn into a positive feedback loop. Alhenawi (2013) addresses this correlation by attributing it to

financial planning skills and saving-behaviour, which increases with financial education. Another reason could be found in the tendency for wealthier people to be more comfortable in risk taking, which, according to Alhenawi (2013), can increase stock-investments, which also adds to the positive feedback loop of wealth and financial literacy. It is important to note that a positive correlation does not equate to a causal relationship, as Lusardi and Mitchell (2007b) explain through their RAND American Life Panel study, wealth may also be the result of increased financial literacy. For the purposes of this study, wealth will be measured by annual income, and a non-causal relationship will be determined.

H3: Income has a positive linear relationship with financial literacy.

Education level

Income and education level are strongly related, as Worthington (2006) found both factors increase the levels of financial literacy. Specifically, in Worthington (2006)'s Australian sample, university graduates had higher financial literacy levels than non-university graduates. Monticone (2010) uncovered the same association of higher education and higher financial literacy, citing Lyons et al. (2007) to explain that higher education is associated with more awareness of components of financial literacy like credit. Another reason is that higher education is associated with higher cognitive ability, which Delavande et al. (2008) found directly impacted participants' financial knowledge in their empirical study using data from the American Life Panel and Cognitive Economics survey. Alhenawi (2013) also found a positive correlation between education level and financial literacy his U.S. sample with the exception of University doctorates, which he attributes to possible sampling error. This research will examine if education level does positively influence financial literacy, as well as test if University doctorates are indeed an exception.

H4: Education level has a positive linear relationship with financial literacy.

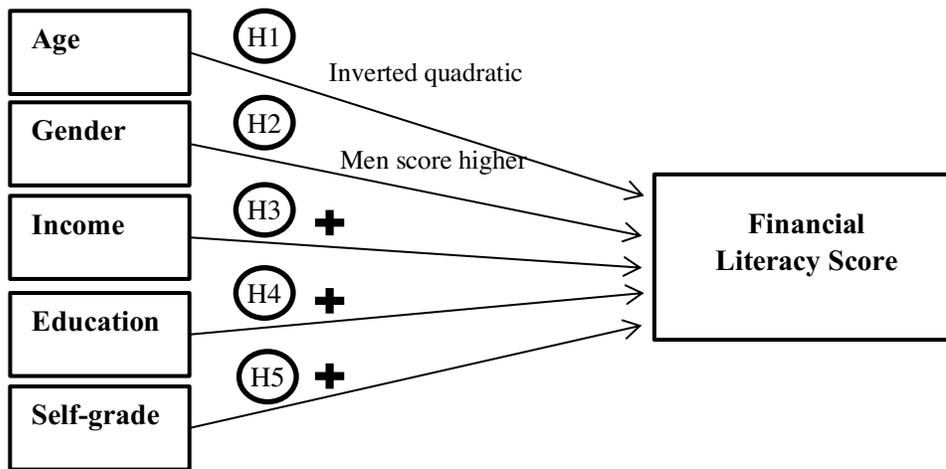
Self-graded financial literacy score

In their study of financial information absorption using American university students, Agnew and Szykman (2005) found that people's inclination to search for financial information is affected by their existing financial knowledge. Agnew and Szykman (2005) explain that people that have the highest financial knowledge tend to not seek out more financial information, as they feel that they are experts. People with the lowest financial knowledge feel discouraged

because they do not feel that seeking financial information will make a difference. Finally, people with moderate financial knowledge tend to do the most financial research. These findings demonstrate the role that self-perception of knowledge on financial information search, which then impacts financial literacy. Approaching self-perception from another angle, Lusardi and Mitchell (2014) reported that there is “often a substantial mismatch between peoples’ self-assessed knowledge versus their actual knowledge...they tend to overestimate how much they know” (p. 15). When it comes to financial literacy, Lusardi and Mitchell (2014)’s findings suggest that people may give themselves higher financial literacy scores than they actually have. This research will use bar chart visualizations to test if people’s perception of their own financial literacy matches the objective measure of their knowledge. It will also examine whether or not higher self-assessed financial literacy grades correspond with higher actual financial literacy scores. Conversely, it will test whether or not low financial literacy self-reported grades are associated with lower actual financial literacy levels. In short, this hypothesis tests whether or not self-graded financial literacy is linearly related to the objective financial literacy levels.

H5: Self-graded financial literacy has a positive linear relationship with objective measures of financial literacy.

Figure 2. Study 1 Research Model



METHODOLOGY

In order to assess level of financial literacy, a grading system was utilized, and an index was created. The answers to three questions in the 2018 Financial Literacy survey are either right or wrong. In questions 1 and 2, one correct point was awarded for each answer. In question 3, one point was awarded if the respondent chose “somewhat agree” and two points were awarded if the respondent chose “strongly agree.” The total maximum point allotment is eight; the minimum is zero.

Linear regression was used to test the effect of the following continuous variables on financial literacy: income number, self-grade of financial literacy, last check credit score, and frequency of credit check. Quadratic linear regression was used to test age number. The categorical variables: age category, gender, income category, education level, smoker self-designation, smoking within 24 months, and e-cigarette usage were tested using Analysis of Variance (ANOVA). The results of these tests are shown in Table 2. To some of the questions, survey respondents had the option to either not answer the question or choose, “I don’t know/I prefer not to answer.” These responses were coded as NA and omitted in the statistical tests. However, these responses are included in Figure 6 in the Appendix, which presents the average financial literacy score of each participant segment through bar graphs.

RESULTS

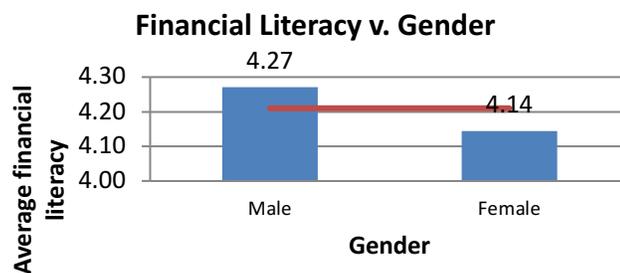
H1: Age has an inverted quadratic relationship with financial literacy. (supported)

The age variable was tested in two ways. The first method used an ANOVA test on the codes for each age category (1 = between 18 and 24, 2 = between 25 and 34, 3 = between 35 and 44, 4 = between 45 and 54, 5 = between 55 and 64, 6 = between 65 and 69, 7 = 70 and older). An F-statistic of .05 was found, meaning that age category is not a significant predictor of financial literacy. The second method used the actual age values that were written by the participants. A linear regression test found an insignificant p-value. However, as indicated in Table 2, a quadratic regression test found a p-value $< .001$. Therefore, actual age values have a quadratic relationship with financial literacy. This difference between age categories and actual age values suggests that within each age category, the financial literacy levels may differ. The adjusted R-squared is $-.0006$, which suggests that there is a large percentage of variability around the mean that is not explained by the model. For the actual age numbers, the regression coefficient is $-.0009$, indicating a negative effect.

H2: Men (vs. women) will score higher in financial literacy. (supported)

Regarding Hypothesis 2, the p-value of .20 for the relationship between gender and financial literacy does not support a linear relationship. The F-statistic is 1.65. The bar chart in Figure 3 below indicates that men had a slightly higher financial literacy score in comparison to women. Therefore, the hypothesis is supported.

Figure 3. Bar chart comparing financial literacy and gender (The horizontal line is the overall average financial literacy score.)



H3: Income has a positive linear relationship with financial literacy. (supported)

Similar to age, the income variable was tested in two ways. The first method used the codes in ANOVA tests for each income range (1 = \$19,000 or less, 2 = between \$20,000 and \$39,999, 3 = between \$40,000 and \$59,999, 4 = between \$60,000 and \$79,999, 5 = between \$80,000 and \$99,999, 6 = \$100,000 or more). The second method tested linear regression using the approximate midpoint of each range, with the exception of the first and last groups (\$20,000, \$30,000, \$50,000, \$70,000, \$90,000, \$100,000). In both methods, income had a p-value <.001. The F-statistic generated from an ANOVA test is 50.06. The regression coefficient is .000013. These results mean that the hypothesis of income being positively related to financial literacy is supported in both linear regression and ANOVA tests. The adjusted R-squared values are .035, meaning that 3.50% of the variability around the mean is explained by the model.

H4: Education level has a positive linear relationship with financial literacy. (supported)

The variable of education level in Hypothesis 4 generated a p-value <.001. The F-statistic is 40.17. The p-value indicates that education level is positively and significantly related to financial literacy.

H5: Self-grade has a positive linear relationship with financial literacy. (supported)

Hypothesis 5 states that what a person gives him/herself as a grade for financial literacy will have an effect on their objective financial literacy score. With a p-value <.001, this hypothesis is supported. The regression coefficient is .038, so one can conclude that the direction of the relationship is positive. The adjusted R-squared is .032, meaning that the model explains 3.2% of the variability around the mean.

Several additional statistical tests were performed as part of an exploratory analysis. With a p-value <.05 and a regression coefficient of .001, the number of days after a person last checks their credit score is positively related to their financial literacy. In other words, the longer someone waits to check their credit score, the higher their financial literacy score tends to be. The adjusted R-squared values are shown in Table 2 below.

Another exploratory analysis uncovered a link between cigarette smoke and poor financial literacy. Participants were asked three questions, (1) whether or not they considered themselves a smoker, (2) whether or not they smoked within the last 24 months, and (3) whether

or not they used e-cigarettes. The p-values for these questions respectively were, $< .05$, $< .1$, and $< .05$. Therefore, answering “yes” to questions (1) and (3) led to lower financial literacy scores,

Because education was noted to have a positive linear effect on financial literacy, with the exception of University doctorate students, the effect of education was checked against the effect of smoking using multiple regression. The responses to education were coupled against the following questions were retested against financial literacy: (1) whether or not they considered themselves a smoker, (2) whether or not they smoked within the last 24 months, and (3) whether or not they used e-cigarettes. In all three scenarios, the coefficient of smoking was greater than that of education. Therefore, smoking has a distinctive negative effect on financial literacy.

Table 1. Independent variables in hypotheses tests.

	Scale	N
Age number	18-75+ years	1524
Age category	1 = 18 to 24 2 = 25 to 34 3 = 35 to 44 4 = 45 to 54 5 = 55 to 64 6 = 65 to 74 7 = 75 or older	1524
Gender	1 = male, 0 = female	1524
Income number (midpoint)	<\$20,000 - >\$100,000	1366
Income category	1 = \$19,999 or less 2 = \$20K to \$39,999 3 = \$40K to \$59,999 4 = \$60K to \$79,999 5 = \$80K to \$99,999 6 = \$100K or more	1366
Education level	1=Elementary 2=High School 3=College 4=University Diploma 5=University Bachelor 6=University Master’s 7=University Doctorate	1513
Self-grade of financial literacy	A=90 B=80 C=70 D=60	1495

	F=50 NA	
Last check credit score	Within the last week = 6 Within the last month = 29 Within the last year = 364 More than a year ago = 366	1047
Frequency of credit check	Daily = 1 Weekly = 7 Monthly = 30 Once every 1-3 months = 60 Once every 4-6 months = 150 Once every 6-12 months = 240 More than Once a year = NA Never = NA	1524
Smoker self-designation	1 = True 0= False	1524
Smoking within 24 months	1 = True 0 = False	1524
E-cigarette usage	1 = True 0= False	1524

Table 2. Study 1 Statistical Results

	Regression coefficient	P-Value	R-squared (adjusted)	F statistic	P-Value
Age number	-0.0009	2.2000e-16*	-0.0006		
Age category				0.0514	0.8206
Gender				1.6510	0.1991
Income number (midpoint)	1.260e-05	3.3020e-12*	0.0342		
Income category				50.0600	2.3750e-12*
Education level				40.1700	3.0590e-10*
Self-grade of financial literacy	0.0375	2.4520e-12*	0.0317		
Last check credit score	0.0010	0.0048*	0.0066		
Frequency of credit check	0.0008	0.2017	0.0004		
Smoker self-designation				10.1200	0.0015*
Smoking within 24 months				3.3460	0.0676
E-cigarette usage				6.0060	0.0144*

Table 3. A Correlation and P-Value matrix was performed on the Financial Literacy Dataset.
 (Note: Because the sample size for the matrices is significantly smaller than that of the hypothesis testing, the p-value/correlation may not be consistent with those of the hypothesis.)

Variable Key

Variable	X
Literacy	1
Age number	2
Gender	3
Income	4
Self-grade	5
Last-check	6
Frequency	7
qsmok_1	8
qsmok_2	9
qsmok_3	10
Education	11

Correlation Matrix (Dark green indicates p-values below 0.05. Light green indicates positive correlation above 0.20. Red indicates negative correlation less than -0.20.)

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
X1	1.00	0.03	0.00	0.17	-0.12	0.07	0.08	0.05	0.08	0.07	0.13
X2	0.03	1.00	0.01	-0.02	-0.03	0.21	-0.09	0.11	0.15	0.16	-0.09
X3	0.00	0.01	1.00	-0.10	0.18	0.04	-0.04	0.02	0.04	0.07	-0.03
X4	0.17	-0.02	-0.10	1.00	-0.16	0.05	0.04	0.13	0.01	0.00	0.28
X5	-0.12	-0.03	0.18	-0.16	1.00	0.03	-0.10	-0.09	0.00	0.00	-0.17
X6	0.07	0.21	0.04	0.05	0.03	1.00	-0.10	0.06	0.06	0.10	0.02
X7	0.08	-0.09	-0.04	0.04	-0.10	-0.10	1.00	-0.03	0.02	-0.03	0.01
X8	0.05	0.11	0.02	0.13	-0.09	0.06	-0.03	1.00	-0.10	0.35	0.13
X9	0.08	0.15	0.04	0.01	0.00	0.06	0.02	-0.10	1.00	0.16	0.08
X10	0.07	0.16	0.07	0.00	0.00	0.10	-0.03	0.35	0.16	1.00	0.03
X11	0.13	-0.09	-0.03	0.28	-0.17	0.02	0.01	0.13	0.08	0.03	1.00

P-Value Matrix

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
X1	NA	0.32	0.90	0.00	0.00	0.03	0.01	0.13	0.01	0.03	0.00
X2	0.32	NA	0.73	0.59	0.30	0.00	0.01	0.00	0.00	0.00	0.01
X3	0.90	0.73	NA	0.00	0.00	0.28	0.21	0.45	0.22	0.04	0.37
X4	0.00	0.59	0.00	NA	0.00	0.14	0.21	0.00	0.70	0.95	0.00
X5	0.00	0.30	0.00	0.00	NA	0.42	0.00	0.01	0.98	0.93	0.00
X6	0.03	0.00	0.28	0.14	0.42	NA	0.00	0.06	0.07	0.00	0.56
X7	0.01	0.01	0.21	0.21	0.00	0.00	NA	0.30	0.63	0.30	0.72
X8	0.13	0.00	0.45	0.00	0.01	0.06	0.30	NA	0.00	0.00	0.00
X9	0.01	0.00	0.22	0.70	0.98	0.07	0.63	0.00	NA	0.00	0.02
X10	0.03	0.00	0.04	0.95	0.93	0.00	0.30	0.00	0.00	NA	0.31
X11	0.00	0.01	0.37	0.00	0.00	0.56	0.72	0.00	0.02	0.31	NA

DISCUSSION

As a result of statistical tests, four hypotheses were supported with p-values <.05. Age, income, and education were proven to be significantly related to financial literacy. Men also demonstrated higher financial literacy through the descriptive bar chart in Figure 3. These results illustrate the important role that socio-demographics have on a person’s absorption and execution of financial knowledge. In line with socio-demographics is a person’s impression of his/herself. This impression translates to differences in the way they grade themselves in financial literacy. Although this linear relationship is supported, the descriptive bar chart in Figure 6 of the Appendix illustrates that people still overestimate their financial knowledge. As demonstrated in Table 2, additional linear regressions were performed on the following variables: “self-grade of financial literacy,” “last check credit score,” “frequency of credit check,” “smoker self-designation,” “smoking within 24 months,” “e-cigarette usage.” An ANOVA test determined that all the variables were significant, with the exception of “smoking within 24 months.” The relationship between financial literacy and smoking has not been directly explored. It is noteworthy that all the smoking questions had different significance levels and yielded a Cronbach alpha of .23, which means that they cannot be combined into one variable with high reliability (Taber, 2018). The relationship uncovered between smoking and financial literacy supports the findings of Lusardi et al. (2010), who found that in a U.S. sample that “those who do not smoke are more likely to respond correctly to financial literacy questions” (p. 368). This study proves that this trend holds for a Canadian sample. Lusardi et al. (2010) explains this finding by citing Fuchs (1982) who found the quality of impatience to be associated with smoking, which could mean that smokers are less willing to invest time in studying financial

matters. Lusardi et al. (2010) also cites Bickel, Odum, and Madden (1999), who found that smokers have a delayed sense of “hypothetical monetary outcomes.” With this delayed sense, smokers could also have a delayed sense of urgency when it comes to financial literacy.

However, as seen in the in Figure 6 of the Appendix, the respondents that answered “yes” to smoking questions had lower financial literacy scores. “Self-grade of financial literacy,” “last check credit score,” and “frequency of credit check” yielded a Cronbach alpha of .42, which also means that they cannot be combined. Nonetheless, all of these variables yielded p-values below .05, thus demonstrating linear relationships.

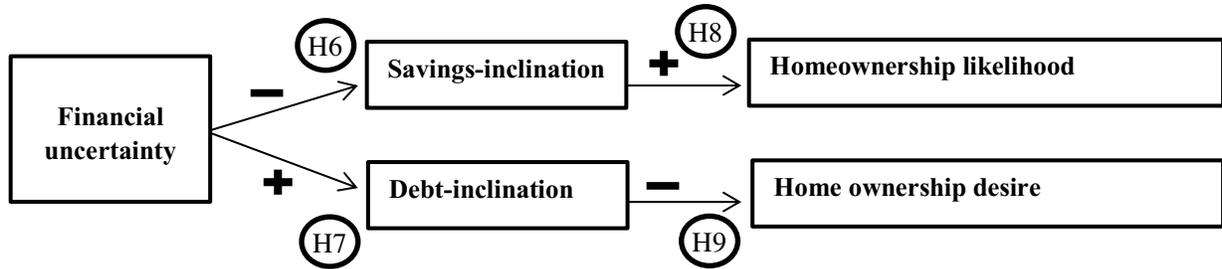
Table 4. Results of Study 1

Hypothesis	Result
H1: Age has an inverted quadratic relationship with financial literacy.	Supported
H2: Men (vs. women) will score higher in financial literacy.	Supported
H3: Income has a positive linear relationship with financial literacy.	Supported
H4: Education level has a positive linear relationship with financial literacy.	Supported
H5: Self-grade has a positive linear relationship with financial literacy.	Supported

Study 1 explored the effects of socio-demographic and behavioural variables on financial literacy. Building on the findings of Study 1, Study 2 looks at financial uncertainty, an underlying component of low financial literacy (Giannetti et al., 2014). It uses data from the 2017 Generational Survey to connect financial uncertainty to savings/debt-inclination, and home ownership.

STUDY 2 – HOME OWNERSHIP (Generational 2017)

Figure 4. Study 2 Conceptual Model



CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Individual Financial Uncertainty

In this study, financial uncertainty does not refer to the general economic climate. Rather, it refers to one's personal financial situation. It includes the uncertainty from losing one's job, as well as having a lack of financial education.

In a paper relating job insecurity and financial literacy to financial distress, Giannetti et al. (2014) uses an Italian Survey on Household Income and Wealth to conduct an empirical analysis. Through ordinal logit, Giannetti et al. (2014) found that people who earn less, tend to acquire more debt and are less able to pay off loans. Giannetti et al. (2014) also uncovered a significant negative relationship between financial literacy and financial distress, meaning that people who are highly financially literate are less likely to experience financial distress, such as excessive debt.

Also investigating the financial education component of financial uncertainty, Hoffmann et al. (2017) used Structural Equation Modelling and a mediation analysis on online survey data of U.S. consumers to find that financial uncertainty is negatively related to the use of personal financial blogs. In explaining this trend, Hoffman et al. (2017) describe financial uncertainty as a disconnect between one's financial ability and one's financial needs. Hoffmann et al. (2017) cite Berger and Calabrese (1975)'s Uncertainty Reduction Theory, in which people actively seek resources in order to lessen uncertainty, to explain why certain consumers find personal financial blogs helpful in reducing their financial uncertainty. Hoffmann et al. (2017) say that consumers who choose not to use personal financial blogs are explained by Sweeny et al. (2010)'s Information Avoidance Theory, in which consumers actively avoid information that they feel is too easily accessible and too-heavily focused on savings.

Delving into the implications of financial uncertainty, Schie et al. (2011) performed logistic regression on data from a Dutch sample of households to prove that uncertainty negatively affects savings-inclination. In their definition of financial uncertainty, Schie et al. (2011) include income knowledge, which is directly related to job concern, and financial literacy, which is related to financial education. To explain the negative relationship between financial uncertainty and saving-behaviour, Schie et al. (2011) cite Iyengar et al. (2004) and Tversky and Shafir (1992), saying that “individuals respond to uncertainty by postponing decisions” (p. 883). This “choice deferral” explains why consumers that feel uncertain towards their financial ability tend to be less savings, and more debt-inclined (Schie et al., 2011, p. 883).

H6: Financial uncertainty has a negative linear effect on savings-inclination

H7: Financial uncertainty has a positive linear effect on debt-inclination

Savings/Debt & Home Ownership

With the exception of during the early 2000 Housing Boom, purchasing a home typically requires a down payment, meaning that home owners need a baseline of initial wealth (Beracha et al., 2017). Relating to the savings-inclination variable, having enhanced saving ability and increased financial comfort mean that a person is more likely to have the cash flow required for the down payment. Because rent prices tend to be more volatile than mortgage payments, home ownership can provide more financial stability than renting (Cox and Followill, 2018). Furthermore, as the housing prices increase, a homeowner’s assets will also appreciate (Rohe et al., 2002b). Beracha and Johnson (2012) explain that this housing equity is why homeowners tend to have greater wealth accumulation. Di et al. (2007) used data from a longitudinal survey of a U.S. sample from 1968 to 1997 to investigate homeowners and their respective wealth. Di et al. (2007) uncovered a positive relationship between home ownership and wealth accumulation, meaning that home owners tend to have a higher level of savings. Flavin and Yamashita (2002) use data from the U.S. Panel Study of Income Dynamics Society of Real Estate Appraisers to create a house price index. Flavin and Yamashita (2002) found that homeowners have the incentive to reduce debt, as they have limited cash flow, and thus, more risk. To counteract this risk, homeowners must exhibit savings-inclined payment tendencies.

Comparing homeowners to renters, Beracha et al. (2017) looked at data from the rent-to-price data from the U.S Decennial Censuses of Housing surveys from 1978 to 2009. Using a Monte Carlo simulation, Berach et al. (2017) found that renters had more ending wealth than

home owners. Furthermore, renters tend to have a greater total cash flow than homeowners, who not only have to make mortgage payments, but also make necessary repairs/maintenance on their property (Beracha et al., 2017). Therefore, people that tend to have high debt levels and concerns about missing payments may choose not to buy a house in order to allocate their funds elsewhere.

H8: Savings-inclination has a positive linear effect on the homeownership likelihood

H9: Debt-inclination has a negative linear effect on home ownership desire

METHODOLOGY

The 2017 Generational dataset had to be cleaned for missing values, reducing the number of observations from 1583 to 60 and 30 items. In this case, missing values include blank responses, as well as when a participant selects the “I do not know” or “I prefer not to answer” option. A scree-plot generated using principle component analysis found 5 factors on both the Varimax and Parimax rotations. Each of the factors had an alpha $>.70$, demonstrating adequate internal reliability.

The items in each factor were then checked to ensure that the question scale was the consistent. The items were then used to create an average index, which reduced 30 items to 5 variables. Using these values, a linear regression was performed to test the four identified hypotheses. One reason why individual linear regressions were utilized is because the researcher wanted to isolate the independent variables. Several of the variables are correlated, as seen in the Correlation Matrix of Table 7. Individual linear regression reduces the effects of multicollinearity. Furthermore, individual linear regression enables a larger sample size in each regression. Due to missing data points, the sample size for a multiple regression model would have been insufficient (i.e., $n = 30$).

Table 5. Factor Loadings for Study 2

Factor 1: (alpha: 0.92) → Debt-inclination

- Debt level
- Debt concern
- Miss mortgage payment
- Miss rent payment
- Miss credit card payment

- Miss auto payment
- Miss student loan payment
- Car ownership importance
- Student loan payment concern
- Minimum payment behaviour

Factor 2: (alpha: 0.77) → Savings-inclination

- Financial optimism
- Home ownership desire 4
- Retirement work expectations
- Financial information access
- Debt comfort
- Financial comfort
- Financial risk comfort
- Retirement comfort expectations
- Saving ability
- Saving importance
- Maximum payment behaviour

Factor 3: (alpha: 0.84) → Lack of home ownership

- Lack of home ownership 1
- Lack of home ownership 2
- Lack of home ownership 3

Factor 4: (alpha: 0.79) → Home ownership desire

- Home ownership desire 1
- Home ownership desire 2
- Home ownership desire 3

Factor 5: (alpha: 0.71) → Financial uncertainty

- Job concern
- Lack of financial information access 1
- Lack of financial information access 2

RESULTS

As a result of the linear regression, the following hypotheses were supported:

H6: Financial uncertainty has a negative linear effect on savings-inclination (supported)
In Hypothesis 6, financial uncertainty had a p-value of $< .001$, supporting the hypothesis. The adjusted R-squared is .05, meaning that 5% of the variability from the mean is explained by the model. The regression coefficient is $-.13$, and the standardized coefficient is $-.23$, indicating that the linear effect is negative.

H7: Financial uncertainty has a positive linear effect on debt-inclination (supported)
Financial uncertainty had a p-value of $< .001$, supporting the hypothesis. The adjusted R-squared is .16, so 16% of the variability is explained by this model. The regression coefficient is $.03$, which means that Hypothesis 7 is supported, and financial uncertainty has a positive effect on debt-inclination.

H8: Savings-inclination has a positive linear effect on the likelihood of homeownership (supported)
In Hypothesis 8, savings-inclination had a significant p-value $< .001$. The adjusted R-squared is approximately 0.086; 8.6% of the variability is explained by the model. The regression coefficient is $-.68$, which means that the hypothesis of savings-inclination having a positive effect on the likelihood of homeownership is supported.

H9: Debt-inclination has a negative linear effect on home ownership desire (supported)
Debt-inclination had a significant p-value of $.013$. The adjusted R-squared is .33. The regression coefficient is $.07$, which means that debt-inclination has a negative effect on home ownership desire, and Hypothesis 9 is supported.

Table 6. Linear Regression results.

	Variables	N	Mean	St. Dev.	t	df
Hypothesis 6	X: Financial uncertainty Y: Savings-inclination	1561	2.07 2.67	0.76 0.43	-9.15	1559
Hypothesis 7	X: Financial uncertainty Y: Debt-inclination	1560	2.07 1.99	0.76 0.58	17.18	1558
Hypothesis 8	X: Savings-inclination Y: Lack of home ownership	1419	2.68 1.81	0.43 1.00	-11.59	1417
Hypothesis 9	X: Debt-inclination Y: Home ownership desire	1556	2.00 3.45	0.58 0.68	2.478	1554

	Variables	p	R-squared (adjusted)	Coefficient	St. Coeff.
Hypothesis 6	X: Financial uncertainty Y: Savings-inclination	< 2.2000e-16*	0.0503	-0.1287	-0.2256
Hypothesis 7	X: Financial uncertainty Y: Debt-inclination	< 2.2000e-16*	0.1587	0.03032	0.3991
Hypothesis 8	X: Savings-inclination Y: Lack of home ownership	< 2.0000e-16 *	0.0859	-0.6783	-0.2942
Hypothesis 9	X: Debt-inclination Y: Home ownership desire	0.01330*	0.0033	0.0731	0.06273

Table 7. A Correlation and P-Value matrix was performed on the 2017 Generational Dataset. (Note: Because the sample size for the matrices is significantly smaller than that of the hypothesis testing, the p-value/correlation may not be consistent with those of the hypothesis.)

Variable Key

Variable	X
Debt.inclined	1
Savings.inclined	2
Home.ownership.desire	3
Lack.of.home.ownership	4
Financial.uncertainty	5

Correlation Matrix

	X1	X2	X3	X4	X5
X1	1	-0.33	0.05	0.38	0.42
X2	-0.33	1	0.18	-0.29	-0.23
X3	0.05	0.18	1	-0.29	-0.08
X4	0.38	-0.29	-0.29	1	0.39
X5	0.42	-0.23	-0.08	0.39	1

P-Value Matrix

	X1	X2	X3	X4	X5
X1	NA	0.00	0.07	0.00	0.00
X2	0.00	NA	0.00	0.00	0.00
X3	0.07	0.00	NA	0.00	0.00
X4	0.00	0.00	0.00	NA	0.00
X5	0.00	0.00	0.00	0.00	NA

Dark green indicates p-values below .05. Light green indicates positive correlation above .20. Red indicates negative correlation less than -.20.

DISCUSSION

Upon linear regression tests, Hypotheses 6, 7, 8, and 9 were supported with p-values of less than .05. Financial uncertainty was found to have a negative linear effect on savings-inclination and a positive linear effect on debt-inclination. Savings-inclination then translated into a negative linear effect on lack of home ownership. Debt-inclination translated into a negative linear effect on home ownership desire.

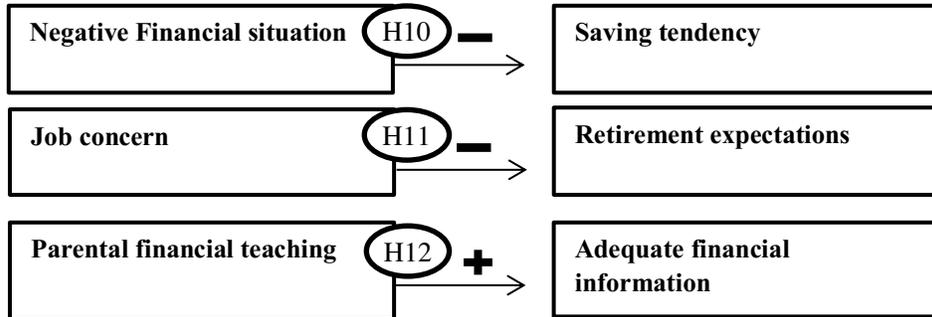
Table 8. Results of Study 2

Hypothesis	Result
H6: Financial uncertainty has a negative linear effect on savings-inclination	Supported
H7: Financial uncertainty has a positive linear effect on debt-inclination	Supported
H8: Savings-inclination has a negative linear effect on the lack of homeownership	Supported
H9: Debt-inclination has a negative linear effect on home ownership desire	Supported

Study 2 looked into financial uncertainty as it relates to financial literacy. Study 3 will look into another component of financial literacy, financial behaviour. Using a sample from the 2018 Generational Survey, Study 3 will investigate three linear relationships involving saving, retirement, and financial education from parents.

STUDY 3— FINANCIAL BEHAVIOUR (Generational 2018)

Figure 5. Study 3 Research Model



CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Saving behaviour

Mitchell and Utkus (2003) describe the traditional life-cycle theory by saying that consumers rationally plan their savings in accordance with their consumption needs. Shefrin and Thaler (1998) presented a behavioural life-cycle hypothesis, in which they utilize a sample of 122 part-time MBA students from Santa Clara University to provide empirical evidence that people tend to spend their current income, rather than planning ahead and thinking about their future financial situation. Therefore, it makes sense that a negative financial situation, characterized by job concern and fear of unexpected bills in this study, would have a negative effect on saving tendencies. Also investigating saving behaviour, Sussman and O'Brien (2016) conducted six experiments with in their study of saving behaviour using American participants. Consistent among the six experiments was the trend that in a financial emergency, people chose to draw from their savings, rather than borrow from other sources (Sussman and O'Brien, 2016). The current study generalizes financial emergencies to negative financial situations, hypothesizing that these situations will have a negative effect on a person's saving behaviour.

H10: Negative financial situation will have a negative linear effect on saving tendencies.

Retirement

In regard to retirement, Mahdzan et al. (2014) utilized a sample of employed individuals from Malaysia to hypothesize that having positive financial future expectations would be positively related to retirement planning. After conducting a logistic regression, Mahdzan et al. (2014) supported their hypothesis, providing the explanation that positive future expectations establish hope, which increases one's likelihood of preparing for retirement. Modigliani and Brumberg (1954) had a different line of thinking. They proposed a Life-Cycle Hypothesis, in which working individuals save part of their income in anticipation of retirement. Ghilarducci et al. (2015) counteract this theory by investigating U.S. workers' retirement readiness, finding that the majority of middle-class workers have insufficient savings and cannot properly plan for retirement. Therefore, if a person is concerned about losing their job, they will also be less confident in their ability to be financially comfortable in retirement.

H11: Job concern will have a negative linear effect on retirement expectations.

Parental financial teaching

Tang and Peter (2015) used data from a U.S. longitudinal study to investigate the effects of financial education, financial experience, and parents' financial knowledge on a young adult's financial knowledge. They found that all three have a positive effect. Chen and Volpe (2002) conducted a survey of 924 American university students and found that 74% of women and 68% of men acquired their financial knowledge from their parents, demonstrating the pivotal role a parent plays in their adult child's financial future.

H12: Parental financial teaching positively relates to having enough financial information.

METHODOLOGY

An exploratory factor analysis was run using R. The 2018 Generational dataset had to be cleaned for missing values, reducing the number of observations from 1527 to 189 and 16 items. In this case, missing values include blank responses, as well as when a participant selects the “I do not know” or “I prefer not to answer” option. A scree-plot generated using principle component analysis found 2 factors on both the Varimax and Parimax rotations. The questions that did not load on either factor were omitted in the correlation matrix. Each of the factors had an alpha greater than 0.7, demonstrating adequate internal reliability. The items in each factor were then checked to ensure that the question scale was the consistent.

The items were then used to create an average index, which reduced 16 items to 10 variables. Using these values, a linear regression was performed to test the four identified hypotheses. Because each linear regression only required two variables, the number of observations was greater than the reduced 189 set. Similar to Study 2, the researcher wanted to isolate the independent variables. Each of the hypotheses is not related. Furthermore, individual linear regressions enable a larger sample size for each analysis.

Table 9. Factor Loadings for Study 3

Factor 1: (alpha = 0.78) → financial negative situation
- (-) Financial situation
- (-) Job concern
- (-) Lack of home ownership 1
- (-) Lack of home ownership 2
- (-) Standard of Living compared to parents
- Fear of unexpected bills
- Not enough financial information access
- Debt concern
Factor 2: (alpha = 0.73) → financial positive situation
- (-) Rent comfort
- Parental financial teaching
- (-) Debt comfort
- Retirement expectations
- Saving ability
- Financial comfort
- (-) Saving monthly percentage
- Financial optimism

An average index was created by grouping the following items into variables:

Financial concern: Fear of unexpected bills, debt concern

Financial situation: Financial situation, Standard of living compared to parents

Saving tendencies: Saving ability, financial comfort, saving monthly percentage, financial optimism

RESULTS

Table 10. A Correlation and P-Value matrix was performed on the 2018 Generational dataset.

(Note: Because the sample size for the matrices is significantly smaller than that of the hypothesis testing, the p-value/correlation may not be consistent with those of the hypothesis.)

Variable Key

Variable	X
Rent.comfort	1
Lack.of.homeownership	2
Financial.concern	3
Debt.comfort	4
Negative.financial.situation	5
Saving.tendency	6
Job.concern	7
Retirement.expectations	8
Parental.financial.teaching	9
Inadequate.financial.information	10

Correlation Table

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	1	-0.03	-0.05	-0.19	0.05	-0.24	0.06	-0.13	-0.15	0.05
X2	-0.03	1	-0.47	0.09	0.36	-0.22	0.35	-0.21	0	-0.33
X3	-0.05	-0.47	1	-0.05	-0.56	0.36	-0.38	0.26	0.12	0.32
X4	-0.19	0.09	-0.05	1	0.04	0.23	0.06	0.12	0.1	-0.15
X5	0.05	0.36	-0.56	0.04	1	-0.41	0.39	-0.28	-0.15	-0.33
X6	-0.24	-0.22	0.36	0.23	-0.41	1	-0.17	0.56	0.31	0.08
X7	0.06	0.35	-0.38	0.06	0.39	-0.17	1	-0.08	-0.01	-0.35
X8	-0.13	-0.21	0.26	0.12	-0.28	0.56	-0.08	1	0.23	0.02
X9	-0.15	0	0.12	0.1	-0.15	0.31	-0.01	0.23	1	0.03
X10	0.05	-0.33	0.32	-0.15	-0.33	0.08	-0.35	0.02	0.03	1

P-Value Matrix (Dark green indicates p-values below .05. Light green indicates positive correlation above .20. Red indicates negative correlation less than -.20.)

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	NA	0.58	0.35	0.00	0.37	0.00	0.31	0.02	0.01	0.43
X2	0.58	NA	0.00	0.11	0.00	0.00	0.00	0.00	0.98	0.00
X3	0.35	0.00	NA	0.40	0.00	0.00	0.00	0.00	0.04	0.00
X4	0.00	0.11	0.40	NA	0.54	0.00	0.32	0.04	0.09	0.01
X5	0.37	0.00	0.00	0.54	NA	0.00	0.00	0.00	0.01	0.00
X6	0.00	0.00	0.00	0.00	0.00	NA	0.00	0.00	0.00	0.16
X7	0.31	0.00	0.00	0.32	0.00	0.00	NA	0.16	0.80	0.00
X8	0.02	0.00	0.00	0.04	0.00	0.00	0.16	NA	0.00	0.76
X9	0.01	0.98	0.04	0.09	0.01	0.00	0.80	0.00	NA	0.58
X10	0.43	0.00	0.00	0.01	0.00	0.16	0.00	0.76	0.58	NA

Table 11. Linear Regression results.

	Variables	N	Mean	St. Dev.	t	df
Hypothesis 10	X: Negative financial situation Y: Saving tendency	1502	2.65 2.47	0.86 0.63	-25.64	1500
Hypothesis 11	X: Job concern Y: Retirement expectations	906	2.99 2.31	1.02 0.97	-6.24	904
Hypothesis 12	X: Parental financial teaching Y: Inadequate financial info	1335	2.26 2.01	0.98 0.92	2.62	1333

	Variables	p	R-squared (adjusted)	Coefficient	St. Coeff.
Hypothesis 10	X: Negative financial situation Y: Saving tendency	< 2.2000e-16*	0.3043	-0.4029	-0.5520
Hypothesis 11	X: Job concern Y: Retirement expectations	6.6510e-10*	0.0403	-0.1934	-0.2033
Hypothesis 12	X: Parental financial teaching Y: Inadequate financial info	0.0090*	0.0044	0.0669	0.0715

As a result of the linear regression, the following hypotheses were supported:

H10: Negative financial situation will have a negative linear effect on saving tendencies
(supported)

In Hypothesis 10, negative financial situation had a significant p-value $< .001$. The R-squared adjusted is .30, so 30% of the variability is explained by the model. The regression coefficient is -.40, and the standardized coefficient is -.55, which means that the hypothesis of negative financial situation being negatively related to financial literacy is supported.

H11: Job concern will have a negative linear effect on retirement expectations
(supported)

In Hypothesis 11, job concern had a p-value $< .001$, supporting the hypothesis. The R-squared adjusted is .04. The regression coefficient is -.19, the standardized coefficient is -.20, meaning that job concern does have a negative effect on retirement expectations.

H12: Parental financial teaching positively relates to having enough financial information (supported)

In Hypothesis 12, parental financial teaching has a p-value $< .01$. The R-squared adjusted is .004. So the model only covers about .45% of the variability. The regression coefficient is .07, and the standardized coefficient is .07, which means that the hypothesis of parental financial teaching having a positive effect on financial information of the adult is supported.

Discussion

Hypotheses 10, 11, and 12 were supported with p-values $< .05$ after conducting linear regressions. Negative financial situation was found to have a negative linear effect on saving tendencies. Job concern had a negative linear effect on retirement expectations. Finally, parental financial teaching was found to be positively related to having enough financial information. These findings will be further explored in the next section.

Table 12. Results of Study 3

Hypothesis	Result
H10: Negative financial situation will have a negative linear effect on saving tendencies	Supported
H11: Job concern will have a negative linear effect on retirement expectations	Supported
H12: Parental financial teaching positively relates to having enough financial information	Supported

GENERAL DISCUSSION

Study 1 identified socio-demographic factors (age, income, education, and self-reported financial literacy) that have a direct effect on financial literacy. Furthermore, the research demonstrated that people can also have different financial literacy scores depending on their gender, ethnicity, primary language, relationship status, province, and occupation. Behavioural characteristics like how often someone checks their credit score, where they choose to obtain their financial information, whether they smoke, whether they own a home or rent, whether or not they use a landline/mobile phone, and whether or not they have children are also associated with different levels of financial literacy.

Study 2 demonstrated that the likelihood or desire for homeownership is significantly affected by one's saving or debt inclination. People that are more savings-inclined have a greater likelihood of purchasing a house. People that are more debt-inclined have a greater likelihood of renting. Participants who thought that owning a home is important or a good investment did not necessarily think they could afford home ownership. Furthermore, this study highlighted the effect of one's personal financial uncertainty.

Study 3 found that financial situation has a significantly negative effect on a person's likelihood to save. Being concerned about one's job also will negatively affect their expectation to live comfortably in retirement. Furthermore, parental financial teaching proved important in an adult's feeling of having adequate access to financial information.

Managerial Contributions

In Study 1, the different financial literacy scores associated with people of different socio-demographic and behavioural characteristics illustrate the need for different approaches when it comes to financial education. For example, males and females have different levels of

financial literacy, as do people of different income and education levels and different ages. With this in mind, the Canadian government is approaching financial literacy correctly by tailoring financial education to different population segments on their website (Anon C., 2018). Schools can expand on this approach by embedding financial education early in their curriculum, as young adults have one of the lowest financial literacy scores. British Columbia and Ontario are already teaching financial education in their primary education curriculum, and as the results on page 42 of the Appendix indicate, the financial literacy levels are positively influenced (Boisclair and Lusardi, 2017). Other provinces should follow suit. Perhaps schools can partner with private institutions to achieve greater effect. One example of a private institution that is partnering with public entities is Equifax. In 2013, Equifax partnered with Junior Achievement, a non-profit organization that brings volunteers into schools to host lessons on financial responsibility (Anon D., 2013). This collaboration between public, private, and non-profit organizations signifies immense power that can greatly impact financial literacy for the younger generations. Once children become adults, however, financial education should continue. Financial institutions like banks, as well as credit bureaus, can help enhance financial knowledge in adults. Toronto-Dominion Bank is an example of a financial institution offering resources to adults. On the corporate responsibility portion of its website, the bank offers an “Adaptive Financial Learning Suite” in which adults can take five lessons to improve their financial literacy (Anon E., 2019). By offering these types of resources, banks can produce a win-win situation. Their customers become more financially literate. In the process, the banks that enable this literacy become associated with a positive corporate brand image without marketing costs from more traditional communication campaigns. Whether public, private, or non-profit, Study 1 demonstrates the need for increased financial education that is tailored to different groups of consumers.

Study 2 demonstrates that savings-inclined people have different motivations and behaviours than those who are debt-inclined, especially when it comes to home ownership. Analyzing home ownership data from the 2011 and 2016 census, Point2 Homes, a real estate company, found lower home ownership in 2016 using a sample of 88 Canadian cities (Tencer, 2018). In this Huffington Post article, Tencer (2018) attributes falling home ownership rates to increased monthly mortgage payments and decreased housing affordability. Decreased home ownership has lasting effects on society, as McCarthy et al. (2001) links individual home ownership to neighborhood stability. One house remaining unsold in the neighborhood could translate into lowered home values for the whole neighborhood. Furthermore, if a debt-inclined

person purchases a home and cannot make the mortgage payments, they may enter into foreclosure (Foote and Willen, 2018). With foreclosures, the home prices of the surrounding neighborhood are not the only things affected. As demonstrated by the 2008 Mortgage sub-prime crisis, increased foreclosures affect financial institutions and the general economy (Foote and Willen, 2018). These multi-faceted effects of home ownership demonstrate the importance of addressing it in appropriate ways. Study 2 indicates the population is not one-dimensional in terms of attitudes and motivations, especially in terms of home ownership. Understanding and adapting to these dimensions will protect financial institutions from another mortgage sub-prime crisis.

The first hypothesis of Study 3 highlights the construct of savings. Banks like the Royal Bank of Canada are already offering consumers tools like Save-Matic® in order to make saving easier by enabling consumers to have a designated amount of money automatically deposited into their savings account (Anon G, 2019). However, the relationship uncovered between negative financial situation (job concern, lack of home ownership, decreased standard of living, fear of unexpected bills, not enough financial information access, and debt concern) and decreased savings demonstrates that financial institutions should address why a consumer is in a negative financial situation, not just savings singularly. Looking at the second supported hypothesis of Study 3, job concern is negatively related to retirement planning; when consumers are concerned about losing their job, they are less likely to plan for retirement. This connection intuitively makes sense. Managerially, financial institutions can help by providing resources to individuals regarding retirement. They can also partner with companies in order to better educate to their employees about their retirement options, even if they encounter unexpected employment termination. The government can also address this connection by offering information about retirement options for people currently with unemployment insurance. The last supported hypothesis of Study 3 illustrates the importance of parents talking to their children about finances. Financial institutions can partner with parent/teacher associations to bring financial education to schools. This finding also connects to Study 1 in these constructs of financial education and literacy. The added benefit of increased financial literacy is better financial decisions at the household level. Alhenawi (2013) references Anthes (2004) and Geradi et al. (2010) to say that low financial literacy levels contributed to “erroneous financial decisions,” which was one factor of the 2008 Global Recession (p. 212). If financial literacy is improved, especially in the generation of adults that are just entering the workforce and just starting to

utilize financial services, then better financial decisions can be made and the likelihood of another economic downturn can be diminished.

Academic Contributions

The most substantial contribution in this research is the use of Canadian industry data for academic research. The studies cited in this paper commonly use European or American data. The exceptions for Canadian data use are McGregor (2016), who utilizes a Word Perfect content analysis of existing financial education curriculum, Killins (2017), who uses existing financial literacy surveys by Lusardi (2015) and Chen and Volpe (1998), and Boisclair et al. (2017) who utilizes an investment knowledge survey by the Canadian Securities Administrators. None of the studies utilize omnibus surveys, which is a distinctive feature of this study. With omnibus data, the researcher had access to additional variables.

These additional variables in Study 1 enabled the researcher to uncover a relationship between smoking and financial literacy. Lusardi et al. (2010) also found this relationship, but only in a U.S. sample. Furthermore, using these additional demographic variables, the researcher was able to map financial literacy amongst different categorical variables, like ethnicity and province, which has never been offered in a Canadian study. Finally, Study 1 presented a new scoring system for financial literacy that utilized accuracy of credit-bureau related questions. Although these questions are distinctive to this study, the findings are mostly consistent with studies like Lusardi et al. (2010).

Study 2 supports existing literature on home ownership. It also elucidates the role of saving/debt inclination. Study 2 also demonstrates that participants have a mismatch between their desire and ability to buy a house. Furthermore, through factor loading 1, named “Debt-Inclination,” Study 2 highlights that participants answer similarly to questions regarding debt level, debt concern, missing payments, car ownership importance, and student loan concerns. Factor loading 2, titled “Savings-Inclination,” connects questions regarding financial optimism, retirement, financial information access, debt comfort, financial comfort, financial risk, savings ability, and maximum payment behaviour.

Study 3 also supports existing literature on savings, retirement, and parental financial teaching. It also provided a unique demonstration of the variables that load together on financial positive and negative situations through factor analysis. Specifically, two factors are generated: financial negative situation and financial positive situation. Financial negative situation is

characterized by job concern, lack of home ownership, standard of living, fear of unexpected bills, financial information access, and debt concern. Financial positive situation is characterized by rent comfort, parental financial teaching, debt comfort, retirement expectations, savings ability, financial comfort, saving monthly percentage, and financial optimism. It is common that variables like saving behaviour, retirement, and parental financial teaching are explored as individual variables (Mitchell and Utkus, 2003; Sussman and O'Brien, 2016; Mahdzan et al., 2014; Ghilarducci et al., 2015; Tang and Peter, 2015; Chen and Volpe, 2002). However, this study is distinctive in its grouping of these variables, along with eleven others, into two categories, via factor analysis. Through these groupings, one can easily identify which variables generate similar responses by participants. For example, Factor 2 of Study 2 connects home ownership, retirement work expectations, and debt comfort. Because they load on the same variable, they are, to some extent, related.

Limitations & Future Research

Limitations

Because the data was collected by Leger 360, the survey methodology was predetermined. For example, the individual scales could not change to become more consistent within each survey. Because the samples for each survey were different, the data could not be collapsed into a data set that would have allowed the test of a more comprehensive conceptual model. Such a test will require future research with a large sample and a questionnaire measuring all of the constructs of interest at one time. Another difficulty was the missing data. The three surveys offered options like "I do not know" or "I prefer not to answer." Unfortunately, these had to be coded as missing values. In the case of Study 2, the sample size reduced from 1583 to 60 observations. The researcher tried to maximize the dataset by running linear regression on specific variables, which enabled more observations. However, the answer choices and resulting small sample size hindered the statistical validity of this study. Relatedly, it has to be acknowledged that a more informative approach to data analysis would have involved a multiple linear regression. This would have allowed the researcher to observe the relative impact of multiple predictors on the criterion. Due to the limited sample size, the research employed simple linear regression models.

Future Research

Thinking about future research, an interesting relationship to explore would be how people's specific credit scores and/or debt levels relate to their financial literacy. Financial literacy is recognized to have an impact on debt levels by the government, as the Canadian National Strategy for Financial Literacy declares its goal to help Canadians "manage money and debt wisely; plan and save for the future; and prevent and protect against fraud and financial abuse" (Anon A, 2017, p. 7). Addressing the effects of debt, Equifax's article, "What Factors Impact My Credit Score?" indicates that payment history and revolving debt are components of credit scores (Anon. F.). The expected relationship would be that as debt increases, payment behaviour becomes less timely, and credit score decreases, along with financial literacy. However, in order to prove the relationship between credit score and financial literacy, personally identifiable information of survey respondents would be required. Although this data would provide more reliable information than self-reported survey responses, consumers' consent would be more difficult to obtain.

Building on the topic of debt, future research can also explore if there is a relationship between a country's total debt levels and their financial education offerings. This study looked specifically at a Canadian sample. The financial literacy levels of specific provinces were highlighted, as well as their policies. A connection between more financial education and higher financial literacy levels was supported. However, financial literacy levels were not correlated with the relative debt levels of the province as a whole. Future studies can compare correlations both provincially and internationally.

One additional idea for future research is adding the variable of housing prices. Study 2 found that people who were more inclined to save were more likely to buy a home. Future research can breakdown this home ownership likelihood. To what extent is home ownership affected by housing prices? Furthermore, in Factor 2 of Study 2, home ownership desire loads on the same factor as debt comfort and retirement work expectations. How would housing prices affect these variables? If increased housing prices leads to increased debt levels, would retirement also be affected? A multiple regression can be used to test this relationship.

Another avenue of research is delving into the counter-intuitive findings. First, why is it that University Doctorates have lower financial literacy scores than their Bachelors and Master's counterparts? Future researchers could explore the underlying factors behind these lower scores. What differentiates people who stop their education at a Master's degree and those who continue

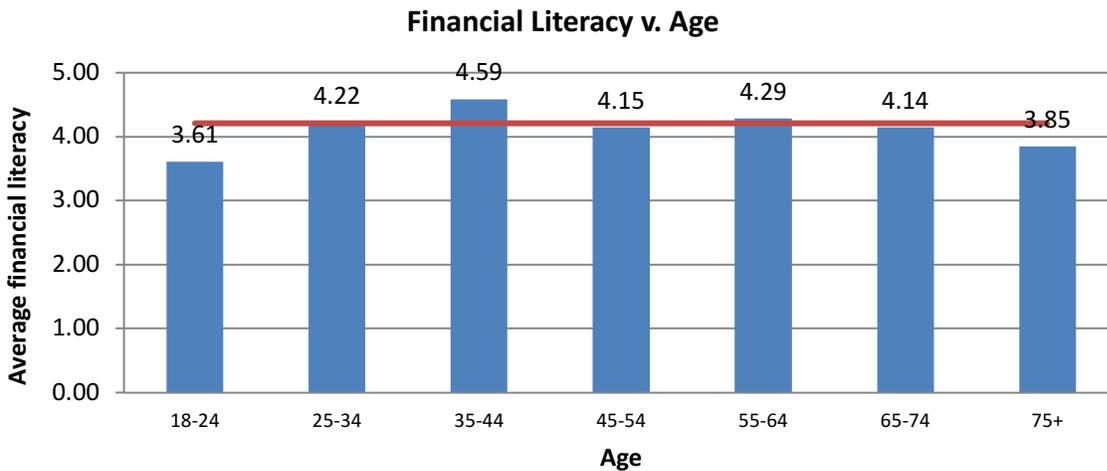
onto a Doctorate degree? Is it that these two different degrees yield different career motivations? If so, does their yearly income play a role in their home ownership and therefore their willingness to learn about financial literacy differs? Second, why is it that smokers in this study had lower financial literacy than non-smokers? Did this trend originate because smokers have different personality attributes that would make them less likely to learn about or retain financial literacy information? Perhaps smokers have different education backgrounds, which would affect their access to financial information. Future researchers can further investigate these questions.

APPENDIX

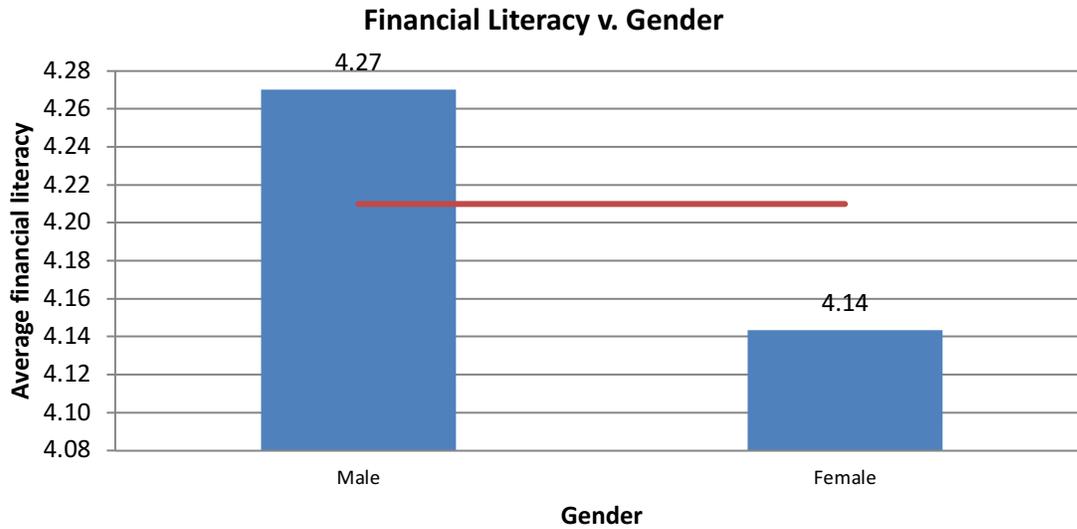
Figure 6. Descriptive Bar Charts Study 1

The following section contains a series of bar charts, as well as a brief interpretation of the results. Financial literacy scores are compared amongst different sample groups according to their responses to age, gender, province, children, occupation, total income, source of financial literacy, self-graded financial literacy, last check of credit report, frequency of checking credit score, telephone, smoking, home ownership, residential area, education, language, ethnicity, and relationship status. Please note that the line indicates the overall financial literacy average across the study sample: 4.21/8.

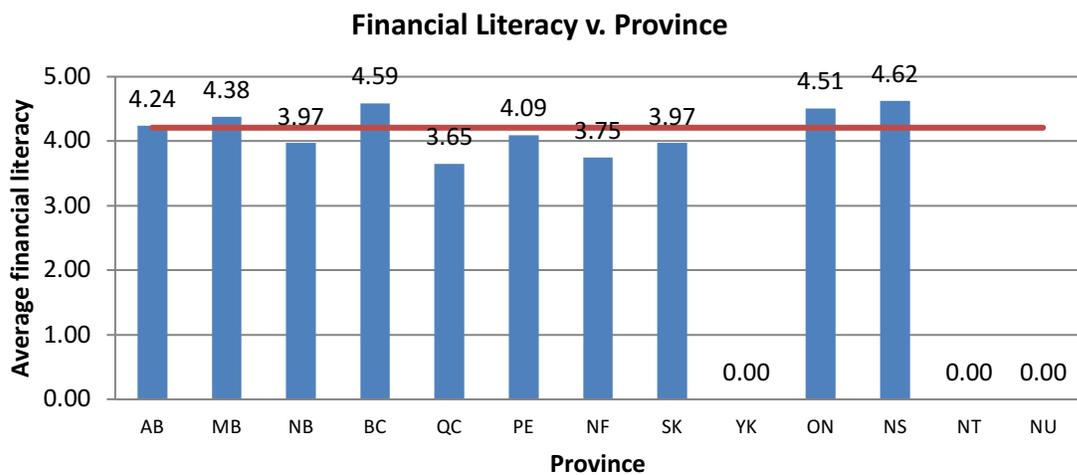
Age: Although age does not have a linear relationship with financial literacy, the bar graph below echoes similar findings to those of Lusardi and Mitchell (2014) and Bajo et al. (2015). The highest financial literacy scores are found in 35-44 year-olds, and the lowest scores are found in 18-24 year-olds, followed by the 75+ year-old group.



Gender: The overall average financial literacy score is 0.13 higher for males than females, consistent with the results found by Chen and Volpe (2002), Mahdzan et al. (2017), Lusardi and Mitchell (2014) and Wagland and Taylor (2009).

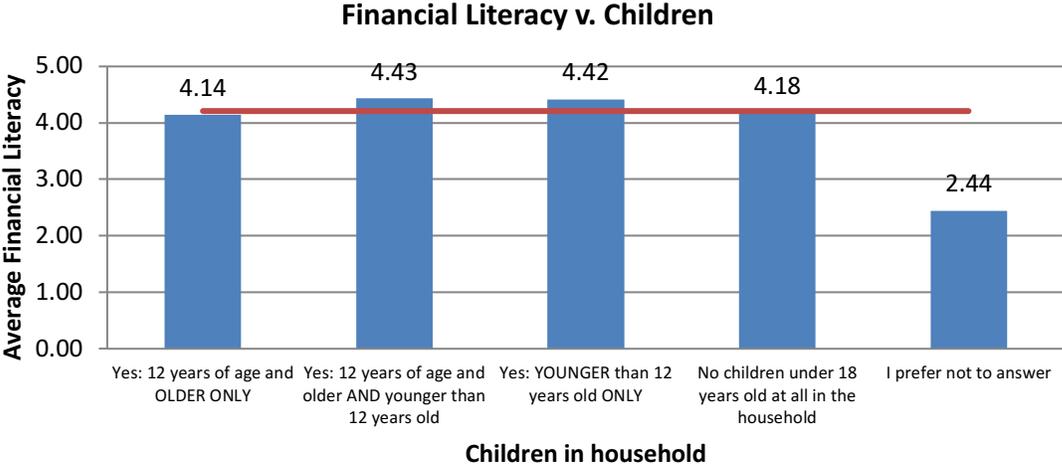


Province: Quebec, Newfoundland and Labrador, New Brunswick, and Prince Edward Island residents score below the sample average in financial literacy of 4.21/8, while Nova Scotia, British Columbia, and Ontario residents fall above the sample average. One reason for British Columbia and Ontario scoring higher in financial literacy is that these provinces incorporated financial literacy into its primary education curriculum. Quebec dropped financial literacy from its curriculum in 2009, which could be a reason for its low score (Boisclair and Lusardi 2017). There is no data for Yukon, the Northwest Territories, or Nunavut.

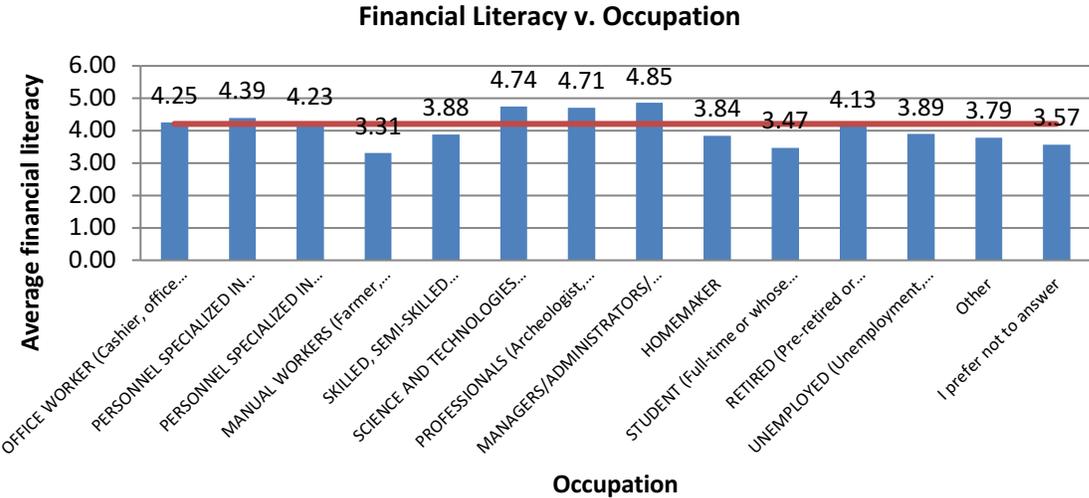


Children: Regarding children in household, the sample separated into having (1) children

12 years and older, (2) 12 years and older and younger than 12 years, (3) younger than 12 years, (4) no children, and (5) preferring not to answer. Group 2 scored 0.01 higher than Group 3. Group 4 is 0.24 lower than Group 3, and Group 1 is the lowest with a score of 4.14/8. Interestingly, Group 5 scored 1.85 less than the average of all the other segments.

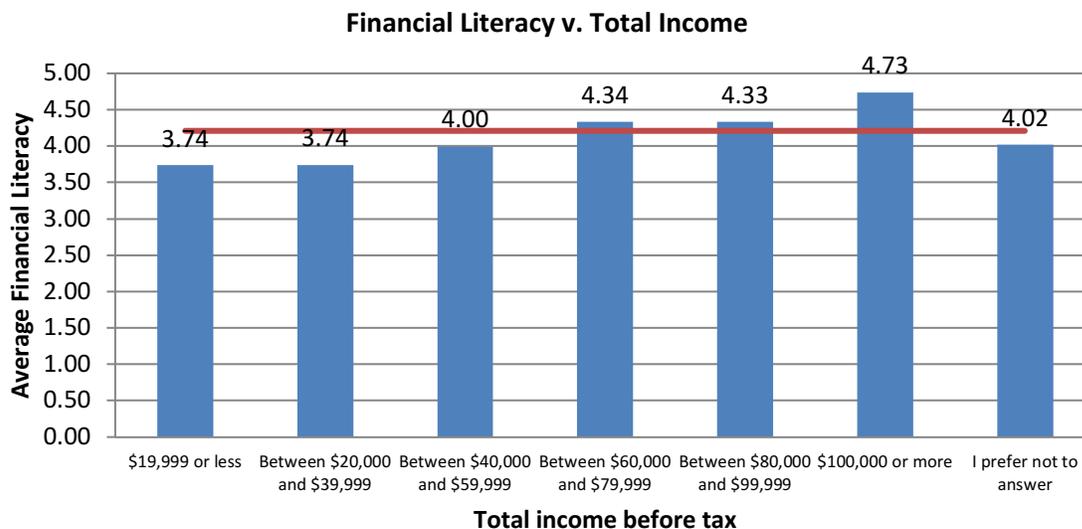


Occupation: Falling above the sample average are Science and Technologies workers, Professionals, Managers/Administrators/Owners, Personnel specialized in sales, and office workers. Below the sample average are personnel specialized in services, retired people, students, homemakers, unemployed, manual workers, and skilled/semi-skilled workers.

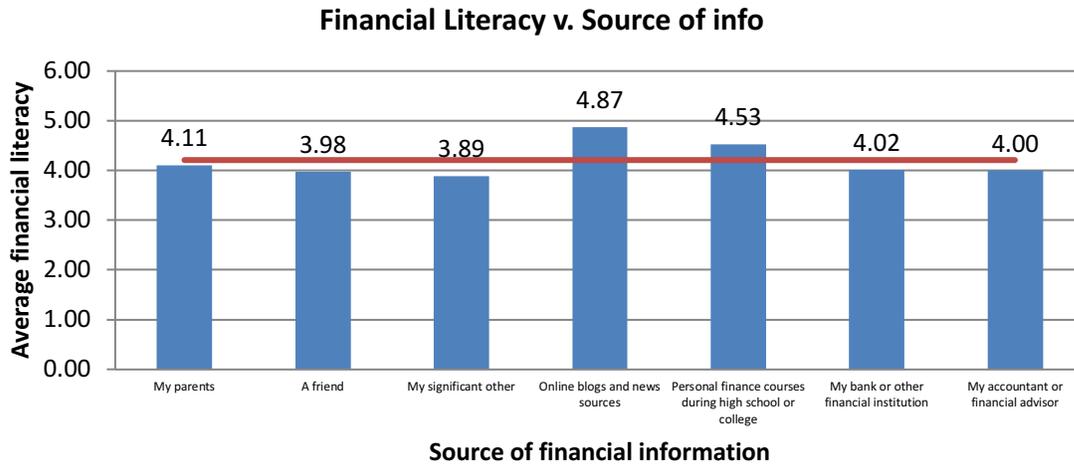


Total income: The highest financial literacy scores are found in those making \$100,000 or more, followed by those making between \$60-80,000, \$80-100,000, between \$40-60,000, between \$20-40,000, and \$19,000 or less. Contrary to expectation, the relationship between

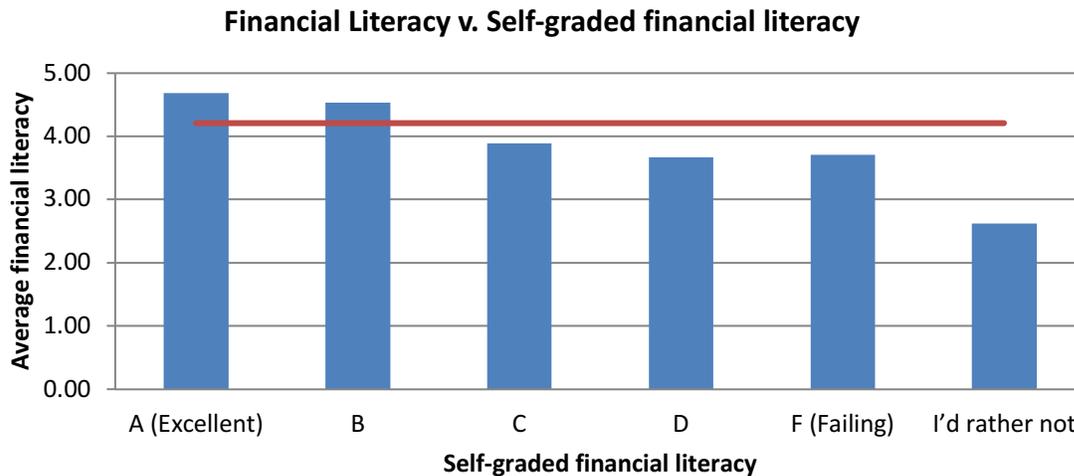
income and financial literacy is positively correlated, with the exception of those making \$80,000-100,000. However, this result could be due to sampling error, as the income is self-reported by the respondents.



Source of Financial Information: Out of the options—my parents, a friend, my significant other, online blogs and news sources, personal finance courses during high school, my bank/other financial institution, my accountant or financial advisor—online blogs and news sources scored the highest. This finding may seem counterintuitive because one might associate online news sources with the 18-24 age-group, who scored the lowest in financial literacy. However, only 7% of those that selected online news sources are in the 18-24 age-group. The largest percentage is made up of 35-44 year olds, who also scored highest in financial literacy. Furthermore, it supports existing findings from Hofmann et al (2018)’s research on personal finance blogs, which found an association between personal finance blogs and higher financial literacy.

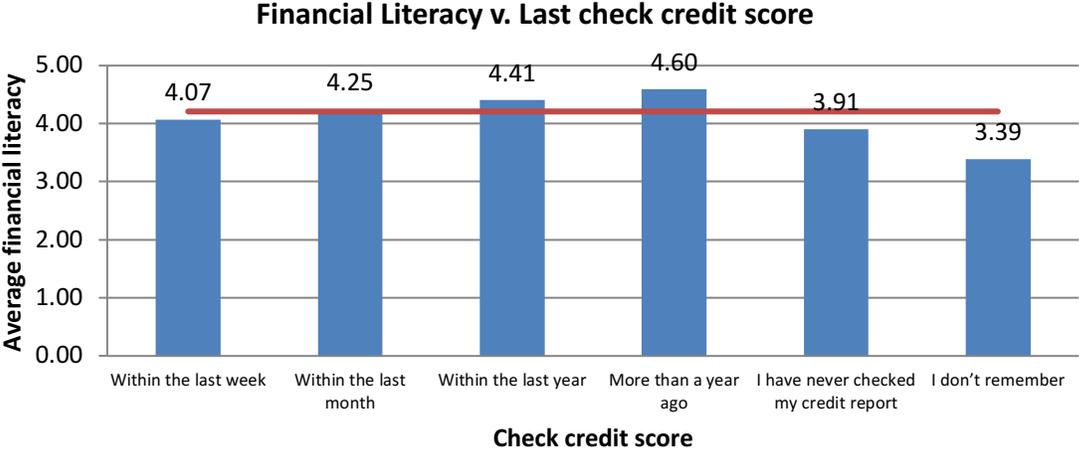


Self-graded financial literacy: Participants had the option of grading themselves on a scale of A (Excellent) to F (Failing). The financial literacy scores corresponded linearly to their self-grade, with the exception of those giving themselves an F having a slightly higher financial literacy score than those who gave themselves a D. However, all the average financial literacy scores fell below the traditional A to F scale. A=90% became 58.5%, B=80% became 56.7%, C=70% became 48.6%, D=60% became 45.8%, F=50% became 46.3%. These results are consistent with Lusardi and Mitchell, (2007b) and Fraczek (2014), who found that consumers often overestimate their financial knowledge.

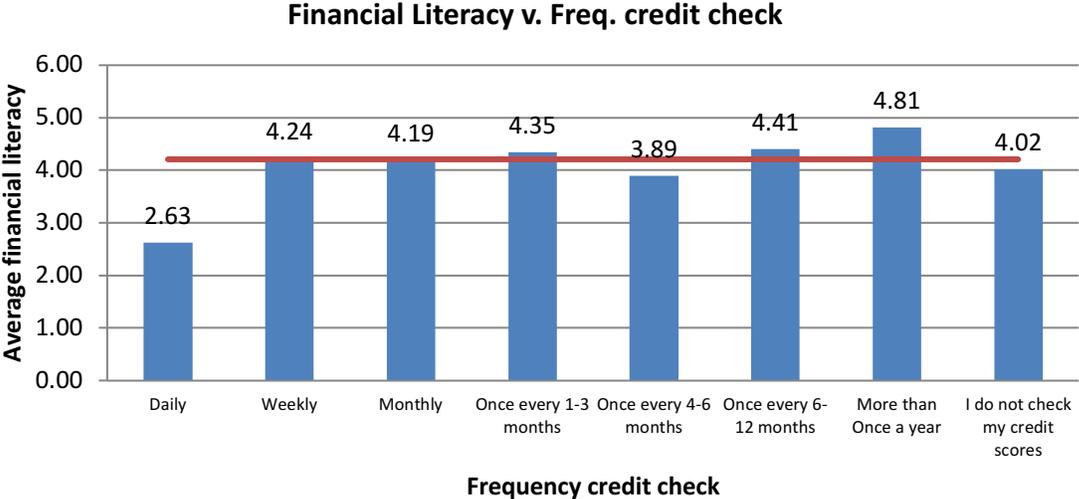


Last check credit report: In response to the question, when did you last check your credit report, participants could choose: “within the last week,” “within the last month,” “within the last year,” “more than a year ago,” “I have never checked my credit report,” and “I

don't remember.” The financial literacy score increases as time duration increases. However, participants that select “I have never checked my credit report” and “I don't remember” have the lowest scores.

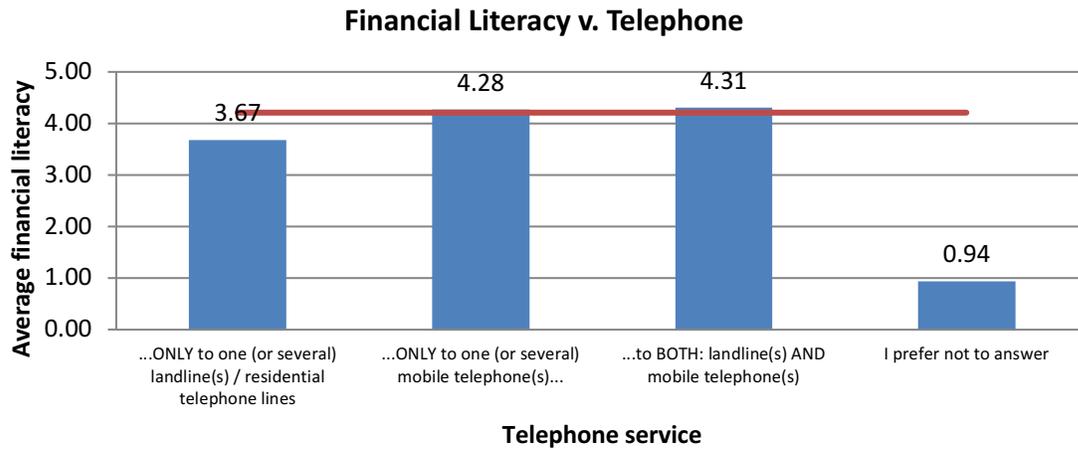


Frequency of obtaining credit score: The question, “How often do you obtain your credit score” is similar to the previous question, but yields slightly different results. Those who obtain their credit score more than once a year have the highest financial literacy score. One possible explanation is that the options are not mutually exclusive, as “more than once a year” covers all of the other answer choices.

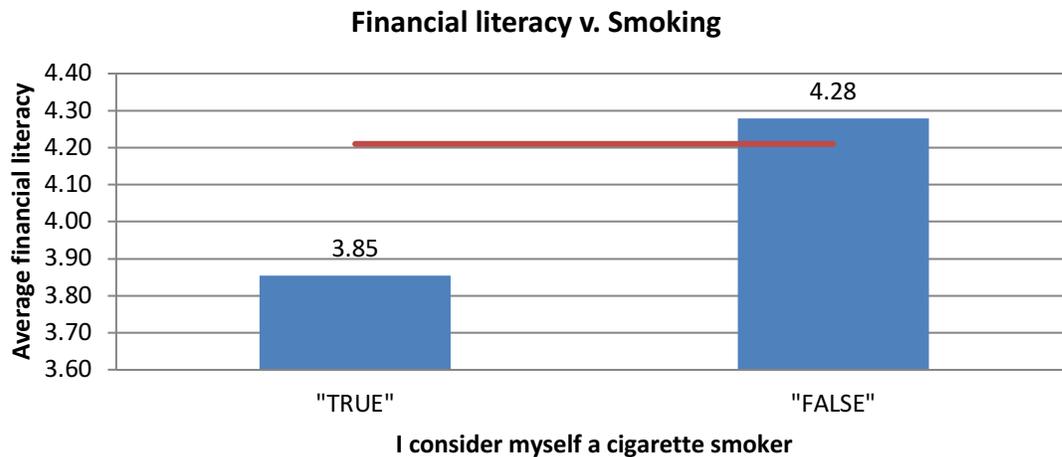


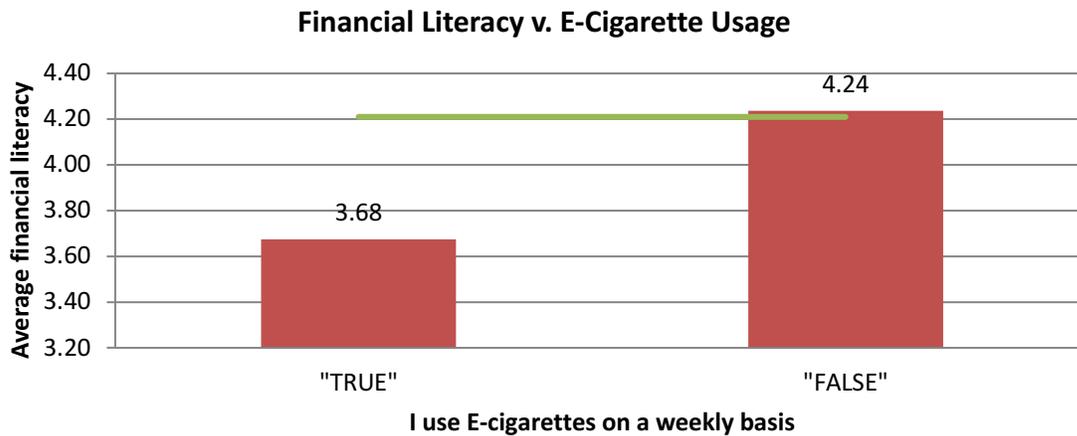
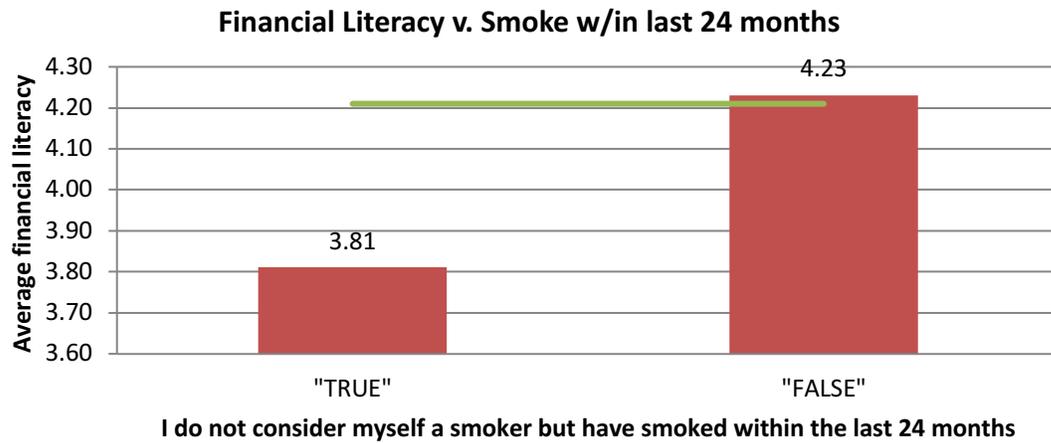
Telephone: Those that have only mobile phones or have both landline and mobile phones have higher financial literacy scores than those who only have landlines or prefer not to answer. This finding corresponds to age, as those who have only mobile phones are 25%

aged 25-34 and 25% aged 35-44.

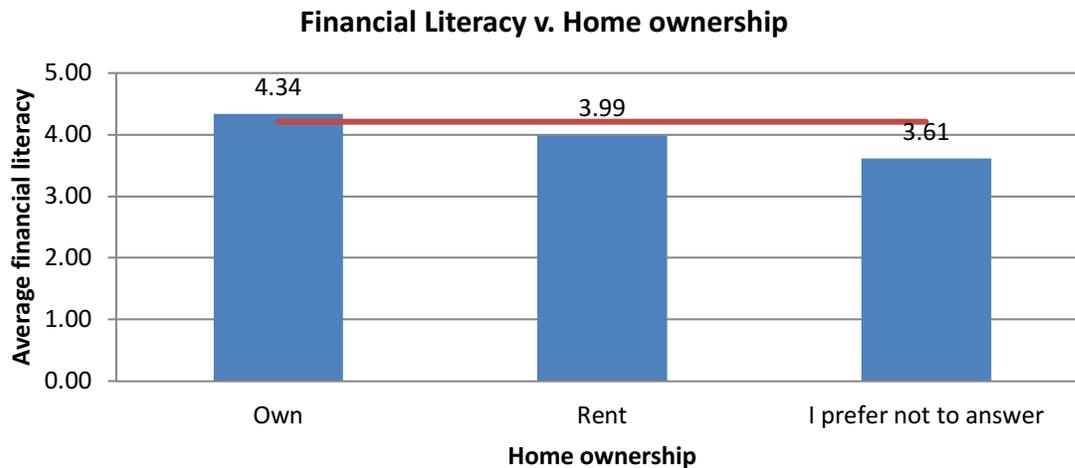


Smoking: In response to all three of the following questions, “I consider myself a cigarette smoker,” “I do not consider myself a cigarette smoker, but have smoked at least 100 cigarettes in the past 24 months,” and “I use E-cigarettes on a weekly basis,” those who selected “True” had consistently lower financial literacy scores than those who selected “False.”

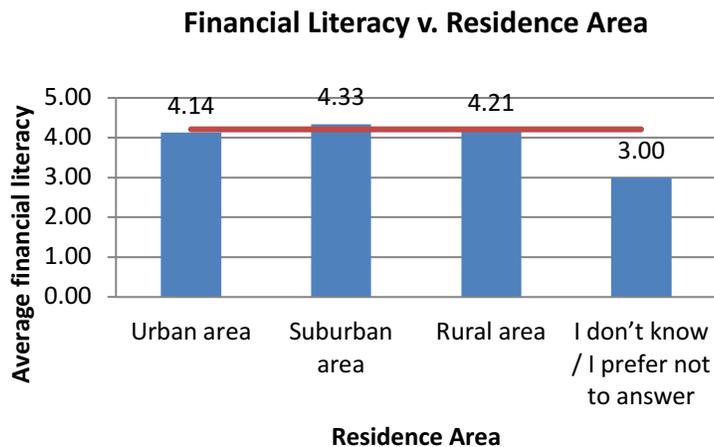




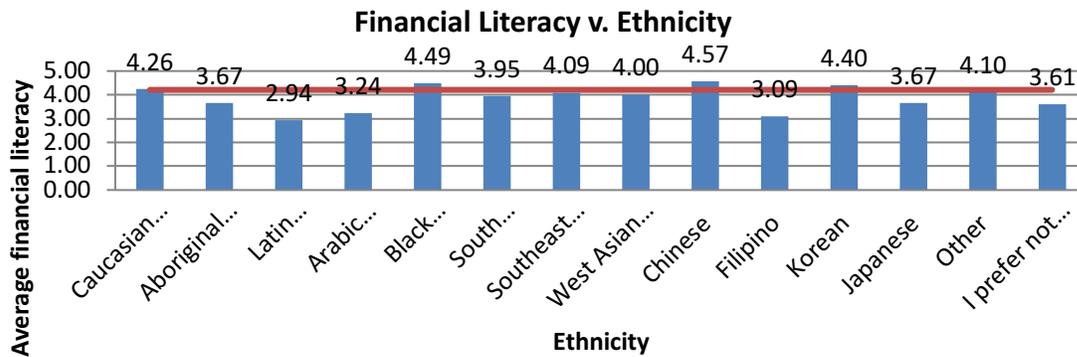
Home ownership: This study found that those who own homes had slightly higher financial literacy scores than those who rent. These findings are consistent with those of Gathergood & Weber (2015), who explained that there is not a causal relationship, but rather that financial literacy is acquired as a person looks into buying a home.



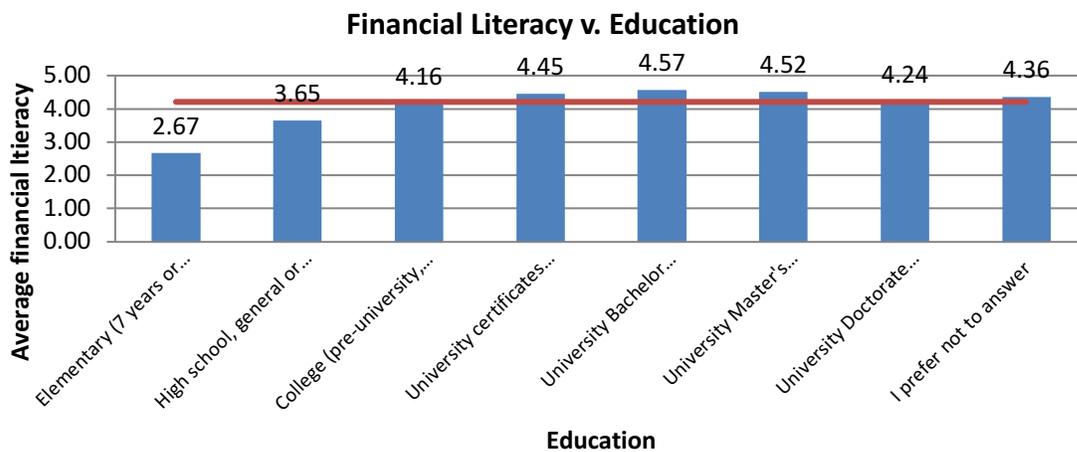
Residential Area: Just as home owners tend to have higher financial literacy scores, so do people living in suburban areas, probably because people that live in urban areas tend to rent due to high housing costs. Klapper and Panos (2011) found that people living in rural areas had lower financial literacy than those living in the city.



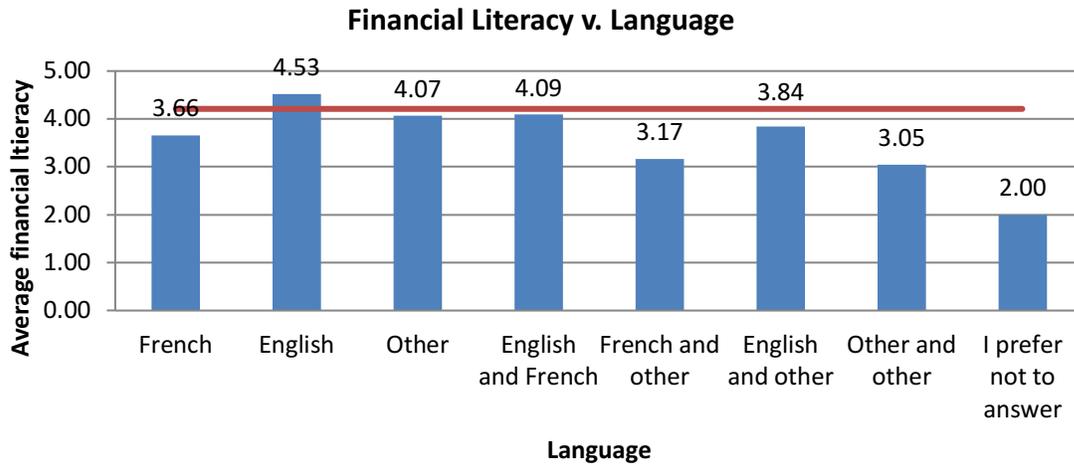
Ethnicity: In this study, Chinese, African-Canadians, and Korean people scored the highest in financial literacy. This finding is inconsistent with previous literature from Lusardi and Mitchell (2007a, 2007b, 2011b), who found that African Americans had the “lowest level of financial knowledge in the U.S. context” (cited by Lusardi and Mitchell, 2014, p. 20). This inconsistency can be explained by the fact that this study is taken from a Canadian context.



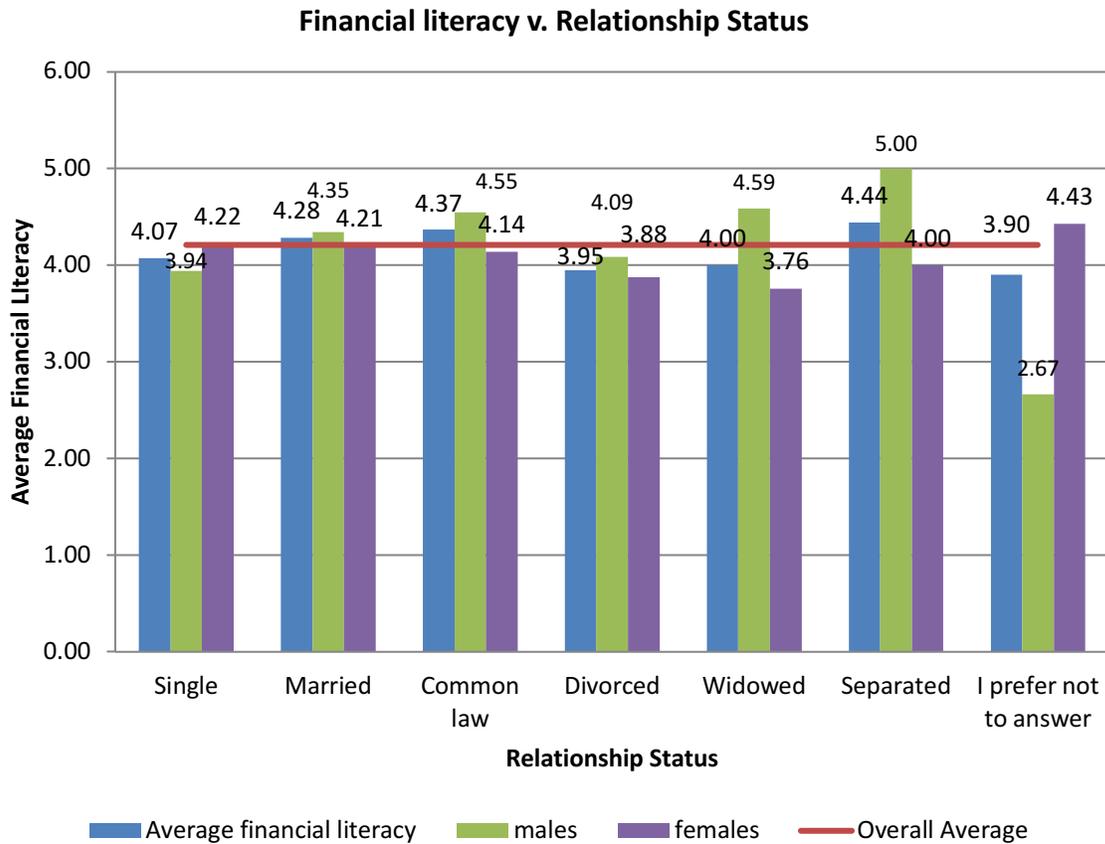
Education: Similar to the findings of Worthington (2006), Monticone (2010), and Alhenawi (2013), higher education is positively related to financial literacy. Furthermore, Alhenawi (2013)’s finding that University Doctorates have lower financial literacy score is also supported.



Language: Respondents who answered that they speak English at home had the highest financial literacy score. Those who selected “French” or “Other” had lower financial literacy score. These findings are consistent with those from the province question, with residents from Quebec scoring lowest. Those who chose “Other and other” do not speak English or French at home, which suggests that they may have immigrants in their families, who may be new to the Canadian credit system.



Relationship status: Single people had lower financial literacy scores than married and common law people. The lowest financial literacy belongs to divorced people, whereas separated individuals have the highest financial literacy.



R Script

Regression code:

```
#Import and view data
url <- ".csv"
data <- read.csv(url, header=TRUE)
head(data)

#missing data
data[data==NA] <- NA

# create new dataset without missing data
newdata <- na.omit(mydata)

#build linear model
linearMod <- lm(y ~ x, data=data) # build linear regression model on full data
print(linearMod)
summary(linearMod)
library(Hmisc)
describe(data)

#standardized coefficients
library("lm.beta")
lm.fit <- lm(y ~ x, data=data)
lm.fit.beta <- lm.beta(lm.fit)
print(lm.fit.beta)
summary(lm.fit.beta)

#chi-square test
library(MASS)
tbl = table(data$y, data$x)
tbl
```

```
chisq.test(tbl)
```

```
#quadratic test
```

```
x <- x
```

```
x2 <- x^2
```

```
quadratic.model <- lm(y ~ x + x2, data=age.sub)
```

```
summary(quadratic.model)
```

```
#multiple regression
```

```
fit <- lm(y ~ x1 + x2, data=mydata)
```

```
summary(fit) # show results
```

```
coefficients(fit) # model coefficients
```

Correlation Matrix

```
#Import and view data
```

```
url <- ".csv"
```

```
data <- read.csv(url, header=TRUE)
```

```
#Create new dataset without missing data
```

```
data <- na.omit(data)
```

```
head(data)
```

```
#View correlation matrix
```

```
cor(data, method = c("pearson"))
```

```
rcorr(data,type = c("pearson"))
```

```
install.packages("Hmisc")
```

```
library("Hmisc")
```

```
res2 <- rcorr(as.matrix(data))
```

```
res2
```

Cronbach alpha code:

```
#Load psych package
```

```
library(psych)

#Import and view data
url <- ".csv"
data <- read.csv(url, header=TRUE)

#Find cronbach alpha
alpha(data)
```

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