

Does Financial Literacy Training in High School Affect Credit Behavior of College Students?

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ABSTRACT

Managing credit is increasingly important not only for adults, but for college students. In recent years with sky rocketing tuition and easily available credit, college students find themselves with increasing debt burdens that can result in serious and lasting financial problems. In response, financial literacy programs are emerging in hopes that better educated people will make sound financial decisions, as well as responsibly manage credit. Research suggests that financial education should begin in high school so that young adults are prepared to effectively manage credit during the college years. However, it also leaves serious questions as to the efficacy of training for this age group. This paper examines whether students retain and use the financial training acquired in high school when making financial decisions while managing credit in college. We find that almost 75% of the 345 students that manage their own credit had received financial training in high school, and that although this training is negatively correlated with poor credit management behavior in college, the association is weak. The paper further reports that despite additional financial literacy training available in college, almost 60% of these students demonstrate poor credit management behavior.

INTRODUCTION

While many adults have credit problems, they are not the only ones abusing credit. Credit problems of college students aged 18-22 are increasingly reported and can have serious long-term impacts on the lives of young people. For instance, the millennial generation (those born between 1976 and 1996) is among the highest group suffering from “mounting national and personal debt and irresponsible spending and lending practices on college campuses” [mobilize.org]. In fact, young adults between the ages of 20-25 are the fastest growing group of those filing for bankruptcy. Also, according to Lusardi, Mitchell, and Curto [2009], between 1997 and 2007 the “average undergraduate student loan debt rose from \$9,250 to \$19,200.” In addition, a study conducted at Kent University showed that the average undergrad had an “estimated credit card debt balance of over \$5,000” [Stolle and Dumpe, 2009].

Ragen and Ragen [2009] report on the results of several studies that shed light on issues related to credit card use by college students. For example, in a 2007 survey conducted at Buffalo State, students disclosed that the reason for putting so many purchases on credit cards is because these students think they will make enough money after college; thus they expect to be

able to repay the debt. They also report on a 2007 survey by the Hartford Financial Services Group Inc. that found that 76% of college students wished “they had more help preparing for their financial future.” In fact, only 24% of students and just 20% of parents say “students are very well prepared to deal with the financial challenges that await them after graduation.” Another study by Keybank and Harris Interactive [2006] found similar results revealing the need to improve financial literacy among college students. For instance, about 32% of college students, when looking back to their freshman year, “admitted that they were ‘not at all’ or ‘not very well prepared’ for managing their money on campus.” This study also found that three-quarters [of students] made mistakes with their money when they arrived on campus, and the biggest mistakes were overspending on food (21%), entertainment (19%) and putting too many purchases on their credit card (16%).

College students’ lack of financial literacy is most apparent in their overuse of credit cards. In fact, Joo, Grable, and Bagwell [2003] report that in the past decade, “increased number and type of credit cards on university campuses has seen an explosive level of growth.” Their study found that college students had mixed practices regarding their credit use and had little credit knowledge. They also found that college students’ exposure to credit management behavior of others impacts their attitudes of it. For instance, if students saw their parents practicing positive credit management behaviors, then they were more likely to have positive attitudes about using credit. Unfortunately, the study also found that college students do not display sufficient knowledge of credit, nor are they improving credit card management practices. They contend that some examples of positive credit practices include paying the full outstanding balance every month, looking for the lowest possible interest rates, monitoring changes in interest rates, knowing one’s credit score, and avoiding late fees. According to “Taking Charge,” a survey conducted by GfK Roper Public Affairs [2008], many adults continue to practice poor credit management. Only 19% reported being either somewhat or very worried about paying credit card bills, while almost 60% report that they are either somewhat or very disinterested in finding lower interest rates on credit cards. Clearly, steps need to be taken to improve understanding of credit card management, starting with college students.

Bevil and Dale [2006] report on a survey of 4,469 college students from Arkansas, California, and Ohio regarding credit use. Although the paper has some serious methodological issues, the descriptive statistics indicate that 76% of the undergraduate students surveyed had at least 1 credit card, that the mean number of credit cards increased almost monotonically with class standing (1.46 for freshmen to 3.04 for graduate students), and that the number of credit cards was significantly positively related (at a 1% level) to student response to the question, “Do you consider your debt out of control?”

While many financial literacy programs exist to the public, most focus on the financial education of adults. Some programs, however, specifically address educating America’s youth, which seems appropriate as more and more young people are making important financial decisions without understanding the consequences of their actions. Our paper examines the relationship between exposure to financial training in high school, and subsequent credit management behavior as college students. Using survey data on Bryant University students ranging from freshmen to seniors, this study examines if financial literacy education in high school has a lasting impact on the credit management behavior of college students. Known for its business education, Bryant requires undergraduates to either major or minor in business. In this paper we measure the extent that students use, and sometimes abuse credit. We find substantial evidence of poor credit management practices among respondents. Examples of poor

practices include excessive use of consumer credit (multiple credit card accounts), routinely making just minimum payments, taking costly cash advances, and behavior that results in fines, fees, and increases in interest rates, as well as adversely impacting their credit worthiness as indicated by their credit scores (Equifax, Experian, TransUnion, and/or FICO scores).

In the next section, we provide an overview of the financial literacy literature. We focus on the availability and efficacy of financial literacy programs that serve high school students. Confounding efficacy, however, is the widely reported lack of motivation for high school students to acquire financial education, which may explain why they don't seem to retain or apply the knowledge when they get to college. We also report on financial literacy training availability, as well as credit card management behavior of college students. Finally we discuss recent regulatory changes that limit student access to consumer credit, and that partially insulates them from the adverse consequences of poor credit management behavior.

The third section describes the methodology. Specifically, we employ a multivariate discriminant model to classify students on the basis of credit management behavior (good or bad). We explore whether exposure to financial literacy training in high school impacts subsequent credit management behavior in college. Among other factors, the impact of subsequent reinforcement of financial principles through college course work, and/or through college financial literacy programs is controlled for. Results are shown in the fourth section, followed by conclusions and policy implications in the last section.

LITERATURE REVIEW

According to Alison O'Connell [2009], financial education is "the process by which financial consumers/investors improve their understanding of financial products and concepts and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being." As a result of receiving financial education, consumers should be more financially literate, and thus be able to make more informed financial decisions. However, as the literature indicates, this is not always the case, and the reasons for that are not always clear.

Mundy [2008] contends that it is important to educate young people in particular because "students are the consumers of the future." In addition, he states, "financial education can help provide students with the building blocks which they will need to make sound financial decisions throughout their lives. If responsible attitudes and good habits are instilled in people at an early age, they are less likely to get into financial difficulties in later life and are more likely to make financial provision for their future." Some of the potential benefits of financial education received earlier in life include the ability to "create household budgets, initiate savings plans, and make strategic investment decisions" [Greenspan, 2002]. Therefore, recent efforts focus on increasing the financial literacy of young people. For example, the *JumpStart Coalition for Personal Financial Literacy* [2009] is focused on educating students. The program strives to improve "the financial literacy of kindergarten through college-age youth by providing advocacy, research, standards and educational resources and to prepare youth for life-long successful financial decision-making." [<http://www.jumpstart.org/bp.cfm>] Aside from programs such as this many high schools offer business related courses that may feature some financial literacy training, or speakers and workshops. Parents also play a role in introducing their children to sound credit management practices that serves to reinforce the work done in formal

financial literacy programs. For example, many argue that young people who have been exposed to financial decisions being made in the household and by family members are more likely to engage in better financial decisions. However, “there are groups who will not be able to benefit from these sources because their parents or friends do not have college degrees or are not financially knowledgeable” [Lusardi, et al., 2009]. Therefore they contend, “Providing financial education in high school may be particularly beneficial to children from disadvantaged backgrounds.” Mandell and Klein [2007] confirm the importance of beginning financial education in high school. They claim that since little “can be done to affect student demographics, the brunt of the responsibility for improving financial literacy has fallen upon the secondary educational system.”

Despite the stated need, programs for high school students are not universally available. According to the Jump\$tart State Requirements website [www.jumpstart.org], in 2009, only three states require at least one-semester course devoted to personal finance, while 18 states require it be incorporated into other subject matter. As for the remaining states, there is no financial education requirement, but some may exist through elective instruction. The majority of high school seniors in the United States cannot be expected to be financial literate when most of them aren't required to take financial education courses. Perhaps if more states made this type of education a requirement, high school seniors across the nation would be exposed to the tools they need to make relevant financial decisions. Unfortunately, there are major “challenges to embedding financial education successfully into schools [such as costs and] and to persuading policy and educational decision-makers to provide room in the curriculum.” In order to teach financial education in a way that students will find attractive, high quality materials must be used, which could be costly [Mundy, 2009]. The lack of financial literacy among young adults, however, is more costly; thus the Obama administration is considering forcing financial education requirements into the curriculum [www.jumpstart.org].

However, despite research that shows that there have been recent efforts to improve students' financial literacy and that there is substantial room for improvement on that score, little evidence exists regarding whether or not this information is being used in college when students actually make financial decisions. Despite public programs and various forms of financial training, a problem with application of financial literacy training may continue to exist for young people.

Does financial education actually lead to better financial decisions? Theory suggests that “financial education leads to greater financial knowledge, greater financial knowledge then leads to better financial behavior, and better financial behavior ultimately leads to improved consumer outcomes” [Hathaway and Khatiwada, 2008]. Some empirical evidence tends to confirm that “financial knowledge is positively correlated with consumer financial behavior.” An important issue is whether this association holds for young people

While the ultimate goal of all financial education programs is to enable people to “make informed decisions in order to improve their financial well-being,” research illustrates mixed evidences of whether or not these programs are effective [O'Connell, 2009]. Hathaway and Khatiwada [2008] found that “highly targeted programs, unlike general programs, tend to be effective in changing people's financial behavior, both in the short run and the long run.” This information reveals that programs which have a specific focus, such as home ownership or credit card counseling, are the programs that are most successful at improving financial literacy. In addition, success is also more likely when counseling is done before consumers engage in a particular activity. For instance, credit card counseling has two objectives. They argue that “the

first [objective] is to address the client's immediate problem and lower the debt burden (post-crisis), while the second is to improve borrower awareness and planning and budgeting skills in the long run (pre-crisis)." As a result, "pre-crisis counseling was more effective at limiting bad credit outcomes or behaviors." The study further shows that people "who received [pre-crisis counseling] were more likely to have more responsible credit habits and higher rates of savings."

In addition, financial education programs tend to be more successful when individuals interact with others. An example of interaction can be seen through "activities such as a stock game" [Mandell and Klein, 2007]. It is particularly helpful when individuals, "[share] among family members [because doing so] can...play an important role in household financial decisions" [Lusardi, et al., 2009]. Consistent with the findings of Hathaway and Khatiwada [2008], these studies show that it is more beneficial to provide financial education *before* individuals begin making financial decisions.

Making financial education interactive using technology is another way to make the subject interesting to young adults. EverFi, created by Tom Davidson, is "Web-based software that teaches young adults to manage their money." The company offers "a five hour series of Web tutorials that let students explore real-world settings...while absorbing lessons about saving money, earning interest, and managing debt." As students gain more skills, they can play a SimCity-style game in which "they control characters' spending habits, reaping the rewards of good choices and suffering the consequences of bad ones" [Burder, 2009].

Although interactive, specific, and targeted programs tend to be more effective, "existing research on the effectiveness of financial education programs is incomplete and unconvincing" due to the lack of program evaluations [Hathaway and Khatiwada, 2008]. They contend that the major problem is that "there are really no industry standards for program evaluations," making it difficult to measure the impact and effectiveness of programs, which means we cannot determine whether education attempts are truly successful at achieving their goal. It could be that the programs "are simply not effective at transferring knowledge ... [or] perhaps, they are poorly designed or administered." They conclude that although some programs do provide evaluations, there seems to be an "inability of these evaluations to capture whether the programs worked or not." Since we don't have standards for evaluations, we also don't have a clear picture "of what works best and why" [O'Connell, 2009].

It is particularly difficult to "to evaluate the effectiveness of financial education among the young" [Lusardi, et al., 2009]. Currently they contend, financial education programs only "assess whether individuals increase their saving after having been exposed to financial education programs." For example, Bernheim, Garret, and Maki [2001] found that high school seniors who took a financial management course in high school saved a higher portion of their incomes than others in middle age. This type of assessment, however, is not enough. New ways of evaluation need to be developed in order to assess "the impact of financial education on the young." They make the suggestion to examine "levels of debt and borrowing behavior among the young." Hathaway and Khatiwada [2008] contend that overall, the current problem that needs to be addressed is that we "just don't know if the programs are not working or if we don't understand whether they are working because they are not being evaluated properly." They suggest that program evaluations could "help to identify best practices, improve program effectiveness, and lead to policies that help consumers make better decisions." They also suggested that these program evaluations be planned during the initial design phases of the financial education program. Nonetheless, it is obvious that in order to measure the effectiveness of financial education programs, evaluations need to be completed.

Thus, even if exposure to financial education in general results in increased financial literacy (confirming the theory of financial education), it does not necessarily follow that those exposed to financial education will retain and use the information later in life. Mandell and Klein [2007] found this argument to be particularly true among high school students. Despite this, McCormick [2009] contends, “the need for financial education for children and youth is clear and compelling.”

The Jump\$tart Coalition for Personal Financial Literacy offers financial literacy standards for high school seniors. For instance, upon graduation, a high school senior should be able to “find, evaluate, and apply financial information” [www.jumpstart.org]. In other words, a high school senior should know how to research financial knowledge himself without having to rely on others, such as his or her parents. A high school senior should also “set financial goals and plan to achieve them.” These should include establishing budgets for spending, as well as setting a goal to deposit a certain amount of money each week or month into a savings or checking account. Additionally, seniors should be able to “develop income-earning potential and the ability to save, use financial services effectively, meet financial obligations, and build and protect wealth” These standards are considered to be fundamental and basic financial knowledge that will be necessary for establishing good credit behavior and making sound financial decisions a few short years after high school is completed.

However, the evidence on the efficacy of financial literacy programs is disappointing. High school seniors are not meeting the Jump\$tart financial literacy standards, even if they received financial education in high school. A Jump\$tart survey revealed that “high school seniors who have completed a full-semester high school course in money management or personal finance are no more financially literate than students who have not taken such a course” [Mandell and Klein, 2007]. In addition, they report that “students who do not have credit cards know more about credit than students who do have credit cards.” Similarly, they also found that “students who own stock in their own name do not know any more about investments than students who own stocks in their parents’ name or who do not own stocks.”

In addition, studies showing that people participating in targeted financial education programs (such as credit card counseling) in close proximity to making an important financial decision, are more likely to make good financial decisions [O’Connell, 2009] may not hold with young people. For example, Mandell and Klein [2007] found that for high school students, “even ‘just-in-time’ education, taken by students close to the time that they make important financial decisions...does not seem to improve knowledge in these decision areas.” Therefore, they conclude that these results “provide limited support to the belief that financial knowledge is related to financial practices.”

Despite the strong support in Mundy [2009] and Mandell [2006], which stresses the importance of educating people at a young age before they have to start making financial decisions, questions persist as to why the information isn’t being retained. Although some financial education programs have been declared effective, in the case of high school students, there have been greater indications of this group not retaining and using the information they’ve learned.

Clearly, providing more financial literacy training may not be the answer. According to Tom Davidson, high school seniors exposed to financial literacy training are not learning the information because, “this stuff is the most ungodly, boring content on the planet” [Bruder, 2009]. Mandell and Klein [2007] argue that financial education does not stick with high school seniors because “they do not perceive that it is relevant to their lives.” According to

motivational and goal setting theory, high school seniors will be engaged in what they are learning only if they are motivated by the information. Based on a 2006 survey, they contend that when it comes to financial literacy, “students may lack the intrinsic motivation to learn and retain concepts of personal financial management.” If however, students have future goals of “a college degree, a professional job, or a higher salary,” then they are more likely to have higher financial literacy. Therefore, financial literacy programs should address student expectations so that they can develop a plan to lead them to successful financial management. If these programs demonstrate how “implementing financial principles will add significant value to their lives,” then high school seniors will be far more likely to retain and actually use the information when making financial decisions. They conclude that in order for high school students to maintain and apply their financial education, they must be reminded that financial decisions will greatly impact their lives. Being reminded of this repeatedly will improve student motivation, which should result in increased financial literacy.

Theoretically, the earlier financial education is introduced to students, the better [McCormick 2009]. Many states, however, don’t require financial management training in the secondary education system, and many parents are not knowledgeable enough themselves to teach their children healthy financial practices. In addition, the efficacy of efforts to provide early financial literacy education is disappointing. The college years may be the first time in which most students make financial decisions, including signing up for a credit card, taking out loans, and choosing auto insurance, and therefore these students may appreciate the relevance of financial literacy training. Unfortunately, as previously indicated, research shows that this group, debt seems to be a mounting problem and students’ overwhelming problems with debt suggest that the stress of having debt is causing anxiety. The 2006 USA Today/National Endowment for Financial Education (NEFE) survey found that 30% of young adults with debt, ages 22-29, “worried about it frequently; 29% had put off or decided against furthering their education because of debt; and 22% had taken a job they would not have taken otherwise because of debt” [Lusardi, et al. 2009]. It is evident that financial education among college students needs to be improved so that high levels of debt (and associated anxiety) might be avoided.

Given the majority of the focus of financial education is geared towards high school students, “little information exists concerning the steps that the university community has taken (or is taking) to improve the financial decision making skills of its students” [Crain, 2009]. There are, however, a few universities that have taken action to improve financial literacy, including Ohio State University, which has developed a seven-week study series on debt management, savings and investing, credit-card abuse, and identity theft [Crain, 2009]. In addition, freshman must complete multiple sessions in the series in order to receive credit for a mandatory Survey 100 class. Another example is Smith College, where the economics department developed a voluntary eight-week course in which students study personal finance, entrepreneurship, insurance, retirement plans, investing, and interpreting financial current events.

In addition, the Kent State University elective financial literacy course, *Me and My Money*, is designed for students who have never taken a business course or who are about to graduate and enter the real world. In 2008, the average Kent student graduated “with loan indebtedness of \$23,500 and a credit card balance of over \$5,000.” This course covers budgeting and saving, financial goal-setting, understanding credit cards, and more. The students construct spreadsheets and develop an understanding of the time value of money. They also construct a budget based on a salary of \$43,000, which is important because most of the students don’t

currently live by a budget. The results were eye-opening and discouraging because students weren't aware that this \$43,000 would be reduced substantially due to "taxes, benefits, and other paycheck withholdings" [Stolle and Dumpe, 2009]. Kent University is considering requiring seniors to take a mandatory personal finance course before they graduate. However, delaying this type of course until senior year cannot be expected to influence credit management problems in college. Therefore, the university is considering programs to assure that all incoming freshman are introduced to basic financial concepts, including the use of credit cards and the importance credit scores.

Clearly, with growing concerns over college students' misuse of credit cards, and rapidly increasing student loan indebtedness, there is an unmistakable need for improving universities involvement in increasing financial literacy. According to Crain [2009], 58 % of the academic affairs provosts/vice presidents at Ohio State University believe that a stand-alone personal financial literacy course *should* be included in the general education curriculum, and 12 % believe it should be a required course, not an elective. As one Kent University student noted, "Everyone is going to need to know this information...not just business majors."

To assess if students' attitudes and behaviors toward credit card use could be changed, Credit Wise Cats examined if a basic seminar providing education on basic money management and financial knowledge altered their views on credit [Borden, Lee, Serido, and Collins, 2007]. The financial education seminar used pre- and post evaluations to determine the impact of the seminar. Although, the seminar was limited to a single college, it provides some evidence on the efficacy of these seminars. The results indicate that a one and a one-half hour financial seminar was effective in enhancing students' overall financial knowledge, positive and responsible attitudes, and their intentions to practice responsible financial decision-making in the future. The results also suggest that this type of seminar format may be more convenient and accessible to more college students than a semester long course. However, intentions to practice responsible financial decision-making does not necessarily translate into actions.

Student exposure to seminars similar to those of the Credit Wise Cats is important for a variety of reasons. First of all, undergraduate students begin college life with little financial knowledge, but have easy access to credit cards [Borden, Lee, Serido, and Collins, 2007]. Financial institutions have taken advantage of this because they know that college students are an "immediate source of revenue and...a way to establish brand-loyalty throughout adulthood" [Amato-McCoy, 2006]. This can be quite harmful to college students, who don't realize the short-term impact of credit card use [Borden, et al., 2007]. For example, students are unlikely to be aware of the fees "or the penalties applied for failure to live up to terms of use" [Joo et al., 2003]. They are also unlikely to consider the long-term effects bad credit behavior can have, including several years of financial debt, low credit scores that hinder future plans, and even personal bankruptcy if credit card use becomes out of control [Holub 2002; Roberts and Jones 2001]. Many students are also unaware, for example, that poor credit history stays with a person for an average of seven years after it is cleared, which can be detrimental for any plans to buy a house or purchase a car. Additionally, Norton [1993] found that "it is becoming more popular for people who do not have adequate cash available to use outstanding credit balances and think they will be able to pay the balance back later." The fact that individuals are predisposed to using credit cards without the ability to pay the balance shows just how little people realize the serious financial difficulties they could face as a result.

College students upon graduation are typically overwhelmed, as they face an "accumulation of student loans, credit card debt, and lack of financial planning for the future."

According to the U.S. Department of Education the number of students relying on loans to pay for their education has quadrupled over the last decade to almost 16% [Dillon and Carey, 2009]. Therefore, it is vitally important for educators to assist college students in learning the skills to effectively manage money, such as reviewing bank and credit card statements, budgeting, controlled spending, and financial record keeping. They should also acquire skills for planning for taxes, insurance, investment, retirement, and real estate issues [Borden, et al., 2007]. Peng et al. [2007] found that the information presented through programs like Credit Wise Cats and personal finance classes had an impact on college students in that they retained higher investment knowledge. They also found, however, that financial education through high school classes did not result in higher investment knowledge. Perhaps this is because “college students are particularly receptive to financial education because of their increased personal financial responsibility” [Borden, et al., 2007]. Therefore, it is important to provide financial literacy training to college students because they have increased levels of financial responsibilities.

The Credit Wise Cats ninety minute seminar proved to be effective in enhancing students’ financial attitudes and knowledge, as well as their intentions of engaging in more responsible credit behavior. Specifically, results showed that after having attended this seminar, “students reported significant changes in their intentions to limit their use of credit cards and to manage their finances in more beneficial ways” [Borden, et al., 2007]. Additionally, they contend that these results prove that the seminar format can be effective, since college students have some of the busiest schedules with high academic demands. Therefore, they claim, “it may be easier for college students to fit a series of brief financial seminars into their schedule rather than a semester-long course.” Although including required or elective financial education courses in a university’s curriculum may also be effective, academic pressures and budget constraints make this prohibitive. As a result, they contend, one effective solution to improving students’ financial knowledge and attitudes towards credit could be to have “seminars or workshops that target specific financial topics.” However, although students expressed greater commitment to limit credit card use, this study does not confirm that intentions were followed by actions.

For years, credit card companies targeted college students as potential customers and bombarded them with advertising incentives to sign up for different cards. This greatly contributed to the circulation of credit cards over the past decade. More recently, however, consumer protection issues have moved to the forefront. For instance, legislation to address abuses by credit card companies and to limit their activities has been enacted since the 2008 near collapse of the global financial system. Senate Banking Chairman Christopher Dodd (D, Conn.) introduced a bill that froze credit cards rates until new credit card laws took effect in February 2010, with some provisions phasing in August 2009. This, however, didn’t apply to card issuers with a credit card circulation of less than two million or to gift-card issuers [Holzer and Lynch, 2009]. Since August 2009, credit card issuers were prohibited from raising interest rates without due notice. Congressmen Barney Frank (D, Mass.) believes that “raising rates retroactively on consumers who carry a balance and have paid their bills on time is the “single unfair economic transaction I can think of that doesn’t involve a pistol” [Holzer and Lynch, 2009]. In addition, they report that card issuers “must give borrowers 45 days’ notice before raising rates on new and existing balances or changing any significant card terms.” And further that, consumers can “...opt out by paying off the balance over time at the original rate.”

In February 2010, the remaining major provisions of the CARD Act became effective and some protection from the adverse effects of poor credit management was enacted. These

provisions included that the credit card company cannot consider the payment as late unless the bill was sent 21 days before the due date. Furthermore, there will be a ban on the company's ability to raise rates unless the cardholder is at least 60 days late making a payment [Holzer and Lynch, 2009]. If however, the cardholder pays the bills on time for six months, then the original interest rate must be restored. In addition, lenders will be required to proportionally allocate payments among balances carrying different interest rates; or "they can credit payments entirely to the balance that carries the highest rate" [Holzer and Lynch, 2009]. Also, credit card issuers cannot offer gifts to college students who agree to fill out credit card applications, and marketing to college students will be very limited. Finally, a person must be 21 years old to obtain a credit card and show proof of payments. If a person is under 21, he/she will need someone who can make payments to co-sign for them. These new laws could be good news for college students struggling to control and manage their debt, but only time will tell what impact the laws will have, and although access to credit is substantially reduced for young people who are now insulated from many of the negative effects of credit card misuse, bad credit management can still have lasting effects on their (and their parent's) credit scores.

Overall, financial education among young adults needs to be improved so they can retain and use this information when making financial decisions throughout their lives. Although steps have been taken to improve financial literacy for the general public, as well as for high school students and college students, more needs to be done. Furthermore, we need to better gauge the effectiveness of the financial literacy programs. While some studies have shown improvements in students' attitudes and the intentions to behave more responsibly, there is little information available as to whether or not these would carry over into actual behaviors. In particular, little evidence exists as to whether financial training in high school, results in better credit management behavior as college students.

Our study does not offer advice on industry standards; nor does it assess the efficacy of specific financial literacy programs. Instead we seek to estimate the association between exposure to financial literacy training in high school and subsequent credit management behavior in college. Specifically, we use stepwise multiple discriminant analysis (MDA) to explore whether financial literacy programs exposed to in high school have a significant impact on the credit management behavior of college students at Bryant University.

METHODOLOGY

Multiple discriminant analysis is a classification technique in which distinctions between two or more categories of cases are explored. Specifically, discriminant analysis is used to evaluate relationships between a non-metric dependent variable and metric independent variables. The classifications are made by linear combinations of variables. The variables "discriminate" between groups of cases. They can be used to predict which group a case will fall into, based on the variables' values. The usefulness of a discriminant model is dependent on its ability to predict the known categories of the dependent variable, known as its accuracy rate.

The stepwise procedure, involves putting the independent variables into the discriminant function one at a time on the basis of the strength of their discriminatory power. This method takes the independent variables that met the statistical test for inclusion in the analysis. In our model, the classification variable is credit management behavior. This variable was coded 1 for bad credit behavior, 0 else. Bad credit behavior had a number of triggers, including multiple

credit cards, making only minimum payments, taking cash advances, late fees, over limit fees, and increases in interest rates.

In addition to a dummy variable for previous high school literacy training, independent variable candidates for inclusion in our model include gender (1 for male), class standing (Year), whether the respondent had taken a basic financial management course (FM), whether the respondent had taken Professor Nigro's credit management seminar (Nigro seminar), whether the respondent was a quant major, two questions to assess financial literacy, plus one (5 point scale) to measure respondent's perception of the usefulness of high school financial literacy training.

The literature provides evidence that age and gender may be important determinants of financial behavior. Gilliam, Chatterjee, and Zhu [2010] find that among the baby boomer cohort, risk tolerance is negatively associated with age and that males are significantly more risk tolerant than females. Their findings on gender are consistent with Hallahan, Faff, and McKenzie [2004], Riley and Chow [1992], Sung and Hanna [1996], Brynes, Miller, and Shaefer [1999], as well as Grable and Joo [1999]. However, Roszkowski and Grable [2010] find that differences by gender on income is greater than for risk tolerance, and that lower risk tolerance can only explain a small portion of the income gap, and Lascu, Babb, and Phillips [1997] find no gender differences in investments and risk-related characteristics. Needless to say these studies were on populations considerably older than college students, but offer promise that gender and age may be important determinants of credit management behavior. A priori we expected that males would have greater risk tolerance, and as a result, more aggressively utilize credit with likely adverse results. If the findings in the literature held for this age group (18 – 21), then the younger the respondent the more risk tolerant, and the more likely to use and possibly misuse credit. In this study class standing (freshman to senior) is a proxy for age.

We expected both exposure to financial literacy training in high school, as well as having the perception that this training was useful in managing credit in college to be negatively related to bad credit management behavior. Further, all students at Bryant, regardless of major, are required to take an introductory finance class (FM) that may provide some financial literacy training. Since this is a sophomore level course many of the respondents will have taken it. In addition, in the Foundations for Learning class that all students are required to take as freshmen, students can elect to participate in a co-curricular activity offered by finance professor Peter Nigro titled *Show Me the Money: College Students and Credit Cards*, where he discusses the problems students have with credit card debt. He gives a one hour presentation multiple times throughout each semester where he discusses credit and the problems students have with credit card debt. For instance, the presentation argues that having a credit card is not a bad thing. In fact, he believes that college students should establish a positive credit history because employers check this kind of information when considering candidates for jobs. The problem is when students take on too much debt that they can't repay. The presentation covers important topics, including the importance of budgeting and what to look for when applying for credit cards. Some advice includes always paying the credit card payment in full since credit card companies make their money when people make the minimum payment. In addition, students should avoid taking cash advances, know the credit scores, and look for the lowest interest rates with a card that has no annual fees. We expected additional exposure to financial literacy training in college, either by taking the basic financial management course or by participating in Professor Nigro's credit seminar, to be negatively related to bad credit management behavior.

In addition, we anticipated that students that select more quantitatively oriented majors (Accounting, Finance, Financial Services, and Actuarial Math) might be more systematic in

managing credit, and that this variable would be negatively related to poor credit management behavior as a result. Finally, we had two questions to assess financial literacy. The first probed respondent's understanding of the relationship between a high FICO score and credit risk, while the second asked if they had specific knowledge of their own FICO score. We anticipated that specific knowledge of the respondents own FICO score would be positively related to poor credit management behavior, while knowledge of the relationship between FICO score and credit risk would be negatively related.

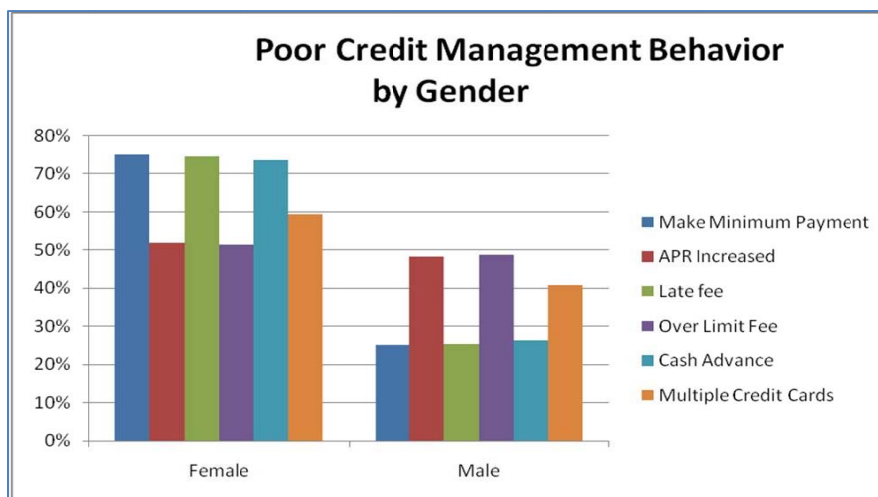
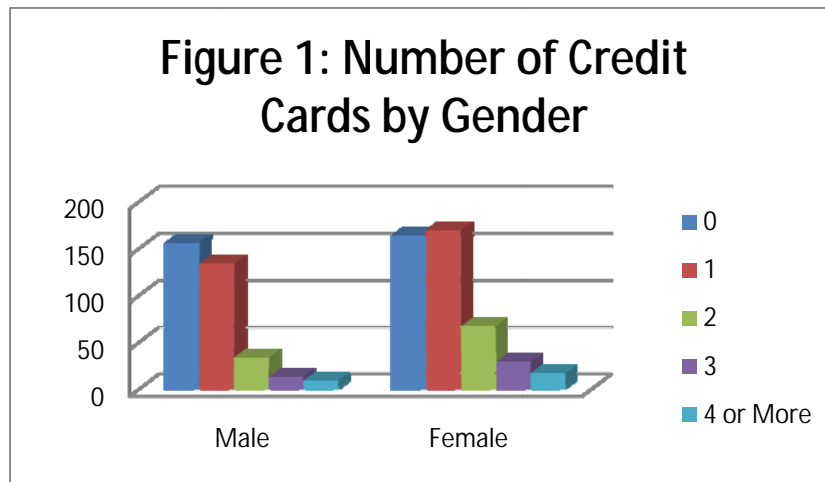
An invitation to participate in the survey¹ was emailed to 3,200 Bryant undergraduates. Of the 882 respondents, 452 reported having at least one credit card, and of those 345 claimed to manage their own credit. Males represented 44.8% of respondents, and females 55.2%.

RESULTS

Table 1 reports the results of the pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions. Some of these results were not consistent with expectations. For example, we expected that as a result of preconceived greater risk tolerance, males would be more aggressive in credit card use and therefore likely to exhibit bad credit management behavior. Although the correlation is low, gender is negatively related to poor credit management behavior, indicating that females are more likely to exhibit poor credit management behavior. This is supported in Figures 1 and 2 that demonstrate that females tend to have multiple credit cards and are

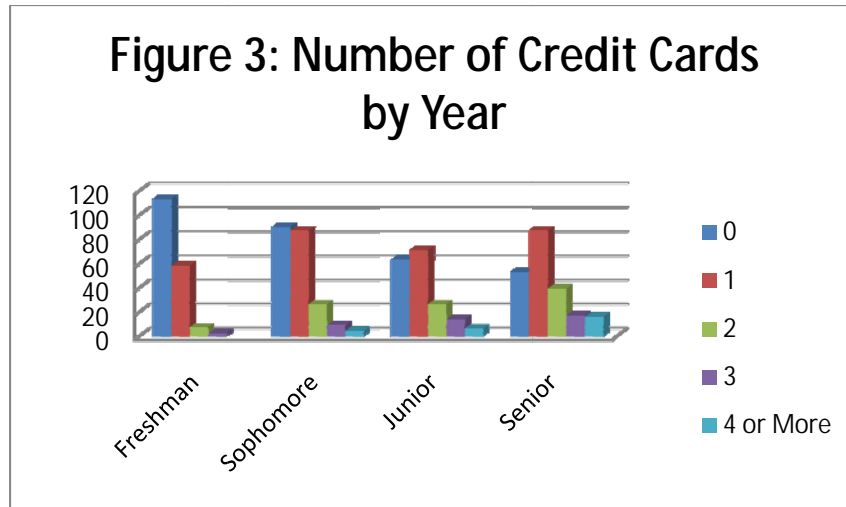
Table 1 Correlation Results

Variable	Correlation
Year (class standing)	.924
Gender	-.070
Quant major	-.333
FM	.581
Nigro Seminar	-.344
Usefulness of HS Training	-.096
HS Training	-.020
Literacy – Own FICO score	.024
Literacy –FICO Score relation to credit risk	-.012

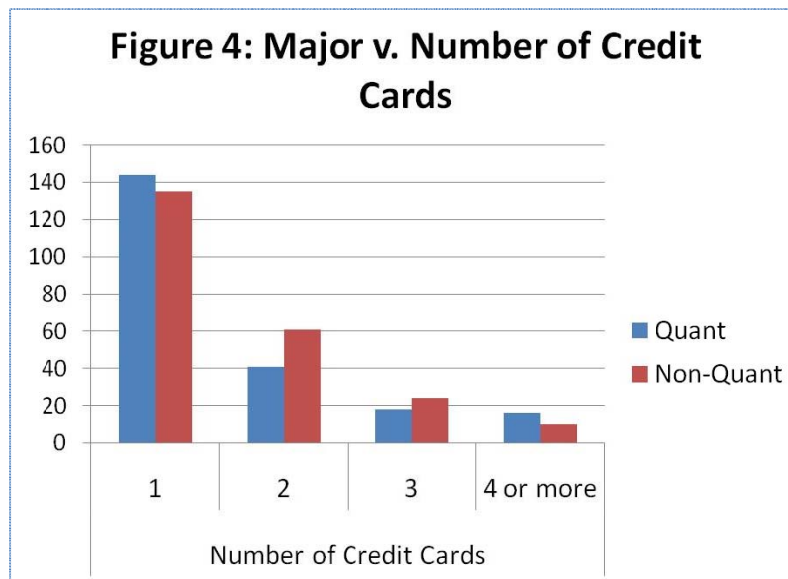


more likely to engage in other bad credit management behavior. These visuals are slightly distorted due to the higher proportion of female respondents, but do generally support the negative correlation. Evidently the greater risk tolerance exhibited by older females in investment behavior does not extend to these undergraduate respondents in their credit management behavior, suggesting that further research is warranted in this area.

With a correlation coefficient of .924, year (or class standing) is the most highly correlated variable under consideration. What this indicates is the higher the class standing the more likely the respondent is to exhibit poor credit management behavior. This runs contrary to findings in the literature regarding age and risk tolerance, but all of the previous studies focus on investment, not credit management behavior, and each studies a substantially older population. Our findings are consistent with Bevill and Dale [2006], however. Figure 3 demonstrates the relationship between class standing and number of credit cards.

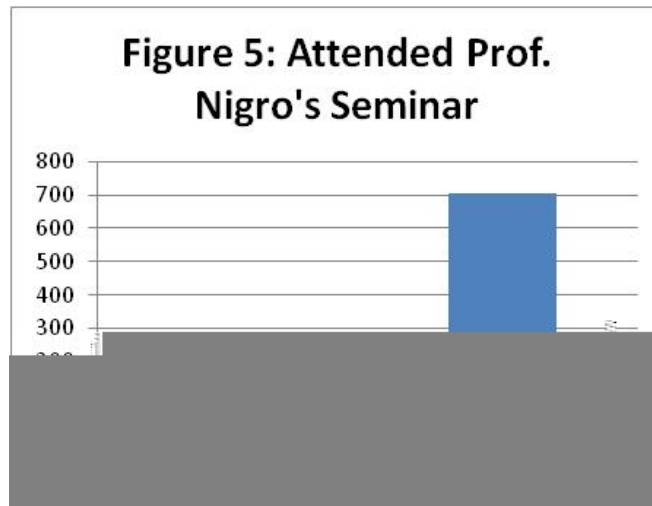


We expected that selecting a quantitatively focused major (such as Accounting, Finance, Financial Services, or Actuarial Math) may provide respondents with greater appreciation for the importance of strong credit worthiness, and therefore would be negatively related to poor credit behavior. This result was supported by the data with a correlation coefficient of $-.333$. Figure 4 demonstrates the relationship between major and number of credit cards and is consistent with the statistical results. Although quant majors are more likely to have one credit card, non-quant majors were more likely to have 2 or 3 credit cards. The number of respondents with 4 or more credit cards was very small with slightly more among the quant majors.

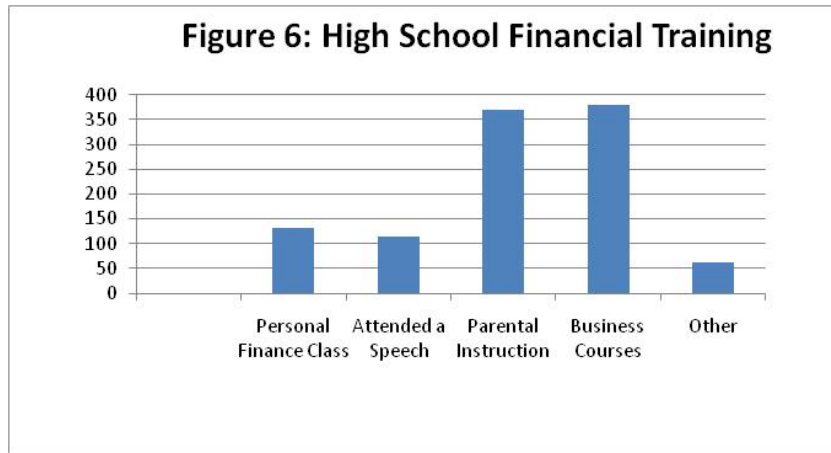


Consistent with expectations, participating in Professor Nigro's seminar, with a correlation coefficient of $-.344$, was negatively related to poor credit management behavior, but unfortunately, as figure 5 indicates, only a small proportion of total respondents (18.8%) report attending. Clearly promotion of this and similar activities (or perhaps even making it mandatory) could be useful in promoting good credit management behavior among college students. Surprisingly, completing the basic finance course (FM) was found to be positively

related to poor credit management behavior with a correlation coefficient of .581. Since the main focus of this course is on principles of financial management, and not personal finance, students typically only get tangential exposure (if any) to personal credit management advice. In addition, since students typically take this course as second semester sophomores, or even as juniors and sometimes seniors, any possible instruction on personal credit management might be too late. Although this variable is highly correlated with class standing, the finance faculty still have some explaining to do, and should probably consider integrating some coverage of personal credit management.



Results on both high school literacy training as well as appreciation for the usefulness of such training for managing credit in college were disappointing. Although the sign of the relationship was consistent with expectations, the magnitude (-.02 and -.096, respectively) indicated a fairly weak relationship at best. Figure 6 demonstrates the types of financial literacy activities in which respondents participated. With a scale from 1 (strongly disagree) to 5 (strongly agree) with the statement that, “Financial literacy training in high school has been very useful to me in managing credit as a college student, “ the mean and median scores from respondents that managed their own credit were 3.86 and 4, respectively, and the standard deviation was .899. This indicates that on average respondents demonstrated some appreciation for the usefulness of this training.



Finally, results on financial literacy questions, although weak, were as expected. With a correlation coefficient of .024, knowledge of respondent's own FICO score was positively related to poor credit behavior, while an understanding of the relationship between FICO score and credit risk, with a correlation coefficient of -.012, was negatively related to poor credit behavior. Virtually all respondents answered the financial literacy question correctly.

The stepwise procedure resulted in a discriminant model that included only Quant Major and Year. (See Table 2.) As you can see, quant majors (which included Accounting, Finance, Financial Services, and Actuarial Math) had a negative coefficient. This means that Quant majors were less likely to have credit behavior problems, which is consistent with what we predicted. On the other hand, Year had a positive coefficient, which means that the more senior a student is, the more poor credit management behavior that person displayed.

Table 2: Canonical Discriminant Function Coefficients

	Function
	1
Quant major	-.767
Year	.947
(Constant)	-2.361

Unstandardized coefficients

In this sample of 345 college students that managed their own credit, 60% were identified as using poor credit management behavior. Table 3 is a summary of the classification results of the study. As you can see, 85.8% of respondents with credit problems were classified correctly, while only 36.8% of those without credit problems were. Overall 65.1% were correctly classified. Clearly, this indicates that the classification accuracy was high, making this multivariate analysis quite useful.

Table 3: Classification Results ^{b, c}

		Credit Behavior	Predicted Group Membership		Total
			0	1	
Original	Count	0	53	91	144
		1	28	169	197
	%	0	36.8	63.2	100.0
		1	14.2	85.8	100.0
Cross-validated ^a	Count	0	53	91	144
		1	28	169	197
	%	0	36.8	63.2	100.0
		1	14.2	85.8	100.0

^a Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

^b 65.1% of original grouped cases correctly classified.

^c 65.1% of cross-validated grouped cases correctly classified.

CONCLUSION

Research suggests that financial education should begin in high school so that young adults can become more literate before being faced with financial decisions. However it also questions whether people in this age group are receptive to such training, and whether they will retain and use the training later in life when making financial decisions. This study examines credit management practices of college students. Specifically, it examines whether Bryant University students retain and use the financial training from high school when making financial decisions and managing credit in college. The findings from this study illustrate that almost 75% of the 345 students that manage their own credit in college had received financial training in high school. Although this training is negatively correlated with poor credit management behavior in college, the association is weak. Evidence in the literature demonstrates that high school students may not appreciate the relevance of financial literacy training and therefore may be unmotivated to retain, and then subsequently apply that knowledge when managing credit later in college. Results of this study support that conclusion. This calls into question efforts to mandate costly financial literacy training programs at the high school level.

A substantially stronger negative relationship between poor credit management behavior and exposure to a one-hour credit management seminar was observed. However, results indicate that even with additional financial literacy training available in college, almost 60% of these students demonstrate poor credit management behavior. Since fewer than 20% of total respondents report taking the one-hour credit management seminar offered, perhaps results would be improved if the session were mandated for all freshmen. In addition, personal credit management should be integrated into the core finance course to reinforce what was taught in the seminar.

Regulatory changes that restrict access to credit by college students, and offer insulation from many of the consequences of poor credit management behavior will not protect students (or their parents) from the negative impact of such behavior (for those that get credit cards under their parents or on their own) on their (or their parent's) credit scores, as well as from the adverse consequences of that on subsequent credit seeking activities. Therefore, these changes do not eliminate the need for financial literacy training in college.

ENDNOTES

¹ Survey questions are available upon request.

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