

Relation between Family-Related Factors and Students' Learning Performance in the First Post-Secondary Accounting Course

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Abstract

This study examines the impact of family income and other factors related to family on the learning and performance of students in their first college-level financial accounting course. Based on data collected through a survey conducted at a public university, we find three main results: 1) family income shows some relation to learning performance in the first college financial accounting course, but the strength of the relation is limited; 2) other family-related factors, including first-generation college student status, family members working in the business, or family members being accountants, have no significant relation with learning performance; and 3) compared with family-related factors such as family income, college GPA, study attitude, as well as motivation, are the key factors that explain learning performance in the first college-level accounting course. The study contributes to the literature and would be useful for accounting educators, policy makers, and students of accounting.

Introduction

In a recent article based on research from the University of Texas, Tough (2014) discussed a phenomenon that may be commonly observed in many universities. Students freshly admitted to university and who have obtained low Scholastic Achievement Test (SAT) scores, belong to families with lower income, and/or parents that did not attend college, are more likely to struggle at academics in their first one or two years at the university, and are less likely to graduate. His article brought immediate nationwide attention (Beyer, et al., 2014; Broton, Frank, & Goldrick-Rab, 2014; Schulze-Cleven, & Olson, 2017) to the learning performance of university students.

Several studies have previously examined the factors related to accounting students' course performance (e.g., Eskew and Faley, 1988; Koh and Koh; Law, 2010). For example, extant research finds that students' academic performance measures such as SAT or Grade Point Average (GPA) have some positive and significant relation to college students' performance in their first financial accounting course (Kalbers and Weinstein, 1999). Prior research also shows that students' high school accounting education is significantly related to their college-level accounting course performance (Xiang and Gruber, 2012). In addition, two studies examined the relationship between family-related factors and accounting students' career development and CPA exam decision. Law (2010) studied three universities in Hong Kong and provided evidence in relation to how parents significantly impact accounting students' career choices. Similarly, Wong, Wong, and Peng (2011) found that parents' career interests predict their children's career interest development. Although a significant amount of research has examined the possible personal factors related to accounting students' course performance (Rohde and Kavanagh, 1996), and how parents influence career development (Wong, et al., 2011), there exists very limited research examining the relationship between *family-related* factors (like family income, parents' education background) and students' performance in the *first* college-level accounting course.

The academic study of accounting integrates many other areas, such as economics, finance, information technology, business law, and ethical behavior (Kinney, 2003). This integration across areas also implies there are many choices and challenges in the real world for accounting professionals (Howieson, 2003). In addition, learning accounting generally requires internship or field study experience (Albrecht, 2009; Albrecht and Sack, 2001), which may be unpaid. The ability to take on an unpaid internship may depend on students' financial standings. The current study seeks to explore whether Tough's 2014 findings relating family income and education level to student performance extend to accounting students in their first accounting class. The purpose of the study is to examine the relation between family-related factors and students' learning performance. To assess this relation, we use data from students' first post-secondary accounting course, a course well-known for being particularly challenging (Arthur and Everaert, 2012). More specifically, our study tests whether accounting students from low-income families experience a disadvantage compared to those from higher-income families. We also test whether accounting students' learning performance is related to other family-related factors, including parents' education and career.

The results show that family income has a positive and significant relation to students' learning performance in the first post-secondary accounting course. However, family income is a minor factor in explaining students' accounting learning performance as a whole, and other family-related factors do not significantly explain students' accounting course learning performance. The strongest predictors of accounting learning in this study are GPA in college and students' attitude/motivation.

This study contributes to the literature in the following ways: First, it adds to the research on the determinants of accounting students' learning performance. To the best of our knowledge, few previous studies have focused on exploring family-related factors and accounting course performance. Hence, it makes our study among the very first to explore the relation between the family-related factors of family income and first-generation college student status and accounting students' learning performance. Second, we hypothesize and provide evidence on the relation between accounting students' learning performance and a set of family-related factors, including family income, family's education background, parent's career, and close relatives' career. Whereas Wong, et al. (2011) focused on how parent's career preference affected accounting students' career choice, we examine additional family-related factors and provide evidence in relation to accounting students' course performance. Finally, the study has practical implications for accounting educators, policy-makers, accounting graduates, as well as potential accounting students. Specifically, the results suggest a hopeful view of accounting students' performance, in that students' learning can improve with improvements in attitude and motivation. Educators and policy-makers need to help students realize, as early as possible, that accounting learning requires perseverance and hard work, which relies on them developing strong habits, rather than on static family factors.

The remainder of the paper proceeds as follows: The next section reviews the relevant literature associated with the determinants of accounting learning performance and develops the testable hypotheses. Section Three presents the sample used in the study and describes the models of the study. Section Four presents the findings based on both univariate and multivariate analyses. The results from some robustness tests are presented in Section Five. The final section concludes the paper.

Literature Review and Hypotheses Development

A considerable amount of previous research focuses on accounting education (Ballantine, Duff, and Larres, 2008; Geiger and Ogilby, 2000; Koh and Koh, 1999). Some investigate general learning outcomes of an accounting education (e.g., Ballantine, et al., 2008; Guney, 2009). Others explore students' decisions to undertake an accounting major (e.g., Geiger and Ogilby, 2000). Still others focus on the relationship between various accounting courses (Baldwin and Howe 1982; Booker, 1991; Doran, Bouillon, and Smith, 1991). Studies focusing on the first post-secondary accounting course (Auyeung and Sands, 1994; Du Plessis, Muller, and Prinsloo, 2005; Rankin, et al., 2003) can be divided into the following two groups: The first group examines factors related to students' performance in the first post-secondary accounting course (Bergin, 1983; Du Plessis, et al., 2005; Rohde and Kavanagh, 1996; Xiang, 2016). The second focuses on the relation between performance in the first post-secondary accounting course and performance in subsequent accounting courses (Booker, 1991; Marriott and Marriott, 2003). Our study is more associated with the first group, because it examines factors related to students' learning performance. Therefore, this literature on factors related to learning will be reviewed in the rest of this section.

Factors Related to Learning Performance in the First Post-Secondary Accounting Course

Accounting is a discipline that requires critical thinking and quantitative skills. Therefore many students find it challenging, especially the first post-secondary accounting course (Xiang and Gruber, 2012). For this reason, it is not surprising that many studies focus on factors predicting students' course performance (Marriott and Marriott, 2003; Sawir, 2005).

Prior Academic Performance

A number of studies have focused on the relation between prior academic experiences and performance in accounting courses (e.g., Byrne and Flood, 2008; Duff, 2004; Hartnett, Romcke, and Yap, 2004; Hellstén, 2004; Rankin, et al. 2003). A typical finding is that students' prior academic performance is positively related to their performance in subsequent accounting course(s). Eskew and Faley (1988) identified several important factors associated with students' performance in the first university-level accounting course: student's academic aptitude (i.e., SAT scores), prior academic performance in high school and college GPA, other academic potential indicators related to accounting (i.e., course performance in math or statistics), motivation (i.e., performance in quizzes or assignments), and prior accounting learning experience in high school. Doran et al. (1991) also discovered that SAT, college GPA, and prior learning experience are important factors in predicting academic performance in the first post-secondary accounting course. A subsequent study by Gist, et al. (1996) shows that students' performance in other courses (i.e., mathematics) helps explain their achievement in the first college-level accounting course.

Prior Accounting Education

As to the role of prior accounting education, the findings are mixed. Some show there is no or very limited relation between prior high-school accounting education on students' accounting performance (Baldwin and Howe, 1982; Keef, 1988), while others show that the prior high-school accounting education is modestly related (Bergin, 1983; Schroeder, 1986), and then there are few that show mixed findings (Xiang and Gruber, 2012; Xiang, 2016). For example, Baldwin and Howe (1982) opined that students with and without high school accounting education differ very little in terms of college accounting performance. Based on data from New Zealand, Keef (1988) supported the findings of Baldwin and Howe in that students' prior accounting learning experience has no relation to their subsequent college-level accounting learning. As Keef and Hooper (1991) pointed out: It is a respect/positive attitude for learning accounting at high school that matters instead of students' ability in manipulating numbers. Schroeder (1986) disagreed with this by showing that at least one year of high-school accounting learning is necessary for students to perform above average in college accounting.

Other studies did uncover the existence of a relation between high school accounting learning and college accounting performance. Bergin (1983) found that prior accounting learning experience is helpful. However, he also pointed out that prior learning is related only to performance on exams occurring early in the university-level course. Xiang and Gruber (2012) focused exclusively on prior high school accounting education and found that it is positively and significantly related to students' college accounting course learning performance. However, it is not a panacea and the effect has to be interpreted carefully: While prior high-school accounting education may to a certain extent help avoid a failing grade, it does not guarantee success (e.g., a grade of A) in the course.

Socioeconomic Factors and Students' Academic Performance

Prior research on children's learning outcomes suggests that the socioeconomic factors, such as family income (Davis-Kean, 2005) and parents' education (Jimerson, Egeland, and Teo, 1999), are associated with their academic performance. For example, some studies identify family income as related to academic performance (Yeung, Linver, and Brooks-Gunn, 2002), while other research finds that parent education plays an important role in predicting academic achievement (Klebanov, Brooks-Gunn, and Duncan, 1994).

Family income

Pettit, Bates and Dodge (1997) provided evidence about how children from lower-income families are likely to perform more poorly academically than children from higher-income families. Hill (2001) supported the results and showed that family income moderates the relationship between parenting behavior and children's learning performance. He pointed out that the relationship is stronger among lower income families than higher income families. In other words, parenting has a significantly stronger relation to children's learning performance for lower income families than higher income families. Linver, Brooks-Gunn, and Kohen (2002) provided consistent evidence to support the fact that family income is an important factor in predicting children's developmental outcomes. In a

national, cross-sectional study of children, Davis-Kean (2005) examined whether socioeconomic status factors such as parents' education and income have any relation to children's academic performance. The results show that both family and parents' education level have some relation to children's academic performance. He also pointed out that this relation exists mainly because parents' behavior and beliefs, which are to some degree related to family income and parents' education level, influence children's behavior and beliefs and hence their academic performance. This leads to our first hypothesis:

H1. Student's learning performance in the first post-secondary accounting course is positively associated with their family income.

Parents' education

Prior studies provide evidence that parents' education is an important factor in explaining children's academic development (e.g., Davis-Kean, 2005; Hill et al., 2004; Klebanov et al., 1994). Using data from low-income families, Halle, Kurtz-Costes, and Mahoney (1997) examine the relationship between parents' education and children's academic achievement. They find that parents with higher education tend to have higher expectations for their children. These higher expectations are generally associated with children's better academic performance. Bradley and Corwyn (2002) find that maternal education contributes to a warm, social climate in the home and hence has the most consistent and direct relation to children's development and outcomes. Hill et al. (2004) agree with the prior study to some degree. However, they point out that, for more highly-educated parents, their own academic involvement is associated with their children having fewer behavior problems, which is the main reason for their children's better academic performance. Focusing on the predictive role of the parents' educational background on individuals' educational and occupational success, Dubow, Boxer, and Huesmann (2009) provide evidence that parents' educational level when the child is eight years old is an important factor that can significantly predict children's educational and occupational success around 40 years later. We therefore expect that parents' education level may predict accounting students' learning performance.

H2. The learning performance of first-generation college students in the first post-secondary accounting course is lower than that of non-first-generation college students.

Parents' career/career preference

It is well accepted that related factors may influence college students' preference in choosing their major or in career development (Leong, et al., 2001). Prior studies named this factor as family cohesion (Johnson, Buboltz, and Nichols, 1999) or parental attachment (Blustein, et al., 1991; Choi, et al., 2012). For example, Blustein, et al. (1991) expatiated the relation between family relationship (psychological separation and parental attachment) on young adults' career development. The results demonstrated that parental attachment (with at least one parent if not both) predicts the young adult's career development process. Wong, et al. (2011) supported their results by using information obtained from universities in Hong Kong to show that, after controlling some related factors such as gender, parents' career interests/preference still have significant influence on young adults' career development. Law (2010) described that accounting students' career choices are influenced by parents. Xiang and Gruber (2012) and Xiang (2016) provided evidence about how students with an accounting major (or who intend to have an accounting major) are likely to be more motivated and hence perform better in the course. Therefore, we developed the following hypothesis:

H3. The learning performance of students with at least one parent working in an accounting- or business-related area in the first post-secondary accounting course is better than that of their peers without such a parent.

Methodology

Sample and Participants

The data in this study was collected from the University of Wisconsin – Whitewater, a public regional university located in the American Midwest. The university is accredited by the North Central Association of Colleges and Universities and the College of Business is accredited by the Association to Advance Collegiate Schools of Business (AACSB).

The first accounting course in the business curriculum, *Introduction to Financial Accounting*, is required for all business majors. Most students take it in their first semester as a sophomore. An experienced instructor works as the course coordinator, who is responsible for developing exams, projects, and other assignments. A major reason for having a course coordinator is to maintain the quality and consistency of the course throughout the years. Students' learning performance is assessed based on four exams (three midterm and one cumulative final), five projects, and other assignments (e.g., homework and quizzes) throughout the semester. The four exams account for about 80% of a student's overall grade, and projects and other assignments make up 20% of the course grade.

During the three-semester sample period, after receiving approval from the IRB office, the instructors distributed a survey to solicit information from students who attended the course including the following: gender, race, current GPA, anticipated major, high school accounting experience, and parents' career. Appendix A provides the details about the survey questionnaire.

The survey instrument was distributed to 326 students among the five sections the authors taught.¹ After deleting two observations because of missing information on student ID, and the 27 students who dropped, our final sample included 281 observations indicating a response rate of 86%. Table 1 describes the data selection process.

Empirical Model

We specify the following OLS regression model to test the hypotheses between socioeconomic factors and students' performance in the introductory financial accounting course:

$$\begin{aligned} Total_Exam_Score_i = & \alpha + \beta_1 Family_Income_i + \beta_2 GPA_i + \beta_3 First_Generation_College_Student_i + \\ & \beta_4 Parent_Being_Business_Career_i + \beta_5 Parent_Being_Accountant_i \\ & + \beta_6 Gender_i + \beta_7 Race_i + \beta_8 Year_In_School_i + \beta_9 ACCT_Major_i \\ & + \beta_{10} With_High_School_Accounting_Course_i + \varepsilon_i \end{aligned} \quad (1)$$

where the dependent variable, *Total_Exam_Score*, is a continuous variable based upon the sum of the grades of the four examinations in the course. The model contains 10 independent variables among which *Family_Income*, *First_Generation_College_Student*, *Parent_Being_Business_Career*, and *Parent_Being_Accountant*, are the main variables of interest. Specifically, *Family_Income* is a categorical variable taking a value from 1 to 6 based on total family income ranging from less than \$25,000 to \$250,000 or above.² *First-generation College Student* is a dummy variable taking value one if at least one parent is with college education and 0 otherwise.

Parent_Being_Business_Career is a dummy variable taking value 1 if at least one parent's career is business related and 0 otherwise. *Parent_Being_Accountant* is a dummy variable taking value 1 if at least one parent is accountant and 0 otherwise. If we find a positive coefficient on *Family_Income*, *Parent_Being_Business_Career*, and *Parent_Being_Accountant*, then Hypotheses 1 and 3 are supported. If we find a negative coefficient on *1st_Generation_College_Student*, then Hypotheses 2 is supported.

We controlled for other factors associated with students' performance in accounting. These factors include *ACCT_Major*, *With_High_School_Accounting_Course*, *Gender*, *Race*, *Year_In_School*, and *GPA*. Specifically, *Gender* is a dummy variable taking the value 1 if male and 0 otherwise. *Race* is a categorical variable with a value ranging between 1 and 5 to represent White, African-American, Asian, Latino, or other, respectively. *Year_in_School* is a categorical variable with a value from 1 to 5 (freshman, sophomore, junior, senior, and graduate respectively). *ACCT_Major* is a dummy variable taking the value 1 if the student's intended major is accounting and 0 otherwise. *With_High_School_Accounting_Course* is a dummy variable taking the value 1 if the student attended a high school accounting course and 0 otherwise. *GPA* refers to the respondent's cumulative college grade-point-average on a 4.0 scale since attending the course. Table 2 provides the information on the variables included.

¹ The data was collected over two years. All sections taught by the authors have been included. The other sections were not included because the instructors were not interested in participating in the study.

² The distribution of the family income included in the survey is from Elwell (2015). In his study related to middle class, incomes are divided as lower, average, upper middle, and high income class/family using the cut points of \$25,000, \$50,000, \$125,000, and \$200,000 respectively. He also describes the top income families as the ones with annual income \$250,000 or above, which is consistent with that of The Census Bureau (<https://www.census.gov/>).

Empirical Results

Univariate Analysis

Table 3 provides the results of the descriptive analysis. Panel A of Table 3 suggests over half the students (67%) are male. The majority of the students are White, while minorities comprise less than 15% of the sample. More than half of students (76%) are sophomores, which is predictable based on the curriculum. About 27% of the students selected accounting as a major. Nearly 60% of respondents went in for non-accounting business majors such as finance, marketing and management, leaving less than 20% of students went in for non-business majors. About one third of students attended one or more accounting course(s) in high school. As far as family income is concerned, nearly 10% of students belonged to families with no more than \$25,000 annual income. About 14% students belonged to families with an annual family income between \$25,000 and \$50,000. A little over half of the students (54%) belonged to families with an annual income between \$50,000 and \$125,000. About 15% of the students belonged to families with an annual income between \$125,000 and \$200,000. No more than 9% students belonged to families with an annual income of \$200,000 or above. About two thirds of the students were first-generation college students. A little over one third of students replied that they had at least one parent whose career encompassed business. No more than 11% of students indicated that at least one parent worked as an accountant.

Panel B presents the mean and the standard deviation of the students' average GPA and examination scores. The results showed that the students' average GPA was 3.18 and the average total exam score was 260 points out of 380 points (68%). The average total score for the course (including projects and other assignments) was 378.92 points out of 480 points for the whole semester (about 79%).

Table 4 shows the *t*-test results of the total examination scores based on the variations in the independent variables. The results show that, generally, female students tend to achieve higher total exam scores than the male students, and the differences are significant at the 10% level. Students majoring in accounting tend to perform better in examinations than students in other majors, and the results are significant at the 1% level. The *t*-tests show that students who have attended a high-school accounting course have a better learning performance than their peers, and the results are significant at the 1% level. Table 4 also shows that students who are first-generation college students tend to obtain higher average examination scores than their peers, and the results are significant at the 5% level. This is to some extent different from existing research (Hill et al., 2004), which shows that when parent(s) possess more education, children tend to perform better academically. Our explanation for the result that first-generation college students tested here show better learning performance is that the first-generation college students may more strongly value the opportunity for higher education and therefore be more likely to work harder than their peers. Further, we find that students with at least one parent working as an accountant tend to achieve higher examination scores than their peers, and the results are significant at the 5% level. In addition, the results show that student course performance varies with their family income: Students from families with higher family income (\$50,000 or above) tend to score higher than students from lower-income families (less than \$50,000), and the results are significant at the 5% level. We did not find significant differences in examination scores in terms of race, year in school, or parent(s) in business.

Table 5 presents the correlation results for the main variables in the study. The findings show that students' learning performance in the first college-level financial accounting course is significantly correlated with factors such as gender, race, prior high school accounting course, GPA, family income, first-generation college student, parent(s) in the business area, and parent(s) being an accountant. The total examination score is positively and significantly corrected with family income at the 5% level. It is also positively and significantly corrected with students' high school accounting learning experience at the 1% level, which is consistent with the extant literature (Xiang and Gruber, 2012; Xiang, 2016). In addition, the total examination score is positively and significantly (at 5% level) correlated with the student's parent(s) being an accountant. In Table 5, we also observe the presence of systematic correlations across certain characteristics. For example, race is negatively and significantly (at 1% level) correlated with family income in that White students are more like to be from families with higher annual income. Students whose parent(s) is/are in a business-related career are more likely to take some accounting course(s) in high school. As such, we conducted multivariate analysis to tease out the characteristics that explain accounting students' course performance, while simultaneously controlling for other factors related to students' examination performance. In addition, we adopted a variance inflation factor (VIF) test to examine the effect of the correlations among the

independent variables (Perera and Richardson, 2010). Therefore, we next performed multivariate analyses to test our hypotheses.

Main Multivariate Results

In this section, we present the findings based on multivariate tests which are used to mainly examine the relationship between students' course performance and some family-related factors. Table 6 reports the results based on *OLS* regressions, including the VIF diagnostics information. The VIF diagnostics quantifies the severity related to the effect of multicollinearity. From the VIF information presented in Table 6, the effect of multicollinearity is at the acceptance level (all less than five).³ Table 6 Column (1) presents the basic results when only one family-related factor (family income) is included in the model. The results provide evidence that family income has a significant relation (at a significance level of 10%) to students' learning performance in the first financial accounting course. Specifically, students from higher family income tend to perform better than their peers from poorer families. The results also show that when family income increases to a higher level, students' examination scores are expected to increase by almost 5 points. Therefore, the evidence lends support to H1. The results also show that students with high school accounting course(s) tend to perform better than their peers. In addition, student's GPA is positively and significantly (at 1% level) associated with his/her examination performance.

The Columns (2) to (5) present the results when adding three other family-related factors (first-generation college student, parent(s) in business area, and parent(s) being an accountant) into the model. The results are very similar to the base results listed in Column (1). However, there is no evidence to support that any of these three family factors is significant in explaining students' learning performance in the first financial accounting course. Hence, Hypotheses 2 and 3 are not supported.

Comparative Importance of Key Factors

The results in Table 6 show that gender, year in school, and accounting major are all significant controlling factors in the model, which are consistent with the extant research (Byrne & Flood, 2008; Xiang and Gruber, 2012). Following these results, more question(s) show(s) up: Compared to other factors, is family income a key factor in explaining students' learning performance in the first college-level accounting course? If not, can we get any factor(s) that is/are more significant in explaining accounting students' course performance? Following that strategy, we keep the key controlling factors and add the other independent variables (which are significant in our base results in Table 6) one by one in the regression.

Table 7 shows the results when the key independent factors in the base results are added one by one in the regression. When accounting major is added in Column (1), it is positively and significantly (at the 1% level) associated with course performance. The adjusted R^2 of the regression is 0.14. In Column (2), when having a high school accounting course is added based on Column (1), having high school accounting course is positively and significantly (at the 10% level) associated with course performance. The R^2 of the regression is 0.15. When GPA is added to the model, GPA is positively and significantly (at the 1% level) associated with course performance. The adjusted R^2 of the regression is 0.34, indicating it is a key factor in explaining students' performance in their first post-secondary accounting course. In Column (4), when family income is added, it is positively and significantly (at the 5% level) associated with course performance. The adjusted R^2 of the regression increased only a little bit (from 0.34 to 0.35). Hence, the results provided in Table 7 show that GPA is the key factor predicting students' learning performance in the first college level accounting course.

Robustness Check

In order to validate our findings from Table 6 and 7, we conducted several robustness tests and presented results in this section. First, we used assignment and homework completion in the course to retest the effect of students' consistency/motivation. In Table 8, Assignment Performance is the total points a student received from all assignments including homework, project, and quizzes throughout the semester. Our results are consistent with the basic results reported in Table 6: Assignment performance enters the regression in a positive direction and at a significance level of 5%. Family income and GPA are still positively and significantly associated with students' examination performance (at the 10% and 1% level respectively). All control variables show results very similar to

³ The similar VIF information is included in both Table 7 and Table 8. In both tables, the VIF diagnostics show that the effect of multicollinearity is at an accepted level (less than five).

those in the basic results presented in Tables 6 and Table 7.

In addition, we performed two additional robustness analyses to provide more confidence. First, we replaced the total examination score with total course score, which includes the projects and other assignments, and use that as the dependent variable. Second, we modified two family-related factors (parent working in business area, and parent being an accountant) by including other direct relatives (i.e., grandparents, aunt and uncle) and close family friends. The findings are qualitatively similar to the results reported in Table 6 and 7.⁴

In sum, the results from the robustness tests are consistent with the results we found in the base results. Hence, these offer additional evidence to support our prediction that family income is one of the significant factors associated with students' performance in the first post-secondary financial accounting course.

Discussion and Conclusions

In the past years, many studies have examined the factors that may significantly predict accounting students' course performance in the first college financial accounting course. However, little research has examined the relationship between family-related factors (e.g., family income and/or parents' career) and accounting students' course performance. Our study examines the relation between socioeconomic factors (i.e., family-related factors) and students' learning performance in the first college-level financial accounting course. Specifically, we investigated whether family-related factors, including family income, parents' education background and career, are related to student performance.

We came up with the following three main findings: First, family income is one of the factors that can predict accounting students' learning performance. Students from families with higher income tend to perform better in the first post-secondary accounting course. However, family income itself is far from the most important factor in determining accounting students' course performance. Second, we uncovered no evidence to support the hypothesis that other family-related factors (i.e., first-generation college student, parent(s) being in the business area, and/or parent(s) being an accountant) are significantly associated with course performance. Third, our study showed that two factors play a key role in predicting students' course performance in the first college level accounting course: students' college GPA and study attitude and/or motivation. The results demonstrated that compared with family-related factors such as family income, other factors (students' GPA and their study attitude / motivation) predict accounting students' course performance in the first college-level accounting course much more powerfully.

The study contributes to the current literature on the determinants of accounting students' learning performance. It is one of the first studies to test the impact of a set of family-related factors on students' learning performance in an accounting course. The study also reveals that personal factors about the students (e.g., study attitude and motivation) are good predictors of accounting course performance. This finding is hopeful for students. Unlike family income, which tends to be stable, these personal factors are not fixed. Students can improve their performance by changing their attitude and motivation. Therefore, administrators and instructors could design interventions to make accounting students more motivated and have a more positive attitude about the course, thereby improving student grades.

There, however, are limitations to the study. First, family income was assessed through students' reports. Our results may be subject to bias, because it is possible that the students do not possess an accurate grasp of their family income. Second, there may be room for improving the survey format in examining the various questions included in this study. Third, our sample may not be representative because it is based on data collected from some of the students at one Midwest public university. Whether the results can be extended to universities in other regions or countries requires future research. In fact, the current study is better to be considered as exploratory. Future research could also look more into what makes a student have a positive attitude and be more motivated: Apart from family factors, could it be experiences gathered in college or the course? We hope future research will further expand upon these questions.

⁴ The results are not reported for brevity. The results can be provided upon request.

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APPENDIX A: SURVEY

ID _____ Name: _____

1. Year in School: Freshman /Sophomore/ Junior /Senior/ Graduate student
2. Gender: _____
3. Race: White/African American/ Asian/Latino/ or specify if not listed
4. You plan in majoring:
Accounting /Finance /Management/Marketing/Economics/IT / or specify if not listed:
5. Does your planned major at the beginning of the semester differ from your current decision?
If yes, why?
6. Current GPA:
7. Do you have any accounting courses before? Yes / No
If Yes, for how long? (Please circle one): One semester / one year / 1.5 years / 2 years or more
8. Family Income Range⁵ (please check one):

1	Less than \$5,000	
2	\$5,000 to \$9,999	
3	\$10,000 to \$14,999	
4	\$15,000 to \$19,999	
5	\$20,000 to \$24,999	
6	\$25,000 to \$29,999	
7	\$30,000 to \$34,999	
8	\$35,000 to \$39,999	
9	\$40,000 to \$44,999	
10	\$45,000 to \$49,999	
11	\$50,000 to \$59,999	
12	\$60,000 to \$69,999	
13	\$70,000 to \$79,999	
14	\$80,000 to \$89,999	
15	\$90,000 to \$99,999	
16	\$100,000 to \$124,999	
17	\$125,000 to \$149,999	
18	\$150,000 to \$199,999	
19	\$200,000 to \$249,999	
20	\$250,000 and above	

9. Are you the 1st generation college student of your family? Yes / No
If no, who else? (Check as many as qualify):
Grandparent(s)/ Father / Mother / Aunt/ Uncle / Brother/ Sister / or specify if not listed:
10. Do you have any relatives (or person close to you/your family) who is/are accountant(s)? Yes / No
If yes, who? (Check as many as qualify):
Grandparent(s)/ Father / Mother / Aunt/ Uncle / Brother/ Sister / or specify if not listed:
11. Do you have any relatives (or person close to you or your family) who is/are business person or in business major and he/she gave you suggestions when choosing your major? Yes / No
If yes, who? (Check as many as qualify):
Grandparent(s)/ Father / Mother / Aunt/ Uncle / Brother/ Sister / or specify if not listed:

⁵ The distribution of the family income is adopted by Elwell (2015).

Table 1. Number of Observations

Description	No.
Total Number of Registered Students in 3 Semesters (5 Sections)	326
Deduct: Students Dropped	(27)
Deduct: Students Who Did not Submit the Survey	(16)
Number of Students Submitted the Survey	283
Deduct: Submitted Survey with Key Missing Data	2
Total Number of Students Included in the Current Study	281

Table 2 Variable Description

Variable Name	Description
<i>Total_Exam_Score</i>	Student's total exam score (in points) in the course
<i>Gender</i>	1=male; 0=female
<i>Race</i>	1=white, 2=African American; 3=Asian; 4=Latino; 5=other
<i>Year_In_School</i>	1=freshman; 2=sophomore; 3=junior; 4=senior; 5=graduate
<i>ACCT_Major</i>	1= accounting; 2=finance; 3=marketing; 4=management; 5=economics; 6=other business; 7 non-business
<i>With_High_School_Accounting_Course</i>	Whether a student is with high school accounting course: 1=yes; 0=no
<i>GPA</i>	Cumulative college grade-point-average (4.0 scale) information when taking the first university-level accounting course
<i>Family_Income</i> ⁶	1 < \$25,000 2 \$25,000-\$50,000 3 \$50,000 - \$125,000 4 \$125,000 - \$200,000 5 \$200,000 - \$250,000 6 above \$250,000
<i>First_Generation_College_Student</i>	Whether a student is the 1 st Generation College Student: 1=yes; 0=no
<i>Parent_Being_Business_Career</i>	Whether at least one parent is working as a business person or with a business major: 1=yes; 0=no
<i>Parent_Being_Accountant</i>	Whether at least one parent is working as an accountant: 1=yes; 0=no

⁶ The family income is defined after Elwell (2015), in which family income is classified as low income family, upper low income family, lower middle class, middle class, upper middle class, and top income family.

TABLE 3. Description of Sample
(*n* = 281)

Panel A: Discrete Variables		
	<i>n</i>	%
<i>Gender</i>		
Male	189	67.26%
Female	92	32.74%
<i>Race</i>		
White	241	85.77%
African American	16	5.69%
Asian	12	4.27%
Latino	12	4.27%
Other	0	0.00%
<i>Year_In_School</i>		
Freshman	21	7.47%
Sophomore	213	75.80%
Junior	42	14.95%
Senior	1	0.36%
Graduate	4	1.42%
<i>ACCT_Major</i>		
Accounting	76	27.05%
Non-Accounting Business	161	57.30%
Non-Business	43	15.30%
<i>With_High_School_Accounting_Course</i>		
Yes	94	33.81%
No	184	66.19%
<i>Family_Income</i>		
Poverty	27	9.61%
Lower Middle	39	13.88%
Middle	150	53.38%
Upper Middle	41	14.59%
High Income	8	2.85%
Top Income	16	5.69%
<i>First_Generation_College_Student</i>		
Yes	189	67.26%
No	92	32.74%
<i>Parent_Being_Business_Career</i>		
Yes	106	37.72%
No	175	62.28%
<i>Parent_Being_Accountant</i>		
Yes	30	10.68%
No	251	89.32%

Panel B: Continuous or Quasi-Continuous Variables

	Mean	SD
<i>GPA</i>	3.18	0.41
<i>Total_Exam_Score</i>	259.81	51.34
Exam 1	67.18	11.87
Exam 2	61.84	14.58
Exam 3	60.53	14.00
Exam 4	70.08	17.79
Total Score	378.92	65.21

TABLE 4. *t* – Test Results
(*n* = 281)

Variables	Mean of Total Exam (In Points)	SD	<i>t</i> -Test ^a
<i>Gender</i>			
Male	252.30	51.24	-1.70*
Female	263.30		
<i>Race</i>			
White	261.70	51.22	-1.53
Minority	248.30		
<i>Year_In_School</i>			
Sophomore	259.0	51.42	0.45
Non-Sophomore	262.3		
<i>ACCT_Major</i>			
Accounting	290.50	47.87	-6.55***
Non-Accounting	248.40		
<i>With_High_School_Accounting_Course</i>			
Yes	270.90	50.60	-2.73***
No	253.30		
<i>Family_Income (< \$50,000)</i>			
Yes	248.60	51.06	2.03**
No	263.30		
<i>First_Generation_College_Student</i>			
Yes	264.80	50.93	-2.35**
No	249.60		
<i>Parent_Being_Business_Career</i>			
Yes	264.40	51.32	-1.15
No	257.10		
<i>Parent_Being_Accountant</i>			
Yes	279.90	50.97	-2.28**
No	257.40		

^a Differences are significant at **p* < 0.10, ***p* < 0.05, and ****p* < 0.01.

Table 5. Correlation Matrix among Variables

	<i>Total_Exam_Score</i>	<i>Gender</i>	<i>Race</i>	<i>Year_In_School</i>	<i>ACCT_Major</i>	<i>With_High_School_Accounting_Course</i>	<i>GPA</i>	<i>Family_Income</i>	<i>First_Generation_College_Student</i>	<i>Parent_Being_Business_Career</i>
<i>Gender</i>	0.101*									
<i>Race</i>	-0.102*	-0.107*								
<i>Year_In_School</i>	-0.053	-0.044	0.143**							
<i>ACCT_Major</i>	0.043	-0.059	0.016	0.055						
<i>With_High_School_Accounting_Course</i>	0.162***	-0.088	-0.069	-0.048	-0.118**					
<i>GPA</i>	0.483***	-0.163**	-0.147**	-0.131**	0.174***	-0.001				
<i>Family_Income</i>	0.097**	0.109*	-0.243***	-0.071	0.004	0.083	0.016			
<i>First_Generation_College_Student</i>	0.139**	0.044	-0.207***	-0.032	-0.040	0.077	0.125*	0.252***		
<i>Parent_Being_Business_Career</i>	0.068*	0.023	-0.116*	-0.014	0.099*	0.170***	0.015	0.422***	0.308***	
<i>Parent_Being_Accountant</i>	0.135**	0.113*	0.013	0.024	0.066	0.020	-0.041	0.220**	0.167***	0.206***

***, **, and * indicate statistical significance at the 0.01, 0.05, or 0.10 level, respectively.

Table 6. Regression Results: Basic Results and Results for Family Factors

Variable	Predicted Sign of Coefficient	(1) Basic Results	(2) Parent College	(3) Family in Business	(4) Family Accountant	(5) Total	VIF
<i>Family_Income</i>	+	4.89 (2.53)**				4.96 (2.78)*	1.29
<i>First_Generation_College_Student</i>	-		-4.43 (7.65)			-2.74 (7.77)	1.12
<i>Parent_Being_Business_Career</i>	+			0.25 (6.36)		0.37 (6.47)	1.20
<i>Parent_Being_Accountant</i>	+				0.97 (6.32)	-2.44 (6.60)	1.19
<i>GPA</i>	+	59.41 (7.24)***	59.24 (7.30)***	58.93 (7.32)***	59.23 (7.31)***	59.45 (7.31)***	1.10
<i>Gender</i>	+	13.28 (6.25)**	14.79 (6.29)**	14.13 (6.28)**	14.49 (6.28)**	13.37 (6.34)**	1.09
<i>Race</i>	+	-0.07 (4.10)	-1.29 (4.13)	-1.87 (4.02)	-1.81 (4.03)	0.21 (4.23)	1.18
<i>Year_In_School</i>	+	12.86 (5.21)**	12.14 (5.24)**	12.63 (5.27)**	12.20 (5.24)**	12.91 (5.28)**	1.06
<i>ACCT_Major</i>	+	29.67 (6.95)***	29.80 (7.01)***	30.06 (7.01)***	29.72 (7.25)***	30.27 (7.25)***	1.19
<i>With_High_School_Accounting_Course</i>	+	11.45 (6.26)*	11.66 (6.34)*	11.63 (6.33)*	11.97 (6.32)*	11.30 (6.35)*	1.11
Observations		281	281	281	281	281	
Adjusted R^2		0.33	0.32	0.32	0.32	0.32	
F-Value		16.66	15.92	15.85	15.96	11.54	

The dependent variables in the column of (1) to (5) are student's total exam score (in points) in this course. ***, **, and * indicate statistical significance at the 0.01, 0.05, or 0.10 level, respectively.

Table 7. Regression Results: Comparative Significance of Key Factors

Variable	Predicted Sign of Coefficient	(1)	(2)	(3)	(4)	VIF
<i>Family_Income</i>	+				4.90 (2.46)**	1.03
<i>GPA</i>	+			59.77 (7.19)***	59.42 (7.15)***	1.07
<i>Gender</i>	+	12.59 (6.09)**	13.41 (6.14)**	14.86 (6.19)***	13.29 (6.20)**	1.06
<i>Year_In_School</i>	+	-0.58 (4.86)	-0.42 (4.86)	11.93 (5.18)***	12.85 (5.16)**	1.03
<i>ACCT_Major</i>	+	42.60 (6.49)***	38.84 (6.80)***	30.03 (6.98)***	29.67 (6.93)***	1.10
<i>With_High_School_Accounting_Course</i>	+		8.77 (6.33)*	12.27 (6.26)*	11.46 (6.23)*	1.09
Observations		281	281	281	281	
Adjusted R^2		0.14	0.13	0.32	0.33	
F -Value		15.69	11.44	22.33	19.53	
p		<0.001	<0.001	<0.001	<0.001	

The dependent variables in the column of (1) to (4) are student's total exam score (in points) in this course. ***, **, and * indicate statistical significance at the 0.01, 0.05, or 0.10 level, respectively.

Table 8. Robustness Check: Regression of the Impact of Students' Motivation (Assignment Performance)

Variable	Predicted Sign of Coefficient	(1)	VIF
<i>Assignment_Performance</i>	+	0.34 (0.10)**	1.09
<i>Family_Income</i>	+	4.37 (2.42)*	1.03
<i>GPA</i>	+	53.49 (7.25)***	1.15
<i>Gender</i>	+	14.33 (6.08)**	1.06
<i>Year_In_School</i>	+	11.69 (5.07)**	1.04
<i>ACCT_Major</i>	+	28.48 (6.81)***	1.11
<i>With_High_School_Accounting_Course</i>	+	11.87 (6.11)*	1.09
Observations		281	
Adjusted R^2		0.36	
F-Value		18.84	
P		<0.001	

The dependent is student's total exam score (in points) in this course. ***, **, and * indicate statistical significance at the 0.01, 0.05, or 0.10 level, respectively.