

# **Factors Affecting Student Performance in Managerial Accounting: An Empirical Study at a US Residential Public University**

**Qian Hao**  
**Kutztown University of Pennsylvania**

**Gregory Kaufinger**  
**Kutztown University of Pennsylvania**

**Mostafa M. Maksy**  
**Kutztown University of Pennsylvania**

*This study examines some determinants of student performance in Managerial Accounting. Of the motivation factors studied (intended grade, intention to take the CPA exam, or attend graduate school) only the first has some association with student performance. None of the three distraction factors (job hours, job type, and course load) has any significant negative effect on student performance. Of the four self-perceived ability factors (Writing, Math, Reading, and Listening) only Math has a strong significant association with student performance. Neither gender nor declared or intended major has significant association with performance. Finally, the grade in the pre-requisite Financial Accounting course and overall GPA are strong predictors of student performance in Managerial Accounting.*

*Keywords: student performance, managerial accounting, motivation factors, distraction factors, self-perceived factors, prior ability factors*

## **INTRODUCTION**

Several prior research studies have explored various factors (e.g., general academic performance, aptitude, prior exposure to mathematics, prior exposure to accounting, age, gender, motivation, effort, and other intervening variables) that are associated with student performance in college-level courses. It is widely believed that motivation and effort significantly influence individual performance in college. However, as the review of prior research below indicates, very few studies have investigated their impact on required undergraduate Accounting courses. This study investigates the associations between selected motivation, distraction, self-perceived ability, prior ability, and other (gender and major) factors and student performance in the undergraduate Managerial Accounting course at a residential public university in the U.S.

As proxies for motivation, the authors use the grade the students intend to earn in the course, intention to take the Certified Public Accountant (CPA) examination, and intention to attend graduate school. As proxies for distraction, the authors use the number of hours of work per week, the type of job (whether or

not it is related to accounting, or business in general) and the number of courses taken per semester. The study measures students' self-perceived abilities using their own self-reported writing, math, reading, and listening abilities. Students' prior abilities are measured by the actual grade earned in the Financial Accounting course, which is a prerequisite for the Managerial Accounting course, and by Overall Grade Point Average (OGPA.) The dependent variable, student performance, is measured in two different ways: the letter grade for the course, and the total overall points percent score (hereafter referred to as 'Points') for the course.

One of the motivations of this study is the belief that identifying factors that motivate students to perform well and factors that distract them from performing well may help us emphasize the motivation factors and discourage the distraction factors. Another purpose of the study is to provide empirical support to the intuitive notion that motivation does indeed lead to better student performance. Also, the study could help us determine whether students make accurate assessment of their own writing, math, reading, and listening abilities. If they do, there should be significant association between their assessment of these abilities and their performance. If there is no significant association between their evaluation of these abilities and their performance, this would be an indication that the students are not making accurate evaluation of their abilities, which could be detrimental to their success in college.

The remaining parts of the paper present a review of prior research, discussion of the study objectives, variables and hypotheses, research methodology, and results. The paper ends with conclusions, recommendations, study limitations, and some suggestions for further research.

## **REVIEW OF PRIOR RESEARCH**

Several prior studies have examined the association between various factors (e.g., general academic performance, aptitude, prior exposure to mathematics, prior exposure to accounting, gender, age, motivation, effort, and other intervening variables) and student performance in college-level courses. The overall Grade Point Average (OGPA) is used frequently as a proxy for prior academic performance and aptitude.

Several researchers, using data from various U.S. universities, find evidence supporting OGPA as a significant predictor of performance in accounting courses (Maksy & Zheng, 2008; Maksy 2012, 2014; Maksy & Wagaman, 2012, 2013, 2015; Gupta & Maksy, 2014; Alanzi 2015; and Mo & Waples, 2015). In the finance area, Biktimirov and Klassen (2008) find OGPA to be a strong predictor of grade in the Financial Management course that is required of all business majors. Many researchers find evidence that both OGPA and the grade(s) in the prerequisite course(s) are significant predictors of performance in the course under investigation (Maksy 2017; Maksy & Rodriguez 2017, 2018; Gupta & Maksy, 2019; Hao & Maksy, 2019, and Leshchinskii & Maksy, 2019). In Saudi Arabia, Al-Twajjry (2010) finds that performance in high school, achievement in pre-university mathematics, and the grade in the financial accounting course as strong predictors of performance in managerial accounting. In Bahrain, Kukreja and Aali (2013) find that GPA in high school, accounting or finance major, and the number of prior courses taken, but most importantly the grade in financial accounting as strong predictors of performance in managerial accounting.

Accounting is a subject area that requires accumulation of prior knowledge and quantitative skills. Thus, several studies have investigated the impact of prior exposure to accounting and mathematics on performance in college accounting courses and the results are inconclusive. On one hand, some studies (for example, and Schroeder, 1986) find that performance is not significantly associated with prior exposure to high school accounting education. On the other hand, some later studies (for example, Rohde & Kavanagh, 1996;) find that prior accounting knowledge, obtained through high school education, is a significant determinant of performance in college-level accounting courses. There is also some ambiguity with regard to the influence of mathematical background on performance in accounting courses. For example, Al-Twajjry (2010) suggest that students with strong mathematical backgrounds outperform students with weaker mathematical backgrounds. However, Guney (2009) suggests that grades in secondary education mathematics are a very strong determinant of performance in accounting but only for non-accounting majors.

Prior studies about the influence of motivation and effort on student performance also report conflicting results. Maksy and co-investigators use “the grade the student intends to earn in the course” as a proxy for motivation and find it to be significantly associated with student performance in various accounting auditing, finance, investment, and management information systems courses (Maksy, 2017; Maksy & Rodriguez, 2017; Gupta & Maksy, 2019; Hao & Maksy, 2019; and Leshchinskii & Maksy, 2019.) Rich (2006) uses students’ homework preparedness and unpreparedness in class as a proxy for effort and non-effort. He finds significant positive association for the former and negative association for the latter with exam percent. Biktimirov and Klassen (2008) find a weak association between hits to a course management system and grades in a finance course. However, using self-reported data, Didia and Hasnat (1998) present very weak counter-intuitive evidence for one of two OLS models, but not for the ordered-probit models, that the more time spent studying per week, the lower the grade in the Introductory Finance course. However, they did not control for GPA.

In recent years, there has been increased interest in studying the influence of intervening variables on student performance. Didia and Hasnat (1998) find a strong positive association between the number of credit hours enrolled in the semester and course grades. This result may seem to be counter intuitive; however, some research (e.g., Gupta & Maksy, 2014), shows that students with higher GPAs take more courses and more credits per semester. Rich (2006) reports significant negative association between class absences and being late to the class, and exam percent. Guney (2009) show there is a clear positive association between attendance and academic performance in accounting courses. Alanzi (2015) finds significant association between class attendance (and college experience) and student performance in a Cost Accounting course at a university in Kuwait. Lynn and Robinson-Backmon (2005) find a significant adverse association between employment status and learning outcomes in upper-division accounting courses. These authors also indicate that a student’s self-assessment of course learning objectives is significantly and directly related to grade performance. In contrast, Maksy and Zheng (2008), Maksy (2012, 2014), Maksy and Wagaman (2012, 2013, 2015) and Gupta and Maksy (2014), find no significant negative association between the number of hours of work per week and student performance in several accounting, auditing, and investment courses. Additionally, in very recent studies, Maksy and co-investigators find no significant negative associations between job hours, job type (if it is not related to accounting or business in general) and course load and student performance in various accounting, auditing, finance, investment, and management information systems courses (Maksy, 2017; Maksy & Rodriguez, 2017, 2018; Gupta & Maksy, 2019; and Leshchinskii & Maksy, 2019.) Al-Twajiry (2010) finds that students carrying more than 15 hours course load per semester perform better than others in a Managerial Accounting course. In contrast, Hao and Maksy (2019) find a significant negative association between course load and student performance in an Advanced Accounting course. Tessema et al. (2014) report that if students work 10 hours or less per week, they are more satisfied and have higher GPAs than students who work more than 10 hours per week. Schleifer and Dull (2009) address metacognition in students and find a strong link between metacognitive attributes and academic performance. Metacognition is frequently described as ‘thinking about thinking’ and includes knowledge about when and how to use particular strategies for learning or for problem solving.

Age and gender are two demographic variables that receive less attention than those factors discussed above, but the results are still inconclusive. Alanzi (2015) finds that gender, age, nationality, scores and majors in high school, grades in prerequisite courses and overall GPA in college, have no significant association with student performance in Cost Accounting. However, Rodrigues et al. (2018) report that males perform better than females in a Professional Entry Exam for Accountants in Brazil. Rodrigues et al. (2018) also report that younger persons perform better than older persons in a Professional Entry Exam for Accountants in Brazil. However, Schrouder and Rhodd (2013) report that older and more experienced students perform better than younger and less experienced students in a Public Administration course. Also, Almunals et al. (2014) report that females perform better than males in the accounting major. They also find other factors significantly associated with the performance of students majoring in accounting including high school major (science majors perform better than humanities majors), marital status (married students perform better than single students), frequency of doing homework, class participation, peer interaction, and number of days studying before the exam.

It is also possible that other intervening variables, besides the demographic variables, may affect student performance in accounting courses in college. Gracia and Jenkins (2003) observe that students who actively demonstrate commitment and self-responsibility towards their studies tend to do well in formal assessments. They are also in agreement with Lane and Porch (2002) who suggest that other important factors like student motivation may explain student performance. Also, Seow et al. (2014) report that prior academic achievement, admission interview, critical thinking, and mathematical aptitude are significantly associated with successful academic performance in an undergraduate accounting degree at a Singapore University.

Conflicting results are also observed about the association between student performance in introductory accounting and their performance in non-introductory accounting courses. Tickell and Smyrniotis (2005) find that the best predictor of academic performance in any one year is the performance in the same discipline in the previous year. Doran et al. (1991) report a very surprising and counterintuitive result that performance in the introductory accounting course has a negative impact on performance in subsequent accounting courses.

While prior research has been largely inconclusive or replete with conflicting results, it is not the purpose of this study to resolve all these conflicts. The authors' primary objective, in this study, is to provide more insight on those areas in which there was some general agreement. Since motivation and effort has generally been positively associated with student performance, the authors try, in this study, to test whether some new selected motivation factors affect student performance in the Managerial Accounting course. The authors also look at several factors which are commonly viewed as possibly distracting students from performing well and test whether they indeed are negatively affecting student performance. Moreover, the study investigates the impact of four self-perceived abilities factors and student performance and whether students make accurate assessment of those abilities. Also, because some prior studies showed some differences between the performance of males and females, and whether the students' major affect their performance, this study will investigate whether gender and major will have similar effects on student performance in Managerial Accounting. Furthermore, the study investigates the impact of two specific measures of prior abilities on student performance, and also uses them as control variables while testing for the association between motivation, distraction, self-perceived abilities, and other factors and student performance in the Managerial Accounting course.

## **STUDY OBJECTIVES AND HYPOTHESES**

The first objective of this research is to study the association between three selected motivation factors (the grade the student intends to earn in the course, the student's intention to take the CPA examination, and the student's intention to attend graduate school), and the student's performance in the Managerial Accounting course at a residential public university in the U.S. The authors hypothesize that there are positive and significant associations between those motivating factors and student performance. That is, students who intend to earn higher grades, take the CPA exam, or attend graduate school, are motivated to perform well and do perform well in the course to achieve their intentions.

The second objective is to study the association between three distraction factors (the student's number of job hours per week during the semester, the student's job type, if it is not related to accounting, or business in general, and the student's number of courses taken in the semester) and the student's performance in the Managerial Accounting course. Intuitively, the higher the number of job hours per week, the less time the student will have to study for the Managerial Accounting course resulting in a lower course grade. Also, if the student's work is not accounting or business related, it will not help the student do well in the Managerial Accounting course. Furthermore, it is likely that the performance of a student taking a higher number of courses will be affected negatively because the student may not be able to devote sufficient number of hours of study to the course.

In light of the prior discussion, the authors hypothesize that if the student's number of job hours per week is higher, and/or the student's job is not related to accounting, or business in general, and/or the number of courses taken in the semester is higher, there will be a significant negative association between

each of these distraction factors and the student's performance in the Managerial Accounting course. Of course, distraction factors may offset each other thereby cancelling out any single factor's effect. For example, a student who works a higher number of hours per week may take fewer courses, and vice versa, so that there is no negative effect on performance. For this reason, the authors test the effect of each distraction factor on student performance while controlling for the other two factors. The authors also investigate the associations among the distraction factors themselves.

The third objective is to study the associations between students' performance in the Managerial Accounting course and their current self-perceived abilities in writing, math, reading, and listening. A positive association between self-reported abilities and performance may indicate that students make reasonably accurate assessment of their abilities. A lack of positive and significant association between certain abilities and performance could be due to the possibility that those abilities are not relevant to the performance in the course or to students' inaccurate assessment of their abilities. Before the students filled out the questionnaires, the authors instructed them to be as honest as possible in their answers so students who plan to take this course in the future would benefit from the results of this research. The authors assume that the students followed those instructions and, thus, the authors hypothesize positive and significant associations between students' self-perceived abilities and their performance in the Managerial Accounting course.

The fourth objective is to study the association between students' performance in the Managerial Accounting course and their grade in the pre-requisite Financial Accounting course, and their overall GPA. Based on the results of many prior studies, the authors hypothesize that there are positive and significant associations between these prior actual abilities and student performance. Thus, the hypotheses are that students who earned higher grades in Financial Accounting, or have high GPAs, will earn higher grades in the Managerial Accounting course, and vice versa.

The fifth objective is to examine the association between students' performance in the Managerial Accounting course and their gender, and major. Based on the results of most prior studies, the authors do not expect any significant association between gender and student performance in the Managerial Accounting course. The authors included this gender variable to empirically show that the results of this study are in line with the results of most prior studies. The authors believe that the major will have a significant effect on student performance because the Managerial Accounting course is an accounting course that covers various managerial accounting topics and some finance topics as well. So, the authors believe that students whose major is accounting or finance will perform better in this course than students whose major is management, marketing, or other business major.

## **STUDY DEPENDENT VARIABLES**

In addition to the 14 independent variables described under the study objectives above, the study uses two dependent variables. Initially, the authors used only the letter grade in the course (A, B, C, etc.) as the student performance dependent variable. However, the authors quickly realized that the letter grade treats a student earning the lowest end of the grade range as having the same exact performance as that of a student earning the highest end of the grade range. For example, assuming the instructor doesn't use pluses and minuses, a student with a total percentage points of 80 and another with a total percentage points of 89 would be considered having equal performance since both students receive a B for the course, even though the first student is one percentage point away from a C grade and the other student is one percentage point away from an A grade. As a result, the authors also decided to use overall points percentage earned by a student in the course (before any curving by the instructor) as a dependent variable.

## **STUDY HYPOTHESES**

The study tests one hypothesis for each independent variable. The formal statements of all 14 hypotheses are presented (classified under five categories of factors) in APPENDIX A. To prevent redundancy, each hypothesis is presented in the alternate form only.

## **RESEARCH METHODOLOGY**

### **Survey Instrument**

Besides the study variables, the survey instrument includes some demographic and other information. For ethical, confidentiality, and potential risk issues pertaining to participants, the authors took the Collaborative Institutional Training Initiative (CITI) Program's Social & Behavioral Research - Basic/Refresher (Stage 1 - Basic Course) related to 'Protecting Human Research Participants.' as required by the University's Institutional Review Board (IRB). The certificates of completion of the CITI training are on file with the researchers and available for presentation upon request by any other interested party.

### **Study Sample**

In spring of 2020, the authors were able to collect the data on the survey instrument from 112 of 127 students enrolled in all the five sections of the undergraduate Managerial Accounting course offered at a US public residential university. The university enrolls about 8,200 students (as of fall 2019), and the College of Business enrolls about 1,000 students. It is a state-supported university that has public access as a major part of its mission statement. It is located near one of the largest cities in the United States (Philadelphia). The two instructors teaching the five sections of the course provided (using only students' ID numbers for confidentiality purposes) the data representing the two dependent variables (the 'letter grade,' and 'overall points percentage'). Both instructors used the same textbook and McGraw Hill's Connect learning system.

One author entered the data from the student questionnaire on an Excel spreadsheet. Another author did the same thing on a separate Excel spreadsheet. Another author matched the two spreadsheets and resolved any discrepancy by referring to the original questionnaire. This virtually eliminated any data entry errors.

### **Data Analysis**

To test the formulated hypotheses in APPENDIX A, the study uses one-way analysis of variance (ANOVA), Pearson and Spearman's correlation coefficients, partial correlations, and ordinary least square linear regressions.

## **STUDY RESULTS**

Table 1 presents the minimum and maximum value, the mean, and the standard deviation for each of the 16 variables of the study. That Table shows an average grade in the Managerial Accounting course of 2.79 out of 4.00, which is almost the same as the average grade of 2.78 in the Financial Accounting course (ACC 121), which is the prerequisite for the Managerial Accounting course. Also, the average Managerial Accounting course grade is lower than the overall GPA of 3.03, and average Intended Grade of 3.46. In comparison, the Maksy and Rodriguez (2018) study of performance determinants in a Managerial Accounting course at a New England Public University report a Managerial Accounting course grade of 2.81 (which is almost the same as in this study), GPA in a prerequisite course of 3.40 (which is much higher than in this study), and overall GPA of 3.02 (which is almost the same as in this study). It is interesting to note that the positive difference of only 0.01 between the average course letter grade and the average Financial Accounting prerequisite course grade is significantly smaller than the comparable negative difference of 0.59 reported by Maksy and Rodriguez (2018). However, the negative difference of 0.24 between the average course letter grade and overall GPA is about the same as the negative difference of 0.21 reported by Maksy and Rodriguez (2018). On the other hand, the negative difference of .67 between the average course letter grade and the average Intended Grade in this study is significantly higher than the positive difference of 0.27 reported by Maksy and Rodriguez (2018). It seems that, for some reason, the students in this study were overly optimistic about what grade they intend to earn, whereas the students in the Maksy and Rodriguez's Study earned better grades than what they intended to earn.

Following is an analysis of the study results by the type of factors investigated (motivation, distraction, self-perceived abilities, prior abilities, and other factors), taking all observations into account.

### **Motivation Factors Associated With Student Performance**

As Tables 2, 3 and 4 indicate, of the three motivation variables discussed in H1 to H3, only Intended Grade (IG) is significantly associated (at the .01 significance level) with student performance (however defined) based on ANOVA, Pearson, and Spearman's Correlations. As Table 4 indicates, after the authors controlled for prior ability, as measured by the grade earned in the pre-requisite Financial Accounting course (ACC 121) and OGPA, this significant association continued but at a lower (.05) significance level.

As Table 5 indicates, the regression analysis did not show any significant association between IG and student performance (however defined). Intention to take the CPA exam (ICPA) and intention to attend graduate school (IGS) are not significantly associated with student performance (however defined) under any test.

The results of this study (of significant association between IG and student performance and no significant association between ICPA or IGS and student performance) are in agreement with several prior studies (e.g., Maksy 2017, Maksy & Rodriguez 2017, Gupta & Maksy 2019, Hao & Maksy 2019, and Leshchinskii & Maksy 2019.) An argument could be made that the lack of significant association between ICPA and IGS is due to the fact that most students taking the Managerial Accounting course were not accounting majors or were not planning to major in accounting to be thinking about the CPA exam. Also, it is too early in the students' College study to be thinking about going to graduate school. Responses to the questionnaire (see Table 7) showed that less than one third (34 out of 105) of the subjects indicated that their major is accounting, or they did not declare a major but thinking about majoring in accounting to be thinking about taking the CPA exam or about going to graduate school.

However, this argument is not a strong one because more recent studies (e.g., Maksy, 2017, Maksy & Rodriguez 2017, and Hao & Maksy 2019), did not show any significant association between ICPA or IGS and student performance in Advanced Accounting and Auditing courses, which are only taken by accounting majors just before their graduation.

### **Distraction Factors Associated With Student Performance**

None of the three distraction factors discussed in H4 to H6, has any significant and negative association with student performance (however defined) under any of the four statistical tests used in the study. The only minor exception to this statement is that the Spearman Correlations in Table 3 show significant negative association between Job Hours and student performance (however defined) but only at the lowest level of significance of .10. Additionally, when the authors controlled for the prior ability factors (ACC 121 Grade and OGPA), Table 4 indicates that significant negative association totally disappeared. This disappearance is telling us that the grade in Financial Accounting and GPA are the determining factor of the grade in Managerial Accounting, i.e., regardless of how many hours per week the students are working, those who have high grades in Financial Accounting and high GPAs earn high grades in Managerial Accounting, and vice versa. Furthermore, as Table 6, Part A, indicates, when the authors controlled for the other two distraction factors (Job Type and Course Load), Job Hours did not show any significant negative association with student performance (however defined). Also, as Table 6, Part B, indicates, when the authors controlled for the other two distraction factors as well as the two prior ability factors, there was no significant negative association between Job Hours and student performance (however defined). The results of this study showing lack of significant negative associations between each of the three distraction factors and student performance, are in agreement with several more recent studies (e.g., Maksy 2017, Maksy & Rodriguez 2017, 2018, Gupta & Maksy, 2019, and Leshchinskii & Maksy.)

### **Self-Perceived Abilities Factors Associated With Student Performance**

Of the four self-perceived ability factors discussed in H7 to H10, only the Math ability is significantly associated with student performance (however defined) under all statistical tests used in the study but with varying levels of significance (.01 under ANOVA and Pearson Correlations, .05 under Spearman

correlations, and .10 under regression analysis). As Table 4 indicates, the associations between Math and student performance under Pearson correlations remained significant (but the level of significance is lowered from .01 to .05) after the authors controlled for prior ability, as measured by Financial Accounting grade and OGPA. This is true also even if the authors control for OGPA alone (this additional partial correlation test is not reported in this paper but is available from the authors upon request.) All statistical tests (ANOVA, Pearson and Spearman correlations, and regression) did not show any significant associations between Writing, Reading, or Listening and student performance (however defined.) The results of this study showing significant associations between Math and student performance (however defined), are in agreement with some prior studies (e.g., Al-Twajjry, 2010, Maksy et al., 2018, and Leshchinskii & Maksy, 2019.)

### **Prior Actual Ability (Control) Factors Associated With Student Performance**

All statistical tests, in Tables 2, 3 and 5, show significant associations (at the .01 level) between both ACC 121 Grade and OGPA and student performance, however defined, with only one exception: the regression test (in Table 5) shows the significance level between ACC 121 Grade and student performance at the .05 (not the .01) level of significance. The results of this study showing significant associations between the prerequisite course(s) and student performance, are in agreement with several prior studies (e.g., Al-Twajjry, 2010; Maksy, 2017; Maksy & Rezvanian, 2017; Maksy & Rodriguez, 2017, 2018; Maksy et al., 2018; Gupta & Maksy, 2019; Hao & Maksy 2019; Leshchinskii & Maksy, 2019; and Maksy & Yoon, 2019a, 2019b). The results of this study showing significant associations between OGPA and student performance, are in agreement with almost all prior studies mentioned in this paper.

### **Other Factors (Gender and Major) Associated With Student Performance**

None of the tests in Tables 2 through 5 show any significant association between gender and student performance, however defined. This result lends support to H13 and is in agreement with many prior studies (e.g., Alanzi, 2015; and Leshchinskii & Maksy, 2019).

The ANOVA test (in Table 2) and Pearson and Spearman correlation tests (in Table 3) show significant associations (at varying levels of significance) between student major and student performance. When performance is measured as Grade, the ANOVA test shows significant association at the .10 level, however; when performance is measured as Points, the ANOVA test doesn't show any significant association between major and performance. Again, when performance is measured as Grade, both the Pearson and Spearman correlations show significant association at the .01 level; however, when performance is measured as Points the Pearson correlation test shows significant association (at the .05 level) between major and performance, but the Spearman correlation test continues to show the significant association at .01 between major and student performance. To identify which major (accounting, finance, management, marketing, or other business major) leads to better performance in the Managerial Accounting course, the authors ran a cross-tabulation between major and grade as shown in Table 7.

A closer look at Table 7 indicates that the order of the majors leading to better performance in the Managerial Accounting course (based on the percentage of the students in each major earning the grades of A's and B's combined) is as follows: finance (86.7%), accounting (73.5%), management (60.7%), marketing (55.6%), and other business major (0%). There was only one student (out of 112) who selected the last major, "other business major." and that student earned the grade of C. Thus, the authors can generally state that students whose declared or intended major is finance (simply referred to here as finance majors) perform better in the Managerial Accounting course than accounting majors, and those perform better than management majors who perform better than marketing majors who perform better than other business majors. However, when the authors controlled for the prior ability factors, as Table 4 indicates, the significant association between major and student performance totally disappeared. The fact that the significant correlations between major and performance disappeared when the prior ability factors are controlled for, tells us that the prior abilities are driving the grades in the Managerial Accounting course. In other words, when we take all students who have the same grades in Financial Accounting and about the same OGPA, we find that those students perform about the same regardless of their major. While the



authors' hypothesis, H14, was that the major will have a significant effect on student performance in Managerial Accounting, the research results do not seem to lend support to that hypothesis. The ANOVA test shows significant association only when performance is defined as grade and only at the lowest significance level of .10. Also, the significant associations under the correlation tests disappear after the prior ability factors are controlled, and the regression test does not show any significant association at all. While Kukreja and Aali (2013) reported that accounting and finance majors perform better than other majors (which is in agreement with the results in this study before controlling for the grade in Financial Accounting and OGPA), Kukreja and Aali did not control for these two prior abilities.

## CONCLUSIONS AND RECOMMENDATIONS

One general conclusion of the study is that motivated students perform significantly better in the Managerial Accounting course than non-motivated students. This is the case only when motivation is measured by the grade the student intends to earn in the course. Intention to take the CPA exam or attend graduate school are not shown in this study to be motivating students to perform well in this course. A possible reason that intention to sit for the CPA exam was not a motivating factor to perform well in the Managerial accounting course is that less than one third of those surveyed were accounting majors or planned major in accounting, and only accounting majors may plan to take the CPA exam. One possible reason that intention to pursue graduate studies was not a motivating factor to perform well in the Managerial accounting course is that the course is being taken early in the students' College education, and most students usually begin to think about graduate school education in their junior or senior years.

In light of the above general conclusion, the authors recommend that accounting faculty should encourage their students to have the intention at the beginning of the semester to earn higher grades and also make every effort to achieve their intentions. The other recommendation in this regard is that accounting faculty should think of some motivating factors (other than intention to sit for the CPA exam or to attend graduate school) to bring to the attention of students taking the Managerial Accounting course that may motivate them to perform well in this course.

Another general conclusion from the statistical tests of this study is that the distraction variables used in the study (i.e., number of job hours per week, working in non-accounting, or non-business-related jobs, and number of courses taken in the semester) have no significant negative associations with student performance.

In light of the above general conclusion, the authors recommend that accounting faculty need not encourage their students to work as fewer hours per week as possible to earn high grades in the managerial accounting course. Furthermore, if students have to work a significant number of hours anyway to support their families, accounting faculty need not stress to the students that they must work in accounting-related or business-related jobs. In addition, accounting faculty need not encourage those students to take as fewer courses per semester as possible to earn high grades in the managerial accounting course. Accounting faculty may advise their students who plan to take higher than average course loads to make sure that they manage their time effectively. Finally, accounting faculty, when advising students with poor performance, need to think of causes (e.g., poor study habits, poor time management, etc.) other than too many working hours per week, or jobs that are non-accounting or non-business related, or too many courses taken per semester to discuss with those students.

As expected, a third general conclusion of the study is that students who feel that their Math abilities are good or very good perform significantly better in the managerial accounting course, than students who feel that their Math abilities are just average or poor. Specifically, the study provides evidence that there is a strong significant association between students' self-perceived Math abilities and their performance in the Managerial Accounting course. However, contrary to expectations, the same cannot be said about Writing, Reading, and Listening abilities, as the study shows no significant associations whatsoever, under any test, between each of these three abilities and student performance in the Managerial Accounting course. One possible reason that these three abilities do not show significant association with student performance is that students, especially those with average or poor abilities, may have overstated those

abilities. When most students taking the survey report that their Writing, Reading, and Listening abilities are good or very good but only a smaller percentage of the students earn grades of A's and B's, no significant association will result between these abilities and student performance. A cross-tabulation between Grade and each of these three abilities (not reported here but available from the authors upon request) confirm that this is indeed the case.

In light of this general conclusion, the authors recommend that accounting faculty encourage their students to improve their math abilities by emphasizing that research confirms that students with very good math abilities earn high grades in Managerial Accounting courses. The authors recognize that many faculty members may already be encouraging their students to do just that; thus, these recommendations are primarily for faculty members who may not be encouraging their students in that regard. Another recommendation in this regard is that accounting faculty should encourage their students to not overestimate their Writing, Reading, and Listening abilities as such overestimation may lead them to not seek help in those areas, for example they may not make an effort to go to a University Writing lab or other centers in the universities that are devoted to providing the students with educational assistance.

As expected, and as shown in prior studies with respect to other courses, a fourth general conclusion of the study is that students with high prior actual ability end up earning high grades in the Managerial Accounting course. Specifically, the study provides evidence that there is a strong significant association between students' grades in the Financial Accounting course and OGPA and their performance in the Managerial Accounting course.

In light of this general conclusion, the authors recommend that accounting faculty encourage their students to study hard to earn high grades in all courses (including the Financial Accounting course) to improve their GPA by emphasizing that research shows that students with high OGPA tend to earn high grades in the Managerial Accounting course. The authors recognize that many faculty members may already be encouraging their students to do just that; thus, these recommendations are primarily for faculty members who may not be encouraging their students in that regard.

As expected, and as shown in most prior studies with respect to other courses, a fifth general conclusion of the study is that students' gender has no significant associations with student performance. Also, the study shows some evidence that students' major has significant correlations with student performance in the Managerial Accounting course with students whose major is finance, followed by accounting are having better performance than students whose major is Management, followed by Marketing and other business majors. However, after controlling for prior abilities those significant correlations totally disappeared. Thus, the general conclusion is that the major does not have a significant effect on student performance in Managerial Accounting.

In light of the above general conclusions, the authors once again recommend that accounting faculty should inform their students that whether their gender is male or female and whether their major is accounting, finance, management, or marketing, what will help them perform well in the Managerial Accounting course is to study hard to earn high grades in all courses (particularly the Financial Accounting course) to improve their GPA by emphasizing that research shows that students with high OGPA tend to earn high grades in the Managerial Accounting course. The authors recognize that many faculty members may already be encouraging their students to do just that; thus, these recommendations are primarily for faculty members who may not be encouraging their students in that regard.

## **STUDY LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH**

This study is subject to some limitations. One limitation is that the study school is a public (or state-supported) university and, thus, the conclusions may not be generalizable to private schools. One suggestion for further research is to replicate the study at a private school. Another limitation is that the study school is a residential school and it is possible that the results may not be generalizable to commuter schools. Consequently, another suggestion for further research is to replicate the study at a commuter school. A third limitation is that the study sample is somewhat small relative to the number of independent variables

analyzed and, hence, the results may not be as robust as they would have been if the sample was larger. Thus, another suggestion for further research is to replicate the study using a somewhat larger sample.

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## APPENDIX A: STUDY FORMAL STATEMENTS OF HYPOTHESES

### Motivation Factors

**H<sub>1</sub>:** *There is a significant positive association between the grade the student intends to earn in the Managerial Accounting course and student performance in that course.*

**H<sub>2</sub>:** *There is a significant positive association between the student's intention to take the CPA exam and student performance in the Managerial Accounting course.*

**H<sub>3</sub>:** *There is a significant positive association between the student's intention to attend graduate school and student performance in the Managerial Accounting course.*

### **Distraction Factors**

*H<sub>4</sub>: There is a significant negative association between the student's average number of hours of work per week and student performance in the Managerial Accounting course.*

*H<sub>5</sub>: There is a significant negative association between the student's job type (if it is not related accounting, or business in general) and student performance in the Managerial Accounting course.*

*H<sub>6</sub>: There is a significant negative association between the number of semester courses a student is taking and that student's performance in the Managerial Accounting course.*

### **Self-Perceived Ability Factors**

*H<sub>7</sub>: There is a significant positive association between the student's self-reported writing ability and student performance in the Managerial Accounting course.*

*H<sub>8</sub>: There is a significant positive association between the student's self-reported math ability and student performance in the Managerial Accounting course.*

*H<sub>9</sub>: There is a significant positive association between the student's self-reported reading ability and student performance in the Managerial Accounting course.*

*H<sub>10</sub>: There is a significant positive association between the student's self-reported listening ability and student performance in the Managerial Accounting course.*

### **Prior Ability Factors**

*H<sub>11</sub>: There is a significant positive association between the grade the student earned in the Financial Accounting course and student performance in the Managerial Accounting course.*

*H<sub>12</sub>: There is a significant positive association between the student's overall GPA and student performance in the Managerial Accounting course.*

### **Other Factors**

*H<sub>13</sub>: There is no significant association between the student's gender and student performance in the Managerial Accounting course.*

*H<sub>14</sub>: There is a significant positive association between the student's declared or intended major (if it is Accounting or Finance) and student performance in the Managerial Accounting course.*

**APPENDIX B: TABLES**

**TABLE 1  
DESCRIPTIVE STATISTICS OF THE STUDY VARIABLES**

	N	Minimum	Maximum	Mean	Std. Deviation
Letter Grade <sup>1</sup>	105	0.00	4.00	2.79	0.984
Overall Points (in %)	105	22.36	100.00	81.60	12.391
Intended Grade <sup>2</sup>	112	2	4	3.46	0.642
CPA <sup>3</sup>	111	1	3	1.69	0.818
Grad Sch <sup>3</sup>	112	1	3	1.86	0.758
Job Hours	107	0	50	11.61	12.147
Job Type <sup>4</sup>	112	0	2	0.82	0.687
Course Load	112	2	6	4.98	0.657
Writing Ability <sup>5</sup>	112	1	4	3.20	0.815
Math Ability <sup>5</sup>	112	1	4	2.76	0.893
Reading Ability <sup>5</sup>	112	1	4	3.24	0.750
Listening Ability <sup>5</sup>	112	1	4	3.16	0.742
ACC 121 Grade <sup>6</sup>	112	1	4	2.78	0.965
OGPA (out of 4.0)	111	1.80	4	3.03	0.581
Gender <sup>7</sup>	112	1	2	1.42	0.496
Major <sup>8</sup>	112	1	5	3.45	1.222

<sup>1</sup>A = 4.00; A- = 3.67; B+ = 3.33; B = 3.00; B- = 2.67; C = 2.00; D = 1.00; F = 0.00.

<sup>2</sup>An A 4.00; At least a B = 3.00; C is fine with me = 2.00

<sup>3</sup>No = 1; Maybe = 2; Yes = 3

<sup>4</sup>Other = 1; Business Related (but not accounting) = 2; Accounting related = 3.

<sup>5</sup>Very Good =4; Good =3; Average =2; Poor =1.

<sup>6</sup>A = 4; B = 3; C = 2; D =1.

<sup>7</sup>Male = 1; Female = 2.

<sup>8</sup>Other (non-business) = 1; Marketing = 2; Management = 3; Finance = 4; Accounting = 5.

**TABLE 2**  
**ONE-WAY ANALYSIS OF VARIANCE**  
**(ALL NUMBERS ARE FOR BETWEEN GROUPS ONLY)**

		Dependent Variables			
		Letter Grade		Overall Points %	
Independent Variables	DF	F Value	Sig.	F Value	Sig.
Intended Grade	2/104	14.161	.000***	15.467	.000***
CPA	2/103	1.219	.300	1.023	.363
Grad School	2/104	0.390	.678	0.078	.925
Job Hours	20/99	0.869	.624	0.490	.963
Job Type	2/104	0.615	.543	0.267	.766
Course Load	4/104	1.333	.263	1.295	.277
Write	3/104	1.260	.292	1.502	.219
Math	3/104	5.104	.002***	5.480	.002***
Read	3/104	0.424	.736	0.309	.819
Listen	3/104	1.602	.194	0.635	.594
ACC 121 Gr	3/104	19.724	.000***	17.562	.000***
OGPA	54/103	2.360	.001***	3.639	.000***
Gender	1/104	1.492	.225	2.164	.144
Major	4/104	2.418	.054*	1.884	.119

\*Significant at 10% level of significance using two tails test

\*\*Significant at 5% level of significance using two tails test

\*\*\*Significant at 1% level of significance using two tails test

**TABLE 3**  
**PEARSON/SPEARMAN CORRELATION COEFFICIENTS<sup>A</sup>**

	Letter Grade	Points	IG	CPA	Grad Sch	Job Hours	Job Type	Course Load	Write	Math	Read	Listen	ACC 121 Gr.	OGPA	Gender	Major
<b>Letter Gr</b>		.950***	.459***	.112	.014	-.142	-.109	.074	.041	.280***	-.012	.044	.571***	.660***	.120	.271***
<b>Points</b>	.991***		.452***	.086	.025	-.114	-.070	.110	.042	.278***	-.002	.040	.558***	.618***	.143	.227***
<b>IG</b>	.436***	.446***		.368***	.135	-.157	-.222**	.169	-.104	.382***	.051	.015	.485***	.430***	.045	.324***
<b>ICPA</b>	.096	.097	.374***		.322***	-.054	-.240*	.035	-.207**	.436***	-.001	.118	.208**	.070	-.081	.673***
<b>Grad Sch</b>	-.013	.012	.145	.309***		.001	-.32	.158	0.060	.175	.125	.105	.190**	.131	.161	.313***
<b>Job HRS</b>	-.183*	-.178	-.184	-.080	.017		-.611***	-.176	0.130	-.107	.193**	.038	-.209**	-.185	.064	-.115
<b>Job Type</b>	-.154	-.159	-.193**	-.239**	-.027	.722***		-.047	0.063	-.174	.102	-.032	-.156	-.116	.169	-.205**
<b>C Load</b>	.117	.127	.177	-.027	.133	-.095	-.013		0.040	.161	.100	.024	.278***	.315***	.023	.032
<b>Write</b>	.026	.035	-.115	-.218**	.063	.119	.049	.054		-.207**	.556***	.365***	.022	.100	.106	-.252**
<b>Math</b>	.244**	.245**	.350***	.445***	.177	-.126	-.154	.135	-.201**		-.074	.154	.230**	.179	-.014	.479***
<b>Read</b>	-.064	-.070	.032	-.016	.103	.185	.077	.132	.550***	-.085		.431***	.087	.109	.210**	-.158
<b>Listen</b>	-.033	-.036	-.003	.099	.103	.048	-.039	.024	.363***	.132	.447***		-.063	.014	.084	-.090
<b>ACC 121 Gr.</b>	.513***	.529***	.497***	.198**	.181	-.240**	-.169	.299***	.024	.223**	.097	-.072		.726***	.103	.376***
<b>OGPA</b>	.696***	.720***	.479***	.095	.142	-.187	-.125	.327**	.100	.183	.075	-.022	.732***		.194**	.291***
<b>Gender</b>	.088	.080	.039	-.102	.173	.077	.157	.094	.105	-.026	.183	.081	.096	.171		-.015
<b>Major</b>	.284***	.291***	.314***	.628***	.307***	-.104	-.185	.027	-.255***	.480***	-.156	-.094	.383***	.320***	-.016	

<sup>a</sup> Pearson correlations are above the diagonal and Spearman correlations are below the diagonal.

\*Significant at 10% level of significance using two tails test

\*\*Significant at 5% level of significance using two tails test

\*\*\*Significant at 1% level of significance using two tails test



**TABLE 4**  
**PEARSON PARTIAL CORRELATION COEFFICIENTS**  
**(CONTROLLING FOR ACC 121 AND OGPA)**

	Letter Grade	Points	IG	CPA	Grad Sch	Job Hours	Job Type	Course Load	Write	Math	Read	Listen	Gender	Major
<b>Letter Gr</b>	1													
<b>Points</b>	.910***	1												
<b>IG</b>	.222**	.230**	1											
<b>CPA</b>	.088	.044	.368***	1										
<b>Grad Sch</b>	-.040	-.021	.048	.263***	1									
<b>Job HRS</b>	.038	.063	-.038	.027	.099	1								
<b>Job Type</b>	-.038	.012	-.113	-.185*	.051	.633***	1							
<b>C Load</b>	-.136	-.064	-.050	-.047	.058	-.057	.110	1						
<b>Write</b>	.000	.004	-.128	-.196*	.061	.099	.064	.045	1					
<b>Math</b>	.243**	.230**	.365***	.386***	.081	-.031	-.114	.057	-.266***	1				
<b>Read</b>	-.102	-.081	-.043	-.004	.129	.172*	.107	.087	.608***	-.130	1			
<b>Listen</b>	.100	.091	.142	.106	.105	.045	-.091	.016	.440***	.143	.521***	1		
<b>Gender</b>	-.029	.032	-.051	-.108	.137	.101	.191*	.043	.111	-.039	.239**	.063	1	
<b>Major</b>	.037	-.016	.210**	.687***	.287***	.045	-.164	-.079	-.294***	.441***	-.198*	-.143	-.109	1

\*Significant at 10% level of significance using two tails test

\*\*Significant at 5% level of significance using two tails test

\*\*\*Significant at 1% level of significance using two tails test

**TABLE 5**  
**REGRESSION ANALYSIS**  
**(ALL NUMBERS ARE FOR 112 OBSERVATIONS)**

Independent Variables	Dependent Variables			
	Letter Grade		Overall Points %	
	t Coeff.	Sig.	t Coeff.	Sig.
Constant	-.739	0.462	3.067	0.003***
IG	1.202	0.233	1.487	0.141
CPA	.346	0.730	.198	0.843
Grad Sch	-.296	0.768	-.053	0.958
Job Hours	.635	0.527	.783	0.436
Job Type	-.214	0.831	-.152	0.880
Course Load	-1.237	0.220	-.615	0.540
Write	1.151	0.253	1.012	0.315
Math	1.914	0.059*	1.940	0.056*
Read	-1.532	0.129	-1.435	0.155
Listen	.473	.637	.286	0.775
ACC 121 Gr	2.324	0.023**	2.396	0.019**
OGPA	4.128	.000***	3.266	0.002***
Gender	.162	.872	.577	0.566
Major	-.813	.419	-1.118	0.267
Adj. R <sup>2</sup>	0.471		0.413	
F	7.164	0.000***	5.884	0.000***

\*Significant at 10% level of significance using two tails test  
\*\*Significant at 5% level of significance using two tails test  
\*\*\*Significant at 1% level of significance using two tails test

**TABLE 6**  
**PARTIAL CORRELATION COEFFICIENTS OF SELECTED DISTRACTION FACTORS**  
**WITH STUDENT PERFORMANCE<sup>a</sup>**

<i>Part A</i>				<i>Part B</i>					
Dependent Variable	Letter Grade		Overall Points %		Dependent Variable	Letter Grade		Overall Points %	
	Coef.	Sig.	Coef.	Sig.		Coef.	Sig.	Coef.	Sig.
<b>Distraction Factor</b>					<b>Distraction Factor</b>				
<b>JHours</b>	-.096	.345	-.084	.412	<b>JHours</b>	.059	.571	.061	.557
<b>JType</b>	-.012	.904	.008	.939	<b>JType</b>	-.051	.627	-.019	.855
<b>CLoad</b>	.037	.714	.081	.426	<b>CLoad</b>	-.133	.200	-.066	.526

<sup>a</sup> Part A: While controlling for the other two distraction factors.

Part B: While controlling for the other two distraction factors and prior actual ability factors (ACC 121 & OGPA)

**TABLE 7**  
**CROSS TABULATION OF MAJOR AND GRADE**

		Major					
		Other	Marketing	Management	Finance	Accounting	Total
Grade	F	0	2	1	0	1	4
	D	0	3	2	2	0	7
	C	0	4	4	0	4	12
	C+	1	3	4	0	4	12
	B-	0	6	3	2	3	14
	B	0	2	7	1	6	16
	B+	0	2	2	2	3	9
	A-	0	4	3	4	6	17
	A	0	1	2	4	7	14
	Total	1	27	28	15	34	105