The Effect of An Integrity Statement on Exam Cheating by Accounting Students

Donald L. Ariail
School of Accountancy
Coles College of Business
Kennesaw State University
585 Cobb Ave.
Kennesaw, GA 30144
dariail1@kennesaw.edu
+1 404-285-0278

Amine Khayati*
Coles College of Business
Kennesaw State University
585 Cobb Ave.
Kennesaw, GA 30144
akhayati@kennesaw.edu
+1 470-578-7430

Carol Hulsey
School of Accountancy
Coles College of Business
Kennesaw State University
585 Cobb Ave.
Kennesaw, GA 30144
chulsey@kennesaw.edu
+1 470-578-3937

*Corresponding author

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Abstract

This study explores the effect of an integrity statement included at the beginning of online examinations taken by students in Principles of Financial Accounting classes. Our sample is composed of numerous exam data points covering tests administered over four years. The results suggest that integrity statements reduce cheating behaviors. Furthermore, students enrolled in fully online classes, compared to students enrolled in face-to-face classes, display higher indications of cheating. Differences are also found across multiple exams taken during a semester, with cheating behaviors being the highest during final exams. In addition, cheating behaviors spiked during the COVID-19 pandemic. Among the demographic variables, age and student status (seniority) are consistently associated with higher indications of cheating. Our findings have implications for reducing cheating in all testing environments—both academic and non-academic. Additionally, our findings provide consistent exam and demographic patterns important to educators in their efforts to curb academic misconduct.

Keywords: Cheating; Academic dishonesty; Honesty oath; Integrity statement; Priming; Covid-19 pandemic; Online proctoring.

The effect of an integrity statement on exam cheating

1. Introduction

Academic cheating is an unethical behavior that is difficult to detect and quantify. Considerable research has documented the insidious increase in student academic misconduct. However, prior research has primarily reported on survey-obtained data about cheating—self-reported cheating and/or perceptions of others cheating. Such data is often challenged based on at least two potential inherent biases: social desirability bias or self-reported bias. In addition, cheating intentions and perceptions of cheating may differ from cheating behaviors, which are difficult to capture with survey methodologies. That is, students may show exemplary ethical awareness and present ethical intentions when presented with ethical dilemmas; nevertheless, fraud triangle elements (cf. Cressey, 1953/1973; Crumbley & Ariail, 2020; PCAOB, n.d.; Wolfe & Hermanson, 2004), especially that of pressure, may result in them cheating in practice.

To mitigate these issues, this study adopts a new approach to proxy for academic misconduct behavior by leveraging advancements in algorithmic online proctoring. Specifically, it operationalizes McGraw-Hill's Proctorio© scores (which are based on red flags of cheating) as proxy measures of academic cheating behaviors that include actual cheating, attempts to cheat, and intentions to cheat. This novel research approach to identifying cheating behaviors captures dishonesty under exam-driven pressures and grade incentivization. Grounded in existing literature, our findings provide a robust test of the effectiveness of an integrity statement presented to students at the beginning of an exam. Insights from this study are also relevant to test-taking in non-academic environments.

Our results indicate that behaviors indicative of cheating, as evidenced by Proctorio© scores, are significantly reduced when an integrity statement is presented at the beginning of an exam. Also, when exam delivery is online, but the class is delivered face-to-face, cheating

behaviors are significantly lower than when class delivery and exam delivery are online. Furthermore, the demographic variables of higher student status and age (higher student seniority) are significantly associated with academic cheating.

This paper proceeds with a discussion of online proctoring and integrity statement literature, leading to our hypotheses. Then, we present the study design and define the study variables, followed by empirical analyses. Finally, we discuss the results and our related conclusions and provide suggestions for future research.

2. Literature Review

2.1. Online Proctoring

The COVID-19 pandemic spurred an emergency migration to online instruction and assessment (e.g., St-Onge et al. 2022). The prevalence of online instruction and testing was associated with an increase in cheating behaviors—a cheating problem that may not have since abated (cf. Ariail et al., 2025a; Ariail et al., 2025b). Coupled with the proliferation of fee-based websites that provide students with searchable answers to assessment questions, concerns about the integrity and reliability of online assessments have grown. Emerson and Smith (2022) reported significantly lower student performance when readily searchable questions were altered and when access to other websites was prohibited. Their findings pointed to students' unethical use of homework assistance websites to obtain answers. In a related study, Sidi et al. (2019) found that plagiarism is more pervasive, and academic dishonesty is deemed more legitimate when assessments are made online.

The opportunities for cheating in online testing (e.g., Underwood & Szabo, 2003) gave rise to the use of algorithmic tools targeted at curbing online cheating. Examples of online proctoring using such tools include Proctorio©, ProctorU© and ExamSoft©. Lee and Fanguy

(2022) concluded that online exam-proctoring technologies have led to educational deterioration rather than innovation—a distrusting environment between students and instructors. There is also evidence that students endure anxiety and frustration when online webcam-based exam proctoring platforms wrongly flag students for cheating (e.g., Woldeab & Brothen, 2021). Nevertheless, there is an ongoing call for remedial measures aimed at curbing online academic cheating. We suggest that one such effective measure is the inclusion of an integrity statement at the beginning of exams/assessments.

2.2. Integrity Statement

Oaths are regarded as one of the oldest forms of ethics management. Aside from the customary occupational oaths, there has been a growing interest in professional oaths in business organizations. Examples include the Dutch Banker's Oath, the MBA oath, and the Economist's Oath (e.g., de Bruin, 2016). While an extensive body of research has investigated the effectiveness of honesty statements, the results have been mixed. Many of these studies have operationalized experimental paradigms with controlled experiments across multiple disciplines. Prior research has variously referred to integrity statements as honesty statements, honesty oaths, honesty declarations, honesty nudges, and commitment requests.

Gerlach et al.'s (2019) meta-analysis of experimental research on dishonest behavior found laboratory studies associated with more dishonesty than field studies. Their findings suggested that dishonest behavior depends on both situational factors like rewards and personal factors like age and gender. And they indicated that publication biases are present in almost all measures of dishonest behavior. Jacobsen et al. (2018) provided similar evidence that dishonesty is a highly malleable behavior that is contextually sensitive to one's state of mind and the

behavior of others. However, Zickfeld et al.'s (2024) meta-analysis results suggested that honesty oaths increase honest behavior when the individual feels committed to honesty norms.

Several studies have asserted the effectiveness of honesty oaths. Beck et al.'s (2020) honesty oath was effective at increasing moral awareness. Similarly, Jacquemet et al.'s (2019) solemn truth-telling oath was effective at reducing lying. This oath also affected decision time: participants under oath took significantly more time to decide whether to lie. In a tax evasion experiment, Jacquemet et al. (2020) found that oath-taking did not affect the behavior of habitual liars. Nevertheless, under oath non-habitual liars became fully honest. Jacquemet et al. (2021) found consistent evidence of reduced lying under oath among anonymous crowd-sourced internet workers. However, truth-telling oaths did not affect shirking.

Cagala et al. (2024a) found that requiring students to sign an honesty declaration led to a doubling in student perceptions of cheating on undergraduate exams. They posited that the signature treatment weakened the perceived social norm of academic integrity, thus resulting in higher levels of cheating. In another academic dishonesty study, Cagala et al. (2024b) found ineffective at curbing cheating a no-cheating declaration that referenced the need for ethical behavior supported by potential sanctions. In a dice-rolling experiment, Zhao et al. (2019) found significantly higher cheating when implicit and explicit moral reminders were introduced. Similarly, Wu et al. (2020) reported that cheating did not decrease when students read, prior to taking an exam, a handout that explained the legal and professional consequences of cheating on examinations. Kettle et al. (2017) found similar inefficacies in a tax experiment conducted in Guatemala. None of their priming treatments, which included honesty statements or information about penalties, were effective. Other failed priming treatments included digital signature nudges (Koning et al., 2020), honesty nudges on self-reported insurance filing claims (Martuza et al.,

2022), and norm-nudge in a paid mind game (Dimant et al., 2020). However, Kobis et al. (2022) found social norm nudging in the form of posters effective at reducing the dishonest and fraudulent act of bribery.

A strand of honest statement literature examined the content, terms, and form of oaths (e.g., de Bruin, 2016). In a recent meta-study, Zickfeld et al. (2024a) tested 21 honesty oaths in an incentivized online tax evasion game. Only 10 honesty oaths were significantly effective in curbing dishonesty. This evidence highlights the saliency of honesty oath content and verbiage.

Taken together, the mixed results found with various forms of honesty statements call for further research. No known prior research has investigated the efficacy of an honesty statement with accounting student subjects. In addition, this study analyzes uniquely measured indications of cheating behaviors instead of student self-reported cheating or their perceptions of others cheating. Thus, this study extends the literature on the efficacy of honesty statements.

3. Hypotheses

In view of the existing literature discussed above, we test the following null Hypothesis:

H1: Academic cheating is not affected by an integrity statement.

In addition, since no known prior research has explored the effects of exam sequence on the efficacy of integrity statements, we test the following null Hypothesis:

H2: Academic cheating is not affected by exam sequence.

And to investigate if the efficacy of integrity statements has changed over time, we test the following third null Hypothesis:

H3: Academic cheating has no temporal effect.

4. Study Variables and Data Collection

4.1. Proctorio© scores

Proctorio© is an online proctoring software that integrates with McGraw-Hill's Connect platform so that it can be embedded in exams created and delivered via Connect. It utilizes a test taker's computer camera and microphone to record the online examination. At the beginning of an examination, the test taker is instructed to perform a pre-check. This typically entails presenting personal identification to the camera and taking a wide view of the surroundings. Video, voice, and screen recording continue during the entire length of the examination and stop when the test taker submits or closes the exam. The exam video recordings for each test taker are later accessible by the course instructor. In addition, the platform allows for "lock down" settings that prevent access to other digital materials during the length of the exam. According to the proctorio.com website, this platform uses algorithms for face and gaze detection. Specifically, it does not track eye movements but rather uses facial detection to flag extended periods when the test taker is looking away from their computer screen. The platform also tracks keystroke anomalies to ensure the test taker consistently interacts with the exam.

Upon the completion of the exam, Proctorio© generates a suspicious activity score (0-100) for each individual exam with higher scores representing higher occurrences of flagged suspicious activities (behaviors) during the exam. The Proctorio© software does not decide if an act of academic cheating has occurred. The suspicious activity score simply informs the instructor of exams that need to be reviewed for cheating. Instructors can then review selected individual exam videos aided by indications of the time frames where a suspicious activity was flagged. Upon review, the instructor can then determine if a breach of exam integrity occurred.

Thus, suspicion activity scores (henceforth, Proctorio© scores) are not measures of verified instances of academic cheating. Rather, they are proxies for suspicious activity triggered by either actual or attempted cheating. Whether a student is eventually successful in cheating is

irrelevant. That is, suspicious cheating activities that may or may not manifest into provable acts of cheating are captured in the Proctorio© scores. For the purposes of this study, we consider Proctorio© scores as proxy measures of academic misconduct. However, two potential limitations are recognized. The first is that innocuous events may be flagged as suspicious. For example, one of the instructors reviewed the video of an exam with a high score only to find that the "red flag" was triggered by a pet dog entering the room and engaging in a noisy scuffle that forced the student to intervene and step away from the camera view. Such events are rare and should not significantly bias the Proctorio© scores as, generally, test takers arrange for disturbance-free space. The second potential limitation is that a resourceful test taker can still cheat and potentially evade being flagged. In other words, not all potential cheating behaviors are included in Proctorio© scores.

4.2. Survey variables and data collection

As previously indicated, Proctorio© scores range from 0 to 100 with higher values indicating higher occurrences of suspicious activities. Exam-related variables include the "Integrity Statement," which is a dummy variable equal to one if the integrity statement was presented at the beginning of the exam and zero otherwise. The integrity statement, which appeared at the beginning of online exams, read as follows:

> *I understand that this exam falls under [University name redacted for blind review] academic honesty policy and that any act of academic dishonesty (cheating) could result in a failing course grade, a formal report on file in the Office of Student Conduct and Academic Integrity, and/or a possible one-semester suspension. Please answer YES if you understand this statement and will not cheat on this exam.*
>
> *Yes (I understand).*

No (I do not understand).

In our analysis, the term "Integrity Statement" is used to identify the subsample of exams with the integrity statement. The subsample of exams without the integrity statement is labeled as "Control." The variable "Exam" was a categorical variable taking the values of one, two, and three sequentially for the three exams taken for each course (1st exam, mid-term exam, and final exam). The "Year" variable captured the year of the exam data, which ranged over the four years of 2021-2024. "Online" was a dummy variable equal to one for online courses and zero for face-to-face courses. "Instructor" was a categorial variable used to control for the instructor effect.

The study's second set of variables were student specific. These variables have previously been found related to students' propensity to engage in cheating. To collect student demographic data, we utilized a dummy survey[1] about a topic unrelated to this study. This survey was voluntary and conducted in Qualtrics. Instructors solicited their respective students by announcement in class or online and with multiple email reminders for them to complete the survey. The resulting student demographic data rendered our control variables: "Age," "Gender," "Student Status," "Ethics Course," and "Major." These variables were coded as follows. "Age" was a continuous variable in years. "Gender" was a dummy variable with one for female and zero for male. "Student Status" was a categorical variable taking values from one to four respectively for freshman, sophomore, junior, and senior. Thus, higher values indicated higher student status. "Ethics Course" was a dummy variable equal to one if a student had previously taken a standalone ethics course, and zero otherwise. And "Major" was a categorical variable used along with the "Instructor" variable in the regression analysis to control for fixed effects.

[1] The dummy survey received the required approval from the university Institutional Research Board.

Mindful of inherent variations in course content and instructor attributes that might affect cheating behaviors, we only collected data from students taking Principles of Financial Accounting. Multiple sections of this introductory accounting course are taught each semester at the University where our sample was collected. This large public University is located the metropolitan area of a major city in the Southeastern United States.

All sections utilized homogenous content and examinations. Minor deviations can only be ascribed to instructor attributes or course modalities, which were controlled in our analyses. It is important to emphasize that regardless of the course modalities (online vs. face-to-face), all examinations were conducted online.

4.3. Study sample

The data collection procedures resulted in two datasets. The first contained the Proctorio© scores and the course-related variables of "Integrity Statement," "Exam," "Year," "Online," and "Instructor." This dataset, which is referred to in our analyses as the "Full Sample" contained 8,465 exam observations. The "Full Sample" data was then merged (by student name, semester, and course) with the demographic data collected with our dummy survey. This process resulted in a reduced data set due to the voluntary participation by students in the dummy survey (not all students completed it) and due to the deletion of incomplete surveys that were unusable. Therefore, this second dataset contained Proctorio© scores and the same variables as in the first dataset with the added student variables of "Age," "Gender," "Student Status," "Ethics Course," and "Major." This reduced dataset, which is referred to in our analyses as the "Sample with Demographics," contained 4,412 exam observations.

5. Results

5.1. Sample statistics

As described above, the Sample with Demographics is a subsample of the Full Sample. Table 1, Panel A, presents the Proctorio© score statistics separately for the two samples. The mean and median for the Sample with Demographics were very similar to those of the Full Sample. Across the subsamples of control, integrity statement, online, and face-to-face, the Proctorio scores medians were the same for the full sample and the sample with demographics. In Table 1, Panel B, it is notable that the numbers of mid-term exams were relatively higher than the numbers of other exams. This is due to a few cases where instructors split the mid-term exam into two parts and allowed students to take, about a week apart, each separately. There were no statistical differences in the Proctorio© scores between the two mid-term exams (not tabulated). Overall, there was no divergence in the distributions of the Full Sample and the Sample with Demographics.

Table 1, Panel C, presents demographic data for the Sample with Demographics. Around 13 percent of the sample was derived from fully online courses, and the remainder from face-to-face ones. This study was conducted over the four years of 2021 to 2024, with disproportionally more observations drawn from 2023. We suggest that the age distribution was typical for a lower-level, undergraduate student population, with around 55 percent being less than 20 years of age. The age distribution indicated that about 80 percent of the students were below the age of 24. The proportions of female and male students were around 44 and 56 percent, respectively. Despite the data being collected from Principles of Financial Accounting classes, only around 11 percent of the students were accounting majors, with the majority (around 54 percent) majoring in business disciplines other than accounting or finance. Of note, all business students at the university where the data was collected are required to take the Principles of Financial Accounting course. Therefore, there was little reason to suspect that idiosyncratic factors related

to accounting majors drove our results. This risk is also mitigated by the fixed effect of the student major variable being included in the regression analysis. Finally, around 25 percent of the students had previously completed an ethics course. Taken together, we suggest that the demographic distributions reflect a homogenous sample of business students.

[Table 1]

5.2. Test of integrity statement

Our first Hypothesis (H1) relates to the effect of an integrity statement on the propensity to cheat. Table 2, Panel A, presents the test of mean differences in the Proctorio© scores between the exams with the integrity statement and those without. For the Full Sample, the mean Proctorio© score for the control group (students whose exams did not include the integrity statement) was 27.23, which is significantly ($p < 0.01$) higher than the mean Proctorio© score of 24.99 for the experimental sample whose exams included the integrity statement. The test of differences in the Proctorio© scores between the sample with the integrity statement and the control sample is also highly significant ($p < 0.01$) for the Sample with Demographics. Thus, we failed to accept our first, and main Hypothesis (H1). Proctorio scores dropped by over eight percent in the presence of an integrity statement. Thus, there was strong evidence that our integrity statement was effective at reducing academic misconduct.

5.3. Test of course modality

In Table 2, Panel B, we turn to course delivery modality. As discussed above, data was collected from fully online and face-to-face Principles of Financial Accounting classes; however, all examinations were conducted online and thus produced Proctorio© scores. That is, the face-to-face courses maintained regular class lectures with the instructor while students took exams online outside of lectures. Thus, we tested the differences in mean Proctorio© scores between the

fully online and the face-to-face courses. The Full Sample had a mean score of 28.16 for fully online classes and a mean score of 25.50 for face-to-face classes. The difference between the means was highly significant ($p < 0.01$). The Sample with Demographics produced similar results. Fully online courses had significantly ($p < 0.01$) higher Proctorio© scores than the face-to-face courses. This evidence suggests that students enrolled in face-to-face classes, instead of fully online classes, tend to engage in significantly less online exam cheating.

[Table 2]

5.4. Test of exam sequence

To explore more granular insights into academic cheating patterns, we next turned to the sequence of exams. As previously indicated, instructors in the sampled classes mostly administered three exams during the semester, which were labeled in the analyses as 1st exam, mid-term exam, and final exam. In testing H2, we posited that students are more restrained at the beginning of each course. Once they gain familiarity with the course and the instructor, they might explore possibilities to boost their grades by cheating. Additionally, for fear of failing the course or not earning their desired grade, one might expect mounting pressures for students to engage in cheating behaviors towards the end of the semester. The tests of equality of means in Table 3, Panel A, indicate significant differences between the three Proctorio© scores for both samples (control and experimental). Consistently, our post hoc tests indicated that Proctorio© scores for the final exams were higher than those for the first and mid-term exams. There is also evidence ($p < 0.05$) that the first exam Proctorio© scores were higher than the mid-term Proctorio© scores for the Sample with Demographics, but this difference was insignificant for the Full Sample. Consistently, the analysis of variance in Table 3 failed to accept our second hypothesis. Therefore, H2 was rejected. Academic cheating was affected by exam sequence.

5.5. Test of year sequence

The data collection process spanned the four-year period from the Fall semester of 2021 to the Spring semester of 2024. This multi-year coverage raised the question of whether a temporal (year sequence) effect existed in the data. To explore this possibility, we conducted an analysis of variance (ANOVA) for Proctorio© scores bifurcated by years. The Welch and Brown-Forsythe statistics in Table 3, Panel A, indicated significant ($p < 0.01$) differences in the Proctorio© scores across years. Thus, we failed to accept our third Hypothesis (H3). Academic cheating did have a temporal effect. The results were not constant over the years of our study. Post hoc tests (Table 3, Panel B) indicated that the mean Proctorio© scores in 2021 were significantly ($p < 0.01$) higher than those of subsequent years. This finding was consistent for both the Full sample and the Sample with Demographics.

[Table 3]

5.6. Correlation matrix

Next, we focused on exploring if Proctorio© scores differed when controlled for demographic differences. First, we produced Pearson Correlations for all the study variables in Table 4. The results indicated that Proctorio© scores were significantly ($p < 0.01$) and negatively correlated with the "Integrity statement" and "Year" variables and were significantly ($p < 0.01$ and $p < 0.05$, respectively) and positively correlated with the "Online" and "Exam" variables. And among the demographic variables, we found positive and significant ($p < 0.01$) correlations between Proctorio© scores and the variables of "Age," "Student Status," and "Ethics Course."

[Table 4]

5.7. Predictors of academic misconduct

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Next, we ran fixed effect regression Models with Proctorio© scores as the dependent variable. The independent variables included the variables of the "Integrity Statement," "Exam" "Year," and "Online." The additional independent variables were all the demographic variables defined and discussed above. The Model controls were the fixed effects of "Instructor" and "Major." We posited that instructor attributes such as teaching style, instructor and personality might impact students' tendency to engage in academic misconduct. And that the student's academic major might contribute to cheating activities. Since our data was collected only in Principles of Financial Accounting classes, we posited that accounting majors compared to other business majors might experience more pressure to perform well in this foundational course, which is a prerequisite for all other accounting courses. That is, students who are accounting majors, compared to students majoring in other business disciplines, might be more tempted to cheat. Across all Models presented in Table 5, the integrity statement variable had negative and highly significant ($p < 0.01$) coefficients, thus supporting our previous evidence of its effectiveness in curbing academic cheating. When added to Model 2, the "Exam" variable displayed positive and significant ($p < 0.05$) regression coefficients, thus supporting our previous finding that cheating activities were significantly higher in the later exams. That is, students tended to cheat more towards the end of the semester than at the beginning. In Model 3, the "Year" variable coefficients were negative and highly significant ($p < 0.01$), thus supporting our previous evidence of a temporal effect. Specifically, academic cheating was significantly higher during the COVID-19 pandemic. Additional support was found in Model 4 for the "Online" variable which had a positive and highly significant ($p < 0.01$) regression coefficient. That is, fully online courses revealed significantly higher indications of academic misconduct. The

regression coefficients for the course-related variables were congruent with our initial analyses. These findings provided further support for our Hypotheses testing results.

The remaining independent variables were related to student demographics. Only the "Age" and "Student Status" variables produced positive and highly significant ($p < 0.01$) regression coefficients across all Models. With these two variables being perhaps related, this finding suggests that academic cheating is highly correlated with student seniority—older and higher status students were more apt to cheat. Despite gender differences being prevalent in most of the existing academic cheating literature (e.g., Gerlach et al., 2019), the "Gender" variable had no significant correlation with Proctorio© scores. And the "Ethic Course" variable was significantly ($p < 0.05$) correlated in only Model 3 ("Year" added) and Model 4 ("Online" added). In Model 1 and Model 2, academic cheating was impervious to students having completed an ethics course.

Overall, the regression analysis results supported prior evidence from the analysis of variance. After controlling for student factors affecting Proctorio© scores and for fixed effects, the coefficients for the variables of "Integrity Statement," "Online," "Exam," and "Year" were significant across all regression specifications. In addition, there was consistent evidence that academic cheating behaviors were significantly more prevalent among older students and those with higher student status.

[Table 5]

6. Discussion and Conclusions.

We operationalized the suspicious activity scores in the online proctoring application Proctorio© to test the effectiveness of an integrity statement. Our results consistently pointed to a significant decrease in cheating activities when students were presented at the beginning of

exams with an integrity statement containing a reminder about the potential penalties for cheating. The positive impact of our integrity statement was robust and unambiguous. We concluded that our integrity statement was effective at curbing cheating. Importantly, this substantial benefit was effectuated at very low cost, the simple priming of students at the beginning of an exam of the importance of integrity and of the negative consequences of cheating. Therefore, we recommend that all online assessments include such a statement. Nevertheless, the mixed results found in other honesty/integrity studies indicated the need for more research. For example, will an integrity statement such as ours be as effective, or perhaps more so, when included in assessments administered in person—in face-to-face modalities? What content and wording are optimum for an integrity statement? Do integrity statements lose their effectiveness with wide usage? Given the focus in accounting education on ethics codes, such as the AICPA Code of Professional Conduct (AICPA, 2014), might upper-level (junior and senior) accounting students who had studied relevant ethical codes, be more positively impacted than other business majors in the efficacy of an integrity statement, perhaps ones that specify code requirements regarding honesty and integrity.

Our findings also suggest a temporal effect with cheating scores being significantly higher when the COVID-19 instructional protocols were in place. At the university where the study data was collected, initial COVID-19 protocols resulted in face-to-face classes being converted to fully online. Next, face-to-face classes were converted to hybrid modalities, a combination of online and face-to-face instruction. In 2022, all COVID-19 related policies and accommodations were completely phased out. Thus, we relate the temporal effect in our results for 2021 to the pandemic protocols wherein students experienced loosened conditions that favored an uptick in cheating. Our results are in accord with media reports during the pandemic

(e.g., Loeb, 2021; Lungariello, 2021; Havranek, 2020; Sirdeshmukh, 2021) and with research findings (e.g., Comas-Forgas et al., 2021; Jenkins et al., 2023; Newton & Essex, 2024) that reported a peak in academic misconduct following the abrupt switch to online teaching modalities.

The evidence that students enrolled in face-to-face courses displayed cheating behaviors that were significantly lower than the cheating behaviors of students enrolled in fully online courses is salient. This finding, which adds to the multitude of specificities already attributed to online courses, is worthy of future research. It could be that personal interaction with instructors has a positive influence on the student ethical behaviors thus reducing incidences of academic misconduct when taking examinations online. Alternatively, this finding could be due to selection bias, where students who are serial cheaters actively pursue enrollment in online courses where exam integrity is perhaps harder to enforce.

Further, our results suggest exam-specific practical insights which have not previously been explored. Specifically, cheating activities appear more prevalent in final assessments than in interim ones. Intuitively, students have limited choices to improve their grades at the end of the semester and thus may be more apt to succumb to pressure to cheat. Or, having perhaps seen others cheat and get away with their unethical behavior, students may progressively find it easier to rationalize cheating. Therefore, we suggest that protocols designed to limit cheating will be most impactful when focused on final exams. Ideally, we recommend that all final exam testing be conducted in face-to-face—in person—modalities that preclude the use of digital devices and access to notes. Nevertheless, this novel finding of exam sequence in cheating calls for more research.

Higher cheating activities were consistently found among the student demographics of age and student level. Older students and those at higher levels in their education exhibited significantly higher cheating behaviors. With age and more years of education, students may tend to become more emboldened to cheat. Alternately, as students progress in their education, they may become more acclimated to cheating being a behavioral norm. That is, they may progressively adopt cost-benefit rationales where the benefits of cheating are perceived to outweigh the cost of being caught (cf. Ariail et al., 2025a). The normalization of cheating creates an unethical environment that can perhaps be mitigated by accounting ethics education. Future research needs to further explore the impact of accounting ethics education on cheating and other unethical behaviors.

We conclude that exam integrity statements can play an important role in decreasing cheating in accounting academia and in accounting practice. Such statements may be one brick in the edifice of trust in the honesty and integrity of accounting professionals. The prevalence of cheating by both accounting students and accounting professionals has recently been referred to as a "crisis for the accounting profession" (Ariail et al., 2025b).

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Table 1
Sample Statistics and Demographics

Panel A: Proctorio© Scores Sample Statistics

	Full Sample				Sample with Demographics			
Proctorio score	**N**	**Mean**	**Median**	**Std. dev**	**N**	**Mean**	**Median**	**Std. dev**
All	8,466	25.89	25.00	10.43	4,413	25.82	26.00	10.65
Control	3,410	27.23	27.00	10.76	1,772	27.29	27.00	10.91
Integrity Statement	5,056	24.99	25.00	10.12	2,641	24.84	25.00	10.36
Online	1,238	28.16	27.00	9.32	573	27.92	27.00	9.06
Face-to-face	7,228	25.50	25.00	10.57	3,840	25.51	25.00	10.83

Panel B: Proctorio© Scores Descriptive Statistics by Exam and Year

	Exams			Year			
	1st Exam	**Mid-term Exam**	**Final Exam**	**2021**	**2022**	**2023**	**2024**
Full Sample							
Number	2,255	4,013	2,198	1,250	1,829	3,397	1,990
Mean	25.90	25.39	26.79	30.68	25.29	24.57	25.68
Sample with Demographics							
Number	1,249	1,994	1,170	825	981	2,011	596
Mean	26.16	24.92	27.00	32.29	24.97	23.36	26.60

Panel C: Descriptive Statistics of Sample with Demographics

	(N = 4,413)			(N = 4,413)	
Variables	No.	%	**Variables**	No.	%
Course Modality			**Student Status**		
Online	573	12.98	Freshman	1,655	37.50
Face-to-face	3,840	87.02	Sophomore	1,849	41.90
			Junior	733	16.61
Year			Senior	176	3.99
2021	825	18.69			
2022	981	22.23	**Major**		
2023	2011	45.57	Accounting	498	11.28
2024	596	13.51	Finance	703	15.93
			Business other than Acct/Fin	2,372	53.75
Age			Non-Business	790	17.90
Under 20	2,416	54.75	Others	50	1.13
20-24	1,712	38.79			
25-29	159	3.60	**Ethics Course**		
30-39	83	1.88	Yes	1,124	25.47
40-49	36	0.82	No	3,289	74.53
50 ≤	7	0.16			
Gender					
Male	2,481	56.22			
Female	1,932	43.78			

Table 2
Differences in Proctorio© Scores

Panel A: Test of integrity statement				
	Control	**Integrity Statement**		**Pooled**
Proctorio© score	Mean (Number)	Mean (Number)	**Difference**	**t-value (p-value)**
Full Sample	27.23 (n=3,410)	24.99 (n=5,056)	2.24	9.74* (<.0001)
Sample with Demographics	27.29 (n=1,772)	24.84 (n=2,641)	2.45	7.54* (<.0001)
Panel B: Test of course modality				
	Online	**Face-to-face**		**Pooled**
	Mean (Number)	Mean (Number)	**Difference**	**t-value (p-value)**
Full Sample	28.16 (n=1,238)	25.50 (n=7,228)	-2.66	-8.30* (<.0001)
Sample with Demographics	27.92 (n=573)	25.51 (n=3,840)	-2.41	-5.06* (<.0001)

* = $p < 0.01$ (2-tailed)

Table 3
Tests of Proctorio© Score Equality of Means (ANOVA)

Panel A: Robust tests of equality of means

		Full Sample (N = 8,465)		Sample with Demographics (N = 4,412)	
		Statistic	**p-value**	**Statistic**	**p-value**
Exams	Welch	13.09	<0.001**	14.61	<0.001**
	Brown-Forsythe	13.21	<0.001**	15.55	<0.001**
Year	Welch	113.47	<0.001**	168.57	<0.001**
	Brown-Forsythe	124.48	<0.001**	183.45	<0.001**

Panel B: Test of Proctorio© score equality of means – Multiple comparisons (ANOVA Post hoc tests)

		Full Sample		Sample with Demographics	
Exam	**Exam**			**Mean Difference**	**p-value**
Final	1st Exam	0.900	0.004**	0.845	0.050*
	Mid-term	1.402	<0.001**	2.082	<0.001**
Mid-term	1st Exam	-0.502	0.067	-1.237	0.001**
Year	**Year**	**Mean Difference**	**p-value**	**Mean Difference**	**p-value**
2021	2022	5.389	<0.001**	7.325	<0.001**
	2023	6.112	<0.001**	8.931	<0.001**
	2024	5.000	<0.001**	5.694	<0.001**
2022	2023	0.722	0.015*	1.606	<0.001**
	2024	-0.389	0.241	-1.632	0.002**
2023	2024	-1.112	<0.001**	-3.237	<0.001**

* = $p \leq 0.05$; ** $p = < 0.01$ (2-tailed)

Table 4
Pearson Correlations

Variables	1	2	3	4	5	6	7	8	9
1. Proctorio© Score	-								
2. Integrity Statement	-0.113**	-							
3. Exam	0.028*	0.041**	-						
4. Year	-0.211**	0.024	-0.001	-					
5. Online	0.076**	-0.026	-0.012	0.229**	-				
6. Age	0.114**	-0.060**	0.261**	-0.007	0.010	-			
7. Gender	-0.021	0.019	0.045**	0.002	0.074**	-0.044**	-		
8. Student Status	0.150**	-0.149**	0.287**	-0.005	-0.099**	0.472**	-0.064**	-	
9. Ethics Course	0.081**	-0.086**	0.166**	-0.004	0.038	0.286**	-0.065**	0.354**	-

* = $p \leq 0.05$; ** = $p \leq 0.01$ (2-tailed)

Table 5
Determinants of Academic Misconduct

	Dependent Variable: Proctorio© Scores			
Independent Variables	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
Integrity Statement	-2.085**	-2.115**	-2.011**	-2.020**
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Exam	-	0.238*	0.233*	0.238*
		(0.0200)	(0.0188)	(0.016)
Year	-	-	-2.115**	-2.439**
			(<.0001)	(<.0001)
Online	-	-	-	2.621**
				(<.0001)
Control variables				
Age	0.147**	0.147**	0.183**	0.151**
	(0.0012)	(0.0011)	(<.0001)	(0.0008)
Gender	-0.273	-0.274	0.011	-0.077
	(0.4028)	(0.4005)	(0.9728)	(0.8104)
Student Status	1.051**	1.049**	0.806**	0.633**
	(<.0001)	(<.0001)	(0.0005)	(0.0065)
Ethics Course	0.537	0.538	0.890*	0.825*
	(0.1738)	(0.1736)	(0.0231)	(0.0352)
Fixed Effects				
Instructor	Yes	Yes	Yes	Yes
Major	Yes	Yes	Yes	Yes
Intercept	22.419**	21.707**	4297.067**	4955.109**
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
R^2	0.047	0.048	0.078	0.083
Observations	4,413	4,413	4,413	4,413

This Table reports the results of fixed effect regression Models using Proctorio© scores as the dependent variable. The first set of regressors are exam related variables which are the variables of interest in responding to the study Hypotheses and include the variables of "Integrity Statement," "Exam," "Year," and "Online." The second set of regressors are the student-related variables of "Age," "Gender," "Student Status," and "Ethics Course." The regression coefficient p-values are reported in parentheses below each coefficient estimate.
* = $p < 0.05$; ** = $p < 0.01$ (2-tailed)