



# Academic Integrity in an Online Culture: Do McCabe’s Findings Hold True for Online, Adult Learners?

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## Abstract

This study examines how the self-reported cheating behaviors of students from a single large institution serving primarily adult students in online courses differ from those previously reported in large-scale studies of academic integrity among traditional-age college students. Specifically, the research presented here demonstrates that students at a large online university are no more likely to engage in most forms of cheating than the traditional-age students in residential institutions studied by Donald McCabe in his seminal research on academic integrity. Relatedly, our study finds that students’ age decreases the likelihood of engaging in cheating behaviors. Moreover, traditional-age undergraduates in our study were no more likely to engage in cheating behaviors than the undergraduate students McCabe surveyed. Our study offers a unique contribution to the extant literature on academic integrity, as we believe this is the largest survey of student attitudes, beliefs, and behaviors from a single institution. The research presented here confounds the common (mis)perception that cheating is more prevalent and easier to accomplish in online learning and assessment.

**Keywords** Academic integrity · Online education · Adult learners · Student surveys · McCabe

## Introduction

Student academic misconduct is a perennial concern for higher education faculty and administrators given the threat it poses to the integrity of teaching and learning, to the reputation of the institution, and to academic quality and student success. The rise of the “new cheating economy” has intensified the focus on academic misconduct (Wolverton 2016). The once-dominant image of cheating in higher education as a test-bank file cabinet in a frat house basement has been rendered quaint by a booming industry of commercialized websites that

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market themselves as providing “study help” and “tutoring” services while facilitating contract cheating and the unauthorized distribution of colleges’ and universities’ proprietary teaching and learning materials. While students paying someone to complete their assignments or sharing assessments and answers is nothing new, there is now a vastness to the availability of commercialized services that increase access to cheating “services” that is unlike anything higher education has seen before.

In this changing landscape of cheating and misconduct, it is imperative for colleges and universities to understand the complex drivers of student cheating. This study examines how the self-reported cheating behaviors of students from a single large institution serving primarily adult students in online courses differ from those previously reported in large-scale studies of academic integrity among traditional-age college students. Specifically, the research presented here demonstrates that students at a large online university are no more likely to report having engaged in most forms of cheating than students studied by Donald McCabe in his seminal research on academic integrity. Relatedly, our study finds that students’ age decreases the likelihood of engaging in cheating behaviors. Moreover, traditional-age undergraduates in our study were no more likely to engage in cheating behaviors than the undergraduate students McCabe surveyed. We can only speculate as to why our results show lower rates of academic misconduct relative to McCabe’s surveys. We do note that the goals of the university’s pedagogical model have driven a movement away from proctored exams to a focus on competency based education and authentic assessment. All exams delivered through UMUC’s online asynchronous modality are non-proctored.

Our study offers a unique contribution to the extant literature on academic integrity, as we believe this is the largest survey of student attitudes, beliefs, and behaviors related to academic integrity from a single institution. The research presented here adds weight to the existing literature that argues against the conventional wisdom that cheating is more prevalent and easier to accomplish in online learning and assessment.

## Literature Review

Most studies on the prevalence of academic misconduct are derived from self-reported and perceptual data from surveys of students or faculty. Findings across these surveys vary widely, with as few as 1 % to as many as 90% of students reporting that they have engaged in academic misconduct, depending on the population surveyed and the definition of academic misconduct used (Bertram Gallant 2008). The first large-scale study of academic misconduct in American colleges and universities was conducted in 1964 by William Bowers, who surveyed more than 5,000 students across 99 institutions and found that roughly three-quarters of college students admitted to having cheated at least once (Bowers 1964). Whitley (1998) reviewed 107 studies and found that self-reported cheating in undergraduate courses ranged from nine to 95% with a mean of 70%.

The most prolific body of survey data around academic integrity is the result of the work of Donald McCabe and the International Center for Academic Integrity. Replicating Bowers’ (1964) study with 1,800 students across nine institutions from Bowers’ original sample, McCabe et al. (2001) found a slight increase in the overall rate of students who admitted to cheating, but a significant increase in “the most explicit forms of test or exam cheating” (p.221).

Studies of students' self-reported academic dishonesty suggest that students in online courses may actually be less likely to engage in academic misconduct than students in face-to-face courses. In fact, Stuber-McEwen et al. (2009) found that even though students reported *believing* that more cheating occurred in online courses, those in online courses were actually less likely to cheat than those in face-to-face courses. The authors suggest that because students in online asynchronous courses can work at their own pace, they may be less likely to engage in "panic cheating" (p.4). Watson and Sottile (2010) also found that cheating was no more prevalent in online classes than in face-to-face classes, and suggested that "classroom social interaction in live classes plays some part in whether students decide to cheat" (p.11).

Nonetheless, academic integrity surveys have consistently found that both faculty and students *believe* that academic misconduct occurs more frequently in online courses (Miller and Young-Jones 2012; Stuber-McEwen et al. 2009). Kennedy et al. (2000) found that 64% of faculty and 57% of students felt it would be easier to cheat in an online course than a traditional course. King et al. (2009) found that 74% of undergraduate business majors perceived cheating online as easier than in face-to-face classes. These perceptions are rooted in the belief that physical distance and the lack of a strong connection to their instructor make students in online courses more likely to cheat (Kelley and Bonner 2005; Rowe 2004). Notably, Beck (2014) points out that faculty are more likely to believe that cheating is easier in online courses if they have never actually taught a course online.

Recent experimental and quasi-experimental studies have used random assignment and exam scores, as opposed to self-reported survey data, to measure academic misconduct. Findings from these studies have been mixed as to the relationship between exam proctoring and academic integrity. A study of students taking online exams found that those taking the exams unproctored scored significantly higher and used significantly more time than students taking the same exam online using test proctoring software (Alessio et al. 2017). Harmon and Lambrinos (2008), using a statistical model to predict academic misconduct, found that students taking unproctored online exams were more likely to be engaging in academic misconduct than those taking the same exam in a proctored classroom based on the use of GPA as a predictor of test scores. However, a study by Beck (2014) using Harmon and Lambrinos' (2008) model contradicted that conclusion, finding no significant difference in the exam scores of students taking the test online compared to those taking it face-to-face. Similarly, several other experimental or quasi-experimental studies found no evidence of increased cheating in unproctored online exams (e.g., Hollister and Berenson 2009; Peng 2007; Yates and Beaudrie 2009). Yates and Beaudrie (2009) compared the results of proctored versus unproctored online exams in community college mathematics courses and found no significant difference in the grades earned. Vazquez-Cognet et al. (2017), in an unpublished manuscript, found no significant effect of proctoring on exam scores for students taking an online economics class who were randomly assigned to take the exam proctored (although they did find significant effects of proctoring for students taking an in-person version of the same class when some of those students were assigned to an in-person proctored exam). Fask et al. (2014) found that students in an undergraduate statistics course who were randomly assigned to take their final exam unproctored online scored higher than the students who took the exam in a physical proctored environment. However, the sample for the study was quite small (44 students total) and academically dishonest behaviors were inferred rather than measured. In addition, the difference in venue and proctoring means that it is difficult to identify the causal mechanism. A subsequent paper by Fask et al. (2015) using the same data does provide evidence that lower GPA and infrequent class attendance have a significant effect

on a latent variable, which the authors interpret as cheating. This methodological approach is an important contribution to the way we measure dishonest behavior. However, given the small sample size and variation in venue as well as proctoring, it is unclear whether these findings are generalizable. Furthermore, although these experimental studies help us better understand academic dishonesty in online environments, it is important to note that they are focused specifically on exam cheating. It is unclear whether these findings are generalizable to the types of assessments used in competency-based learning models.

Furthermore, there is some evidence that online courses may be less conducive to certain types of academic misconduct, such as “collaborative cheating,” than face-to-face courses. McCabe (2005) found unauthorized collaboration to be the most pervasive cheating behavior, with 42% of students admitting to “working with others on an assignment when asked for individual work.” Similarly, Carpenter et al. (2006) found that 56% of engineering students admitted to copying from another student’s homework. Collaborative cheating was also the behavior students were least likely to consider a serious violation of academic integrity (McCabe 2005). The pervasiveness of collaborative cheating may be explained in part by the fact that peer influence and behavior is one of the strongest motivators of student cheating (McCabe and Treviño 1993, 1997). Jordan (2001) explained that “the more cheating a cheater sees and the more cheating a cheater believes peers are doing, the more cheating acts the cheater commits” (p. 242).

In contrast to the findings from traditional classroom settings, there is less evidence of widespread collaborative cheating in online courses. In an online course, students may have limited or non-existent contact with other students, and are in any case unlikely to directly witness their classmates engaging in academic misconduct. As a result, academic misconduct may be less likely to be normalized in online courses. Miller and Young-Jones (2012) found that students in face-to-face classes were more likely to engage in unauthorized collaboration than those in online classes and suggested that there is “a culture or social component to cheating” (p. 11) that may be absent from online courses. Similarly, after finding significantly higher rates of unauthorized collaboration among students in face-to-face courses as compared to online courses, Hart and Morgan (2010) suggested that, “Online students may not have as much interaction with other students in the program and therefore may be less likely to participate in these [collaborative] forms of cheating” (p. 504).

Yet some studies suggest that lower rates of academic misconduct in online courses may be more a function of age than of course modality (e.g., online or face-to-face). For example, Miller and Young-Jones (2012) found that, after controlling for age, there was no significant difference in the cheating behaviors of students who took only online courses compared to those who only took face-to-face courses. Online learners tend to be older, with an average age of 29, compared to the “traditional” 18-to-21-year-old college student population (Clinefelter and Aslanian 2016), and multiple studies have found that older students are less likely to cheat than traditional-age students (Gerdeman 2000; Miller et al. 2008; Newstead et al. 1996; Stuber-McEwen et al. 2009). Older students also tend to be more certain about which behaviors constitute cheating and to define cheating more broadly than younger students (Newstead et al. 1996). Adult learning theory posits that older students tend to draw from internal, rather than external, sources of motivation to achieve specific learning goals and that adult learners seek to take personal responsibility for and self-direct their own learning to a greater extent than traditional-age students (Knowles et al. 2012; Newstead et al. 1996). These qualities may make adult learners less likely to cheat: “Individuals with learning goals are more likely to persist in challenging tasks and may even seek them out, and it is reasonable to

suggest that such students will be less likely to resort to cheating as a way of coping with a challenging situation” (Newstead et al. 1996, p. 229).

Nonetheless, the age of students in online courses does not conclusively explain their lower rates of academic misconduct. Hart and Morgan (2010) found that students in face-to-face courses were more likely to cheat compared to students in online courses, regardless of age. However, the sample in this study was older and contained few traditional-age students (Hart and Morgan 2010). In a sample composed exclusively of traditional-age students, Black et al. (2008) found that 81% felt that cheating within their online course was no more prevalent than cheating in traditional courses. There is thus a clear need to disentangle the threads of course modality and age to help institutions and researchers better understand the nature of academic misconduct in online courses and the extent of unauthorized collaboration in those settings. This urgency is not unique to online learning. But institutions with large online program offerings such as the one involved in this study have strong incentives to grapple meaningfully with how to apply understandings about student demographic profiles and academic misconduct to teaching and learning environments.

## Methods

The findings presented in this study are drawn from data collected at a large, open enrollment university (University of Maryland University College, or UMUC) in January and February of 2018. The survey was developed to better understand students' perceptions and the broader culture of academic integrity as part of the work of a university-wide working group (the Academic Integrity Working Group, or AIWG). The AIWG was charged with developing an institutional strategy and set of recommendations on a range of operational and pedagogical issues related to transforming and sustaining a culture of academic integrity at the university (University of Maryland University College 2018).

McCabe (2005) developed a survey instrument that was used for a three-year study of more than 80,000 students across 83 college campuses in the United States and Canada. This survey instrument (hereafter referred to as “McCabe’s survey”), which asked students to self-report on whether they had personally engaged in any of a range of behaviors associated with academic misconduct within the past year, has been adapted by other scholars to better capture academic misconduct in online learning environments (Hart and Morgan 2010; Miller and Young-Jones 2012).<sup>1</sup> We similarly adapted McCabe’s survey instrument to be more appropriate for the unique context and student body of UMUC, which differs in significant ways from the traditional residential institutions used in previous studies (e.g., McCabe 2005; McCabe and Treviño 1997; McCabe et al. 2001). The majority of UMUC students attend courses online and the median age of UMUC undergraduates is 31. Most UMUC students attend college part-time and are employed full-time. In addition, UMUC plays a unique role as an institution serving students affiliated with the U.S. military: approximately 60% of UMUC’s worldwide student population are military or military-affiliated.

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<sup>1</sup> As one of the preeminent scholars of academic integrity, Donald McCabe conducted many surveys of academic integrity and no doubt adapted and refined a variety of survey instruments over the years. The survey instrument referred to throughout this paper as “McCabe’s survey” and which we use for comparison purposes in this study was published by McCabe in 2005 (“Cheating among college and university students: A North American perspective”).

Finally, the survey instrument - and UMUC's approach to academic integrity more broadly - were developed in the context of the university's learning model. This learning model emphasizes project-based learning in lieu of traditional assignments and authentic, rather than summative, assessment. Authentic assessment involves "engaging and worthy problems or questions of importance, in which students must use knowledge to fashion performances effectively and creatively. The tasks are either replicas of or analogous to the kinds of problems faced by adult citizens and consumers or professionals in the field" (Wiggins 1993). One function of this new learning model is that UMUC has moved away from proctored exams, with most students taking exams unproctored in online asynchronous courses. Thus, our survey instrument focused on academic integrity across a range of assignments and course activities, rather than on exams.

In addition to demographic questions, the survey asked students about four aspects of academic integrity:

- Their knowledge of the academic integrity standards and policies at the university;
- Aspects of academic integrity standards and policies their instructors had addressed with them;
- Their perceptions of other students' academic integrity behaviors at the university; and
- What academic integrity violations they themselves had committed as students at the university.

The invitation to participate in the survey was sent to all active students via the survey software Qualtrics on January 31, 2018. The active student population at the university is defined as anyone who has taken a class in the last two years as well as all students who have been admitted to take classes at the university and are eligible to enroll. In all, 147,139 unique students were invited to participate in the survey. A reminder message was sent to respondents who had not started or fully completed the questionnaire on February 7, 2018 and the survey was closed at midnight on February 11, 2018.

The survey received a response rate of 3 %, which, although low, is roughly consistent with the literature. McCabe (2005, p. 2) points out that response rates for these types of surveys can be "as little as five percent to 10 percent on some large campuses." Given our sample size of nearly 150,000 students, UMUC is much larger than even most large campuses. For example, McCabe and Treviño (1993) had a sample of approximately 6,000 students, but this was made up of students from 31 institutions and used a pen and paper survey. McCabe's (2005) sample of more than 80,000 students was collected over three years and across 83 different campuses in the United States and Canada. Thus, our resulting sample of 4,105 responses was nonetheless sizeable, and larger than most other comparable surveys which have been carried out on this topic. In fact, we believe this study features the largest sample for a survey of academic integrity from a single institution and certainly of working adult students in online higher education.

Although we adapted some aspects of McCabe's survey for our study, this paper presents how our findings compare to McCabe's (2005) results only on those survey questions which were identical (or very nearly so) on the two surveys. To do this, we compared the means reported by McCabe to the means of the corresponding questions from the UMUC survey. To statistically test whether the differences between the results were significant, a test of proportions (Z score for population proportions) was used where appropriate. OLS regression was used to test the effect of age on the frequency of engaging in cheating behaviors, as is standard for models with a continuous dependent variable. Logistic regression was used to test the

likelihood of a student ever engaging in a given activity, as is standard for models with a binary dependent variable.

In light of the literature examined in the previous section, this study tests several hypotheses:

- H1: Students at an online university are no more likely to engage in most forms of cheating than students in McCabe's sample.
- H1a: Students at an online university are specifically less likely to engage in collaborative cheating than students in McCabe's sample.
- H2: Age decreases the likelihood of a student engaging in cheating behaviors at an online university.

## Results

The results presented here focus first on the questions that were identical between our survey and McCabe's survey, then on those that were similar but not identical. In light of prior research that suggests that age is a stronger determinant of cheating behavior than course modality, we then examine the effect of age on the results.

Table 1 shows the self-reported rates of cheating behaviors for UMUC respondents and McCabe's respondents, where the questions in both surveys are identical or almost identical. Although the UMUC questionnaire asked whether and how often the student engaged in each behavior, the means reported here are for the percentage of respondents who indicated that they had engaged in the behavior *at least once*. The same is true for the McCabe data reported.

Overall, we found no category for which UMUC data showed higher rates of cheating behavior by students when compared to McCabe's. In fact, UMUC students were less likely to engage in nearly every category of cheating behavior than those in McCabe's sample. This is true for both undergraduate and graduate students. Compared to McCabe's findings, UMUC students appear less likely to engage in the following cheating behaviors:

- Paraphrase or copy a few sentences without referencing.
- Work on an assignment with others when asked for individual work
- Turn in work done by someone else
- Submit a false bibliography
- Submit false data
- Help someone else cheat on a test.

These differences are statistically significant at the 99% confidence level. Notably, for the survey item, "working on an assignment with others when the instructor asked for individual work," we found a difference of 31 percentage points for undergraduates and 12 percentage points for graduate students between UMUC students and those in McCabe's sample.

It is possible that this is a change that has happened over time for all students, given that McCabe's data was collected prior to the now ubiquitous technology used to detect and deter plagiarism and other forms of academic misconduct.<sup>2</sup> However, we find this explanation

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<sup>2</sup> However, we note that the International Center for Academic Integrity is currently developing survey instruments that will provide an interesting comparison to our results here by making more recent data available.

**Table 1** Comparison of self-reported cheating behaviors of UMUC respondents and McCabe's respondents

UMUC category	McCabe 2005 category	UMUC Undergraduates <i>n</i> = 1,500 approx	McCabe Undergraduates <i>n</i> > 46,000	UMUC Graduate Students <i>n</i> = 890 approx	McCabe Graduate Students <i>n</i> > 7,000
Paraphrasing or copying a few sentences from any source without references	Paraphrasing/copying few sentences from written source, [internet source] without footnoting it	22%**	38% [36%]	20%**	25% [24%]
Copying material, almost word for word, from any source and turning it in as your own work	Copying material almost word for word from a written source without citation	6%	7%	5%	4%
Working on an assignment with others when the instructor asked for individual work	Working with others on an assignment when asked for individual work	11%**	42%	14%**	26%
Turning in work done by someone else	Turning in work done by another	3%**	7%	2%*	3%
Submitting a false or fake bibliography, works cited, or reference list	Fabricating/falsifying a bibliography	3%**	14%	2%**	7%
Submitting false or fake lab data or research data	Fabricating or falsifying lab data [research data]	2%**	19%	1%**	7%
Turning in a paper or other material you purchased or obtained	Obtaining paper from term paper mill	3%	3%	2%	2%
Helping someone else cheat on a test	Helping someone else cheat on a test	3%**	10%	3%**	6%

\*\*  $p < .01$ ; \*  $p < .05$

unlikely given that the adoption of such technology is inconsistent and at the time of the survey UMUC was not requiring all assignments to be submitted to a commonly used similarity scoring software. As such, we find strong evidence for H1: UMUC students are no more likely to engage in cheating behaviors than students in McCabe's sample. We additionally find strong evidence for H1a: students at the online university are less likely to work on an assignment with others when asked for individual work. This result is in bold in Table 1.

We found one instance in which UMUC students were more likely than students from McCabe's sample to engage in cheating behaviors: the use of unauthorized materials (Table 2). UMUC students were asked whether they had used any unauthorized materials to assist in completing a test, while McCabe's sample were asked two separate questions about unauthorized materials: whether they had used unauthorized crib/cheat notes and whether they had used an unauthorized electronic device to obtain information during a test/exam. Nonetheless, it does appear that UMUC students are more likely to use unauthorized material on tests or assignments, and our institutional experience is that this material may often come from commercial websites that position themselves as providing tutoring or study help.



**Table 2** Use of unauthorized materials: comparison of UMUC respondents and McCabe's respondents

UMUC category	UMUC undergraduates <i>n</i> = 1500 approx	UMUC graduate students <i>n</i> = 890 approx	McCabe 2005 category	McCabe undergraduates <i>n</i> > 46,000	McCabe graduate students <i>n</i> > 7,000
Using any unauthorized material to assist in completing a test, examination, or other course assignment	12%**	10%**	Using unauthorized crib/cheat notes	8%	4%
			Using unauthorized electronic device to obtain information during test/exam	5%	2%

\*\*  $p < .01$ ; \*  $p < .05$

As discussed above, the existing literature is divided on the question of whether age is a stronger predictor of academic misconduct than course modality. As such, we attempted to test the effect of a students' age on their likelihood of engaging in academic misconduct. Unfortunately, many respondents to our survey did not complete the demographic section of the questionnaire, either because they chose not to answer those questions or because they exited the survey before reaching those questions, which were at the end of the survey. In addition, some students noted in open-ended comments that they were uncomfortable disclosing demographic information that they worried could be used to identify them on a survey dealing with such a sensitive topic. Thus, only 2,262 students (55% of respondents) reported their age range, which they selected from a drop-down menu. Based on a bivariate OLS model - which used a dummy variable (coded as 1 if the respondent's age was missing, and 0 otherwise) as the predictor and a measure of how many cheating behaviors the respondent indicated they had engaged in as the dependent variable - the data appear to be MCAR (Missing Completely at Random). Respondents randomly dropped out before reaching the demographics section (the other demographics questions, such as gender and graduate status have similar amounts of missing data). As such, the missing data for age does not pose a problem (see Appendix Tables 7 and 8). Both the mean and median age ranges for these students were between the ages of 36 and 44 (see Appendix Tables 7 and 8). A count of the average number of cheating behaviors reported by age range (Table 3) shows that the number of cheating behaviors does appear to be lower, in general, among older respondents compared to younger ones.

**Table 3** Cheating behaviors reported by age range

Age range	Mean behaviors engaged in
18–20	1.57
21–25	1.64
26–30	1.43
31–35	1.34
36–40	1.147
41–45	1.26
46–50	1.08
51–55	1.10
56–60	0.75
61–65	0.79
66–70	0.5
71 +	1.875

**Table 4** OLS regression: frequency of engaging in cheating behaviors

	Estimate
(Intercept)	1.763** (0.159)
Age	-0.075** (0.023)
Female	-0.169 (0.109)
Graduate	0.037 (0.103)
Military	-0.188 (0.111)

When we estimate an OLS regression on the data (Table 4), with a measure of how many cheating behaviors the student reports having engaged in as the dependent variable and age as the main predictor, controlling for gender, whether the respondent is an undergraduate and military affiliation (coded as 1 for active duty and veteran; 0 otherwise), we found that age was a significant predictor of engaging in cheating behaviors. While the effect is substantively small, it is significant at the 99% confidence level. On average and holding all else equal, moving from one age range to the next (older) age range means that a respondent has engaged in .075 fewer cheating behaviors.<sup>3</sup>

The result holds when we estimate a logistic regression (Table 5). Here we recode the dependent variable as a dummy, with students who have engaged in any cheating behavior coded as 1 and those who have not engaged in any coded as 0. Older students are less likely to have engaged in any cheating behavior. Predicted probabilities of the results below show that - holding the other variables at their sample means - a student in the 18–20 age range has a .527 probability of having engaged in at least one cheating behavior. This goes down to .439 for the same student in the 41–45 age range, and to .338 in the 71 or older age range. Given this evidence, we fail to reject H3: age does in fact decrease the likelihood of a student engaging in cheating behaviors at the online university.

Given the difference within the UMUC data across the age ranges, we introduced a new hypothesis to offer a more stringent test of H1a, which applies only to undergraduate students in both samples: *H3a: Traditional-aged undergraduate students at the online university are no more likely to engage in cheating behaviors than the undergraduate students in McCabe's sample.* Here we define traditional-aged students as those in the first two age categories, ages 18–20 and 21–25. In order to test whether online university undergraduate students of traditional age are no more likely to engage in various forms of cheating, the dataset was trimmed to include only undergraduate students age 25 and younger. This reduced the sample size to 189 respondents. Given this small sample size we must be cautious in interpreting the results. Table 6 shows the percentage of traditional-aged students who engaged in each of the cheating behaviors, compared to the McCabe undergraduates (test of population proportions).

On several survey questions, UMUC students reported engaging in cheating behaviors at similar or marginally higher rates than those reported by McCabe, although none are higher at

<sup>3</sup> An Ordered Logistic regression was also estimated, treating the dependent variable as ordered categories. The results were similar.

**Table 5** Logistic regression: likelihood of engaging in cheating behaviors

	Estimate
(Intercept)	0.1507 (0.1466)
Age	-0.0707** (0.0212)
Female	0.0332 (0.1004)
Graduate	0.1175 (0.0954)
Military	-0.0756 (0.1021)

statistically significant levels. On several items, UMUC results were lower and statistically significant, including the results for working on an assignment with others when individual work was requested. Although the result for traditional-age undergraduates is a percentage point higher than for the UMUC undergraduate sample as a whole, it is still much lower than the result reported by McCabe and statistically significant at the 99% confidence level. Given these results, we fail to reject H3a: traditional-age undergraduate students at an online university are in fact not more likely to engage in cheating behaviors than the undergraduate students in McCabe's data.

**Table 6** Comparison of cheating behaviors for traditional-aged respondents

UMUC category	McCabe 2005 category	UMUC undergraduates <i>n</i> = 1500 approx	UMUC traditional aged undergraduates <i>n</i> = 189	McCabe undergraduates <i>n</i> > 46,000
Paraphrasing or copying a few sentences from any source without references	Paraphrasing/copying few sentences from written source, [internet source] without footnoting it	22%	27%**	38% [36%]
Copying material, almost word for word, from any source and turning it in as your own work	Copying material almost word for word from a written source without citation	6%	10%	7%
Working on an assignment with others when the instructor asked for individual work	Working with others on an assignment when asked for individual work	11%	12%**	42%
Turning in work done by someone else	Turning in work done by another	3%	4%	7%
Submitting a false or fake bibliography, works cited, or reference list	Fabricating/falsifying a bibliography	3%	4%**	14%
Submitting false or fake lab data or research data	Fabricating or falsifying lab data [research data]	2%	3%**	19%
Turning in a paper or other material you purchased or obtained	Obtaining paper from term paper mill	3%	3%	3%
Helping someone else cheat on a test	Helping someone else cheat on a test	3%	4%**	10%

\*\*  $p < .01$ ; \*  $p < .05$

## Limitations

Although McCabe's instrument was the inspiration for our survey, we adapted McCabe's questionnaire to reflect UMUC's unique student population, global presence, and operational needs. For example, some questions struck us as being more appropriate for traditional college students attending residential institutions and/or engaging primarily face-to-face learning. These questions were removed or adapted to better capture the attitudes, beliefs, and actions of UMUC's population, who are predominantly working adults and military-affiliated students in asynchronous, online courses. However, although McCabe's respondents attended traditional residential institutions, it is unclear whether and how many students in his sample were enrolled in online courses. Other questions, such as those focused on institutional factors (e.g., an honor code) were also adapted or removed as appropriate for the online university context. Given that the two questionnaires were not identical, this study only compares our findings with McCabe's on survey items that were identical or very nearly so. Furthermore, even for those survey items that were identical, we cannot test for the statistical significance of the differences between our findings and McCabe's beyond a test of proportions, as we do not have access to McCabe's original raw data for analysis. As such, we must base our comparisons on McCabe's published findings, which do not include data points beyond reported means (McCabe 2005).

The phrasing of our questions on behavior is also different in an important way. McCabe asks whether students have engaged in a given behavior in the past year, our survey asks whether the student has ever engaged in a given behavior. Adult students often take a more nonlinear pathway through higher education, coming in and out of coursework, sometimes for more than a year before returning, reflecting the complication involved in balancing work, personal life, and education. As such, for the purposes of comparison, this stacks the deck against the online university data - the time span asked about is longer and so students are more likely to respond that they have engaged in a given behavior. This, although a limitation, actually strengthens the results presented here, where the frequency with which these behaviors are reported is consistently lower than what McCabe found. An additional limitation is that, as Miller and Young-Jones (2012) point out, comparing the percentages of students who report having cheated can be misleading, as such a percentage combines frequent or chronic cheaters with students who may have cheated only once. This limitation is common in the literature in light of how data are typically collected.

Finally, the representativeness of our sample is difficult to gauge. For this survey, we chose to use inclusive gender response categories (Human Rights Campaign 2016), rather than the traditional IPEDS gender categories. We also chose to make the demographic section of the survey optional. As a result, how our sample compares to the known values of the population is unclear.<sup>4</sup> Additionally, some of the students who gave open-ended responses for the gender category indicated that at least some were wary of giving information that they felt could be used to identify them, further complicating the comparison between the sample and the population. For these reasons we decided not to attempt to weight the responses, but rather to report the data as collected. As the seminal papers in the literature (e.g., McCabe and Treviño 1993, 1997) do not mention weighting or adjusting for bias, we assume that this is standard in reporting data on such a sensitive topic.

<sup>4</sup> For example, the sample is 46% male, while UMUC's population (per IPEDS) is 54% male. However, UMUC's population (per IPEDS) is 3% "unknown," while the sample is less than 1% non-binary/third gender, 1% "prefer to self describe," and 6% "prefer not to say."

## Discussion

Almost 20 years ago, McCabe claimed that many cheating behaviors are on the rise (McCabe et al. 2001). Accordingly, we might expect to see certain behaviors as more prevalent at an online university compared to what was reported by McCabe. However, our study found lower rates of cheating behaviors in almost all categories. Compared to McCabe's findings, the online university students appear less likely to engage in the following cheating behaviors: paraphrase or copy a few sentences without referencing; work on an assignment with others when asked for individual work; turn in work done by someone else; submit a false bibliography; submit false data; or help someone else cheat on a test.

The most striking difference in results was found on "Working on an assignment with others when the instructor asked for individual work." The difference of 31 percentage points for undergraduates and 12 percentage points for graduate students shows that this behavior is far less common at the online university (undergraduates: 11%; graduate students: 14%) than at the institutions McCabe surveyed (undergraduates: 42%; graduate students: 26%). Of course, this may well be a result of the nature of online education, in which students do not interact in person. This lack of personal interaction could make unsanctioned collaboration more difficult or less likely - both in that it may be more difficult to judge who is a potential collaborator and more difficult to coordinate a time and (virtual or physical) place to collaborate.

Despite the fact that the online university students were less likely to engage in collaborative cheating behaviors, they were more likely to report using "unauthorized materials" on tests or assignments. It is possible that this result is a function of the online environment and UMUC's academic model, in which students do not take tests and exams in proctored classrooms and thus have a greater ability to use resources that are unauthorized and that would be more difficult to use if taking a test in a room with other students. Some researchers have posited that the lack of face-to-face communication between a student and their peers and instructor can lead to lower likelihood of a student feeling obliged to act honestly (Kelley and Bonner 2005; Rowe 2004). However, given the lower rates of cheating behaviors for every other category, this does not seem to be supported by our findings. It does seem likely that something about the online environment makes this form of behavior easier to carry out and perhaps also easier to dismiss as trivial for the actor. This requires further research in order to determine whether this is more of a problem for online students relative to traditional students, and why.

## Conclusion

This study examined how the self-reported cheating behaviors of students from a single large institution serving primarily adult students in online courses differed from those previously reported in large scale studies of academic integrity among traditional college students. As the evolving cheating economy becomes more complex (Wolverton 2016), it is imperative for academic institutions to understand all of the complex drivers of student cheating. This study demonstrates that at a large online university, students are no more likely to engage in most forms of cheating than the traditional-aged students attending residential institutions studied by

Donald McCabe and the International Center of Academic Integrity. However, the students in this study were more likely to admit to the use of “unauthorized materials” on tests and assignments. Future research should determine whether this behavior is indeed characteristic of the online student population when compared to the traditional student population. It is quite possible that the proliferation of materials online to aid in academic dishonesty are a more salient issue than the modality of the classes students take.

Finally, our results offer new insights on the impact of age on engaging in cheating behavior online. As adult learners increasingly turn to online institutions to achieve their educational goals, presenting evidence against the received wisdom of the prevalence of cheating in online learning environments is paramount to preserving the legitimacy and integrity of these students’ educational achievements. Of course - beyond a focus on cheating in exams - institutions must do more to ensure that students are disincentivized from engaging in any academically dishonest behaviors, and strive to make institutional commitments to academic integrity visible and consistent across the teaching and learning enterprise.

## Appendix

**Table 7** Respondent age range and frequency

	Age range	Frequency
1	18–20	39
2	21–25	174
3	26–30	312
4	31–35	380
5	36–40	357
6	41–45	331
7	46–50	293
8	51–55	204
9	56–60	109
10	61–65	30
11	66–70	16
12	71 +	17
	NA’s	1822
	Total	4084

Table 8 shows the results of a bivariate OLS regression where the predictor variable is a measure whether the respondent’s age is a missing value (coded as 1 if missing) and the dependent variable is a measure of how many cheating behaviors the respondent has engaged in.

**Table 8** Model showing no significant effect of missing data

	Estimate	Std. error	t value	Pr(> t )
(Intercept)	1.24466	0.04920	25.30	<0.000
Age Missing	0.09134	0.20779	0.44	0.66

## References

- Alessio, H. M., Malay, N. J., Maurer, K., Bailer, A. J., & Rubin, B. (2017). Examining the effect of proctoring on online test scores. *Online Learning*, 21(1). <https://doi.org/10.24059/olj.v21i1.885>
- Beck, V. (2014). Testing a model to predict online cheating—Much ado about nothing. *Active Learning in Higher Education*, 15(1), 65–75. <https://doi.org/10.1177/1469787413514646>.
- Bertram Gallant, T. (2008). *Academic integrity in the twenty-first century: A teaching and learning imperative*. San Francisco: Jossey-Bass.
- Black, E. W., Greaser, J., & Dawson, K. (2008). Academic dishonesty in traditional and online classrooms: Does the “media equation” hold true? *Journal of Asynchronous Learning Networks*, 12(3–4), 23–30.
- Bowers, W. J. (1964). *Student dishonesty and its control in college*. New York: Bureau of Applied Social Research, Columbia University.
- Carpenter, D. D., Harding, T. S., & Finelli, C. J. (2006). Engineering students' perceptions of and attitudes towards cheating. *Journal of Engineering Education*, 95(3), 181–194.
- Clinefelter, D. D. L., & Aslanian, C. B. (2016). *Online college students 2016: Comprehensive data on demands and preferences*. Louisville: The Learning House, Inc..
- Fask, A., Englander, F., & Wang, Z. (2014). Do online exams facilitate cheating? An experiment designed to separate possible cheating from the effect of the online test taking environment. *Journal of Academic Ethics*, 12(2), 101–112. <https://doi.org/10.1007/s10805-014-9207-1>.
- Fask, A., Englander, F., & Wang, Z. (2015). On the integrity of online testing for introductory statistics courses: A latent variable approach. *Practical Assessment, Research, & Evaluation*, 20(10) Retrieved from <http://pareonline.net/getvn.asp?v=20&n=10>.
- Gerdeman, R. (2000). Academic dishonesty and the community college. ERIC Clearinghouse for Community Colleges, University of California at Los Angeles.
- Hamon, O. R., & Lambrinos, J. (2008). Are online exams an invitation to cheat? *The Journal of Economic Education*, 39(2), 116–125. <https://doi.org/10.3200/JECE.39.2.116-125>.
- Hart, L., & Morgan, L. (2010). Academic integrity in an online registered nurse to baccalaureate in nursing program. *The Journal of Continuing Education in Nursing*, 41(11): 498–505. <https://doi.org/10.3928/00220124-20100701-03>
- Hollister, K. K., & Berenson, M. L. (2009). Proctored versus unproctored online exams: Studying the impact of exam environment on student performance. *Decision Sciences Journal of Innovative Education*, 7(1), 271–294. <https://doi.org/10.1111/j.1540-4609.2008.00220.x>.
- Human Rights Campaign. (2016, October 26). Collecting transgender-inclusive gender data in workplace and other surveys. Retrieved April 3, 2019, from Human Rights Campaign website: <https://www.hrc.org/resources/collecting-transgender-inclusive-gender-data-in-workplace-and-other-surveys/>
- Jordan, A. E. (2001). College student cheating: The role of motivation, perceived norms, attitudes, and knowledge of institutional policy. *Ethics & Behavior*, 11(3), 233–247. [https://doi.org/10.1207/S15327019EB1103\\_3](https://doi.org/10.1207/S15327019EB1103_3).
- Kelley, K. B., & Bonner, K. (2005). Digital text, distance education and academic dishonesty: Faculty and administrator perceptions and responses. *Journal of Asynchronous Learning Networks*, 9(1), 10.
- Kennedy, K., Nowak, S., Raghuraman, R., Thomas, J., & Davis, S. F. (2000). Academic dishonesty and distance learning: Student and faculty views. *College Student Journal*, 34(2), 309.
- King, C., Guyette, R., & Piotrowski, C. (2009). Online exams and cheating: An empirical analysis of business students' views. *The Journal of Educators Online*, 6(1). <https://doi.org/10.9743/JEO.2009.1.5>
- Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2012). *The adult learner* (6th ed.). Taylor & Francis Group. Retrieved from <http://ebookcentral.proquest.com/lib/umdcpl/detail.action?docID=680833>
- McCabe, D. L. (2005). Cheating among college and university students: A North American perspective. *International Journal for Educational Integrity*, 1(1). <http://dx.doi.org.proxy-um.researchport.umd.edu/10.21913/IJEI.v1i1.14>
- McCabe, D. L., & Treviño, L. K. (1993). Academic dishonesty: Honor codes and other contextual influences. *The Journal of Higher Education*, 64(5), 522. <https://doi.org/10.2307/2959991>.
- McCabe, D. L., & Treviño, L. K. (1997). Individual and contextual influences on academic dishonesty: A multicampus investigation. *Research in Higher Education*, 38(3), 379–396.
- McCabe, D. L., Treviño, L. K., & Butterfield, K. D. (2001). Cheating in academic institutions: A decade of research. *Ethics & Behavior*, 11(3): 219–232 [https://doi.org/10.1207/S15327019EB1103\\_2](https://doi.org/10.1207/S15327019EB1103_2)
- Miller, A., & Young-Jones, A. D. (2012, April). *Academic integrity: Online classes compared to face-to-face classes*. Presented at the meeting of the Southwestern Psychological Association, Oklahoma City, OK.
- Miller, A., Shoptaugh, C., & Parkerson, A. (2008). Under reporting of cheating in research using volunteer college students. *College Student Journal*, 42(2), 326–339.

- Newstead, S. E., Franklyn-Stokes, A., & Armstead, P. (1996). Individual differences in student cheating. *Journal of Educational Psychology*, 88(2), 229–241. <https://doi.org/10.1037/0022-0663.88.2.229>
- Peng, Z. (2007). Giving online quizzes in corporate finance and investments for a better use of seat time. *The Journal of Educators Online*, 4(2). <https://doi.org/10.9743/JEO.2007.2.3>
- Rowe, N. C. (2004). Cheating in online student assessment: Beyond plagiarism. *Online Journal of Distance Learning Administration*, 7(2) Retrieved from <https://www.westga.edu/~distance/ojdla/summer72/rowe72.html>.
- Stubber-McEwen, D., Wiseley, P., & Hoggatt, S. (2009). Point, click, and cheat: Frequency and type of academic dishonesty in the virtual classroom. *Online Journal of Distance Learning Administration*, 12(3). Retrieved from <https://www.westga.edu/~distance/ojdla/fall123/stuber123.html>
- University of Maryland University College. (2018, June). Philosophy of Academic Integrity. Retrieved November 6, 2018, from <https://www.umuc.edu/current-students/learning-resources/academic-integrity/philosophy.cfm>
- Vazquez-Cognet, J., Sarmiento-Barbieri, I., & Chin, T. (2017). *Can we stay one step ahead of cheaters? A clinical trial on the effect of proctoring in online exams*. Department of Economics, University of Illinois.
- Watson, G. R., & Sottile, J. (2010). Cheating in the digital age: Do students cheat more in online courses? *Online Journal of Distance Learning Administration*, 13(1).
- Whitley, B. E. (1998). Factors associated with cheating among college students: A review. *Research in Higher Education*, 39(3), 235–274.
- Wiggins, G. P. (1993). *Assessing student performance: Exploring the purpose and limits of testing*. San Francisco, CA, US: Jossey-Bass.
- Wolverton, B. (2016, August 28). The new cheating economy. The Chronicle of Higher Education. Retrieved from <https://www.chronicle.com/article/The-New-Cheating-Economy/237587>
- Yates, R. W., & Beaudrie, B. (2009). The impact of online assessment on grades in community college distance education mathematics courses. *American Journal of Distance Education*, 23(2), 62–70. <https://doi.org/10.1080/08923640902850601>.

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