

Session 2531

The Influence of Academic Dishonesty on Ethical Decision-Making in the Workplace: A study of engineering students

T.S. Harding¹, D.D. Carpenter², C.J. Finelli³, and H.J. Passow³

¹Kettering University, Flint, MI

²Lawrence Technological University, Southfield, MI

³University of Michigan, Ann Arbor, MI

Abstract

According to studies conducted over the past four decades, engineering students self-report high frequencies of academic dishonesty (cheating) while in college. Research on college students in all fields has indicated that such behavior is more common among students who participate in academic dishonesty at the high school level and is correlated with other deviant or unethical behaviors, such as petty theft and lying. If, in fact, such correlations do exist, one might hypothesize that there is also a relationship between academic dishonesty in college and deviant or unethical behavior in professional practice. Placing this relationship in the context of higher frequencies of academic dishonesty among engineering students only increases the seriousness of the problem for engineering educators, corporations and society.

To examine this issue we have initiated a multi-university study on the attitudes, perceptions and behaviors of college-aged engineering students toward academic dishonesty and unethical professional behavior. A majority of the students in our sample population work for a considerable period of time in an engineering setting during their college years, providing us with a unique opportunity to study the connection between academic dishonesty and professional behavior within the same sample of individuals. The survey used in this study asks questions about the respondent's decisions during opportunities to "cheat" in each of two contexts: college classrooms and workplace settings. In each context, respondents are asked to consider what opportunities to cheat presented themselves, whether they felt any pressure to cheat (or not to cheat), and ultimately what decision they made in this specific instance. The survey also asks respondents to report how frequently they have cheated in school or the workplace.

Results suggest that there is a clear connection between cheating in high school and the decision to cheat in a specific scenario in college. In addition, frequent cheaters in high school reported being more likely to decide to violate work place policies. Finally, comparison of student responses to the pressures and hesitations to cheating across the contexts of academic and workplace settings indicates there are distinct similarities in the decision-making processes used by respondents in these two contexts.

Introduction

A majority of educators are aware that academic dishonesty is a serious problem in higher education. However, engineering educators face a particularly troubling problem considering that engineering undergraduates have consistently self-reported some of the highest levels of cheating among all other disciplines. Moreover, the trend indicates an increased number of engineering students cheating. In 1964 Bowers¹, in the largest study to date, found that 58% of engineering students self-reported cheating in college. In comparison McCabe² found that by 1996 82% of engineering students self-reported cheating. In both cases, students in engineering reported the second highest rates of cheating, behind only business students.

The consequence of unethical behavior is immediately apparent at the collegiate level: students misrepresent their ability and potentially receive an advantage over their peers. However, the longer-term consequences are cause for even greater concern. A student who has managed to cheat his way through college not only presents a false impression of himself to a future employer, but may also have such a poor sense of moral obligation and responsibility that he cannot be expected to act ethically as a professional engineer. In this case much more than the integrity of the academic process is at stake because engineers (more often than their business counterparts) are responsible for the physical welfare of the consumers of the products they design and manufacture.

In a study based on their Theory of Planned Behavior, Beck and Ajzen³ surmised that prior and future behavior are only correlated to the extent that the underlying determinants, such as attitudes, subjective norms, perceptions of behavioral control and intentions, have not changed over time. Thus, if a correlation exists between high school cheating and college cheating, one would presume that the underlying determinants, what some would refer to as the morality of the individual, have not changed from one context to the other. If such a correlation does exist, one can argue that situational factors, which are certainly different between context, have a less significant influence than the underlying moral determinants. There does seem to be considerable support in the literature for the hypothesis that the underlying determinants establish participation in deviant behavior regardless of context. Correlations have been found between academic dishonesty and shoplifting³, risky driving⁴, theft from employers⁵, alcohol abuse⁶, and cheating on income taxes⁷. These data suggest the apparent conclusion that disciplines with higher self-reported levels of academic dishonesty are producing professionals with seriously compromised morals who are more likely to participate in professional dishonesty. Given the higher rates of cheating previously reported among engineering students, such a conclusion does not bode well for the discipline of engineering.

The long-term goal of our research is to identify what variables control an engineering student's decision to participate in academic dishonesty. In particular, if we can uncover the variables that lead to higher levels of cheating among engineers, we might be able to develop interventions at the institutional and classroom level that would reduce the extent of cheating. For the present study, our research is driven by two hypotheses. First, we hypothesize that students who report a prior tendency to participate in dishonest behavior (as measured in high school) are more likely to do so in college and in professional practice. Second, we hypothesize that there are definite similarities in the reported variables involved in the decision-making processes of students who

engage in academic dishonesty (as measured in college) and those who engage in professional dishonesty. To investigate these hypotheses, we have developed an exploratory survey, which asks respondents' about *decisions* during opportunities to "cheat" in each of two contexts: college coursework and workplace settings. For each context, respondents were asked to consider a specific instance in which they had been *tempted* to cheat, what pressures they felt to cheat or not to cheat in this specific instance, and ultimately what decision they made. Because we are interested in engineering students and their professional behavior, our sample includes only undergraduate engineering students at two technical private universities where students either participate in an intensive cooperative education program or consist of non-traditional students who work in engineering settings. This paper will present both qualitative and quantitative data from the survey but will consider this data only in the aggregate. The qualitative data in particular will provide us with an indication of what variables might be involved in decisions to participate in academic and professional dishonesty. We intend to use this information to develop a model of the decision-making process, similar to that developed by Whitley⁸, that can then be tested over a broader sample using a more comprehensive instrument.

In this paper we consider academic dishonesty to be a deviant behavior since it varies from the cultural norm of academic integrity within higher education. We also consider professional dishonesty to be a deviant behavior since it varies from either internally mandated corporate policies or professional codes of ethics such as that developed by the National Society of Professional Engineers. For this work, the question of interest is whether an individual who participates in academic dishonesty in college is more or less likely to participate in deviant behavior in professional practice. Further, we are interested in understanding the underlying variables in the decision-making process that lead to the deviant behavior in both cases to determine whether similarities exist. Presumably, if individuals who cheat in college were more likely to do so in professional practice, one would anticipate considerable similarities in their decision-making processes.

Methodology and Sample

A total of 130 students enrolled at two technically-oriented private universities responded to the survey. These institutions were selected because of the increased likelihood that students attending these universities had work experience that was directly related to engineering practice. In one case, students are required to participate in an intensive cooperative education program whereby they work in an engineering facility every other term beginning from the freshmen year. The second university consists of a large population of non-traditional students who attend school part-time. Many of these students hold jobs in engineering settings.

Students were asked to complete the survey in their classes to maximize the response rate (85.9%). Due to their lack of experience in college and workplace settings, first year students were not included in the sample. Of the sample, the majority was 3rd and 4th year students as shown in Table 1. Participants reported working full-time an average of 6.8 months ($\sigma = 3.0$) during the last academic year, and an average of 38.7 hours per week ($\sigma = 10.8$) during this time. Of the individuals who responded, 40% indicated working in an engineering position, 10% in retail/restaurant service, 10% in trades and construction and 9.2% indicated in some other area. This experience is crucial to our study given that we are interested in collecting data from

individuals exposed to both work-place and academic settings within recent memory, particularly those from an engineering setting. For the current study, responses from those working in an engineering setting were not separated from those working in non-engineering settings due to limitations with sample size. We recognize that one potential limitation of this study is that by using students for both the cheating and work experience survey, our sample may have a generally lower level of moral development and maturity than we might expect from full-time engineers. However, we felt that this limitation was outweighed by the advantage of using common samples for both portions of the study.

Table 1: Distribution of class standing for sample population

Class Standing	Percentage of Sample
1 st Year	0%
2 nd Year	7%
3 rd Year	42%
4 th Year	33%
5 th Year	16%
Unknown	2%

Participants completed a thirteen-item questionnaire consisting of three sections. The first section contained questions related to the respondents' background including the extent to which they worked in the past year and how frequently they cheated in high school. The second section dealt with issues relating to college cheating and what factors influence a respondent's decision to cheat. Likewise, the third section of the questionnaire dealt with decisions regarding deviant behavior in the workplace.

To avoid potential underreporting due to social desirability bias⁹, care was taken to develop protocols that assured respondent anonymity. Participants completed the questionnaire in their classrooms. The questionnaire was distributed by one of the authors of this paper who briefly discussed the nature of the research and the participants' rights. The proctor left the room while participants completed an anonymous questionnaire. Respondents were asked to place completed surveys into a large plain envelope, which was then sealed and returned to a department administrative assistant who delivered the surveys to the proctor for entry into the data set. These protocols and the survey itself were approved by an institutional review board for the behavioral sciences.

Responses to open-ended questions on the survey were analyzed using a technique similar to that reported by McCabe *et al.*, referred to as the "content analysis procedure"¹⁰. In the first step, each response was examined verbatim by three independent examiners. The examiners determined what thought units were involved in each response. During the second step, each examiner independently attempted to identify similar categories of thought units. Each category was given a descriptor that was inclusive of all thoughts units within that category. As a group, the examiners integrated and refined their lists of categories into one master list. In the final step, the examiners grouped the categories into a list of overall themes through discussion, negotiation and consensus. It is our belief that through this process, the variables involved in the respondents' decision-making process are revealed in the emergent themes.

Quantitative Comparison of Behavior across Contexts

Because we are interested in investigating the connection between past behavior and future decision-making, it is instructive to examine the relationship between self-reported levels of cheating in high school and whether or not the respondents followed through with their decision to participate in academic and/or professional dishonesty. It should be noted that it is not possible to compare self-reported behavior in college directly to workplace behavior. In this study we have asked respondents to consider a specific situation in which they were tempted to participate in deviant activities. Since we are not measuring behavioral trends, but rather the result of a single decision, it would not be instructive to compare the results of these individual decisions across the contexts of academic and professional settings. It is also important to point out that the small sample size of this study prohibits establishing statistical significance for the trends discussed here.

Table 2 contains a comparison of self-reported frequencies of cheating in high school to the decision of whether to cheat in the specific situation the respondent was considering when completing the survey. Respondents who indicated that they had cheated more frequently in high school were more likely to indicate a positive decision to cheat in the scenario they were considering in college. For example, students who reported never having cheated during an average term in high school indicated they decided not to cheat in this scenario by more than a two-to-one ratio. This trend is reversed for students who reported frequently cheating in high school. Here we see that 61.5% of these students decided to go through with their decision to cheat, compared to only 38.5% who decided against it. The actual number of respondents is shown in parentheses for each response pairing.

Table 2: Decision to cheat in college as a function of self-reported frequency of high school cheating. Number of respondents is shown in parentheses.

Frequency of high school cheating	College Cheating Decision	
	Decided to cheat	Decided <u>not</u> to cheat
Never	31.6% (6)	68.4% (13)
Once	47.1% (8)	52.9% (9)
A few times	40.3% (25)	59.7% (37)
Frequently	61.5% (8)	38.5% (5)

Similar observations can be made when comparing the self-reported frequency of high school cheating and the decision to participate in professional dishonesty, as shown in Table 3. Only 37.5% of respondents who reported never cheating during an average term in high school decided to violate their workplace policies in the specific instance they were considering, whereas 63.6% of respondents who frequently cheated in high school decided to go through with their plans. There is an increasing trend in the number of respondents indicating they had decided to violate their employer's workplace policies as the frequency of high school cheating increases. Together the data presented in Tables 2 and 3 support our first hypothesis that past behavior, in this case cheating in high school, can be a strong indicator of future participation in academic or professional dishonesty.

Table 3: Decision to violate workplace policies as a function of self-reported frequency of high school cheating. Number of respondents shown in parentheses.

Frequency of high school cheating	Decision to Violate Workplace Policies		
	Decided to violate policies	Decided <u>not</u> to violate policies	Other
Never	37.5% (3)	50.0% (4)	12.5% (1)
Once	44.4% (4)	44.4% (4)	11.1% (1)
A few times	56.8% (25)	25.0% (11)	18.2% (8)
Frequently	63.6% (7)	9.1% (1)	27.3% (3)

Similarities in Variables Influencing Decision-Making Across Contexts

This section describes the results of using the content analysis procedure to analyze the responses to four open-ended questions on the survey. The first two questions ask the respondents to indicate what pressures they felt when tempted to cheat in college (Question 7.2) and what thoughts made them hesitate in their decision to cheat (Question 7.3). Similar questions were asked regarding the pressures (Question 11.3) and hesitations (Question 11.4) involved in the decision to participate in professional dishonesty. In this study we describe pressures as internal and external influences that increase a respondent's likelihood to participate in the deviant behavior. Conversely, hesitations are internal and external influences that reduce this likelihood. Comparison of the themes identified through the content analysis procedure indicates substantial similarities in the nature of the variables involved in the decision-making process though not necessarily their relative frequency of being reported. Given the small sample size, frequency is of less concern since we are not attempting to establish statistical significance, though it may be useful in identifying a coarse measure of the relative importance of the themes that were identified.

In comparing the emergent themes regarding the pressures to participate in academic and professional dishonesty across these two contexts, we see that most themes are common as shown in Table 4. The extent of commonality in the themes suggests that there are substantial similarities in the pressures that respondents feel to participate in academic and professional dishonesty. Each pair of common themes is coded with a variable name that attempts to capture the intent of the thematic pairs. It should be noted that some themes could not be grouped across the two contexts. These themes are also provided in Table 4. For example, in terms of the pressures to cheat, respondents indicated that being unprepared, lacking motivation and perceiving that cheating works were all temptations to cheat. No similar response could be found among those for violating workplace policies. In the case of violating workplace policies there were also several responses that did not match up with those for cheating, including: I wanted or needed it, inconsequential/seemed harmless, wanted to avoid conflict, someone told me to do it and no one would care. In both contexts, the number of responses that fell within these non-matching themes is substantial; suggesting that further investigation is needed to identify related variables and their influence in either, or both, contexts.

**Table 4: Self-reported pressures to participate in academic and professional dishonesty.
Number of responses is shown in parentheses.**

<i>Common Variable Name</i>	<i>Academic Dishonesty (Question 7.2)</i>	<i>Professional Dishonesty (Question 11.3)</i>
Insufficient resources	Not enough time (36)	Lack of resources to complete job (7)
Importance of success	Grade pressure (15)	Wanted to seem better than I was (5)
Projection of blame	Professor deserved it (14)	Company deserved it (7)
Perceived chance of success	Material was too hard (13)	Not confident in my abilities (3)
Perceived risk of detection	It's easy to cheat (10)	It's easy to do/get away with it (3)
Industriousness	Lazy or procrastinated (7)	Didn't want to put forth the effort (4)
Attitude	It's not cheating (6)	It isn't wrong/I didn't know it was wrong (2)
Perceived norms	Everyone does it (2)	Everyone does it (4)
Peer influence	Others needed my help (1)	Others needed my help (4)
Unmatched Themes	Cheating Works (7)	
	Unprepared (22)	
	Lack of Motivation (17)	
		No one would care (2)
		Inconsequential/Seemed harmless (9)
		I wanted/Needed it (19)
		Wanted to avoid conflict with others (3)
		Someone told me to do it (3)
Undetermined Theme	Could not be determined (5)	Could not be determined (12)
Incorrect Entry	Unrelated to question (0)	Unrelated to question (6)

Table 5 reveals the commonalities between the hesitations respondents reported when considering academic (Question 7.3) and professional (Question 11.4) dishonesty. Here again, the substantial number of common themes between academic and professional contexts suggests there are common restraints on the decision to become involved in a deviant behavior. As before, however, there are some themes that did not agree. For example, in the case of academic cheating some respondents indicated that it was physically too hard or time consuming to cheat. Likewise, among the themes for hesitations to participate in professional dishonesty several themes were unpaired: negative consequences for customers, work had to get done, and it could affect product quality. These themes relate to specific scenarios that are not found in academic settings. However, an argument could be made to group these themes under the common variable moral obligation, though this was not done.

Table 5: Self-reported hesitations in the decision to participate in academic and professional dishonesty. Number of responses is shown in parentheses.

<i>Variable Name</i>	<i>Academic Dishonesty (Question 7.3)</i>	<i>Professional Dishonesty (Question 11.4)</i>
Moral obligation	Desire to learn/Desire to do own work (33)	Personal standards (11)
Conscience	Shame, conscience, guilt, etc. (22)	Shame, conscience or guilt (5)
Risk of formal sanctions	Cheating is against the rules/Fear if sanctions (17)	Might get fired/It is illegal (13)
Perceived Risk of detection	Fear of getting caught (12)	Fear of getting caught (8)
Attitude	Cheating is wrong (11)	It is wrong (8)
Expected value of success	It won't get you anything (2)	Could be more work/money later (2)
Influence of significant others	Would lose respect of others (2)	Would lose respect of others (5)
Unmatched Themes	Physically too hard or time consuming to cheat (5)	
		There would be negative consequences (4)
		Could affect product quality (3)
		Work had to get done (3)
No Hesitation	No Hesitation (11)	No Hesitation (11)
Undetermined Theme	Could not be determined (10)	Could not be determined (6)
Incorrect Entry	Unrelated to question (1)	Unrelated to question (10)

Overall, it is apparent there are definite consistencies between the pressures and hesitations that students identified in their decisions to participate in either academic or professional dishonesty. This finding qualitatively supports our second hypothesis.

Discussion

In the case of the quantitative data in which we compare self-reported frequencies of cheating in high school and the decision to participate in academic and professional dishonesty, we observed a definite, though not statistically significant, relationship between past behavior (high school) and behavior in college and the workplace. The dictum that "past behavior is the best predictor of future behavior" appears to be true in this case. Since past behavior does not inform future behavior for its own sake, we must assume that the underlying determinants of these dishonest behaviors, as described by Beck and Ajzen³, have not changed for these respondents despite a change in context from high school to college to professional practice. According to these findings, as the amount of cheating increases among engineering undergraduates (as has been the case over the past 40 years) we should expect a related increase in dishonesty in professional practice.

What about the respondents who indicated they decided not to participate in dishonest behavior despite having frequently cheated in high school? One possibility is that since we asked students to consider only one scenario, these individuals may have chosen a scenario in which they ultimately decided not to participate in the dishonest behavior. We do not know whether this decision was a common one for them or a rarity. It is also possible that there was some sort of change in the factors that influence the respondents' decisions between contexts. Determining what these changes are could be instructive for developing pedagogical and institutional strategies for reducing cheating on college campuses. Future analysis will examine the individual responses of particular students to examine what variables might change from one context to another.

As stated previously, a long-term goal of our research is to identify variables that influence a student's decision to participate in academic and/or professional dishonesty and the relative influence of these variables on this decision. Therefore, one of the purposes of the study described in this paper was to determine whether the variables present in decisions to participate in academic dishonesty are in fact similar to those involved in professional dishonesty. If so, we might then suspect that the same variables could be affected in college with potential improvements in ethical behavior even into professional practice.

The results of this study suggest that there are, in fact, substantial similarities in the themes that emerged from the qualitative analysis. As a result, it seems likely that students weigh many of the same issues when making decisions about their behavior regardless of the context (academic or professional). This is both sobering and hopeful. For those students who are prone to participate in academic dishonesty we would expect them to make similar decisions in professional practice. However, if we can identify variables that are of greatest influence on the decision to cheat in college (particularly among engineering students), we could develop interventions that would alter the decision-making process of individual students. This would

have the result of not only reducing cheating in college but also increasing ethical behavior in professional practice.

An important question that remains to be answered is what variables are most influential in an individual's decision to participate in dishonest behavior. To determine this, we plan to develop a model of the decision to cheat in college along the lines of that proposed by Whitley⁸. It is encouraging to note that, of the sixteen themes found by this study to be common across both the academic and professional context, twelve themes can be related directly to a variable included within the Whitley model. Those that do not seem to correspond to the Whitley model (including projection of blame, peer influence, risk of formal sanctions and influence of significant others) tend to deal with external influences such as quality of teaching by the instructor, treatment by a manager, pressure from friends, etc. Given the extent to which such external influences are noted by the respondents in this study, it might be necessary to include these variables within a model adapted from Whitley's. In addition, there are a number of themes from this study that were not common across context that also do not match with any variable from Whitley's model. These include the perception that the action was harmless, the individual wanted to avoid conflict and someone told the individual to do it. These themes deal primarily with issues encountered in the workplace, but if our premise holds true that the decision-making process in academic and professional settings is similar, they may also need to be included in a new model.

References

1. Bowers, W. J. (1964). Student Dishonesty and its Control in College, Bureau of Applied Social Research, Columbia University.
2. McCabe, D. L. (1997). "Classroom Cheating Among Natural Science and Engineering Majors." Science and Engineering Ethics **3**: 433-445.
3. Beck, L. and I. Ajzen (1991). "Predicting Dishonest Actions Using the Theory of Planned Behavior." Journal of Research in Personality **25**: 285-301.
4. Blankenship, K. L. and J. Whitley, B.E. (2000). "Relation of General Deviance to Academic Dishonesty." Ethics and Behavior **10**(1): 1-12.
5. Hilbert, G. A. (1985). "Involvement of Nursing Students in Unethical Classroom and Clinical Behaviors." Journal of Professional Nursing **1**: 230-234.
6. Kerkvliet, J. (1994). "Cheating by Economics Students: A comparison of survey results." Journal of Economic Education **25**: 121-133.
7. Fass, R. A. (1989). Cheating and Plagiarism. Ethics and Higher Education. W. W. May. New York, Macmillan: 170-184.
8. Whitley, J., B.E. and P. Keith-Spiegel (2002). Academic Dishonesty: An Educator's Guide. Mahwah, NJ, Lawrence Erlbaum Associates.
9. Edwards, A. L. (1957). Techniques of Attitude Scale Construction. New York, Appleton-Century-Crofts.
10. McCabe, D. L., L. K. Trevino, et al. (1999). "Academic Integrity in Honor Code and Non-Honor Code Environments: A Qualitative Investigation." Journal of Higher Education **70**(2): 211-234.

TREVOR S. HARDING is Associate Professor of Manufacturing Engineering at Kettering University, where he teaches courses in materials engineering and selection and manufacturing processes. He has been involved in the Educational Research and Methods Division of ASEE for several years. His research interests include academic dishonesty, wear behavior of orthopaedic implants and fatigue in aerospace materials.

DONALD D. CARPENTER is an Assistant Professor of Civil Engineering at Lawrence Technological University and serves as Chair of the University Educational Innovation Collaborative. He is actively involved in ASEE and

serves as Faculty Advisor for the American Society of Civil Engineering Student Chapter. Professionally, his research interests involve water resources, stream restoration and watershed processes.

CYNTHIA J. FINELLI is Managing Director of the Center for Research on Learning and Teaching North at the University of Michigan. Her research interests include the study of academic integrity among engineering students and the design and test of a sample instrument to evaluate student teamwork skills.

HONOR J. PASSOW, P.E., is a Ph.D. student in Higher and Postsecondary Education at the University of Michigan and a Research Associate for Assessment at the University of Michigan's College of Engineering. Ms. Passow's technical experience includes a M.S. and B.S. in Mechanical Engineering from M.I.T., engineering work experience at Siemens and General Motors, and professional engineering registration.