

## **2006-636: CHEATING IN COLLEGE AND ITS INFLUENCE ON ETHICAL BEHAVIOR IN PROFESSIONAL ENGINEERING PRACTICE**

### **Trevor Harding, Kettering University**

Dr. Trevor S. Harding is Associate Professor of Industrial and Manufacturing Engineering at Kettering University where he teaches courses in engineering materials and manufacturing. Dr. Harding's research interests include wear phenomenon in orthopedic implants, ethical development in engineering undergraduates, and pedagogical innovations in environmental education. Currently, Trevor serves on the ERM Division Board of Directors and on the Kettering University Center for Excellence in Teaching and Learning Advisory Board.

### **Cynthia Finelli, University of Michigan**

Dr. Cynthia J. Finelli is Managing Director of the Center for Research on Learning and Teaching North and Associate Research Scientist of Engineering Education at University of Michigan. Her current research interests include evaluating methods to improve teaching, exploring ethical decision-making in engineering, developing a tool for comprehensive assessment of team-member effectiveness, and assessing the effect of the first year experience on under-represented student retention. She serves on the Executive Board of the Educational Research and Methods Division (ERM) of ASEE and was the ERM Division Program Co-Chair for the 2003 Frontiers in Education Conference and the 2006 ASEE Annual Conference and Exposition.

### **Donald Carpenter, Lawrence Technological University**

Dr. Carpenter is an Assistant Professor of Civil Engineering. Dr. Carpenter also serves as Chair of the Educational Innovation Collaborative at LTU and Coordinator of the Civil Engineering Assessment Program. He is actively involved in ASEE and serves as Faculty Advisor for the ASCE Student Chapter at LTU. His research interests involve academic integrity, assessment tools, urban stream restoration, and watershed processes.

# **Cheating in College and its Influence on Ethical Behavior in Professional Engineering Practice**

## **Abstract**

Research has demonstrated that engineering undergraduates report rates of cheating higher than those in most other disciplines, and that students who cheat in college are more likely to make unethical decisions as professionals. To explore the relationship between academic and professional ethical behavior, the authors launched the Work Experience Study (WES) that examines students' decision-making processes in situations where they are tempted to engage in unethical behavior in academic and professional settings. The population sampled for WES includes engineering undergraduates with substantial work experience in engineering. Such a sampling strategy enables us to make comparisons between academic and work-place scenarios based on responses that are both contemporary and relevant.

Previously the authors presented findings from the study which suggest that individuals who reported cheating in high school were much more likely to do so in college and in the work-place, as compared to those who indicated they had not cheated in high school. In addition, these findings identified similarities between the pressures to cheat reported by students for an academic scenario and a work-place scenario. This paper focuses on the interaction of several variables involved in this decision, including prior engagement in academic dishonesty, the perception of unethical behavior among one's peers, the context of the unethical behavior, and the frequency with which respondents are *tempted* to engage in unethical behavior. The results suggest that while there are many similarities in the decision-making processes involved at the academic and professional level, there are also substantial differences in both the nature and magnitude of the relationships between predictor variables. Such a finding points to the need for further research into developing a better understanding of the complex interplay of psychological, moral, and situational factors on the ethical decision-making of students and professionals alike.

## **Introduction**

For as long as tests and homework have been a part of higher education, students have been finding ways to cheat on these assessments. What has only more recently become apparent is that the extent to which individuals engage in cheating is dependent on the field of study of the individual. For example, Bowers<sup>1</sup> and McCabe<sup>2</sup> both showed that engineering students self-reported significantly higher rates of cheating than did students in other disciplines (excluding business). Explanations for elevated cheating among engineering students include higher work loads, the vocational orientation of the discipline, and the grade orientation (as opposed to learning orientation) of engineering students. However, the interaction of these and other explanatory factors is not understood, leaving faculty and academic institutions with little more than a trial-and-error approach to reducing cheating among engineering students.

Furthermore, recent research among professional disciplines (e.g. business, engineering, medicine, etc.) has revealed a correlation between engagement in unethical behavior in college

and engagement in unethical behavior in graduate school and/or professional practice<sup>3,4</sup>. This correlation may indicate causality between college cheating and professional dishonesty, in which a person who engages in academic dishonesty develops less resistance to later engaging in professional dishonesty. Alternatively, the relationship may be strictly correlational such that there are a set of common personal and situational variables found in both the academic and professional settings that influence particular individuals' decisions to engage in unethical behavior.

To understand what motivates a student's decision to engage in unethical behavior in college and the connection between this behavior and future unethical behavior in professional practice, the authors undertook the Work Experience Study (WES) as part of a larger research project. The WES was designed as an exploratory study to provide insight into students' decision making processes in instances where they had previously been tempted to engage in unethical behaviors in college and workplace settings. In short, WES is meant to investigate the usefulness of several important variables involved in students' ethical decision making for the development of a theoretical model of this process. The current paper will present a detailed analysis of several of these variables, building on previously published results<sup>5,6</sup>. This paper does not, however, intend to identify practical recommendations for dealing with cheating in the academic or workplace settings.

Figure 1 provides an overview of the variables and their interactions that will be discussed in this paper. This figure is not based on a theoretical understanding of the issue, nor is it a complete and necessarily accurate depiction of the decision making processes used by engineering undergraduate students. Rather, it is intended as a guide to the reader so that they may more easily follow the analyses and conclusions arrived at in this paper.

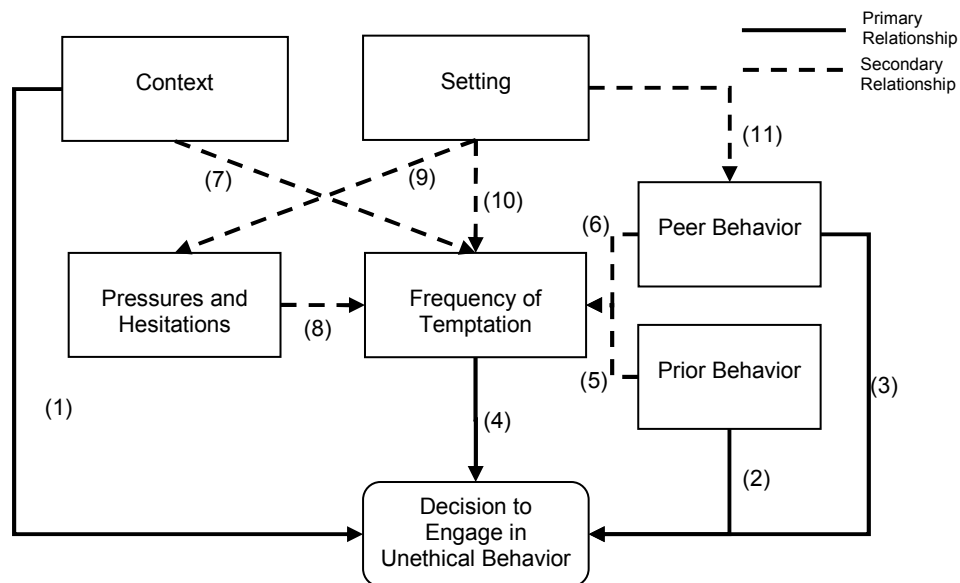


Figure 1: Conceptual overview of Work Experience Study. The dependent variable (decision to engage in unethical behavior) is shown in a rounded box while the predictor variables are shown in square boxes. Solid arrows represent direct relationships between predictor variables and the dependent variable. Dashed arrows represent secondary relationships between predictor variables. Each relationship is labeled with a number in the order they are discussed in the paper.

The conceptual overview shown in Figure 1 indicates that the dependent variable of interest is the ultimate *decision* that a student made to engage or not engage in an unethical behavior. It should be noted that the definition of unethical behavior in this study is context specific. In the case of the college setting, students were asked to recall an instance in the past where they were “tempted to cheat” and to base their responses to several questions on their recollections of this instance. Therefore, respondents are free to define for themselves what constitutes cheating or unethical behavior. This design is intentional as we are more interested in students’ decision making processes when they are faced with a situation that they know to be in violation of some set of rules, norms or moral standards. Similarly, in the workplace setting respondents were asked to recall an instance in the past where they had been “tempted to violate workplace policies”.

Based on the variables included in the WES study, the decision to engage in unethical behavior is influenced most directly by a) the student’s perception that his/her peers engage in unethical behavior (*peer behavior*), b) the extent to which the student reports engaging in prior high school cheating (*prior behavior*), c) the frequency with which a student perceives that they are tempted to engage in unethical behavior (*frequency of temptation*), and d) the *context* of the unethical behavior (e.g. cheating on a test versus cheating on a computer program; or stealing office supplies versus falsifying quality assurance documents). These primary relationships (Relationships #1 - 4) to the final decision are shown in Figure 1 as solid arrows. The *frequency of temptation* (which seems to be a fairly central variable) was also related to *prior behavior*, *peer behavior*, the *pressures and hesitations* reported by students when tempted to behave unethically and *context* through several secondary relationships (Relationships #5 – 8). These secondary relationships are shown by dashed arrows in Figure 1. Finally, the *setting* for the unethical behavior (college setting versus workplace setting) was found to influence the *pressures and hesitations*, *frequency of temptation* and *peer behavior* (Relationships #9 – 11)

## Sample Description

A total of 130 students enrolled at two technically-oriented private universities responded to a thirteen item questionnaire. 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 quarter 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.

The majority of the sample consisted of 3<sup>rd</sup> and 4<sup>th</sup> year students (42% and 33% respectively) with the remainder of the sample consisting of 2<sup>nd</sup> year (7%) and 5<sup>th</sup> year (16%) students. Due to their lack of experience in college and workplace settings, first year students were not included in the sample. 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 to the questionnaire, 40% indicated working in an engineering position, 10% in retail/restaurant service, 10% in trades and 9.2% indicated in some other area. 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. The authors 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, it was felt that this limitation was outweighed by the advantage of using a paired-sample for both settings.

## Questionnaire

As stated above, the questionnaire included 13 items divided into three sections. The first section contained items related to the participants' backgrounds including the extent to which they worked in the past year and how frequently they cheated in high school (*prior behavior*). The second and third sections of the questionnaire included items pertaining to the college setting and workplace setting respectively. For each setting, the items measured the *frequency of temptation*, the *context* of the unethical behavior, the *pressures/hesitations* participants reported experiencing when they recalled being tempted to cheat in a specific situation, the perception of *peer unethical behavior*, and the ultimate *decision* they made in this specific situation.

The questionnaire was administered in select engineering classes to maximize the response rate (85.9%). These classes were selected to produce a sample that excluded first year students, but still produced a wide sampling of the various engineering disciplines on campus. To avoid potential underreporting due to social desirability bias<sup>7,8,9</sup>, care was taken to develop protocols that assured respondent anonymity. All survey administration protocols, and the questionnaire itself, were approved by an institutional review board for the behavioral sciences.

Responses to open-ended items regarding the *pressures/hesitations* were analyzed using a technique similar to that reported by McCabe *et al.*, referred to as the "content analysis procedure"<sup>10</sup>. 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 categorize thought units. Each category was given a descriptor that was inclusive of all thought 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. Through this method, the variables involved in the respondents' decision-making process are revealed in the emergent themes.

## The Decision to Engage in Unethical Behavior

Perhaps the most significant finding of the WES study is that the setting had no effect on the ultimate decisions reported by study participants. In the case of the college setting, 37.7% of the respondents decided to cheat in the situation they were considering, while 34.6% of respondents decided to engage in unethical behavior in the workplace setting. Therefore, participants in this study report deciding to engage in unethical behavior in both academic and professional settings at approximately the same rate ( $t=1.64$ ,  $df=68$ ,  $p=0.11$ ). However, the context within a specific setting was found to strongly influence the decision to engage in unethical behavior (Relationship #1 in Figure 1). In the college setting, two possible contexts in which a student might consider cheating are exams and homework. Results of the WES study indicate that less

than 15% of those who were tempted to cheat in an exam situation did, while more than 45% of those who were tempted to cheat on homework did. Similarly, in two workplace contexts, falsifying records and using company supplies improperly, less than 55% of those who were tempted did falsify records, while more than 70% of the respondents who were tempted to improperly use company supplies did. These findings suggest that providing a context within which research participants consider their responses will be essential in future studies.

Another finding is that students who reported a prior tendency to cheat in high school were more likely to report cheating in a specific college situation and to report violating workplace policies. To measure prior behavior respondents were asked to indicate how frequently they cheated during an average term in high school on a four-point Likert scale (0 = never, 1 = once, 2 = a few times, and 3 = frequently). 20.0% of respondents self-reported having never cheating during an average term in high school, while 63.8% reported cheating a few times or more. The average respondent reported cheating slightly more than once per term ( $m = 1.55$ ,  $\sigma = 0.94$ ). Of those who reported *never* cheating in high school, almost 70% decided *not* to cheat in a specific instance in college, and 50% decided *not* to violate workplace policies. On the other hand, of those who reported *frequently* cheating in high school, less than 40% decided *not* to cheat in a specific instance in college, and less than 10% decided *not* to violate workplace policies. Thus, prior behavior appears to be related to the decision to engage in unethical behavior in the future (Relationship #2 in Figure 1). It should be pointed out that prior cheating in high school was correlated significantly ( $r=0.242$ ,  $p<0.05$ ) to the decision to violate work place policies; however, it was not significantly correlated ( $r=0.172$ ,  $p=0.15$ ) to the decision to cheat in college.

The third direct relationship presented in Figure 1 is the influence of peer behavior on the individual's decision to engage in unethical behavior (Relationship # 3 in Figure1). The role of peer behavior in setting the social norms within a particular setting is a well known factor in the ethical decision making of individuals<sup>11,12</sup>. Respondents to the questionnaire were asked to indicate what percentage of their peers at college cheat and, similarly, what percentage of their peers in the workplace violate their employers' policies. The average rate of perceived peer cheating in college was 50.2% (min=1%, max=100%,  $\sigma=26.7\%$ ), while that in the workplace was 34.7% (min=0%, max=100%,  $\sigma=29.5\%$ ). Incidentally, this difference is statistically significant ( $t=4.74$ ,  $df=103$ ,  $p<0.001$ ) suggesting that setting plays an important role in establishing the perception that one's peers behave unethically (Relationship #11 in Figure 1). In the case of the college setting, a perception of high levels of peer cheating was significantly correlated to a decision to cheat in a specific instance ( $r=0.290$ ,  $p<0.01$ ). However, in a workplace setting, a perception of peer unethical behavior was not significantly correlated with a decision to cheat ( $r=0.148$ ,  $p=0.24$ ). This is not surprising considering that students perceive a lower level of perceived peer unethical behavior in the workplace setting despite reporting a positive decision to engage in unethical behavior with nearly the same frequency as in the college setting (see above).

### **The Role of Frequency of Temptation**

The fourth variable found to relate to the decision to engage in unethical behavior was the frequency of temptation (Relationship #4 in Figure 1). To explore this relationship respondents were asked to indicate how frequently they felt a temptation to behave unethically during the

past academic term (in the case of the college setting) or ever (in the case of the workplace setting) for each of seven different contexts (see Tables 1 and 2 for a list of contexts) using a 5-point Likert scale (0=never, 1=once, 2=2-5 times, 3=5-10 times, 4=10+ times). Since the frequency of temptation is measured with an ordinal, rather than continuous scale, it is converted here to a *temptation index* to simplify statistical analysis. The temptation index is not the average number of times that an individual reported being tempted in a given context or setting, rather it represents the sum of scores on the frequency of temptation item across all seven contexts presented on the questionnaire. Thus the temptation index has a range of 0 (never tempted to cheat in any context) to 28 (tempted to cheat 10 or more times in all seven contexts).

Because the contexts differ between settings, the temptation index is calculated independently for each setting. For the cheating setting, the temptation index had a mean score of  $m = 5.81$  ( $\text{min}=0$ ,  $\text{max}=28$ ,  $\sigma=5.01$ ). Thus, respondents indicated being tempted to cheat slightly less than once (i.e., average temptation index/seven total contexts=0.83) per context on average during the last academic term. As will be discussed later, however, certain contexts elicited much higher reported levels of temptation than others. In the workplace setting the temptation index had an average score of  $m=3.11$  ( $\text{min}=0$ ,  $\text{max}=19$ ,  $\sigma=3.86$ ). Thus, respondents were tempted to behave unethically about 0.44 times per context on average. It should be noted that the average temptation index for the workplace setting is significantly different from that measured for the college setting ( $t = 5.25$ ,  $df = 115$ ,  $p<0.001$ ).

To explore the primary relationship between the frequency of temptation to behave unethically and the decision to do so (Relationship #4 in Figure 1), a bivariate correlation analysis was conducted using the temptation index as a dummy variable. In the case of the college setting a higher temptation index was significantly correlated to the decision to cheat ( $r=0.285$ ,  $p<0.01$ ). Increased temptation to behave unethically was even more strongly correlated to the decision to violate workplace policies ( $r=0.367$ ,  $p<0.01$ ). The higher correlation in the workplace setting reflects the previous finding that participants report significantly less temptation to engage in unethical behavior in the workplace, but are just as likely to do so regardless of setting.

Of the secondary relationships presented in Figure 1, the first is that between participants' self-reported rates of prior cheating in high school and the frequency with which they perceive being tempted to behave unethically (Relationship #5 in Figure 1). Prior high school cheating was found to weakly correlate with an increase in the temptation index in the college setting ( $r=0.243$ ,  $p<0.01$ ). However, in the workplace setting, prior behavior was just barely correlated to the temptation index ( $r=0.184$ ,  $p=0.04$ ).

Another secondary relationship was between the frequency of temptation and the respondents' perceptions of peer behavior (Relationship #6 in Figure 1). In the college setting, a higher level of perceived peer cheating was moderately correlated to an increased temptation index score ( $r=0.332$ ,  $p<0.001$ ). In the case of the workplace setting, however, the correlation between peer behavior and temptation was even stronger ( $r=0.414$ ,  $p<0.001$ ). Given these relatively strong correlations for both settings it would seem that a perception of unethical behavior among one's peers leads to a personal increased sensitivity to temptations to behave unethically.

A third variable which was found to relate secondarily to the frequency of temptation was the context in which the temptation occurred (Relationship #7 in Figure 1). As reported above the average temptation index scores differed significantly according to setting. However, within each setting certain contexts provide more temptation to participants than do others. Table 1 presents the direct responses to the frequency of temptation item on the questionnaire, rather than the temptation index since we are breaking out scores for each context. According to the data participants report being tempted most frequently to cheat on homework ( $m = 1.65$  on five-point Likert scale from 0 to 4). This was followed by tests or quizzes ( $m = 1.00$ ), lab reports ( $m = 1.00$ ) and computer programs ( $m = 0.77$ ). In Table 2 the frequency of temptation is shown as a function of context of unethical behavior in a workplace setting. In this case the context which corresponded to the highest levels of temptation were improper use of company resources ( $m = 1.00$ ), falsifying records ( $m = 0.70$ ) and ignoring product quality problems ( $m = 0.41$ ). Based on open-ended responses, the context of “falsifying records” was often seen by participants as padding expense accounts or time cards. Due to sample size limitations, ANOVA could not be used to establish significant differences in these average scores.

**Table 1: Frequency of temptation to behave unethically in a college setting as a function of context**

Context	Times Tempted to Cheat in Last Academic Term				
	Never	Once	2 – 5 Times	5 – 10 Times	10+ Times
Homework	23.8%	17.7%	33.1%	14.6%	8.5%
Test or quiz	43.1%	19.2%	29.2%	4.6%	1.5%
Lab report	50.8%	12.3%	24.6%	6.2%	4.6%
Computer program	60.0%	11.5%	16.9%	4.6%	3.8%
Final exam	66.2%	16.9%	10.8%	2.3%	1.5%
Term paper	71.5%	13.8%	10.0%	1.5%	1.5%
Team project	78.5%	6.2%	9.2%	2.3%	1.5%

**Table 2: Frequency of temptation to behave unethically in a workplace setting as a function of context**

Context	Times Tempted to Violate Workplace Policies Ever				
	Never	Once	2 – 5 Times	5 – 10 Times	10+ Times
Falsify records	64.6%	6.9%	17.7%	2.3%	4.6%
Lie about work quality	78.5%	6.2%	6.2%	3.8%	1.5%
Ignore product quality problems	74.6%	6.9%	12.3%	1.5%	0.8%
Ignore safety problems	81.5%	7.7%	5.4%	1.5%	0.0%
Take credit for others work	86.9%	4.6%	3.8%	0.8%	0.0%
Accept improper gifts from vendors	85.4%	5.4%	4.6%	0.8%	0.0%
Improper use of company resources	47.7%	13.8%	24.6%	2.3%	6.2%

The final observed secondary relationship is that between the reported pressures and hesitations that participants reported and the frequency of temptation (Relationship #8 in Figure 1) as measured by the temptation index. The pressures and hesitations reported by participants were



discussed in a previous publication<sup>6</sup>. Table 3 presents the average temptation index for each of the 14 identified pressures to cheat reported by students. The data presented in this table indicates that nearly all of the pressures reported by participants had an average temptation index greater than the overall average of 5.81. This occurred because the most frequently reported pressure was a blank or unrelated response which was also correlated to the lowest average temptation index as shown in the table. Therefore, respondents who reported feeling any pressures to cheat when they recalled a specific situation were far more likely to be tempted to cheat in general.

Perhaps more interesting are the findings that not all reported pressures to cheat had the same average temptation index. Students who reported the pressures “cheating works”, “the material was too hard” and “grade pressure” reported the highest average temptation index. These pressure themes might be reflective of students who are more “grade-oriented” than their peers, seeing grades as the ultimate purpose of college. This contrasts with those pressures with lower average temptation indices, such as “lack of motivation”, “it’s not cheating” and “others needed my help”, which are not as easily linked to a grade-oriented disposition.

**Table 3: Temptation index for the college setting as a function of the reported pressures and hesitations to cheat.**

<b>Pressure to Cheat</b>	<b>Temptations Index</b>	<b>Hesitation to Cheat</b>	<b>Temptations Index</b>
Cheating works	9.29	No hesitations	11.64
Material too hard	8.75	Fear of getting caught	8.60
Grade Pressure	8.47	It’s wrong	7.40
Lazy or procrastinated	7.14	Too hard or time consuming	6.00
Everyone does it	7.00	Fear of sanctions	5.77
Easy to cheat	6.89	Desire to do own work	5.69
Not enough time	6.56	It’s against the rules	5.56
Professor deserved it	6.50	Desire to learn	5.44
Unprepared	6.00	Would lose respect of others	5.00
Lack of motivation	5.88	Shame, conscience or guilt	4.95
It’s not cheating	4.67	It won’t get you anything	0.50
Others needed my help	4.00	Blank or unrelated	0.50
Blank or unrelated	2.31	Undetermined	3.57
Undetermined	5.75		

Table 3 also presents the temptation index for the college setting as a function of the hesitations reported. This data reveals that participants who reported “no hesitations” to cheating had, on average, a much higher temptation index score, followed by students reporting that they “feared getting caught”. On the other hand, hesitations that corresponded to the lowest average temptation index were “would lose respect of others”, “shame, conscience or guilt” and “it won’t get you anything”. These hesitations seem to reflect more internal, perhaps moral, influences on the decision making process.

Table 4 presents the temptation index as a function of pressures to engage in unethical behavior in the workplace setting. The temptation index again varies as a function of the reported pressures to engage in unethical behavior at the workplace. Interestingly, the notion that

“everyone does it” corresponded to the highest temptation index. This supports the findings presented above that peer behavior was strongly correlated ( $r=0.414$ ,  $p<0.001$ ) to the temptation index in the workplace.

Table 4 also presents the temptation index as a function of reported hesitations in the workplace. Interestingly, the idea that the respondent had “no hesitations” is no longer related to the highest temptation index as it was for the college setting. Instead the pressures “there would be negative consequences” or a “fear of getting caught” were associated with the greatest amount of temptation. Again, it appears that external influences on the decision making process are related to individuals who are more sensitive to temptation.

**Table 4: Reported number of temptations to violate work place policies in a professional setting as a function of the reported pressures to violate work place policies.**

<b>Pressures to Violate Workplace Policies</b>	<b>Temptation Index</b>	<b>Hesitations to Violating Workplace Policies</b>	<b>Temptation Index</b>
Everyone does it	7.75	There would be negative consequences	10.00
I wanted to seem better than I was	6.20	Fear of getting caught	8.33
Someone told me to do it	6.00	Would require more work or money later	6.33
It's easy or easy to get away with	5.67	I might be fired or get in trouble	4.63
Wanted to avoid conflict with others	5.33	Could affect product quality	4.50
Didn't want to put forth the effort	4.75	Personal standards of pride/integrity	3.91
Others needed my help	4.00	Would lose respect of others	3.60
No one would care	4.00	No hesitations	3.36
Lack of resources to do job	3.86	Shame, conscience or guilt	3.00
The company deserved it	3.43	Is or could be illegal	2.33
Not confident in my abilities	3.33	It is wrong	1.82
I didn't know it was wrong	3.00	Work had to get done	1.00
Inconsequential, seemed harmless	2.67	Blank or unrelated	3.60
I wanted/needed it	2.63	Undetermined	2.42
None or it isn't wrong	2.00		
Blank or unrelated	1.69		
Undetermined	4.18		

### **Role of Setting**

As was discussed previously, the number of participants who decided to engage in unethical behavior in the college setting was not statistically different from the number that decided to engage in unethical behavior in the workplace setting ( $t=1.64$ ,  $df=68$ ,  $p=0.11$ ). Therefore, participants in this study report deciding to engage in unethical behavior in both academic and professional settings at approximately the same rate. This could suggest that an individual's decision to engage in unethical behavior is independent of setting but affected differently by other variables within each setting. However, that authors suspect that because the same participants are being used to represent both college and workplace populations, the similarities in rates of engagement of unethical behavior could be a reflection of these individuals' maturity and experience. In other words, if traditional college students were compared to experienced professional engineers, their rates of deciding to behave unethically might be considerably different as a result of the supposedly superior maturity and experience of the professionals. To investigate this possibility, a longitudinal study in which students are tracked from college (or

perhaps earlier) into the workplace for several years would be needed. To date, no such studies have been undertaken in the field.

In addition to making similar decisions across setting, participants reported common pressures and hesitations in both settings (Relationship #9 in Figure 1). Pressures common to both settings include insufficient resources, the importance of success, and projection of blame (i.e. the sentiment that others “deserved” the behavior). Hesitations common to both settings include a perceived moral obligation or their conscience, and the risk of detection or formal sanctions. This seems to indicate that despite differences in the factors which affect the decision according to the setting, there may be a common set of internal and external pressures and hesitations which are perceived by individuals when they consider behaving unethically. The relative importance of each of these pressures and hesitations for the population of interest, or for any given individual, is not yet known.

The setting for the unethical behavior was found to have a significant impact on the reported values for the temptation index (Relationship #10 in Figure 1). The average temptation index for the workplace setting is significantly different from that measured for the college setting ( $t = 5.25$ ,  $df = 115$ ,  $p < 0.001$ ), indicating that respondents were significantly less likely to be tempted to behave unethically in the workplace as compared to college, despite having decided to engage in unethical behavior in the workplace at approximately the same rate (see above).

Finally, setting was found to play an important role in participants’ perceptions that their peers engaged in unethical behavior (Relationship #11 in Figure 1). The average rate of perceived peer cheating in college (50.2%) was found to differ statistically from the average rate of perceived peer unethical behavior in the workplace setting (34.7%) at the  $p < 0.001$  level as described above. Furthermore, the influence of peer behavior on both the decision to engage in unethical behavior and the frequency of temptation were both different according to the setting. In the case of the decision, peer behavior was moderately correlated ( $r = 0.290$ ,  $p < 0.01$ ) to the decision to cheat in college but uncorrelated to the decision to engage in unethical behavior in the workplace. While peer behavior was moderately to strongly correlated to the temptation index for both settings, the correlation was substantially stronger in the workplace setting. Thus setting plays an important, but complex role in establishing the importance of the perception of peer behavior on an individual’s decision.

## **Conclusions**

Perhaps the most alarming finding in this study was that the number of participants who reported deciding to engage in unethical behavior in a specific situation was effectively identical regardless of the setting (college or workplace). However, how students arrive at this decision appears to be influenced differently by several variables that are common across both settings. For example, the perception that peers were frequently engaged in unethical behavior was more strongly correlated to the decision to cheat in college than it was to the decision to violate workplace policies. In this case, we could hypothesize that students are more sensitive to their peer’s behavior in college where they are on, more-or-less, equal social footing with their peers. However, the participants included in this study are largely employed as co-op interns and part-time engineers. Consequently, their interactions with and perceptions of peers may be limited by

their lower status within the company. Thus, the consideration of social norms and social roles will be an important part of any future research.

Conversely, frequent prior cheating in high school and perceiving more temptation to behave unethically were more strongly correlated to behaving unethically in the workplace than in the college setting. Here we might argue that since the workplace represents a setting with more serious consequences for unethical behavior (at least as perceived by the participants), only those students who were most predisposed to behaving unethically through their past behavior would be willing to do so in the workplace. Further, those individuals who would behave unethically in the workplace are those students who are for whatever reason more sensitive to temptation and succumb more easily to it. This information points to the need to incorporate more psychological information about the deviant and the influence of past behavior on their temperament into future research studies.

Another important finding from this study was that the context of the unethical behavior was as important as the setting in which it occurred. Participants clearly made different decisions about engaging in unethical behavior depending on the context of the behavior. Likewise, participants reported experiencing different amounts of temptation to behave unethically depending on the context. Certainly we can hypothesize as to why specific contexts may have more influence; however, the authors feel that the most important conclusion is that the context of the behavior must be defined for the research participant if valid data on unethical behavior are to be attained.

It was also observed that students who are frequently tempted to cheat often cited different pressures and hesitations to cheating than did those who were seldom tempted. A similar finding was seen for the workplace setting, though the pressures and hesitations reported were not necessarily the same across setting. Apparently participants who were more sensitive to temptation invoked different considerations in their decision making processes than those who were less sensitive. Currently it is unclear why this difference occurs, but it suggests an interesting avenue for further research.

Finally it was observed that the perception of unethical behavior among one's peers had a strong to moderate relationship with the perception of being frequently tempted to behave unethically. It is unclear in which direction this relationship goes, however. One explanation might be that if an individual is frequently tempted to behave unethically, their peers might be equally tempted, and that by means of rationalization, their peers must be behaving unethically. On the other hand, it could be argued that as one observes increased levels of unethical behavior among their peers they become increasingly aware of opportunities, and thus temptations, for unethical behavior.

## References

- 1 Bowers, W.J. *Student Dishonesty and its Control in College*. Bureau of Applied Social Research, Columbia University, New York, NY. 1964.

- 2 McCabe, D.L. "Classroom cheating among natural science and engineering majors." *Science and Engineering Ethics*. 3:433-445. 1997.
- 3 Nonis, S., and C.O. Swift. "An examination of the relationship between academic dishonesty and workplace dishonesty: A multicampus investigation." *Journal of Education for Business*. 77(2): 69-77. 2001.
- 4 Sims, R.L. "The relationship between academic dishonesty and unethical business practices." *Journal of Education for Business*. 68(4): 207-211. 1993.
- 5 Harding, T.S., D.D. Carpenter, C.J. Finelli, and H.J. Passow. "Does academic dishonesty relate to unethical behavior in professional practice? An exploratory study." *Science and Engineering Ethics*. 10(2):311-324. 2004.
- 6 Harding, T.S., D.D. Carpenter, C.J. Finelli, and H.J. Passow. "The influence of academic dishonesty on ethical decision making in the workplace: A study of engineering students." *Proc. 2004 American Society for Engineering Education Annual Conference, ASEE, Washington D.C., 2004.*
- 7 Crowne, D.P. and D. Marlowe. *The Approval Motive: Studies in Evaluative Dependence*. John Wiley & Sons, Inc., New York, 1967.
- 8 Paulhus, D.L. "Measurement and Control of Response Bias." *Measures of Personality and Social Psychological Attitudes*. Academic Press Inc., San Diego, CA, 17-59, 1991.
- 9 Randall, D.M. and M.F. Fernandes. "The Social Desirability Response Bias in Ethics Research." *Journal of Business Ethics*. 10:805-817. 1991.
- 10 McCabe, D.L., L.K. Trevino and K.D. Butterfield. "Academic integrity in honor code and non-honor code environments: A qualitative investigation." *Journal of Higher Education*. 70(2):211-234. 1999.
- 11 McCabe, D.L., L.K. Trevino and K.D. Butterfield. "Cheating in academic institutions: A decade of research." *Ethics and Behavior*. 11(3): 219-232. 2001.
- 12 Beck, L., and I. Ajzen. "Predicting dishonest actions using the Theory of Planned Behavior." *Journal of Research in Personality*. 25(3):285-301. 1991.