

Students' perceptions of both the certainty and the deterrent effect of potential consequences of cheating

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1. Introduction

Extensive research indicates that cheating among undergraduate students is a serious problem. A recent study by McCabe⁵ reported that as many as nine in ten engineering undergraduates admit to one or more incidents of cheating in college and up to 23% admit to repetitive examination cheating. Several consequences of cheating, including personal shame, embarrassment, and institutional sanctions, have been studied and proposed as possible deterrents. For instance, McCabe⁶ examined the role of peer disapproval of cheating and found that the frequency of self-reported academic dishonesty was lower when respondents perceived that their peers disapproved of such misconduct. Franklyn-Stokes³ found shame/embarrassment at being caught copying from a neighbor during an examination, copying another student's coursework, or fabricating references of a bibliography to be a deterrent to cheating. She also reported that fear of punishment or of being found out was a factor but was not one of the main reasons students listed for not cheating. A study by Cochrane² examined the effects of perceived certainty and severity of shame, embarrassment, and formal sanction threats on the self-reported prevalence of involvement in a variety of forms of academic dishonesty. Of particular interest are his findings regarding two specific forms of cheating: looking at another's answers on an examination and falsifying information for a term paper. He reported that "the only form of threat that appears to enter into and influence the rational calculus of prospective cheaters is their own sense of shame associated with acts of academic dishonesty." He "failed to find any evidence of deterrent effect for ... embarrassment [and] ... formal sanction threats on student's levels of academic dishonesty" and reported that "cheaters and noncheaters were equally unaffected by the threat of any embarrassment..."

In response to these findings, the authors have initiated a long-term investigation to identify and validate concrete approaches for reducing the frequency of cheating among engineering students. As part of that investigation, they have studied the potential consequences and deterrents described above. The authors have previously described factors that correlate with the frequency and definitions of cheating among engineering undergraduates and presented student opinions on what actions might prevent cheating^{1,4}. However, they have not reported their findings regarding the correlations between students' perceptions of shame, embarrassment, and institutional sanctions and their decision to cheat. In this paper, the authors compare students' perceptions of the certainty of experiencing three potential consequences of cheating (shame, embarrassment,

and sanctions) and the students' predictions of the deterrent effect of those consequences on their decision to cheat in three contexts (examinations, homework, and term papers).

2. Methods

2a. The instrument

A direct-question, self-report survey was administered to 695 undergraduate students in engineering and pre-engineering courses at twelve institutions ranging from community colleges to large research universities. Student participation in the study was voluntary and unmonitored, and the results were anonymous to protect each participant. Demographics of the sample are similar to those previously reported for this investigation^{1,4}. The seven-page survey contains 139 questions; this paper involves responses to a subset of those questions that address student perceptions about the certainty and possible deterrent effect of three potential consequences in their own decision to cheat.

2b. Variables

Consequences

In one part of the survey, three scenarios representing distinct contexts for cheating are described. Those are listed here.

- A. "Imagine you are stuck on a problem during the final exam in a required class you are failing. You are considering looking at your neighbor's exam." [Examination]
- B. "Imagine you are working on a homework assignment in a group and you are considering copying one of the homework solutions from another student in the group." [Homework]
- C. "Imagine you are considering including references to articles you have not read in the bibliography of your term paper, just to increase the length of your bibliography." [Term paper]

For each scenario, respondents were asked to indicate their perceived certainty of experiencing three potential consequences (shame, embarrassment, and institutional sanctions). Response choices were "agree", "not sure", and "disagree". The statements, modeled after published work by Cochran², are listed here.

1. "I would feel ashamed of myself if I benefited from ..." [Shame]
2. "Most of the people whose opinion I value would lose respect for me if they found out I had ..."[Embarrassment]
3. "There is a good chance that I would get caught if ..." [Sanctions]

Deterrents

The authors were also interested in determining if students perceived the potential consequences of cheating as effective deterrents. Thus, for the same three scenarios presented previously, respondents were asked to indicate the influence that three potential deterrents to cheating (shame, embarrassment, and institutional sanctions) would have in their own decision to cheat. Those statements are listed here.

1. "Feeling shame about ... would prevent me from doing so." [Shame]
2. "The potential loss of respect would prevent me from ..." [Embarrassment]
3. "The chance of getting caught would prevent me from ..." [Sanctions]

2c. Overview of statistical methods

The authors were interested in identifying differences in student perceptions about the certainty of experiencing three consequences and the perceived deterrent effect of those consequences based upon the cheating context. To initiate the study, the descriptive statistics pertaining to student perceptions were compared. That analysis indicated that student responses tended to group according to the *context* in which the cheating transpired. To verify this finding, a factor analysis was conducted. In this study, the data had adequate variance to undertake factor analysis (Bartlett's Test of Sphericity: $p < 0.001$ and Kaiser-Meyer-Olkin's Measure of Sampling Adequacy, $MSA = 0.826$), and a four component factor was sufficient to describe the data. The resulting factors into which student perceptions could best be grouped corresponded to differences in the *context* of cheating, rather than differences in type of consequence or deterrent.

To quantify the differences that were revealed in the factor analysis, several analyses using a Friedman Test were conducted. This nonparametric procedure removes missing cases of each variable in a pairwise manner so the responses can be directly compared. The Friedman Test was used to test the null hypothesis that three related variables came from the same population. For each case, the three variables are ranked from 1 to 3, and the test statistic is based on these ranks. Results of the test indicated that students tend to perceive differences in the certainty of experiencing a given consequence according to the context of cheating rather than the type of consequence. Similarly, results showed that students perceive differences in the effect of these deterrents according to the context in which the cheating occurs rather than the type of deterrent.

3. Results and discussion

3a. Descriptive statistics

Consequences

Table 1 tabulates the responses about student perception of the certainty of experiencing each potential consequence (shame, embarrassment, and sanctions) in three contexts: examinations, homework, and term paper. The percent of valid responses indicating “agree”, “not sure”, and “disagree” for each of the statements is tabulated, along with the average and standard deviation of the responses.

		Table 1: Student perception of the <i>certainty</i> of experiencing consequences in three contexts.				
		Percent of valid responses			Coded responses*	
Context	Consequence	Agree	Not sure	Disagree	Average	Std dev
Examination	Shame	59.7%	22.3%	18.0%	0.418	0.777
	Embarrassment	46.3%	28.2%	25.5%	0.208	0.822
	Sanctions	42.9%	29.6%	27.5%	0.154	0.826
Homework	Shame	24.1%	20.7%	55.2%	-0.311	0.835
	Embarrassment	15.4%	24.6%	60.0%	-0.446	0.746
	Sanctions	19.6%	23.7%	56.8%	-0.372	0.791
Term paper	Shame	42.2%	22.9%	34.9%	0.074	0.875
	Embarrassment	23.2%	30.8%	46.0%	-0.228	0.801
	Sanctions	31.8%	29.3%	38.9%	-0.071	0.839

*Responses are coded as 1 for “agree”, 0 for “not sure”, and -1 for “disagree”.

From these data, it is apparent that respondents perceive that they would experience shame, embarrassment, and sanctions in the context of a final examination (average coded response is 0.418, 0.208, and 0.154 respectively). However, respondents perceive that they would not experience these consequences in the context of copying a homework assignment (average response = -0.311, -0.446, and -0.372 respectively). Finally respondents are not in agreement about the certainty of experiencing shame or sanctions in the context of falsifying the bibliography of a term paper (average response = 0.074 and -0.071 respectively) and they perceive that they would not experience embarrassment in that context (average response = -0.228).

Deterrents

Table 2 contains responses about student perception of the deterrent effect of each possible consequence (shame, embarrassment, and sanctions) on their decision to cheat. The percent of valid responses indicating “agree”, “not sure”, and “disagree” for each of the statements is tabulated, as is the average and standard deviation of the responses.

		Table 2: Student perception of the <i>deterrent effect</i> of potential consequences on their decision to cheat in three contexts.				
		Percent of valid responses			Coded responses*	
Context	Deterrent	Agree	Not sure	Disagree	Average	Std dev
Examination	Shame	49.1%	27.4%	23.5%	0.255	0.813
	Embarrassment	46.7%	24.0%	29.3%	0.175	0.855
	Sanctions	65.2%	19.5%	15.2%	0.500	0.746
Homework	Shame	21.2%	24.7%	54.1%	-0.329	0.803
	Embarrassment	20.9%	22.4%	56.6%	-0.357	0.806
	Sanctions	27.1%	24.2%	48.7%	-0.216	0.844
Term paper	Shame	36.6%	26.4%	36.9%	-0.003	0.858
	Embarrassment	29.2%	27.4%	43.4%	-0.142	0.841
	Sanctions	42.9%	24.9%	32.2%	0.107	0.861

*Responses are coded as 1 for “agree”, 0 for “not sure”, and -1 for “disagree”.

From these data it is apparent that respondents agree that shame, embarrassment, and sanctions would each have a deterrent effect on their decision to cheat in the context of a final examination (average coded response is 0.255, 0.175, and 0.500 respectively). However, respondents perceive that none of consequences these would have a deterrent effect in the context of copying a homework assignment (average response = -0.329, -0.357, and -0.216 respectively). Finally respondents are not in agreement about the deterrent effect of shame in the context of falsifying the bibliography of a term paper (average response = -0.003), but they perceive that embarrassment would *not* be an effective deterrent (average response = -0.142) and that sanctions would (average response = 0.107).

In general, responses for students’ perceptions of the certainty of experiencing consequences and the deterrent effect of these potential consequences on their decision to cheat appear to be clustered according to *context* of cheating rather than by potential consequence (i.e., shame, embarrassment, or sanctions), but further analysis (presented in the following section) is needed to substantiate this claim.

3b. Clusters of questions having similar responses

Consequences

Factor analysis: To verify the phenomena that student perceptions of the certainty of experiencing consequences are clustered according to cheating *context* rather than by type of consequence, the nine statements about consequences were studied using a principle axis factoring method with varimax rotation. Table 3 lists the factor into which each statement was categorized and the corresponding component loading.

Table 3. Factor analysis of student perception of the certainty of experiencing consequences in three contexts.			
Context	Consequence	Factor	Component loading
Examination	Shame	1	0.862
	Embarrassment	1	0.721
	Sanctions	2	0.925
Homework	Shame	3	0.772
	Embarrassment	3	0.819
	Sanctions	3	0.658
Term paper	Shame	4	0.677
	Embarrassment	4	0.787
	Sanctions	4	0.785

These data support the claim that respondents' perceptions of these consequences tend to factor by cheating context. It shows that students perceive the certainty of experiencing shame and embarrassment (i.e., personal consequences) similarly in the context of an examination (both statements are grouped into Factor 1). On the other hand, students perceive the certainty of experiencing sanctions differently in that situation (this consequence loads onto a separate factor, Factor 2). Further, students tend to perceive the *certainty* of experiencing all three consequences similarly in the contexts of cheating on a homework assignment and on a term paper. In these two contexts, unlike cheating on an examination, institutional sanctions are perceived by students as being no more likely to occur than the personal consequences of shame and embarrassment.

Thus, because student responses to the statements about shame in each of the three contexts do not load onto the same factor, the authors infer that respondents perceive different certainties that they will experience shame in each context. Similarly, respondents perceived different likelihoods of experiencing the consequences of embarrassment and sanctions depending upon the context in which the cheating occurs. To verify that these differences in student perceptions are indeed based upon *context* of cheating rather than upon type of consequence, Friedman Tests were conducted.

Friedman Tests: Two separate analyses using a Friedman Test were conducted to describe the differences identified in the factor analysis with more detail. In particular, comparisons of the three consequences *within* and *between* each context of cheating were made. For all data reported here, the results are statistically significant ($p < 0.001$).

Data comparing the students' perception of the certainty of experiencing shame, embarrassment, and sanctions *between* each cheating context is tabulated in Table 4. In that table a positive mean

rank indicates that respondents agreed that they would experience the consequence, while a negative mean rank indicates that respondents disagreed.

Consequence	Context	Mean rank
Shame ($\chi^2 = 349.7$)	Examination	0.37
	Homework	-0.39
	Term paper	0.01
Embarrassment ($\chi^2 = 326.9$)	Examination	0.38
	Homework	-0.31
	Term paper	-0.07
Sanctions ($\chi^2 = 184.5$)	Examination	0.26
	Homework	-0.29
	Term paper	0.03

These data indicate that the respondents perceived they would be more likely to experience shame from cheating in the context of an examinations than in the context of a term paper (mean rank = 0.37 versus 0.01), and the respondents do not believe they would experience shame from cheating in the homework context (mean rank = -0.39). The value of χ^2 is quite large for this comparison (349.7), indicating that these differences themselves are large. Similar responses are noted for the consequences of embarrassment and sanctions in the contexts of cheating on an examination or on a term paper. Notice that for cheating in the homework context, students perceive that they would not experience any consequence (mean rank is negative for all comparisons).

Table 5 contains results of the Friedman Test comparing the students' perception of each consequence *within* a cheating context.

Context	Consequence	Mean rank
Examination ($\chi^2 = 52.7$)	Shame	0.17
	Embarrassment	-0.06
	Sanctions	-0.11
Homework ($\chi^2 = 22.8$)	Shame	0.08
	Embarrassment	-0.09
	Sanctions	0.01
Term paper ($\chi^2 = 80.1$)	Shame	0.08
	Embarrassment	-0.09
	Sanctions	0.01

These data indicate that, in the examination context, students perceive they are more likely to experience shame for cheating than they are to experience embarrassment or sanctions (mean rank = 0.17 versus -0.06 and -0.11). In the context of cheating on homework, students perceive they are slightly more likely to experience shame than embarrassment or sanctions (mean rank equals 0.08, -0.09, and 0.01 respectively), but in general students neither agree nor disagree about the certainty of experiencing these consequences. Results are similar for the context of cheating on a term paper (mean rank near zero for all comparisons). Note that for the

comparisons of Table 5, the magnitude of χ^2 is considerably smaller than for the comparisons displayed in Table 4. This confirms that students' perception of the *certainty* of experiencing a given consequence depends more upon the *context* of cheating than on the type of consequence.

Deterrent effects

Factor analysis: To verify the phenomenon that student perceptions of the deterrent effect of each consequence on their decision to cheat are clustered according to cheating *context* rather than by type of deterrent, all nine statements about deterrents were studied using a principle axis factoring method. Table 6 lists the factor into which each statement was categorized and the corresponding component loading.

Table 6. Factor analysis of student perception of the deterrent effects on their decision to cheat in three contexts.			
Context	Deterrent	Factor	Component loading
Examination	Shame	1	0.816
	Embarrassment	1	0.799
	Sanctions	2	0.917
Homework	Shame	3	0.804
	Embarrassment	3	0.794
	Sanctions	3	0.778
Term paper	Shame	4	0.780
	Embarrassment	4	0.765
	Sanctions	4	0.789

Notice that results here are similar to those obtained in the analysis of perceptions of consequences: respondents' perceptions of the deterrent effect on their decision to cheat tends to factor by cheating *context*. As before, the data show that students perceive shame and embarrassment as equally likely to have a deterrent affect on their decision to cheat in the context of an examination (both statements load onto Factor 1). On the other hand, students perceive sanctions as having a different deterrent effect (this deterrent loads onto a separate factor, Factor 2). Further, students tend to perceive all three consequences as having a similar effect in their decision to cheat in both contexts of cheating on a homework assignment and on a term paper. Again, to confirm that these differences are based upon the *context* of cheating rather than upon the consequence, Friedman Tests were conducted.

Friedman Tests: Two separate analyses using a Friedman test were conducted to describe the differences identified in the factor analysis with more detail. As before, comparisons of the three deterrents *within* and *between* each context of cheating were made. For all data reported here, the results are statistically significant ($p < 0.001$).

Table 7 contains results that compare student perceptions of the effect of each deterrent in their own decision to cheat between each context.

These data indicate that students perceive that shame would likely have a deterrent effect in the context of cheating on an examination (mean rank = .31), they are neutral on its deterrent effect in the context of a term paper (mean rank 0.02), and they perceive that it would not have

Table 7: Comparison of deterrents between each cheating context.

Deterrent	Context	Mean rank
Shame ($\chi^2 = 265.6$)	Examination	0.31
	Homework	-0.32
	Term paper	0.02
Embarrassment ($\chi^2 = 219.7$)	Examination	0.29
	Homework	-0.26
	Term paper	-0.03
Sanctions ($\chi^2 = 322.0$)	Examination	0.37
	Homework	-0.34
	Term paper	-0.03

deterrent effect in the context of homework (mean rank = -0.32). As before, the large value for χ^2 indicates a significant difference in their perceptions. In terms of embarrassment, students perceive a deterrent effect for examinations (mean rank = 0.29), they are neutral on its effect in the context of a term paper (mean rank = -0.03), and they disagreed that embarrassment would be effective in the context of cheating on homework (mean rank = -0.26). Finally, students perceive institutional sanctions as a deterrent measure only for examinations (mean rank = 0.37); they are neutral on the deterrent effect of sanctions on a term paper (mean rank = -0.03) and they did not agree that it would be a deterrent on homework (mean rank = -0.34).

Table 8 contains results of the Friedman Test describing how effective respondents felt that each type of deterrent would be in preventing cheating within each context.

Table 8: Comparison of deterrents within each cheating context.

Context	Deterrent	Mean rank
Examination ($\chi^2 = 102.4$)	Shame	-0.07
	Embarrassment	-0.14
	Sanctions	0.22
Homework ($\chi^2 = 25.5$)	Shame	-0.04
	Embarrassment	-0.05
	Sanctions	0.09
Term paper ($\chi^2 = 58.7$)	Shame	0.01
	Embarrassment	-0.13
	Sanctions	0.12

In regards to cheating on an examination, this data indicates that students perceive institutional sanctions as a likely deterrent (mean rank = 0.22), while they believe that shame and embarrassment would not have a deterrent effect on their decision to cheat (mean rank = -0.07 and -0.14). Although the differences are not as significant, these perceptions are similar for cheating on homework or on a term paper.

4. Summary and practical implications

The analyses presented here indicate that the *context* in which cheating occurs is critical in understanding students' decisions about cheating and in preventing undergraduate student cheating. The results support two main findings. First, responses about student perceptions of the *certainty* of experiencing each consequence are clearly grouped by *context* rather than by type of

consequence. Respondents perceived that they are *likely* to experience a given consequence (shame, embarrassment, or sanctions) in the context of cheating on an examination, but they are *not sure* about the likelihood of experiencing the consequence in the context of cheating on a term paper, and they perceive that they are *not likely* to experience the consequence in the context of cheating on homework.

Second, respondents' perceptions of the deterrent effect of each potential consequence are also grouped by *context*, rather than by type of deterrent. Students perceive that shame, embarrassment, and sanctions would each have a *deterrent effect* in their decision to cheat on an examination, would have a *neutral effect* in the context of a term paper, and would have *no deterrent effect* on their decision to cheat on homework.

These findings indicate that, for the students in our sample, the potential consequences of shame, embarrassment, and sanctions are more likely to have a deterrent effect on the decision to cheat in the context of examinations. One possible explanation for this is that students consider that type of assessment to be more "serious". However, practical experience as educators indicates that this form of assessment is not the optimal choice for measuring student performance. Rather, homework assignments, in which the student is allowed to reflect on the work and to engage in deeper thinking, may provide more useful information about student performance. Thus, the challenge for faculty becomes one of making homework seem more serious to the students, thereby reducing the level of cheating and allowing educators to benefit from the fact that this may be the "truest" method of assessment. To achieve this goal, educators could increase the weighting which is placed upon homework in assigning the final course grade or could adopt policies (and make these policies clear to the students) that treat homework cheating as severely as examination cheating.

So of the three potential consequences investigated here (shame, embarrassment, and sanctions) an educator's potential influence on shame and embarrassment is limited. Shame results purely from the students' own ethical standards and has to do with values and attitudes. This consequence is very personal and is challenging to teach. On the other hand, embarrassment results from social interaction and is affected by cultural and social causes on campus. These influences could be changed with significant, coherent effort of a faculty, student body, and staff. Sanctions, though, result from both *clear institutional policy* and *consistent implementation of that policy*. This consequence is the most straightforward to influence, but it requires that each faculty member commit to knowing the rules and sticking to the formal rules *in all suspected cases* of cheating.

Therefore, because this study indicates that 27–65% of surveyed students predict that sanctions would be an effective deterrent (depending on the cheating context), the authors recommend careful review of formal policies about sanctions for cheating *and* review of the actual or informal processes used to respond to suspected cases of cheating. This means clarifying the formal policies about the response to suspected cases of cheating, including sanctions, and simultaneously supporting widespread faculty commitment to *consistently* upholding these policies. Consistent sanctions would be the first step toward changing the culture of the campus to reduce cheating and would lay the groundwork for possibly increasing the effectiveness of embarrassment as a deterrent to the decision to cheat.

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