

# Investigating Moral Disengagement Among First-Year Engineering Students

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**Abstract**—In this Research Full Paper, we investigate moral disengagement among first-year engineering students. Current engineering ethics education typically assumes that providing information about what is ethical (i.e., as explicated in ethical codes) and developing ethical reasoning skills will lead to ethical behaviors in the classroom and on the job. However, we know that people, including students and practicing engineers, sometimes engage in unethical conduct. Bandura's theory of moral disengagement explains how people disengage from their ethical principles and behave unethically. In this paper, we investigate and characterize moral disengagement among first-year engineering students. This study is based on survey and interview data collected from first-year engineering students at four U.S. universities as part of a larger longitudinal, mixed-methods research project. Our survey sample showed similar or lower moral disengagement scores as compared to other studies, while our interview data revealed how different students applied different ethical frames when evaluating moral situations and/or making moral decisions. Moreover, seven of the eight types of moral disengagement measured by the survey instrument were evident in our interview data, and we propose another mechanism called unreflective disengagement. We expect our study will be of interest to researchers and engineering educators who wish to better understand moral disengagement among students, including as a potentially relevant factor in ongoing efforts to enhance engineering ethics training.

**Keywords**—academic integrity; engineering ethics; first-year; moral disengagement; ethical frames; moral justification

## I. INTRODUCTION

The work of engineers profoundly impacts diverse stakeholders, a fact clearly recognized in statements found in many codes of ethics that call on engineers to first and foremost consider issues of public safety, health, and welfare. ABET also includes 'an understanding of professional and ethical responsibility' [1] as a required outcome for undergraduate engineering degree programs, and has proposed even stronger language in recently approved revision of these criteria. As a consequence, it is expected that engineering students universally encounter at least some ethics instruction during their time in undergraduate degree programs. Yet we also know that people, including students, sometimes engage in unethical conduct, even though they might have well-developed personal standards about ethical behavior. Bandura [2] refers to this phenomenon as "moral disengagement," which is a cognitive mechanism in which one's self-regulatory processes are deactivated. With Bandura's theory of moral disengagement as a framework, this study reports preliminary

findings from a larger longitudinal, mixed-methods research project targeting four different universities in the USA [3]. In this paper, we investigate when and how engineering students experience moral disengagement. Discussed are the quantitative survey measures ( $n=721$ ) and interview data ( $n=105$ ) related to moral disengagement collected from engineering students during their first year of college.

Prior research by Harding, et al. [4] suggests past unethical behavior (i.e., academic dishonesty) can be an indicator of future unethical behavior, despite the changes in context from high school to college and then the workplace. In other words, first-year engineering students who often exhibit morally disengaged behaviors may repeat the deviant behaviors when they become more advanced students, and even when they enter the workplace (i.e., industry, academia) as professionals. Therefore, investigating first-year engineering students' moral disengagement, such as when and how they exhibit morally disengaged behaviors, can provide researchers with insights for developing improved engineering ethics interventions which can help nurture more ethical engineers. This work has manifold implications for engineering education, especially given the potential connections between moral disengagement, academic integrity, and professional ethics. More specifically, we intend that findings from this study can inform ongoing efforts to improve ethics education by providing foundational information about engineering students' moral disengagement.

## II. BACKGROUND

Much of the literature and research related to engineering ethics has focused on cognitive models of moral and ethical decision making [5]-[7] in which moral judgment is primary. These models assume that moral behavior flows from knowledge and moral judgment, so that if you know what is moral, you will be compelled to act morally. Failure to act morally is attributed to undeveloped or faulty moral judgment. Although scholars have proposed models recognizing personal and organizational factors that may impact a person's behavior, either positively or negatively, moral knowledge and judgment are at the core of most of these models [8], [9], [10].

In contrast, Bandura's theory of moral disengagement is derived from his social cognitive theory where moral behavior is moderated by self-regulatory mechanisms [2], [11]. In this model, "immoral behavior occurs not necessarily as a function of faulty judgment, but rather through a series of psychological disengagement mechanisms that individuals employ to make immoral behaviors appear less reprehensible. From this

perspective, many individuals know that their behavior is immoral, but they cognitively disengage from the moral aspects of the situation to allow themselves to commit the behavior [12, p. 124].” As this quote suggests, Bandura offers a more nuanced picture of how ethical transgressions can occur, potentially running counter to individual moral judgment or reasoning, and in ways that may or may not be aligned with relevant contextual norms (e.g., cultural, organizational, etc.).

Researchers have also found significant relationships between moral disengagement and immoral behavior, as well as strategies and factors that mitigate the moral disengagement [13]-[15]. For example, Kish-Gephard, et al. found that “when personal gain incentives are relatively moderate, reminders of harm to others can reduce the likelihood that employees will morally disengage. Furthermore, when strong personal gain incentives are present in a situation, highly conscientious individuals are less apt than their counterparts to engage in morally disengaged reasoning” [15, p. 267].

Although most research has provided evidence of the relationship between moral disengagement and immoral behavior, Reynolds et al. [12] explored the relationship between moral knowledge, moral disengagement, and immoral behavior. They conducted five studies using multiple methods and found “no evidence of the proposed processes associated with moral disengagement. Furthermore, [their] data suggests that moral knowledge is a key driver of moral behavior in everyday situations and is not easily set aside” [12, p. 124]. However, one of the limitations noted in this same paper, and a critique of Bandura’s original work, is that there may be situations where moral disengagement is more or less likely.

Our study builds on the previous research to better understand mechanisms that students may employ to negotiate and make sense of ethical issues they are facing. One major goal of this work is to better understand the extent to which engineering students are inclined to morally disengage, including specific mechanisms they employ to negotiate and make sense of ethical issues they directly or indirectly face.

### III. STUDY DESIGN

The overarching study design of our larger NSF-funded project consists of three data collection phases covering the entirety of the typical undergraduate engineering student experience [3]. The baseline data collection consists of multiple survey measures and interviews during the first year. The mid-point data collection is a repeat of the survey during the junior year (5th semester), while the third data collection consists of a repeat survey and interviews during the participants’ senior year (8th semester). The survey includes items and measures related to engineering ethics knowledge, justice beliefs, political and social involvement, macro-ethical considerations, moral attentiveness, moral disengagement, and ethical climate, along with extensive demographic questions. A portion of the survey respondents were also invited to participate in one-on-one interviews. The semi-structured interview protocol included questions related to: 1) general definitions of ethics and engineering ethics, including macro-ethics, 2) experiences (past, present, and future) that may shape

students’ ethical perspectives and sense of social responsibility, 3) ethical climate, 4) ethical scenarios, and 5) select survey items identified for further probing, e.g., due to noticeably high or low scores among individual or all survey respondents. All data was carried out at each school under appropriate human subject research protections and IRB approvals.

The four participating universities represent different geographic locales and university types, including a public research-intensive and project-based university in the Southwest (Arizona State University); a private, religious, and research-intensive university located in the Mountain West (Brigham Young University); a public, primarily undergraduate-serving university located in the Mountain West (Colorado School of Mines); and a public research-intensive university located in the Midwest (Purdue University). Preliminary analysis of the overall survey data has been completed and results published previously [3], [16]-[17]. For this study, we focus on the survey items and coded interview sections related to moral disengagement.

The moral disengagement survey items used in this study and reported in this paper are drawn from a previous study by Detert, Treviño, and Sweitzer [13] that built on previous work by Bandura et al. [18]. The survey probed eight dimensions of moral disengagement: 1) moral justification, 2) euphemistic labeling, 3) advantageous comparison, 4) displacement of responsibility, 5) diffusion of responsibility, 6) distortion of consequences, 7) attribution of blame, and 8) dehumanization. We coded the interview participants’ responses to the probing questions regarding the selected moral disengagement items. Additionally, we looked for and coded for other evidence of moral disengagement throughout the entire corpus of interview data, such as when students were describing examples of ethical situations that they or others had faced. The following sections report preliminary quantitative analyses and findings of the moral disengagement survey items. We also discuss our efforts to analyze the prompted interview sections related to the items, as well as unprompted instances of moral disengagement that were identified in a large subset of the interview data (i.e., covering  $n=74$  of 112 total student interviews). It should also be noted that the pseudonyms appearing below always start with the same letter as the student’s university affiliation, e.g., Courtney was a student at Colorado School of Mines.

### IV. PRELIMINARY DATA ANALYSES AND FINDINGS

#### A. Survey Data

The total number of responses to the moral disengagement scale, within the larger study, was 756. Of those, 35 were eliminated, either due to missing item responses or results that suggested a lack of committed participation. The most common reason for eliminating a response was a lack of variation in responses, or variation that ceased after the eighth item (suggesting that thoughtful responding had ended). For each response, the item totals—24 items, each on a 5-point Likert scale—were combined to create a score ranging from 24 to 120. The scores were then normalized from 1 to 5 to reflect the Likert scale used. Of the remaining 721 responses, the mean score was 1.99 with a standard deviation of 0.44.

From the original sample of 756 participants, 111 completed follow-up interviews. From this subset of 111, 6 of their moral disengagement scores were eliminated using the same procedure as noted above. The composite mean from this subset (n=105) was 1.97, with a standard deviation of 0.41, which suggests that the subset is a good representation of the larger (n=721) sample population. Table I summarizes the means and standard deviations of the subset for each of the eight factors, showing additional and consistent representation of the corresponding means and standard deviations from the full set. When checking for internal consistency between factors,  $\sigma=0.8$  for the full set and  $\sigma=0.79$  for the subset.

The factor with the highest mean score was *moral justification*, at 2.87 for the full set (SD=0.70), and 2.84 for the interviewed subset (SD=0.72). This factor also has the closest subset representation of the full set. From this factor, item 2, which is one of the 24 survey items for investigating students' moral disengagement, was selected as a case for cross reference with qualitative interview data. This item asked participants to rate the statement: "It's ok to steal to take care of your family's needs." The mean scores for this item were 2.35 for the full set (SD=1.01), and 2.27 for the subset (SD=0.99). The subset's results (n=105), being only 0.08 points lower than the full set (n=721), suggest good representation.

TABLE I. SUMMARY OF MORAL DISENGAGEMENT FACTOR AND COMPOSITE MEANS AND STANDARD DEVIATIONS

Factor	Full Set (n=721)		Subset (n=105)	
	Mean	SD	Mean	SD
Moral Justification	2.87	0.70	2.84	0.72
Euphemistic Labeling	1.65	06.64	1.61	0.62
Advantageous Comparison	1.49	0.65	1.38	0.54
Displacement of Responsibility	1.91	0.68	1.97	0.65
Diffusion of Responsibility	2.61	0.79	2.76	0.73
Distortion of Consequences	1.76	0.66	1.70	0.59
Attribution of Blame	2.09	0.68	2.02	0.74
Dehumanization	1.50	0.72	1.46	0.61
<b>Composite/Overall</b>	1.99	0.44	1.97	0.41

To further situate these results, 10 other studies which implemented the same moral disengagement scale were reviewed. Table II summarizes the means and standard deviations of each study with sample size [12], [13], [19]-[26]. Their sample sizes ranged from 44 to 600 (average n=224, total n=2239). The simple average mean score from those 10 data sets is 2.25 (individual means ranging from 1.39 to 2.81), with a standard deviation of 0.52 (individual SDs ranging 0.38-0.86). The weighted average mean score from these studies is 2.27, with a weighted standard deviation of 0.53. Results from our study therefore fall in the middle to lower end of typical ranges for this scale (i.e., suggesting less moral disengagement among our subjects). The qualitative findings presented below provide additional insights about how our subjects' perceptions

of moral disengagement, which may in turn shed further light on the survey results.

TABLE II. COMPARISON OF MORAL DISENGAGEMENT SCALE COMPOSITE MEANS AND STANDARD DEVIATIONS IN REPORTED STUDIES

Author	Year	N	Mean	SD
Reynolds et al. [12]	2014	104	2.56	0.86
Baron, Zhao, and Miao [19]	2015	106	2.30	0.40
Chowdhury and Fernando [20]	2014	600	2.04	0.55
Christian and Ellis [21]	2014	44	1.39	0.38
Egan, Hughes, and Palmer [22]	2015	380	2.44	0.52
Kish-Gephart et al. [15]	2014	151	2.03	0.43
Ogunfowora and Bourdage [23]	2014	237	2.20	0.39
Ogunfowora et al. [24]	2013	215	2.22	0.40
Samnani, Salamon, and Singh [25]	2014	221	2.50	0.78
White-Ajmani and Bursik [26]	2014	181	2.81	0.51
<b>Simple Average</b>	<b>n/a</b>	<b>220</b>	<b>2.25</b>	<b>0.52</b>
<b>Weighted Average</b>	<b>n/a</b>	<b>2239</b>	<b>2.27</b>	<b>0.53</b>

### B. Responses to Disengagement Interview Prompts

One of the survey items most frequently presented to students in interviews was the statement "It's okay to steal to take care of your family's needs." This survey item was included in 30 transcripts (out of total 37 transcripts that included probing questions of the survey items). Here we report on some insights gleaned from our further study of how students reasoned through their responses to this survey item. When comparing students who selected more neutral answers (agree; neither agree nor disagree; and disagree) with students who chose extremes (strongly disagree; or strongly agree), it is first worth noting that the latter tended to take a deontological approach that emphasized duty and rules. For example, among the students who selected "strongly disagree", Courtney suggested that she had "been raised that it's not okay to steal ever. That's one of the Ten Commandments." Ace, who chose "strongly agree," stated, "even though you know you shouldn't be doing it, but it's the betterment of your family, so you got to take care of them." Such responses lack evidence of a complex reasoning process compared to other types of responses, but a lack of evidence does not necessarily mean that students do not perform ethical reasoning. Nonetheless, many students seemed to follow a more rigid kind of principlism, such as by acting in a prescribed way ("matter of course" attitude), as reflected in declarations such "stealing is just wrong."

In contrast, students who selected neutral (neither agree nor disagree) or relatively moderate response on either side of the scale (agree or disagree) often adopted a more teleological approach, which frequently includes more situational and contextual considerations. As an example, Anthony, who answered neutrally, said, "If your family is starving, I feel like most people respond in that way where they want to ensure that their family is okay. In another sense, you're stealing from another person who can be in the similar situation to you."

Some students who “agreed” with the statement also showed situational thinking and conditional agreement. For example, as Amanda explained, “I agree under certain circumstances. If you’re poor or starving, yes. There are better means though, but if it’s really important, then yes, I would agree.” Moreover, Cole, who “disagreed” with the statement, said, “I feel like there’s more consequences to that action... there’s more to that story than just feeding your family, because that’s how other people feed their families by selling [the food]”. Such answers show wider and more nuanced consideration of how situation and context may inflect what counts as moral or ethical.

We additionally observe that the students who selected more neutral answers (neither agree nor disagree) often explained their responses by using expressions such as “if you are in the case like that’s your only option” or “if you are in a situation.” Although the students struggled to choose one specific side of the options by saying, “I am not entirely sure”, “this is a hard question”, etc., the reason might stem from their consideration of multiple perspectives or situations simultaneously, rather than a lack of moral consideration or engagement, especially as compared to students who select “strongly disagree” with high levels of confidence.

### C. Unprompted Examples from Interviews

As noted above, we coded all instances of moral disengagement in a large subset of the interview transcripts (n=74), such as when students were asked to share “memorable ethical situations.” We then looked for the eight kinds of moral disengagement from the original survey within this subset of the data. Table III summarizes the eight mechanisms of moral disengagement, including brief descriptions of each [18]. We also include our newly proposed mechanism, *unreflective disengagement*. In this section, we present evidence of seven of these mechanisms employed by students, more specifically drawn from three examples where interviewees gave first-hand explanations for their own conduct (i.e., as opposed to evaluating hypothetical situations or the conduct of others).

To begin, many of the examples relevant to this section involve academic integrity and related issues. For instance, in an exchange with a student about academic conduct at his own institution, he was asked if the school’s expectations for conduct were generally being met. As he replied:

Like how I copied the code from two weeks ago as homework because I didn't know how to do it and nobody was going to explain it to me? No. It's different. You hear horror stories like my friends talk about like, “Oh yeah, we have this class where everybody took the test together, basically,” and I cringe, but that doesn't happen here thankfully. [Phineas]

This passage suggests two kinds of moral disengagement. First, *attribution of blame* is invoked through a circumstantial justification of a questionable practice, i.e., the student is compelled to copy the code in light of an apparent lack of instructional support. The second sentence then invokes *advantageous comparison*, where the offending action is downplayed through juxtaposition with a more serious transgression, i.e., wholesale cheating on exams. The student’s

comment, “I cringe,” further exaggerates the difference between the two types of misconduct.

TABLE III. SUMMARY OF MORAL DISENGAGEMENT MECHANISMS [18]

Mechanism	Description
Moral justification	Portraying detrimental conduct in the service of valued or moral purposes, thus making it seem more personally and socially acceptable
Euphemistic labeling	Strategic use of language to mask reprehensible activities or conferring a respectable status upon them
Advantageous comparison	Comparing problematic conduct with more reprehensible activities, thus making the original conduct appear to be less harmful
Displacement of responsibility	Viewing one’s actions as the result of social pressures or dictates rather than taking personal responsibility for those actions
Diffusion of responsibility	Feeling less responsible for one’s own actions when part of a group that diffuses or divides responsibilities among the group members
Distortion of consequences	Avoiding, minimizing, or distorting the harm one causes as a result of their actions
Attribution of blame	Blaming victims for bringing suffering on oneself and regarding oneself as a faultless victim driven to problematic conduct
Dehumanization	Not regarding particular subjects as persons who have feelings, hopes and concerns and deserve respectful treatment
Unreflective disengagement*	Lack of reflection around the ethical or moral dimensions of a given decision or situation

\* Mechanism not in original framework but identified in our study

A similar example can be found in an excerpt where another student described being a part of a group that helped a friend complete an assignment ahead of a deadline:

That was obviously going around bending the rules, he didn't do the work by himself, but we made sure that after submission of that homework, he understood how to do those questions, because we know he's smart. He scores more than us on any of the exams. It's just that he didn't have time for it because he is a floor senator or something and then he had a couple of meetings and a football match, FIFA, boys and their FIFA. We ended up helping him out, so bending the rules when it's necessary is fine. It's those kind of gray areas I was talking about, that sometimes it's okay to bend around the rules.

Four kinds of moral disengagement are arguably evident in this passage. To begin, we again see *attribution of blame*, but in this case the student receiving help is framed as a somewhat hapless victim of his own overcommitments and time pressures. Indeed, we found many instances of students citing poor time management as factors contributing to questionable behaviors such as copying homework. Second, this example suggests *moral justification*, in that the social purpose of “helping out” a friend is used to justify the group’s action. This strategy is further bolstered by a kind of *distortion of consequences*, where the interviewee never acknowledges the possibility of getting caught and punished for this conduct. The interviewee instead emphasizes another possible consequence – not learning the assigned content – and then downplays this issue by pointing out that the student receiving help is very smart and understands the material. Fourth and finally, the interviewee repeatedly uses *euphemistic language* to sanitize

and convolute the ethical transgression via phrases like “helping him out,” “bending the rules,” and “gray areas.”

Other types of moral disengagement can be found in a third example, which was provided by an interviewee who served as a juror in a teen court program. She more specifically described a case involving a classmate from her high school, and explains how she was concerned at the time that some of the other jurors were friends of the student on trial and would likely be biased in his favor. Yet rather than raise this as a concern, she decided to “just stay the course and see what happens ... [and] hoped that other people were also being objective about it.” As she went on to explain, “I knew they were going to vote their way and I knew ... again, context. I knew I didn’t have a lot of sway with these people and I knew that no matter how much I talked about it or tried to convince them they probably would just shrug it off.” This suggests evidence of *diffusion of responsibility*, with the student feeling marginalized and thus deferring moral responsibility to a potentially biased group.

Interestingly, the student further justifies this course of action by juxtaposing her preconceptions about the offending student with a final outcome that seemed positive. In fact, she admits that she initially “demonized him” during the hearing. She additionally goes on to explain how “it’s fortunate that this guy turned out to be a good person and that I was wrong. I’m glad I was wrong but if he had actually turned out to be a douche then I would’ve been mad that he had gotten off that easily.” Here we find evidence of *dehumanization*, where the interviewee’s demonization could provide cover for punitive measures. Yet in concluding that her assessment was wrong and the offending student was “truly remorseful”, she further validates her own decision not to speak up about biases among other jurors. This could also be viewed as a *distortion of consequences*, where the outcome of a remorseful student receiving a reasonable punishment is emphasized over the fact that a biased group of peers ultimately meted out that same punishment.

Another remark from this interviewee suggests yet another disengagement mechanism. Reflecting on her role as a juror, she states: “I know that’s not really any better than me, though, so what right do I have to judge?” Similar to the biblical creed “judge not, that ye be not judged,” this kind of statement suggests an abrogation of moral responsibility. Hence, it could be viewed as an instance of *moral justification*, namely through appeal to an ethical principle suggesting that an individual’s right to judge is somehow limited by their own fallible character.

In this section, we have presented three examples from our data illustrating seven moral disengagement mechanisms. While the quantity and quality of evidence is greater for some types than others, we nonetheless found this typology useful for our analysis. However, we did not find any clear instances of *displacement of responsibility*, where deferring to an authority figure helps justify one’s own actions. As a final point, we also found examples suggesting other kinds of disengagement. One prominent type involved what we call *unreflective disengagement*, which is evident when an individual admits a simple lack of reflection around the ethical or moral dimensions of a given decision or situation. For

example, one interviewee described how he got in trouble for a prank in high school. Reflecting on what had happened, he explained: “It seemed harmless to me, but supposedly it was very offensive, which I didn’t think about when I built it.”

## V. DISCUSSION

As reported above, our survey suggest that the first-year engineering students who participated in our study have similar or perhaps even lower moral disengagement scores as compared to other studies that have used the same instrument. We also found that scores from our interviewee subgroup were generally comparable to the larger student sample, and observe that moral justification had the highest subscale score among the eight factors.

These findings in turn set the stage for our use of interview probes focused on specific items drawn from the moral justification scale, including as a way to better understand how students reason through and respond to such statements. According to further qualitative analysis of student responses to one of these item prompts, we discovered that we cannot unambiguously claim that the students who selected the lowest scaled item (1=“strongly disagree”) have the lowest levels of moral disengagement. Rather, we found patterned responses among students that were to some extent aligned with different ethical frames (e.g., deontological versus teleological perspectives). More specifically, we observe a polarization tendency among students who followed a deontological approach, which means that they were often more likely to select extreme choices (strongly disagree or strongly agree) on the scale. We also observed a convergence effect toward the middle of the scale (agree, neither agree nor disagree, or disagree) among students who adopted a teleological approach, indicating their consideration of more situational and contextual factors. These findings suggest the potential for notable measurement biases, at least for this item, which may in turn help explain why scores for the moral justification scale were relatively high in comparison to the other factors.

Our efforts to identify the eight specific kinds of moral disengagement elsewhere in the interviews further enriches and extends the study findings. To begin, we find it promising that we were able to identify seven of the eight types of disengagement in the subset of interviews we analyzed, which provides some added reassurance regarding the general validity and utility of the measurement space explored by Bandura et al. [18] and Detert et al. [13], even if select items may have some amount of measurement error. We also found that evidence of moral disengagement was frequently encountered in interviewee discussions of ethical transgressions involving academic integrity in high school and/or university contexts, and we were further struck by many examples where multiple kinds of moral disengagement were invoked by interviewees to justify or rationalize their direct participation in certain ethical transgressions. Finally, our analysis led us to propose another mechanism, *unreflective disengagement*, which could have potential utility in future research efforts.

## VI. FUTURE WORK

As noted above, the qualitative data of this study included student responses to moral disengagement item prompts (i.e., survey probing questions and answers), and evidence of moral disengagement in other parts of the interviews. Each type of data has possibilities for further data analysis, beginning with our efforts to extend the analyses presented here, which are drawn from 74 of 112 total interviews. Further, we are still in the process of analyzing how students responded in their interviews to three other items on the moral disengagement scale (i.e., “It’s all right to fight to protect your friends”, “If a group decides to do something harmful, it’s unfair to blame any one member of the group for it”, and “If someone leaves something lying around, it’s their own fault if it gets stolen”). Additionally, we are intrigued by the possibility of revisiting and potentially even revising some of the survey items in light of the measurement issues identified in the present analysis, particularly in consideration of the various “ethical frames” that students employ when thinking and about responding to these kinds of survey items.

We are also planning to conduct more in-depth analysis of all the other interview data related to ethical disengagement. In this paper, we introduced a few examples from students’ interview data, which fit Bandura’s eight mechanisms of moral disengagement. However, what this paper reported is only a small subset of the results, mainly limited to when students shared “memorable ethical situations.” Therefore, possible next steps include analysis of the entire data set across different types of questions (e.g. situations in which students more likely bend rules, ethical scenarios) and finding patterns or seeing if there are other unexpected themes. For example, the most and least common types of moral disengagement mechanisms among engineering students can be investigated and compared to that of different populations (e.g. law, medical, sports contexts). Also, how students respond to engineering-specific questions and scenarios is another interesting direction for investigation.

Research on ethical disengagement is important in the field of engineering education, which fosters development of technical professionals who have social responsibility rooted in the field’s monopoly of technical knowledge, accredited educational pathways, and professional licenses. At the same time, researchers such as Cech [27] have found tentative evidence for a “culture of disengagement” in engineering degree programs, where students actually become less socially conscious and less concerned about their professional and ethical responsibilities during the course of their training. On one hand, our survey results suggest that levels of moral disengagement are not anomalous when compared to the results of other studies. Yet our qualitative data nonetheless reveal many specific situations where students engage in most of the eight moral disengagement mechanisms.

A key question is therefore whether and how perceptions of ethics, including moral disengagement, will change among the students who participated in our study. To answer that question, we are preparing to collect and analyze a final round of survey and interview data from these same groups of students during their senior year of university. Further analysis

of these data sets will build on the findings presented here, including to look for evidence of changes in their levels of moral disengagement.

More practically, it is worth reiterating considerable evidence of moral disengagement mechanisms in our interview data. Making students more aware of how these mechanisms are often invoked to justify unethical or immoral behavior may help them more deeply and critically reflect on their own decision-making processes. Hence, this research provides engineering ethics educators with baseline information for developing additional instructional tools or guidelines. We also observed tensions between different ethical frames students used to reason through the survey items, which suggests that teaching moral theories and reasoning can help students reason through ethical dilemmas. We hope that such interventions have positive impacts on professional ethics by helping students learn to avoid moral disengagement and uphold high standards of personal and professional conduct.

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