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The impact of community engagement on undergraduate social responsibility attitudes

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ABSTRACT

The literature on student development cautions that social responsibility attitudes may stagnate or decline as students proceed through college. Given the importance of students' future professional obligations to society, identifying ways to reverse this trend is crucial. In turn, an important aim of this study, situated at a large public university, is to evaluate the prospects of community engagement as a strategy to foster professional social responsibility development. The study uses longitudinal results from an instrument known as the Generalized Professional Responsibility Assessment (GPRA) to assess personal and professional social responsibility attitudes. The study's sample includes 128 students who completed a survey both in 2017, when entering college, and in 2019, when near the midpoint of college. Findings indicate that social responsibility attitudes remain stagnant, and that students over that time period attach more importance to salary as compared to helping people when considering job priorities. Yet, results reveal that increased community engagement predicts growth in social responsibility attitudes, even when controlling for students' pre-college social responsibility attitudes and demographic characteristics. Further, a novel contribution of this study is a focus on two sub-categories of community engagement: discipline-based and peer-based. Discipline-based community engagement appears to foster professional aspects of social responsibility, while community engagement experiences tied to peer interaction appear to exert greater impacts for non-White students. An observation derived from the study is that community engagement, particularly when it connects to a student's discipline or draws on peer influences, could be an effective strategy to promote social responsibility development.

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Introduction

Academic institutions have multifaceted goals when it comes to educating their students. Among those goals, and arguably a foundational purpose of higher education, is to cultivate within students a genuine concern for the public, especially for those planning to join professions that have direct connections to public safety and well-being. Yet there are reasons to suspect that academic institutions are not fully succeeding in achieving this goal, or even worse, are creating an environment where their students' sense of social responsibility diminishes over time (Cech 2013; Kifle 2020). In

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light of these concerns, our research team has engaged in a multi-year mixed methods effort, taking place at a large public university in the United States, to assess changes in student social responsibility attitudes and to consider what factors influence these attitudes in positive or negative directions.

Importantly, a focus of the project and core topic of this paper is the role of community engagement (CE) activities. Indeed, CE has been examined for quite some time in terms of the potential impact that it may have on students (Meadows and Jarema 2006; Oakes et al. 2011; Pritchard and Tsang 2000). Yet, much remains unknown the extent to which CE might shape student personal and professional social responsibility development throughout undergraduate education (Natarajarathinam, Qiu, and Lu 2021). In turn, this paper assesses the role of CE in student social responsibility development including how specific kinds of CE activities impact undergraduate students. To do so, our research team administered a survey to a cohort of undergraduate students at the beginning and midpoint of their careers at an academic institution, measuring student social responsibility attitudes and frequency of participation in CE activities. An important novelty of the study is a proposed distinction between *discipline-based* CE and *peer-based* CE, underexplored factors in the literature. By *discipline-based*, we mean CE activities that overlap with a student's major or specific career aspirations, such as those involving a student chapter of a professional association. By *peer-based*, we mean CE activities that are engaged in or initiated in part due to a desire to socialize with friends or other peers.

Along these lines and as part of the broader project, three research questions underpin this paper. First, do student professional social responsibility attitudes change while in college and if so, how? Second, do CE activities (including discipline-based and peer-based) contribute to a change in social responsibility attitudes? Third, how do student characteristics moderate the role of CE in social responsibility development? The findings reported here suggest that CE may contribute to social responsibility development.

The paper is organized as follows. We begin by reviewing the two pillars of our conceptual framework: the literature on social responsibility and the role of CE in its development. We then describe the study context, participants, and measurement and analysis approach. The results section describes patterns regarding social responsibility change and student preferences for salary versus helping others before presenting the findings on the impact of CE. We show how overall CE as well as discipline-based and peer-based CE may impact social responsibility attitudes, and consider whether student demographics moderate impacts. We end with a discussion of study limitations and practical and scholarly observations.

Background and conceptual framework

While social responsibility can have different definitions (e.g. Corley, Kim, and Scheufele 2016), it typically refers to one's obligations to act in consideration of the public good. Social responsibility can apply both to personal and professional contexts. Personal social responsibility describes how individuals may develop an awareness, ability, and a sense of obligation to help others in need in everyday life (Canney and Bielefeldt 2015a). Yet much of the scholarly discussion on social responsibility pertains to acts performed in one's professional capacity. For example, drawing on the 'safety, health or welfare' phrasing typical in engineering or other professional codes of ethics (ACM 2018; IEEE 1996), Bird (2014) states that 'The social responsibility of scientists requires that they also attend to the foreseeable societal impacts of their work, particularly as these impacts affect the safety, health or welfare of the society.' Of course, individuals need not be engineers, scientists, or part of a formal profession to have societal responsibilities tied to their job or career.

Given the importance of these dimensions of work, many scholars emphasize the need for students to develop ethical attitudes and skills (Fiesler et al. 2021; Kohlberg 1984; Rest et al. 2000; Solbrekke and Englund 2011), including those pertaining to social responsibility. The importance of integrating ethics into the curriculum, including in science and engineering, has been recognized

for some time (e.g. National Academy of Engineering 2009). Unfortunately, despite the recognition that social responsibility is an important aspect of educational outcomes, Cech's (2013) research indicates that student social responsibility attitudes remain flat or may even decline over the course of an undergraduate engineering program.

Many strategies have been proposed to cultivate a sense of professional responsibility within students. Prominent among these is classroom-based ethics education (Hess and Fore 2018), especially the use of standalone ethics courses and ethics case studies in fields such as nursing (Woods 2005), business (Christensen et al. 2007), and military education (Robinson, Lee, and Carrick 2008). Case studies have a long history, for example, in engineering ethics (Fleddermann 2000; Harris et al. 2019; Herkert 2000) and bioethics (Pence 2021). In addition, many scholars contend that 'ethics across the curriculum' is the most likely approach to have a meaningful impact on student professional development (Mitcham and Englehardt 2019). A relatively new approach to social responsibility education is tying pedagogy to the United Nation's Sustainable Development Goals (Severino-González et al. 2022). There is also an emerging literature on 'University Social Responsibility' that examines how the culture and approaches within academic institutions are tied to social responsibility (e.g. Coelho and Menezes 2021). Further, characteristics of the student population may be tied to social responsibility development, such as gender (Canney and Bielefeldt 2015b; Lin and Loui 2017), religion (Canney and Bielefeldt 2013), and race or ethnicity (Naphan-Kingery et al. 2019).

Another method for cultivating social responsibility is CE, a key focus in our study. While CE can be difficult to define precisely, the *Principles of Community Engagement* (2011) instructively states that CE is 'the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people.' Along these lines, it is noteworthy that some approaches to CE are broadening their scope beyond local efforts to encompass international and global dimensions of social responsibility (e.g. Jones et al. 2021).

CE is often tied to and encompasses service learning, which is frequently defined as 'a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities' (Ryan 2012). CE activities do however extend beyond the classroom to include, for example, service-oriented experiences related to student extracurricular groups or professional internships (Rulifson and Bielefeldt 2018). Thus while CE includes service learning and classroom-oriented activities, the former is broader than the latter and in part represents a critique of service learning as limited to more transactional, unidirectional engagement (Vanasupa and Schlemer 2014; Ward and Wolf-Wendel 2000).

A primary aim of our study is to examine how CE might shape the personal and especially professional social responsibility attitudes of undergraduate students. To investigate the development of such attitudes, we draw on two conceptual pillars, the first of which is Canney and Bielefeldt's Professional Social Responsibility Development Model (PSRDM), which articulates distinct pathways for personal and professional trajectories (Canney and Bielefeldt 2015a). The PSRDM has three realms. The first realm is *Personal Social Awareness*, which refers to whether one develops a sense of awareness, self-efficacy, and obligation with respect to helping people in need. The second, *Professional Development*, pertains to whether one gains an appreciation for the ethical and social dimensions of professional activities. In principle, these two distinct realms – Personal Social Awareness and Professional Development – jointly lead to *Professional Connectedness*, or a sense of obligation to help others within the context of one's professional role (Canney and Bielefeldt 2016). Much is unknown about how personal and professional social responsibility develop jointly or separately. Yet the PSRDM provides a helpful conceptual framework for starting to understand that relationship.

Second, our project's approach and methodology is also informed by the broader CE literature. Studies indicate the effectiveness of CE activities for advancing student outcomes such as interpersonal development, social understanding, commitment to service, and cognitive development (Celio, Durlak, and Dymnicki 2011; Eyler et al. 2001; Natarajarathinam, Qiu, and Lu 2021), though

there are some domains where the impacts are mixed or uncertain. Successful CE may foster sustained involvement (Delve, Mintz, and Stewart 1990), greater depth of collaboration with communities (Cruz and Giles 2000; Ward and Wolf-Wendel 2000), ongoing critical reflection (Eyler 2002; Mitchell 2008), and institutional support provided by university leadership (Bender 2008). Yet only a modest body of evidence shows that CE contributes to the development of key skills and dispositions needed for professional social responsibility in particular to emerge (Astin and Sax 1998; Bielefeldt and Canney 2014). Our work aims to address this gap by asking whether CE – or specific forms of CE – can help to bolster social responsibility development.

Methodology

Participants and survey administration

This study is part of a larger research effort and took place at a large public university in the United States. Approximately two-thirds of its undergraduate student population major in an engineering or computing program.[1] The study involved the administration of a survey at two time points to the cohort of undergraduate students who began college in fall 2017. All students in this entering cohort were recruited via email and surveyed approximately one month before entering college, and all enrolled students in the same cohort were surveyed again in the summer of 2019 after they completed their second year of undergraduate studies. 845 students completed the first round of the survey out of 2995 who received a request to participate, while 216 students completed the second round of the survey out of 2437 invited students. To improve response rates, participants is 2019 were offered a $5 incentive to complete the survey, while participants in 2017 were not compensated. The study was reviewed and approved by the university's Institutional Review Board.

A total of 128 students completed both surveys and passed the attention check questions. Given our emphasis on longitudinal study of student development, these students constitute the analytical sample for the paper. Table 1 displays demographic details of these students along with summary

Table 1. Descriptive summary of key variables ($n = 128$ respondents).

Variable	Mean (Std. Dev.)	Range	Variable	Mean (Std. Dev.)	Binary Coding Value
Dependent Variables			**Control Variables (continued)**		
Personal Social Awareness 2019	6.05 (.65)	[4.23–7.00]	Gender		
Professional Development 2019	6.34 (.63)	[2.33–7.00]	*Male*	.53 (.50)	[1]
Professional Connectedness 2019	5.47 (.86)	[3.07–7.00]	*Female*	.47 (.50)	[0]
PSRDM 2019	5.95 (.59)	[4.26–6.98]	Race/Ethnicity		
			White	.55 (.50)	[1]
			Non-White	.45 (.50)	[0]
Independent Variables			College		
Overall CE	53.52 (65.26)	[0–423]	*Engineering*	.62 (.49)	[1]
Discipline-based CE	21.52 (31.50)	[0–150]	*Non-Engineering*	.38 (.49)	[0]
Peer-based CE	11.16 (15.94)	[0–70]	Country of Origin		
			USA	.94 (.24)	[1]
			International	.06 (.24)	[0]
Control Variables			First Generation		
Personal Social Awareness 2017	6.08 (.65)	[4.22–7.00]	*Yes*	.03 (.18)	[1]
Professional Development 2017	6.34 (.64)	[2.89–7.00]	*No*	.97 (.18)	[0]
Professional Connectedness 2017	5.52 (.88)	[3.31–7.00]	Religious		
PSRDM 2017	5.99 (.57)	[4.56–7.00]	*Yes*	.52 (.50)	[1]
			No	.48 (.50)	[0]

Note: PSRDM refers to the Professional Social Responsibility Development Model.

statistics regarding key dependent and independent variables. Given the limited response rates and possibility of differential dropout, we performed checks to assess possible bias related to sample attrition and find no immediate cause for concern. Online Appendix A provides further details about our study procedures, participants, generalizability of our sample, and tests of sampling bias.

Measures and analysis approach

To shed light on the relationship between CE activities and student social responsibility attitudes, we collected longitudinal data using the Generalized Professional Responsibility Assessment (GPRA) (Borenstein et al. 2019). The GPRA is adapted from the Engineering Professional Responsibility Assessment (EPRA), a validated instrument based on the PSRDM framework (Canney and Bielefeldt 2015a; 2016). While the EPRA has engineering students as its target population, our tool was modified to be relevant to students from any discipline. Our key dependent variables are measures of the three overarching realms of the PSRDM. There are a total of eight constructs based on 42 associated 7-point Likert questions (reproduced in Online Appendix F) under the three realms of *Personal Social Awareness* (constructs: Awareness, Ability, Connectedness); *Professional Development* (constructs: Base Skills, Professional Ability, and Analysis); and *Professional Connectedness* (constructs: Professional Connectedness and Costs/Benefits). For our key analyses, we aggregate these eight constructs to the level of the three realms by taking averages, and then take a master average-of-averages to establish a single social responsibility score.

While the GPRA is adapted from a validated instrument, we also performed basic reliability testing and made minor refinements, discussed in more detail in Online Appendix B. Most constructs had acceptable reliability levels as measured by Cronbach's alpha after we removed two questions from the Analyze construct and one from the Professional Ability construct. However, the Professional Development realm should be interpreted more cautiously given relatively lower reliability scores, as presented in Table 2.

As independent variables, we construct an index measuring overall community engagement during college (*overall CE*) from student responses to a set of questions about the frequency of participation in various CE activities. For example, students were asked how often they engaged in community service through organizations such as Habitat for Humanity, through campus religious organizations, and so on.[2] Consistent with Canney and Bielefeldt (2016), we apply a simple scaling factor to each activity, such that 'have not participated' is multiplied by 0, 'only a few times during college' by 1, 'once or twice per year' by 2, 'more than twice a year but not routinely' by 5, 'monthly' by 20, and 'weekly' by 50. We aggregate the scaled scores for all CE activities to create the composite score of overall CE. Notably, this score reflects the *quantity* of CE, rather than its *quality*, a limitation and trade-off related to our broader study design.

Additionally, to expand on the scholarly understanding of the impacts of specific types of CE on students, we introduce two novel measures of CE: *discipline-based CE* and *peer-based CE*. Our study's

Table 2. Construct and realm reliability scores for PSRDM instrument.

PSRDM realm	Construct	Number of items	Cronbach's alpha
Personal Social Awareness (PSA)	1. Awareness (aw)	5	0.65
	2. Ability (ab)	4	0.75
	3. Connectedness (co)	4	0.80
	PSA realm overall	13	0.77
Professional Development (PD)	1. Base Skills (ba)	1	–
	2. Analyze (an)	2	0.62
	3. Professional Ability (pa)	3	0.47
	PD realm overall	6	0.51
Professional Connectedness (PROC)	1. Professional Connectedness (pc)	19	0.92
	2. Costs-Benefits (cb)	4	0.78
	PROC realm overall	23	0.86

conceptualization emphasizes the role of discipline-based CE, measured by a subset of CE activities connected with a student's discipline and profession, in shaping professional social responsibility attitudes. The second novel measure we employ is peer-based CE, which involves activities where peer groups play a major influence in the student's motivation to participate (e.g. Greek life or other student extracurricular organizations). Our interest in this latter measure emanates from our qualitative findings (Schiff et al. 2021) that students often participate in CE activities due to peer influences, including as a way to socialize with friends, and that peers are a major factor in shaping a student's social responsibility attitudes. We conceive of these two constructs as part of a formative measure approach (Jarvis, BacKenzie, & Podsakoff, 2003) and scale and aggregate responses for each associated subset of CE activities, as with the overall CE measure. Online Appendix C lists the respective survey items for these two novel measures and discusses our rationale behind the construction of these CE measures and our formative measurement approach.

We use a set of demographic covariates across our models: gender, race/ethnicity, academic major, country of origin, first-generation status, and religiosity. The covariates are aggregated into binary measures (e.g. White vs. non-White, male or female) for both pragmatic and theoretical reasons. Pragmatically, limited sample sizes for certain subgroups preclude a more fine-grained and reliable analysis. Theoretically, research suggests that some subgroups of students have different relationships with CE and social responsibility development that are worth modeling and exploring. For example, Pence (2019) argue that non-White students and women may be influenced by an equity ethic; correspondingly, reporting on possible trends aggregated in this way could help to explain the impact of CE for these important subgroups. The key dependent variables, independent variables, and covariates that constitute our main models are summarized in Figure 1, with additional detail about the sample and construction of variables presented in Online Appendix A.

Our primary analysis approach is Ordinary Least Squares (OLS) regression. While related studies assessing the impacts of CE on social responsibility development have identified univariate mean differences in student attitudes over time, this study additionally controls for student characteristics as well as pre-college social responsibility attitudes. This multivariate and longitudinal approach improves our ability to assess causal impacts of CE as compared to cross-sectional or univariate

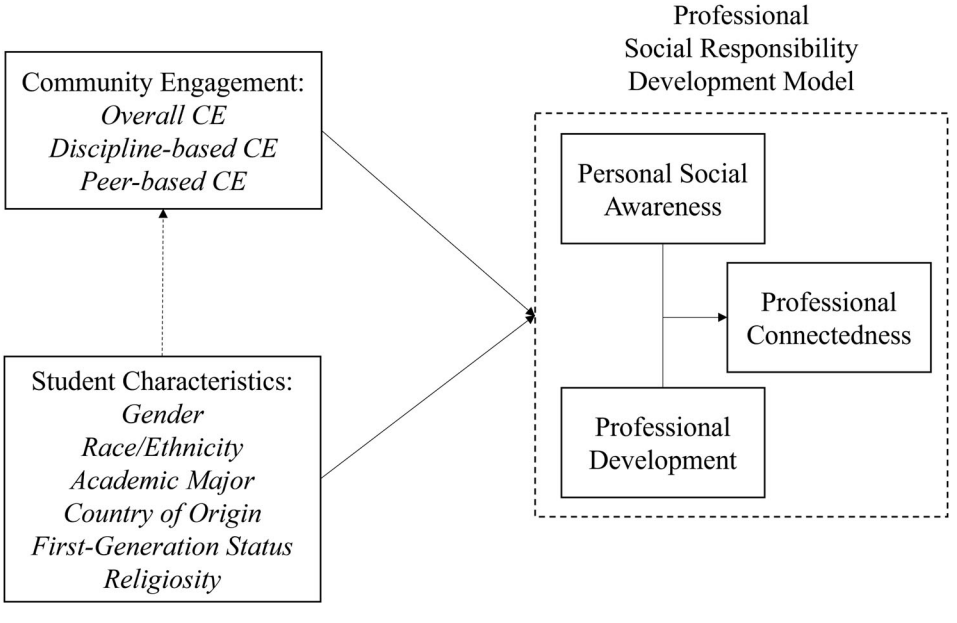

Figure 1. Overview of core study elements and methodological approach. Professional Social Responsibility Development Model (PSRDM) adapted from Canney and Bielefeldt (2015a).

mean comparison approaches alone. Importantly, however, our approach remains limited in terms of both causal robustness and generalizability; we discuss various benefits and limitations of our analysis approach in Online Appendix D. Finally, we present bivariate correlation coefficients and difference-of-means tests to examine the strength and direction of the relationships among demographic characteristics, CE activities, and PSRDM scores (see Online Appendix E).

Results

Overall changes in social responsibility attitudes

In line with our first research question, Figure 2 shows changes in overall PSRDM and realm subscores between the two survey administrations, at the beginning and midpoint of the students' undergraduate program. Consistent with Bielefeldt and Canney (2016), Cech (2013), and Howland et al. (2022), we observed little change in overall student social responsibility attitudes over the first half of their undergraduate program. Participants, on average, showed slight and insignificant (Wilcoxon signed-rank test, $p > .05$) decreases from 2017 to 2019 along the Personal Social Awareness (PSA) and Professional Connectedness (PROC) realms, as well as in the (average-of-averages) PSRDM score, and with no detectable change in the Professional Development (PD) realm.[3] *These results reiterate concerns that social responsibility attitudes may remain flat or decline during undergraduate education, at least during the first two years of college*.

Since these responses refer to attitudes that students hold while still in college, it is challenging to extrapolate how they may affect eventual behavior in the workplace. However, the survey instrument includes additional questions that allow examination of values related to one's anticipated career. In particular, participants were asked to identify which factors are most important to them when seeking a future job, and did so by distributing ten 'stones' amongst eight job priority 'bins,' including salary, job location, being self-employed, and so on. The score for each job priority thus ranges from 0 to 10 possible points, summing to 10 points across the eight job priorities.

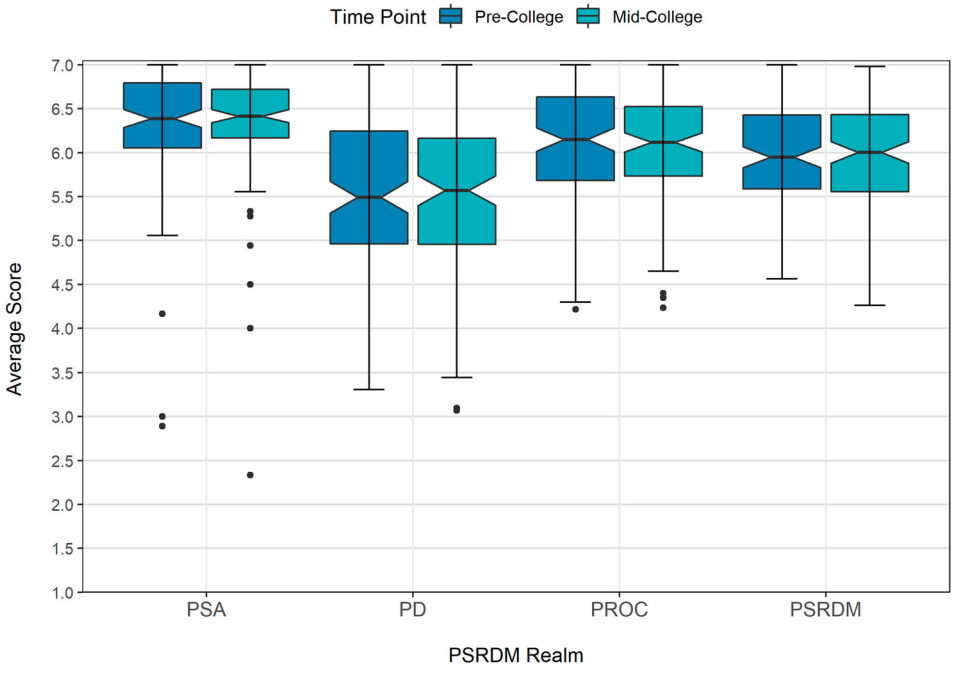

Figure 2. A box-whisker plot of overall changes in PSRDM realms and overall PSRDM scores between 2017 (Pre-College) and 2019 (Mid-College). 5 = 'Slightly Agree' and 7 = 'Strongly Agree.' ($n = 128$ respondents).

Figure 3 examines the priority students placed on two of the job priorities: *Salary* and *Helping People*. We selected these two items because the latter could serve as a rough proxy for social responsibility attitudes and a comparison between them could provide some insight about a student's career mindset. We compared the average scores for these categories across the two survey time points for the overall participant group and for several demographic subgroups (gender, race/ethnicity, and major). Salary is a clear priority for nearly all subgroups of students other than for female students. *Moreover, for students overall, salary becomes a more critical consideration over time* – with scores increasing from pre-college ($M = 2.76$) to mid-college ($M = 3.10$), paired samples (t (127) = 2.45, $p < .05$), *whereas the importance of helping others through one's work remains relatively flat or even declines*. These results reinforce the notion that the importance attributed to professional social responsibility, including how it influences career choices, may decline during college.

Impact of overall community engagement on student social responsibility attitudes

We perform OLS multiple regression analysis to identify whether CE might impact student social responsibility attitudes. Our general model specification is: $y = \alpha + \beta CE + \gamma X + \varepsilon$, where β corresponds to the association between CE and the PSRDM outcomes of interest (y) and X refers to a vector of student demographic covariates (gender, race/ethnicity, major, country of origin, first-generation status, and religiosity). In some models, we incorporate 2017 PSRDM scores, which help us to control for student pre-college social responsibility attitudes and thus better isolate changes during college.

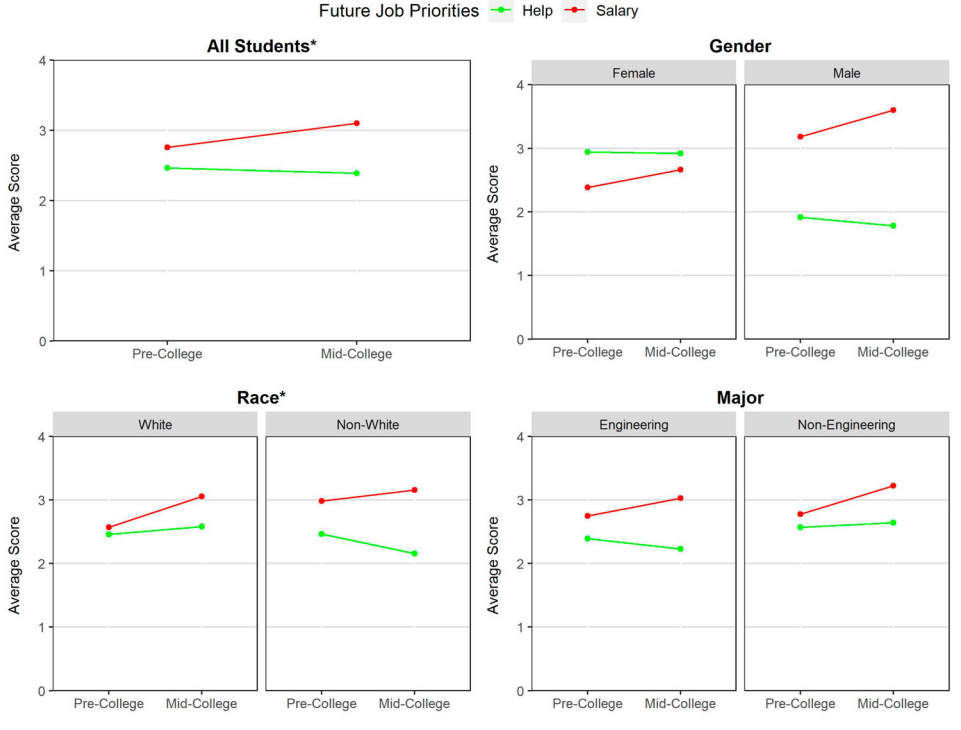

Figure 3. The importance of future job qualities for students: Salary and Helping People ($n = 128$ respondents). Students distributed 10 stones in 8 bins, so the possible range for any given bin (e.g. Salary) is 0–10. Standard deviations are omitted and the range is shortened for visibility. There are statistically significant increases (paired samples t test, $p < .05$) in the importance of Salary for all students and for White students.

Three models predicting student 2019 PSRDM scores were tested: Model 1 includes demographic covariates only and reveals that gender has a large association with social responsibility attitudes, while race/ethnicity, student major, international and first-generation status, and religion do not. Model 2 adds the overall college CE index score as a variable (Overall CE 2019); and Model 3 further incorporates each student's pre-college social responsibility attitudes as measured by their overall PSRDM score in 2017. The goodness-of-fit for the models, indicated by R^2 values, improves from Model 1 to Model 3 with Model 3 explaining a sizable 57% of variability of the data. For comparability, we report standardized effects.

As shown in Table 3, the results from Model 2 indicate that a one standard deviation (*SD*) increase in the degree of overall CE during college was associated with an average .26 *SD* increase in student PSRDM 2019 scores, holding all covariates constant. In line with the results of our *t* tests, being a male student is associated with lower social responsibility attitudes, even after controlling for other student characteristics. Additionally, student PSRDM scores are positively predicted by formal religious affiliation in this model. Yet, once pre-college attitudes are controlled for in Model 3, arguably the most robust model, these covariates are no longer significant predictors of PSRDM scores.

Notably, the only statistically significant predictors in Model 3, the only model which takes longitudinal trends into account, are pre-college social responsibility attitudes (PSRDM 2017) and overall CE. Critically to our research questions, *the positive influence of overall CE on PSRDM scores remains statistically significant even when accounting for pre-college PSRDM scores*. In particular, a one *SD* increase in overall CE during college corresponds to an average .14 *SD* increase in student PSRDM scores. This finding constitutes promising evidence regarding CE's capacity to foster professional social responsibility attitudes.

Impact of discipline-based and peer-based community engagement on social responsibility attitudes

We next test the extent to which discipline-based CE (e.g. activities associated with a student's major, internships, and professional organizations) and peer-based CE (e.g. activities where socializing with peers plays a major influence, such as Greek life) predict student social responsibility attitudes, and whether they operate in similar or different ways as compared to overall CE, the more general measure. We again use multiple linear regression and adapt the most robust model from above by varying the key independent variable, while controlling for student covariates and pre-college social responsibility attitudes. Table 4 reports the results for the models which assess the impacts of discipline-based CE (Model 1) and peer-based CE (Model 2) on social responsibility attitudes.

Unlike overall CE and in contrast to our expectations, discipline-based CE does not appear to have statistically significant impacts on overall student PSRDM scores. In contrast, peer-based CE is a

Table 3. Results of multiple regression analysis predicting PSRDM 2019 scores: Overall CE.

	Model 1			Model 2			Model 3		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Overall CE 2019	–	–	–	.002	.001	.259**	.001	.001	.136*
PSRDM 2017	–	–	–	–	–	–	.626	.071	.609***
Male	−.448	.097	−.378***	−.379	.096	−.320***	−.124	.080	−.106
White	.160	.098	.134	.133	.095	.112	.097	.073	.082
Engineering Major	−.032	.101	−.026	−.024	.097	−.020	−.024	.075	−.020
Country of Origin: USA	.295	.204	.121	.274	.196	.112	.290	.151	.119
First Generation	.066	.283	.020	.120	.273	.035	.203	.210	.060
Religious	.185	.098	.156	.200	.095	.169*	.099	.073	.084
(Constant)	5.697	.212	–	5.558	.209	–	1.831	.457	
R^2	.211			.274			.568		
RMSE	.540			.521			.400		
F	5.403***			6.454***			19.570***		

Note: * indicates $p < .05$; **$p < .01$; and ***$p < .001$.

Table 4. Results of multiple regression analysis predicting PSRDM 2019 scores: Discipline-based and Peer-based CE.

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Discipline-based CE 2019	.002	.001	.103	–	–	–
Peer-based CE 2019	–	–	–	.005	.005	.137*
PSRDM 2017	.628	.073	.610***	.659	.069	.641***
Male	−.134	.080	−.114	−.130	.080	−.110
White	.095	.074	.081	.113	.073	.095
Engineering Major	−.024	.076	−.020	−.026	.075	−.022
Country of Origin: USA	.309	.152	.127*	.301	.151	.124*
First Generation	.176	.212	.052	.195	.210	.058
Religious	.107	.075	.091	.067	.074	.057
(Constant)	1.830	.464	–	1.645	.452	–
R^2	.561			.570		
RMSE	.404			.399		
F	18.979***			19.724***		

Note: * indicates $p < .05$; **$p < .01$; and ***$p < .001$. ($n = 128$ respondents).

statistically significant and positive predictor of overall PSRDM scores while holding all other variables constant. A one *SD* increase in peer-based CE corresponds to a .14 *SD* average increase in PSRDM, similar to the effect size for overall CE. *This result implies that peers or social groups may indeed be influential in enhancing college students' social responsibility attitudes*.

Notably, however, discipline-based CE positively predicts the Professional Development (PD) realm within the broader PSRDM framework. As the second panel of Figure 4 depicts, there is a positive and substantial predictive relationship between discipline-based CE and PD ($\beta = .20$, $p < .05$), even when controlling for student covariates and pre-college PD scores, whereas peer-based CE has no such effect on PD scores.[4] This suggests that students are more likely to gain useful skills and knowledge for their professional growth when engaging in CE activities closely related to their discipline or future profession. *In other words, discipline-based CE could be a key aspect of developing more robust professional social responsibility attitudes*. Yet, discipline-based CE does not appear to bridge the personal and professional trajectories of social responsibility development. A

Figure 4. Coefficient plots for estimating the effect of different types of CE on social responsibility attitudes. The lines indicate 95% confidence intervals; variables whose intervals cross the reference line at 0 are not statistically significant. Overall CE and peer-based CE (but not discipline-based CE) predict PSRDM scores, while overall CE and discipline-based CE (but not peer-based CE) predict PD scores.

disconnect remains, possibly related to a bifurcation between student personal and professional attitudes, a trend also identified in our prior qualitative work (Schiff et al. 2021).

The role of student demographic characteristics in social responsibility development

Finally, we evaluate how the impact of CE on social responsibility might vary across demographic subgroups, as well as how demographic characteristics might play a role in CE engagement and social responsibility development more generally. Most prominently, female students reported higher CE both before and during college as well as higher levels of social responsibility attitudes. Our findings are consistent with research by Canney and Bielefeldt (2015b) and a body of research indicating higher levels of baseline concern about social issues among female students. Yet despite higher *baseline* attitudes (see Online Appendix E), female student social responsibility attitudes remain flat over time, and no significant differentiation was detected between genders *over time* in PSRDM scores (i.e. from 2017 to 2019). Moreover, there was no gender-specific impact of CE on their social responsibility attitudes. *That is, females appear to be on a higher but parallel track as compared to male students.* Consequently, one should not assume female students are exempt from the need to foster social responsibility development.

For other demographic characteristics, including international status, major, first-generation status, and religiosity, we observe similar dynamics. In general, there are few notable impacts of CE on social responsibility that are differentiated within a given subgroup. That is, while some subgroups have higher *baseline* social responsibility attitudes and are more likely to participate in CE (e.g. female, non-engineering, American-born, first-generation, and more religious students), *students of all subgroups face flat or declining social responsibility attitudes. Moreover, no student subgroup among those we studied showed statistically significant increases in overall PSRDM scores*.

For race/ethnicity, while subgroups have statistically similar levels of CE participation, peer-based CE has differentially positive impacts on social responsibility attitudes for non-White students as compared to White students. In particular, we tested whether race/ethnicity moderates the relationship between peer-based CE and PSRDM by adding an interaction term between race/ethnicity and peer-based CE to our regression model. As the first panel of Figure 5 depicts, *non-White students who participated in higher levels of peer-based CE had statistically significant increases in social responsibility attitudes compared to White students* ($p = .02$). In contrast, peer-based CE does not produce statistically significant differential impacts by, for example, gender, major, or religion. No other forms of CE were found to produce meaningfully different impacts on social responsibility for other student subgroups.

It is important to note that the effects of peer-based CE could depend on how peer-based CE is defined (i.e. which kinds of CE 'count'), the quality of the CE experiences in terms of established best practices, and how demographic groups are coded (e.g. whether race is defined in a binary way or in more finely grained terms). Moreover, we find that CE experiences generally do not lead to differential impacts within and across most student subgroups, which suggests that the experiences and attitudes of students related to CE and social responsibility development may be significantly shaped by common factors such as institutional climate. Nevertheless, peer-based CE could be helpful in supporting social responsibility development for students from minority racial or ethnic groups. More research is needed, however, to understand the possible effects of peer-based CE.

Discussion

This study evaluates whether and how student social responsibility attitudes change over time, and what role community engagement has in fostering student moral development. Our research contributes to the scholarly literature on CE and social responsibility development in several ways.

First, using a survey instrument based on the PSRDM framework, *we provide evidence that CE can indeed promote social responsibility development, even when accounting for student pre-college social*

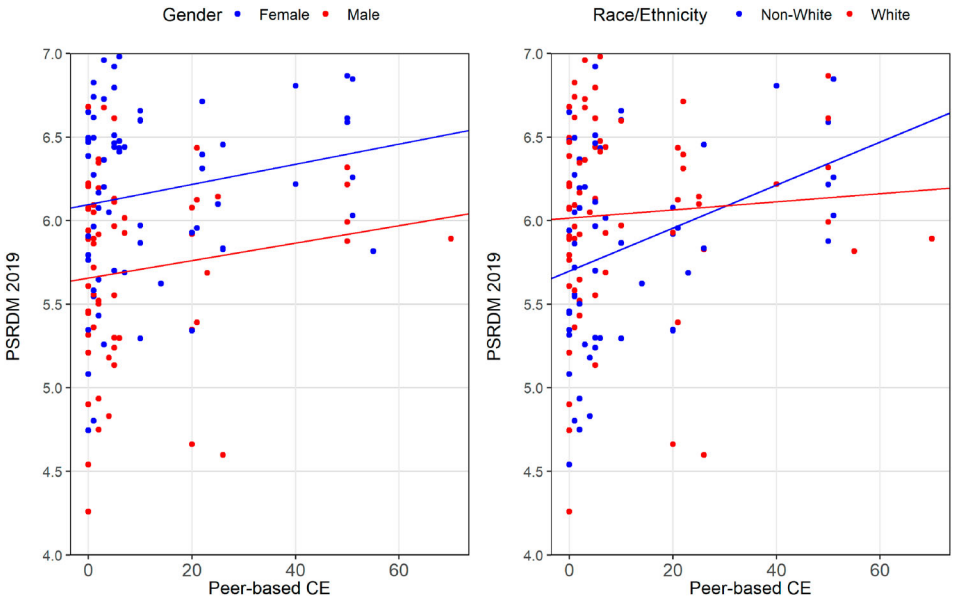

Figure 5. Moderation analysis for student demographic subgroups. Slope lines indicate how peer-based CE predicts PSRDM scores. The x-axis is the scaled measure of student participation in peer-based CE. A statistically significant moderation effect is found for race/ethnicity and peer-based CE ($p = .02$), suggesting peer-based CE has uniquely positive effects on non-White students. Discipline-based and overall CE do not produce significant moderation effects for any subgroup.

responsibility attitudes. Compared to studies employing cross-sectional or univariate mean differences, our study uses a longitudinal multivariate regression approach (results in Table 3) to provide more robustness as to possible causal effects. While this study lends support to the notion that student social responsibility attitudes remain flat or decline over time (Howland et al. 2022), it also indicates that CE may constitute an important factor to mitigate or reverse these trends.

Second, our study adds depth to and broadens the scholarly conceptualization of CE. While much of the literature focuses on traditional 'volunteering' activities like helping at a food kitchen or donating blood (Bielefeldt and Canney 2014), our study incorporates a wide variety of CE activities, such as through coursework, internships, and peer groups (see Online Appendix C). This recognizes that student social responsibility development is not merely a result of a single ethics course, case study, or 'weekend' volunteer experience. Rather, it is connected to many different types of experiences that constitute a continuum in an individual's life. Given our goal of exploring CE in a fuller sense, we examine two novel forms of CE, peer and discipline-based, that the theoretical underpinnings of our approach and our prior qualitative work suggest could be important to student moral development.

Our results indicate that discipline-based CE, activities connected to a student's major or career aspirations, may shape the Professional Development realm within the PSRDM framework. Yet discipline-based CE fails to drive overall social responsibility attitudes, as depicted in Figure 4 and Online Appendix F. The underlyin gexplanation for this mixed finding is unclear, though our prior qualitative research suggests that student personal and professional social responsibility attitudes may be disconnected for a variety of reasons. In particular, students typically pursue their majors due to intellectual interest and fit rather than for social or ethical goals; thus, they might not connect their personal values and interests, such as those pertaining to student mental health or racial equity, with professional social responsibility concerns, including obligations to clients or coworkers (citation omitted). While discipline-based CE may inform a student's sense of how their professional development intersects with social or ethical concerns, it may be insufficient to drive

a holistic sense of professional connectedness as conceived of in the PSRDM framework. Recent work on CE suggests that further research on factors like logistical and cultural barriers (Natarajarathinam, Qiu, and Lu 2021) could help explain why some forms of CE are more effective than others.

In contrast, peer-based CE activities do appear to drive increases in overall student social responsibility attitudes. That peer-based CE does not have an impact on the professional development component suggests that discipline-based CE and peer-based CE act in different ways. Peer-based CE also has a differentially positive impact for students from minority racial or ethnic groups, as depicted in Figure 5. This is in itself worthy of further study. Though some of the CE literature notes the importance of developing genuine and lasting relationships while engaging with members of the community (Eyler 2002; Ward and Wolf-Wendel 2000), our findings encourage attention to the dynamics of student social groups as possible drivers of CE engagement and social responsibility development. Fostering these patterns could involve encouraging group activities, peer reflection, or bringing in recent alumni to speak about professional experiences.

Finally, our results illustrate the role of student demographic characteristics in CE and social responsibility development. While certain subgroups, such as female students, may have higher baseline attitudes towards social responsibility (see Online Appendix E), we find that a variety of student characteristics cease to be statistically significant predictors of social responsibility development once pre-college social attitudes are taken into account. Many student subgroups seem to experience similar patterns of flat or declining social responsibility attitudes in college, even if baseline trends differ. The lone exception in our study cohort is the finding that peer-based CE may be especially helpful in driving social responsibility development for non-White students. Overall, this suggests that common features of student experience in college are driving these trends. Yet targeted strategies and associated research may still be needed to mitigate against social responsibility decline for particular student subgroups (Bielefeldt 2021).

Limitations

Our study is subject to a number of limitations, some of which we elaborate on in Online Appendix D. First, while not unusual for student surveys, our response rates are relatively low for both survey administrations (approximately 28% for the 2017 survey and 9% for the 2019 survey). The ultimate study sample that is the focus of this paper – the members of the entering 2017 cohort who completed both studies – constitutes only approximately 5% of the entering 2017 cohort. Relatedly, sample attrition and selection bias could pose a threat to the validity of our results of our results. Yet our statistical tests using logistic regression to predict non-random sampling between the two survey waves (see Online Appendix A) provide little evidence of sample attrition bias along nearly all observed student characteristics including pre-college social responsibility attitudes and CE activity, though we cannot rule out such bias along unobserved student characteristics. The generalizability to other student populations is also a limitation for reasons unrelated to response rate or attrition, as the student cohort in our study may be dissimilar from other groups of students, for example given the high proportion of engineering majors at the university.

Because our sample size is relatively modest overall, we perform calculations to determine if we are sufficiently powered to detect our main results using the G*Power software tool. A statistical test of 'Linear multiple regression: Fixed model, R^2 increase' within the F tests family indicated that a required sample size for a single coefficient is 127 to detect an R^2 increase. This is based on a power level of .80, alpha level of 5%, with 7 predictors, and an effect size of 0.063, corresponding to the R^2 increase between Model 1 and Model 2 in Table 3 (the effect of Overall CE on mid-college PSRDM scores). This suggests our sample size is just large enough to detect the main effects; however, additional analyses that rely on subgroups (e.g. gender or race differences) would require a larger sample size.

Another possible limitation is that the students in the sample had only just completed their second year of their undergraduate program. Other studies have also evaluated students at the

midpoint of their academic careers (Bielefeldt and Canney 2014). Yet students may develop further as they complete their academic programs, participate in internships (Rulifson and Bielefeldt 2018), and so on. Indeed, it is common at our institution that students take courses more directly connected to their major, such as design or capstone courses, *after the second year* of their degree program. Nevertheless, the experiences and scaffolding during the early years of a student's academic career are subjects worthy of study.

Other limitations may result from how we approach conceptualization and measurement. For example, the measures of discipline-based and peer-based CE are novel to this study, and could be defined in alternative ways, such as by including other sets of activities in these constructs. The approach to scaling and weighting activities according to the frequency of CE activity participation could be different as well, though our method was designed to be consistent with research in the field such as Bielefeldt and Canney (2014). Additionally, our instrument relies on the psychometric validation performed on the original instrument ours is adapted from Canney and Bielefeldt (2016).

Finally, a key limitation relates to our study's focus on 'quantity' over 'quality,' focusing strictly on intensity of CE participation. The literature has established that certain characteristics of CE are especially effective, such as activities that are sustained, collaborative, and involve reflection (Celio, Durlak, and Dymnicki 2011; Eyler et al. 2001; Natarajarathinam, Qiu, and Lu 2021). Yet, given our desire to study the comprehensive range of student CE experiences over time, asking students to accurately recollect additional, specific details of these diverse experiences is prohibitively difficult. This would likely be more feasible in more targeted research focused on a single intervention, for example. As such, while our study allows us to identify the quantity and type of certain CE experiences, it is limited in its ability to explain aspects of quality like reflection, relationships with community members, or learning goals like civic responsibility. However, our prior qualitative findings suggest that at least some CE experiences students engage in might not adhere to best practice characteristics (cite omitted), implying the effects here may represent a lower-bound estimate.

Conclusion

Community engagement appears to serve as a viable strategy for fostering social responsibility development for undergraduate students. This could be of interest for educators attending to student social responsibility development, as well as employers looking to cultivate a sense of professional social responsibility at the workplace. This study highlights two specific and potentially important sub-types of CE – discipline-based and peer-based – that may contribute to student moral development. However, more work is needed to understand how these and other types of CE activities influence social responsibility attitudes. Future research should seek to examine the effectiveness of specific features of CE activities, how CE interacts with both personal and professional dimensions of social responsibility, and how the continuum of CE experiences shape social responsibility attitudes alongside other influences and inhibitors in students' lives.

Notes

1. Of note, despite growing interest in CE at our institution, it does not have a Carnegie Elective Community Engagement classification.
2. These CE activities are overwhelmingly voluntary in the context of the institution. While some students are required to take an ethics course tied to their major, those courses do not usually involve service learning or CE.
3. While these results present an aggregate picture, Online Appendix E and Online Appendix Tables E1 and E2 provides more detail on the number of students who increased or decreased with respect to all PSRDM realms and individual constructs, and whether over-time changes per construct were statistically significant. Based on results from Wilcoxon signed-rank tests comparing pre-college and midpoint SR scores, there were significant changes for the Ability and Base Skills constructs.

4. See Online Appendix F for more detailed information about impacts of the CE measures on all realms of the PSRDM. We find that no CE measure is associated with increased PSA or PROC, and thus focus on PD and PSRDM here.

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Data Availability of data and code

Due to concerns related to student privacy and confidentiality, data will not be made openly available.

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