Exploring Alignment Between Engineering Students' Job Plans and Post-Graduation Outcomes

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Abstract — **This Research-to-Practice Full Paper investigates engineering students' career goals and intentions regarding organizational settings, and how their goals and intentions relate to their background, learning and contextual measures. Moreover, despite vocational choice and turnover having been heavily studied in the literature, few studies have examined how students' career goals relate to change in their organizational settings over time and how these perceptions then influence their turnover intentions. To fill in this research gap, this paper explores how organizational setting and respondent aspiration to be in that setting relate to turnover intentions.**

The paper is based on the nationally-representative, longitudinal Engineering Majors Survey and has a sample size of 350 respondents, characterized as employed and recently graduated (<2y) from an undergraduate engineering program. Respondents are categorized in three different alignment groups (Aligned, Fluid, Unaligned) according to their career goal achievement. Respondents who are currently employed in the type of organization, they had imagined being employed at a year earlier are called *Aligned*. Respondents who are actually employed in the type of organization (e.g., small versus large firm) to which they stated "Might or might not" be employed a year earlier are classified as *Fluid*. Finally, respondents, who work in the organizational setting, which they did not want to work in one year prior, are called *Unaligned*. The paper also determines respondents turnover intentions (Stay, Flexible, Go) related to organizational settings, such as small companies or medium and large companies. Alignment and turnover groups were then compared with each other in relation to background, learning, and contextual measures. Background measures are gender, underrepresented minority status, and first generation to college status. Learning measures are internship experience, and contextual measures are job satisfaction and grade point average.

The findings suggest that most of these recent graduates are Aligned and want to Stay in their organizational setting. Employees in small companies are relatively less Aligned and are more likely to Go and leave the organizational setting than are employees in large companies. Respondents who have done an internship are more often Aligned and less likely want to Go and leave their organizational setting than those who have not done an internship. These results suggest that many respondents decide before graduation on an organizational setting and continue to desire the same organizational setting after being employed for some time.

Future longitudinal research should compare organizational settings-based turnover intentions with turnover intentions related to specific companies, -as a complement to much of the in literature on turnover intentions mostly refers to leaving specific organizations.

Keywords: career decisions, labor turnover intentions, organizational setting, engineering graduates, alignment

I. Introduction

Turnover intentions, low rates of job satisfaction, and an innovation-inhibiting environment can significantly damage economic prosperity [1, 2]. Various studies have examined career choices, satisfaction, and turnover intentions in specific work environments and organizations [3–8]. However, there is little research regarding the influence of learning measures such as internship experience on career choices in an organizational setting (i.e., large firms vs small firms). Further, while many researchers have examined experiences of engineering students during college, relatively little is known about the experience of engineering graduates in the transition phase from school-to-work [9, 10]. To begin to address these literature gaps, this paper examines the possible influence of background, learning, and contextual measures on career decisions and turnover intentions related to organizational settings.

II. Background

Career decisions are highly complex and difficult to make for many individuals. One reason is that career decisions have a high impact on many areas of an individual's life, such as spare time, societal status, social relationships, financial status, etc. [11, 12]. Several career decision and career development theories identify influential factors like vocational interest and goals [4, 13]. The research presented in this paper is based on Social Cognitive Career Theory (SCCT) [14].

Social Cognitive Career Theory

Lent, Brown, and Hackett [14] developed SCCT, which is derived from Bandura's [15] Social Cognitive Theory, to explain individuals' career choices. According to Social Cognitive Theory, personal, environmental, and cognitive factors influence an individual's decisions and behaviors. Building on this framework, Lent and Brown [16] identified

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relationships that affect academic and career interest development specifically along with performance and choice. As depicted in Fig. 1, career decisions are a function of multiple interrelated characteristics, experiences, and contexts in SCCT.

The current paper focuses on how "person inputs" (background characteristics such as gender, underrepresented racial/ethnic minority [URM] status, first-generation to college [FGC] status), "learning experiences" (namely, internships) and "contextual supports and barriers" (for the purpose of this work, manifested as grade point average in college and job satisfaction in the workplace) are associated with career choices related to organizational settings ("choice goals" and "choice actions"). Other career choices related to specific companies and roles are not considered in the following analysis.

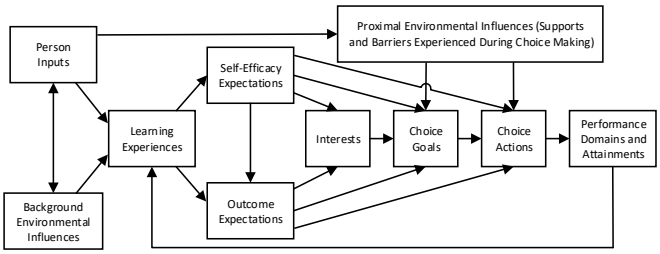

Fig. 1: Social Cognitive Career Theory model [14]

III. Research Questions

This study zeroes in on a unique aspect of career choice: that of alignment with initial organizational setting plans, and how, in turn, alignment might be associated with turnover intentions. One dimension of our analysis considers alignment of a respondent's past organizational setting goals with their current organizational employment, and we develop categorical labels that goes from Aligned to Unaligned, as detailed in Section IV.

The second dimension of our analysis is forward looking, considering consistency or stability between current organizational employment with one's organizational target(s) within five years, and this consistency being a possible indicator of turnover intentions. We develop categorical labels that goes from Stay to Go, as detailed in Section IV.

In this research, organizational setting is defined as a characterization of the organizational structure, whether it is small or large business, a governmental organization, or a person's own start-up organization. Further examples for organizational setting are stated in Table 1 in Section IV.

This paper addresses the following questions: *How Aligned are employees in their organizational setting? How do Aligned employees differ, based on background, learning, and contextual measures, from Unaligned? Furthermore, how do Stay employees differ, based on the same background, learning, and contextual measures, from Go employees?*

IV. Methods

In 2015, the National Center for Engineering Pathways to Innovation (Epicenter) at Stanford University launched the longitudinal "Engineering Majors Survey" (EMS), which aimed to provide a deeper understanding of undergraduate engineering students' interests and career goals surrounding innovation and entrepreneurship. The survey was first deployed in 2015 (so called "EMS 1.0"). A follow-up survey was deployed in 2016 (so called "EMS 2.0"). All respondents were undergraduate juniors and seniors at the time of EMS 1.0. They attended one of a nationally representative sample of 27 U.S. engineering schools. About one-fourth of these respondents had graduated and entered the workforce by EMS 2.0 (see "Sample Selection", below).

One survey question on EMS 1.0 and one survey question on EMS 2.0 captured respondents' career goals regarding organizational settings. In addition, one question captured respondents' current job in EMS 2.0. By observing the change of the career goals over time, longitudinal analysis is possible. These survey questions are:

1) Question 20 (Q20) of EMS 1.0 asked "How likely is it that you will do each of the following in the First Five Years after you graduate?" and then listed eight organizational settings each of which students had to rate on a five-point Likert scale ("Definitely will not", "Probably will not", "Might or might not", "Probably will", "Definitely will"). Table 1 presents those eight career alternatives. Q20 is also labeled **organizational setting 1.0**.

Table 1: The eight career alternatives of question Q20 in EMS 1.0: How likely is it that you will do each of the following in the First Five Years after you graduate?

(A) Work as an employee for a small business or start-up company	(B) Work as an employee for a medium- or large-size business
(C) Work as an employee for a non-profit organization	(D) Work as an employee for the Government, military, or public agency (GMP) (excluding a school or college/university)
(E) Work as a teacher or educational professional in a K-12 school	(F) Work as a faculty member or educational professional in a college or university
(G) Found or start your own for-profit organization	(H) Found or start your own non-profit Organization

Source: [17]

2) Question 113 (Q113) of EMS 2.0 asked respondents "Please specify which organizational role and type best align with your current position." and then listed the same eight career alternatives as in Table 1. Q113 is labeled **job 2.0**.

3) Question 88 (Q88) of EMS 2.0 asked "Regardless of what you are doing now, how likely is it that you will do each of the following in the next FIVE YEARS?" and then listed the same eight career alternatives as in Table 1, each of which respondents had to rate on the same five-point Likert scale as in EMS 1.0 Q20. Q88 is labeled **organizational setting 2.0**.

Fig. 2 illustrates the theoretical framework that is developed based on the three survey questions described above, which capture "choice goals" and "choice actions" from the SCCT model. The three data points of organizational setting are ordered in a chronological sequence. The research questions

focus on the longitudinal change in organizational setting preference and the possible influence of background, learning and contextual measures.

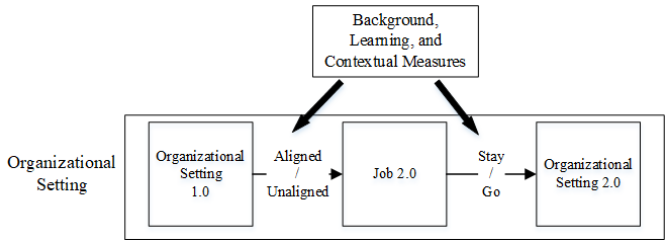

Fig. 2: Theoretical framework for the current study

Sample Selection

The sample for this paper consists of 350 EMS survey respondents who had completed their bachelor degree in engineering between 2015-16 and who worked full- or part-time at the time of completing the EMS 2.0 survey. In other words, individuals in this sample are all recent graduates from their engineering degree programs.

Categorization of Employees Regarding Different Organizational Settings

The research questions aim to identify the career goals, as defined by different organizational settings in the EMS data set. As previously mentioned, there are three different data points in the EMS regarding organizational setting. In the first data point, **organizational setting 1.0**, the respondents stated *how likely* it is that they work in a specific organizational setting after graduation. In the next data point, **job 2.0**, the respondents stated in which organizational setting they are *currently working*. In the last data point, **organizational setting 2.0**, the respondents stated in which organizational setting *they want to work* in the following five years.

EMS 1.0 Q20 and EMS 2.0 Q88 are both questions that ask 'how likely' provide answers choices on a 5-Point-Likert-Scale that ranges from "Definitely will not" to "Definitely will". This paper clusters "Definitely will not" and "Probably will not" together because they both mean that something will likely not happen. Similarly, "Definitely will" and "Probably will" are clustered together because they both mean that something will happen. According to this logic, "Might or might not" is its own group because it is in between.

In order to compare an individual's longitudinal changes in organizational setting, two constructs were developed: **level of alignment** and **level of stability**.

Level of Alignment

Level of alignment is determined by the position that respondents are working in, in 2016, and by the statement respondents gave one year earlier about their desired organizational setting. Thereby, three mutually exclusive groups are formed: Aligned, Fluid and Unaligned respondents.

Respondents who are employed in the type of organization, which they considered to be employed in one year ago (by stating "Probably will", "Definitely will" in Q20 on EMS 1.0) are called Aligned. For instance, a respondent who works currently (at the time of EMS 2.0) as an employee for a small business or start-up company (Option A in Table 1) and stated one year ago that they "Definitely will" or "Probably will" work as an employee for a small business or start-up company is classified as **Aligned**.

Respondents who are currently employed in the type of organization, that they did not consider as an option (by stating "Definitely will not", "Probably will not") are classified as Unaligned. For instance, a respondent who works currently as an employee for a small business or start-up company and stated one year ago that they "Definitely will not" or "Probably will not" work as an employee for a small business or start-up company is classified as **Unaligned**.

Respondents who are actually employed in the type of organization to which they stated "Might or might not" be employed are classified as Fluid. For example, a respondent who works currently as an employee for a small business or start-up company (Option A in Table 1) and stated one year ago that they "Might or might not" work as an employee for a small business or start-up company is called **Fluid**.

Level of Stability

Level of stability is determined by the current position the respondents are working in and by the organizational setting they want to work in within the next five years. Thereby, three mutually exclusive groups are formed: Stay, Flexible and Go respondents.

Respondents who are currently employed in the type of organization that they hope to be employed in for the next five years (by stating "Probably will", "Definitely will" in Q88) are classified as Stay respondents. Stay respondents do not want to leave their current organizational setting but they still could want to leave their company. Thus, for instance, a respondent who works currently as an employee for a small business or start-up company (Option A in Table 1) and stated that they, in the next five years, "Definitely will" or "Probably will" work as an employee for a small business or start-up company is called **Stay respondent**.

Respondents who are employed in the type of organization, which they do not consider as an option in the next five years (by stating "Definitely will not", "Probably will not") are classified as Go respondents. For instance, a respondent who works currently as an employee for a small business or start-up company and stated that they "Definitely will not" or "Probably will not" work as an employee for a small business or start-up company in the next five years is assigned to the **Go group** because they are expressing a desire to be in a different organization setting. Therefore, the respondent would have to change their organizational setting, which may mean leaving

their current company, in order to be consistent with their organizational setting goals.

Respondents who are employed in the type of organization to which they stated "Might or might not" be employed in the next five years are called **Flexible**. For example, a respondent who works currently as an employee for a small business or start-up company (Option A in Table 1) and stated that they "Might or might not" work as an employee for a small business or start-up company in the next five years is classified as Flexible.

Background, Learning, and Contextual measures

Job satisfaction measures how satisfied a respondent is with their current employed position. For the purpose of this paper, the job satisfaction variable is coded as 0="Not satisfied", 1="Satisfied". In the survey, job satisfaction was reported on a 5-Point-Likert-Scale which was then transformed into a binary category during analysis. Respondents who answered "Neither dissatisfied nor satisfied" belong to the not satisfied group. **Internship experience** measures if a respondent has done an internship during college time. It is a binary variable, which is coded 0="No" and 1="Yes". **Gender** is measured as female (coded as 0), male (coded as 1), and "I prefer not to answer" (coded as -9). For the purpose of the between-gender analysis, people marking "I prefer not to answer" are excluded. In this paper, **underrepresented racial/ethnic minority (URM)** is defined as any respondent who indicated a Latino/a, African American, Native American or Pacific Islander race or ethnicity. It is coded as 0="Not URM" and 1="URM". Adopted from Schar (2017), this paper defines **First Generation College (FGC)** as any respondent whose parent(s)/guardian(s) had less post-secondary education than an associate degree. It is coded as 0="FGC" and 1="Not FGC". **Grade Point Average (GPA)** is an ordinal variable and consists of the following eight answer options (including the coding): A or A+: 0; A-: 1; B+:2; B: 3; B-: 4; C+:5; C: 6; C- or lower: 7. For the purpose of this paper, the categories A or A+, and A- are always grouped together.

Sample Characteristics

Table 2 delineates background measures and employment status for the 350 employed respondents. The majority of respondents in the sample are men. Moreover, seven percent of the respondents are classified as URM and 15 percent are FGC. The mean age is 25 years. Ninety-four percent work in their employed position on a full-time basis.

Table 2: Distribution of background measures and employment status of the respondent sample

	Sample	Gender	URM and FGC		Employment Status	
	Total	Female	URM	FGC	Part-time	Full-time
n	350	127	25	51	20	330
%	100%	37%	7%	15%	6%	94%

V. Results

Overlap between level of alignment and level of stability

Table 3 illustrates the overlap between level of alignment (Aligned/Fluid/Unaligned) and level of stability (Stay/Flexible/Go). Four respondents are excluded from this analysis due to nonresponse to one or both of the alignment and stability items.

Table 3: Crosstab comparison between level of alignment and level of stability

		EMS 2.0			
		Stay	Flexible	Go	Total
EMS 1.0	Aligned	211 (85%)	34 (14%)	4 (1%)	249 (72%)
	Fluid	56 (77%)	12 (16%)	5 (7%)	73 (21%)
	Unaligned	10 (42%)	5 (21%)	9 (37%)	24 (7%)
	Total	277 (80%)	51 (15%)	18 (5%)	346

As shown in Table 3, the majority of respondents are Aligned (72%) and are classified as Stay respondents (80%). Go respondents form the smallest group, being only 5 percent of the sample.

Aligned respondents who want to Stay in their organizational setting form the largest group. Over half of respondents in both Aligned and Fluid categories are in the Stay category with regards to stability at their organizational setting. The group of Aligned Stay respondents is almost 53 times larger than the Aligned Go group (statistically significant difference in proportions, Fisher's exact test, $p<0.01$).

Notably, the 24 respondents in the Unaligned category are more evenly distributed (in terms of raw numbers) across the Stay, Flexible and Go categories than those in the Aligned and Fluid categories.

Exclusiveness & Inclusiveness of respondents regarding the organizational setting 1.0

So far, this paper has investigated what proportion of respondents are actually employed in an organizational setting that they hoped to be employed one year before. In the next step it is useful to probe if these respondents said only one time "definitely will" or "probably will" to one type of organizational setting (as listed in Table 1) (called exclusive) or if they said it multiple times, i.e., to multiple organizational settings (called inclusive). In other words, Exclusively Aligned respondents show preference for one specific organizational setting, whereas Inclusively Aligned respondents revealed preference for multiple organizational settings. For example, if a person stated only one "definitely will" to a small business and never "probably will" or "definitely will" to any other organizational setting (see Table 1), then the person would be classified as exclusive. If the person stated "definitely will" to a small business *and* a government institution, then the person would be classified as inclusive. Table 4 presents the distribution of exclusive and inclusive respondents across the level of alignment.

Table 4: Exclusiveness/inclusiveness

	Total	Exclusive N [%]	Inclusive N [%]
Aligned	249	157 (63%)	92 (37%)
Fluid	73	35 (48%)	38 (52%)
Unaligned	25	5 (20%)	20 (80%)

The fraction of Exclusive respondents differs by Alignment category (Aligned, Fluid, Unaligned; difference in proportions, $p<0.03$). The majority of Aligned respondents are Exclusive (63%), whereas, the majority of Unaligned respondents are Inclusive (80%).

Additional differences between Aligned respondents and Unaligned respondents

Table 5 shows how Aligned and Unaligned respondents differ based on background, learning, and contextual measures. The associations between the different variables and level of alignment groups are tested with Fisher's exact or chi-square test.

Table 5: Association between level of alignment and background, learning, and contextual measures

	Job Satisfaction N [%]	Internship Experience N [%]	Female N [%]	URM N [%]	FGC N [%]
Aligned	204 (82%)	210 (84%)	90 (36%)	23 (9%)	42(17%)
Fluid	59 (81%)	47 (64%)	25 (34%)	1 (1%)	6 (8%)
Unaligned	19 (82%)	17 (68%)	11 (46%)	1 (4%)	3 (12%)

The proportion of satisfied respondents in each level of alignment group is around 82 percent and is not statistically different across levels ($p>0.1$).

Some 84 percent of the Aligned respondents have done an internship in comparison to only 68 percent of the Unaligned respondents (marginally significant difference in proportions, Fisher's exact test, $p=0.051$). Similarly, some 64 percent of the Fluid respondents have done an internship which is significant different from the Aligned group (statistically significant difference in proportions, chi-square test, $p<0.01$).

There is no significant difference in the percentage representation of women across the three alignment groups. There is a statistical difference between the percentage of URM respondents in the Aligned and Fluid groups (chi-square test, $p<0.05$). There is a marginally significant difference between the percentages of FGC respondents in Aligned and Fluid groups (chi-square test, $p=0.07$). Overall, we see greater proportions of URM and FGC respondents are in the Aligned groups.

Association between level of stability and background, learning, and contextual measures

Table 6 shows the results of the relationship between level of stability (i.e., Stay or Go) and background, learning, and contextual measures.

Table 6: Association between level of stability and background, learning, and contextual measures

	Job satisfaction N [%]	Internship Experience N [%]	Female N [%]	URM N [%]	FGC N [%]
Stay	231 (83%)	224 (81%)	105 (38%)	20 (7%)	43 (15%)
Flexible	39 (77%)	41 (79%)	13 (25%)	5 (10%)	8 (15%)
Go	12 (79%)	11 (61%)	9 (50%)	0 (0%)	0 (0%)

There is no significant difference in job satisfaction based on level of stability. The proportion of respondents who have done an internship is much higher in the Stay group (81%) compared to only 61 percent in the Go group (marginally significant difference in proportions, Fisher's exact test, $p=0.07$). The proportion of women in the Go group (50%) is the highest of all the stability groups, significantly higher than the proportion of women in the Flexible group (statistically significant difference in proportions, chi-square test, $p=0.04$). The proportions of FGC in the Stay group and the Flexible group differ from the share of FGC in the Go group (marginally significant difference in proportions, Fisher's exact test, $p=0.09$). URM status is not statistically related to level of stability ($p>0.1$). Across both sets of analyses, undergraduate GPA is not statistically related to level of alignment *or* stability ($p>0.1$).

Difference between small and large companies

To better understand the differences between Aligned and Unaligned, and between Stay and Go respondents we considered differences between specific organizational settings (see Table 7). Due to the small numbers in many organizational groups only two groups are considered: employees in small business or start-up company and employees in medium- or large-size business.

Table 7: Percentage distribution of respondents currently in small and large companies

	Aligned	Fluid	Un-aligned	Stay	Flexible	Go
	30	23	7	45	10	5
Small business	50%	38%	12%	75%	17%	8%
Women	10	10	2	18	1	3
%	45%	45%	10%	86%	0%	14%
Men	20	13	5	27	9	2
%	53%	34%	13%	71%	24%	5%
Medium and	205	43	8	215	37	6
Large firms	79%	17%	3%	83%	14%	2%
Women	76	12	5	81	10	3
%	82%	13%	5%	86%	11%	3%
Men	128	31	3	134	26	3
%	79%	19%	2%	82%	16%	2%

Since 74 percent of the women in our sample are in medium and large companies and only 17 percent are employed in small businesses, it is interesting to look, in particular, at the share of women who want to leave in these two groups. The share of Go women in small businesses is 14 percent, higher than the 3 percent in large firms. The share of Go men in small businesses is 5 percent, similar to the 2 percent in large firms.

As presented in Table 7 (left part) just 50 percent of the employees in a small company are Aligned, as compared to 79 percent of those in medium and large firms (statistically significant difference in proportions, Fisher's exact test, $p<0.01$). Consistent with these results, the share of Unaligned employees is also higher in small companies. In the 'Stay/Go' construct, the difference between small, and medium and large firms is not as large as in the level of alignment category. However, in a small company, the proportion of employees who want to Stay is still lower than the proportion of employees who want to Stay in a medium and large company (statistically significant difference in proportions, Fisher's exact test, $p=0.03$). Furthermore, in a small company the proportion of employees who want to Go is higher than the proportion of employees who want to Go in a medium and large company (statistically significant difference in proportions, Fisher's exact test, $p=0.03$).

VI. Discussion

The large proportion of Aligned respondents (72%) suggests that most respondents have identified, even before graduation, what kind of organizational setting they want to work in, and they are able to achieve those goals. This underscores the importance of an institution's career center supporting the career development process earlier than in a student's last year of university. These findings initially seem at odds with previous literature, which suggests that many engineering students, even shortly before graduation, are undecided about their career plans [18]. The difference can be explained by the fact that organizational setting is not a detailed job description, or even a statement about working in engineering or non-engineering roles. It is possible that students have some sense of the type of organizational setting they want to work in (e.g., large or small company), but not the specific job (and/or are considering many roles and positions).

The majority of respondents are Aligned and even more respondents want to Stay in their current organizational setting. The high percentage of Aligned and Stay respondents hints that the respondents mostly make the "right" setting decision in the first few years after earning their bachelor's degree. Moreover, the job decisions regarding organizational settings may not change often or quickly. This stands in contrast to literature regarding general career choices, which states that career decisions are unstable and turnover rates are high [19, 20]. We note, though, that staying in an organizational setting can simultaneously involve changing jobs or companies within the same type of organizational setting. For instance, a person can leave Google but go to Amazon. High turnover, in other words, can describe jobs and companies, and not necessarily what we call "organizational settings" in our research.

The data reveal that the share of respondents who want to leave small companies, as an organizational setting, is higher than for medium or large organizations. The results are in accordance with research from Tak [21], which states that employees in small- and medium-sized companies are more likely to leave their organizations.

No conclusion about fluctuation *within* a company setting can be derived from this finding because the EMS only provides data about the type of organization; it is possible that Stay respondents also change companies but Stay in the same organizational setting.

Those with a preference for multiple organizational settings (inclusive alignment) are less driven by pursuing a particular organizational setting (and even more Fluid), and so they were perhaps more willing to take a job that was not Aligned with their interests. It is striking that if they were inclusive, meaning they had goals to pursue multiple organizational settings, then the respondents were less likely to be Aligned than the exclusive group, despite having more opportunities for alignment (as multiple organizational settings could have led to alignment). Our results suggest people who are open to working in a variety of organizational settings are more likely to find themselves unaligned with their organizational setting goals once employed. Perhaps being 'open' or 'inclusive' leads to less of a drive for a particular organizational setting.

The results show that level of alignment is not associated with job satisfaction. This finding is somewhat contradictory with previous literature, which indicates that job satisfaction relates to the work environment and personality type [22, 23]. It may be the case that job satisfaction relates more closely with the role assigned to an individual or the experience within a specific company, rather than alignment with the desired organizational setting, which is a broader description of the work environment.

Level of alignment is associated with having done internships. One possible interpretation of this finding is that internships may help students to identify their preferred organizational setting. These results are in accordance with the results of Neapolitan [24], who concludes that internships clarify career choices. Reasons could be that students recognize what they like and what they do not like. They can test different professions and work environments. Our data show that if a respondent has done an internship, the person is more likely to have a desire to Stay in her or his current organizational setting (which may be different from where they did their internship). Institutions could better support their students getting internships. Internships allow students to experience different types of organizational settings prior to committing to a full-time job after graduation. This could support students in goal setting and career goal achievement. Literature also indicate a positive impact of internships on the future career like job offers and salary, but there is little literature regarding the influence of internships on career choice [25, 26].

In the current research, higher percentages of URM and FGC respondents are observed within the Aligned group as compared to their percentages within Unaligned and Fluid groups. There is little research that investigates if FGC student characteristics have an influence on career choice and how URM students act on their career options after graduation [27]. Future research needs to explore why rates of alignment might differ for different groups of students.

Half of those who indicated that they want to leave their organizational setting are women, even though the proportion of women in our sample was only 37 percent. Furthermore, we see that women working in small businesses/start-ups are more likely to fall into our Go category than are men employed in small businesses/start-ups. In addition, women working in large companies are slightly more likely fall into the Go group, but there is not a large difference compared to men. Further work is warranted to better understand how women experience working in different types of organizational settings, as this may be an influencer for job shifts. Some studies indicate that, in general, women are more likely to leave their employer [28, 29]. However, there is scarce information regarding women's turnover intentions related to organizational setting in previous research. Moreover, only 45% of the women in small companies are Aligned, as compared with over 80% of the women in large companies. This trend is also shared by men. This suggests that a fair number of individuals who were not planning on working for a small company do.

The fractions of URM respondents in the 'Stay' and 'Go' groups are similar. However, there were very few URM respondents in our sample, so these results should be interpreted with caution. Further research is necessary to improve our understanding of how underrepresented racial/ethnic minorities experience the work place in different types of organizational settings and how this influences their decisions to Stay in or change organizational settings. The percentages of FGC respondents in the Stay and Flexible groups differ marginally from that in the Go group, suggesting that half of the FGC respondents found the "right" organizational setting. Similarly though, these results should be interpreted with caution due to the small sample size. No previous literature is found on turnover intentions of FGC.

VII. Conclusion, Implications and Limitations

All in all, the results of this research suggest that most respondents are Aligned (thereof most are exclusively Aligned) and want to Stay within their organizational setting in the next five years. These results also suggest that most respondents have made their career choice before graduating with an engineering degree on an organizational setting and this career choice seems relatively stable. The choice of wishing to stay in the same organizational setting is higher for Aligned than for Unaligned respondents. Employees in small companies are relatively less Aligned and are more likely to plan to leave this organizational setting compared with employees in medium and large firms. Level of alignment has a statistically significant association with internship, URM and FGC, whereas level of stability has a statistically significant association with person inputs and learning experience like internship, gender and FGC. Doing an internship is associated with a higher level of alignment and lower intentions to pursue a different organizational setting.

Implications for our theoretical framework (SCCT) are threefold. First, our work focuses on a dynamic dimension of choice goals and choice actions: longitudinal alignment between the two. In other words, our work suggests that researchers using SCCT might examine not only a variable such as "persistence in field", but how well persisting in a field aligns with one's initial goals as the primary career outcome of interest. Second, in our work, person inputs and learning environments appear to have more salience in alignment than do the (very few) contextual measures under study. Would this be true in a more comprehensive, larger study of alignment? How do possible effects of inputs and learning environments actually depend on (broader measures of) contextual supports and barriers, for instance? Third, to what extent would more complex SCCT-based models necessitate separate analyses for such groups as women and men? Are plans to leave a small firm (and then actual departure) goals/actions that operate differently for different social groups, so much so that a single model with moderators would not sufficiently reveal how theorized associations are contingent on one's social location, status, and identity?

The current study has a number of implications for schools of engineering and universities at large. On the one hand, career development centers can play a stronger role in finding internships and advising students about careers. This consultation should already start at the beginning of the studies to establish a continuous process. Career development centers can also work as an intermediary to connect students with companies (e.g. through a database). Career advisors could discuss organizational setting as a factor in career decision making, not just roles or specific companies. Consequently, students would consider the type of organization they feel they could prosper and enjoy working in. On the other hand, faculty should be more involved in advising about careers but also adapt the curriculum to include mandatory internships.

Moreover, universities could connect current engineering students with alumni through a mentor program that gives students valuable insights, chances to do internships at alumni companies, and opportunities to make even more informed career decisions. Engineers pursue jobs in various organizational settings and work in a diversity of roles, and alumni can provide valuable insight to current students [29–31]. Career counseling and advising should involve discussions about organizational setting (size of firm) and not just role or other factors related to the job. The goal would be to move towards alignment for all engineering students as they move into the workforce—and perhaps even a more holistic rendering of alignment, where setting, role, company, and short- and long-term personal and financial goals are evaluated in tandem.

Several limitations to this paper should be noted. The basis of this paper is the EMS, which is a nationally-representative, multi-institutional, longitudinal paper with focus on engineering students career pathways. This paper took a sub-sample of the EMS by selecting only participants who have graduated since 2015 and have a bachelor degree in engineering. Therefore, the results and respective conclusions are limited to this population and cannot be generalized to students of other majors, nations and educational systems.

Even so, relatively little is known in literature about the experience of engineering graduates in the transition phase from school-to-work, and this paper helps to understand engineering graduates' career decisions with regard to alignment [9, 10]. Organizational setting can be influential in career decisions and could be considered alongside occupation and role. Consequently, the concept of organizational settings can add value to the career choice literature. The impact of alignment should be tested in further studies. Alignment can be a useful dimension to add to the SCCT model, particularly in longitudinal studies that capture career goals over time and job placement. Qualitative interviews could be helpful to give deeper insights in the quantitative results of this paper. Future research could examine the indication that a number of individuals who were not planning on working for a small company actually does work for small companies. Analyses related to URM and FGC status should be interpreted with caution due to the small sample size of respondents in these groups. Future work could collect data especially from URM and FGC respondents in specific organizational settings to get more statistical power and insight into the experiences of respondents from these backgrounds. Future research needs to look at URM, FGC, and gender more intersectionally as well.

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