The impact of engineering identity and mindset on undergraduate engineering students' perceptions of failure

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Musab Umair graduated with a BSc in Software Engineering from McGill University, where he developed a strong interest in the educational experiences of engineering students. Drawing from both academic study and firsthand experience, his work reflects on how engineering education can better support student learning and professional development.

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1. Introduction and Background

This empirical research brief paper explores the impact of engineering identity and mindset on undergraduate engineering students' perceptions of failure.

Failure plays a central role in learning and innovation in STEM, as evidenced by accounts of successful practitioners across STEM who describe failure as essential to their development and problem-solving processes [1]. Additionally, productive failure has been shown to enhance students' conceptual understanding and transfer more effectively than direct instruction [2]. However, research and student narratives suggest that many students enter university unprepared to cope with challenges and setbacks, having had limited exposure to productive failure and thus interpreting ordinary difficulties as threats rather than learning opportunities [1], [3].

The implications of failure in undergraduate engineering programs may be different because of their distinctive structure and culture. Compared to other college programs, engineering programs are highly career-focused, emphasize rigorous math and science coursework, and often employ competitive grading practices and "weeding-out systems" [4]; as a result, engineering retention is driven primarily by students' quantitative preparation, first-year GPA, and confidence in engineering-related abilities [5]. Beyond these academic factors, Marra *et al.* found that students' lack of belonging is significantly associated with leaving engineering [6]. While failure in engineering education has been researched extensively, most studies tend to examine the relationship between failure and one construct, e.g., emotions, mindset, fear, or impact on learning [7]. This narrow focus may limit our understanding of how multiple constructs interact to shape students' perceptions and responses to failure.

Our study seeks to advance this research area by integrating engineering identity, which has been associated with belonging and persistence [8], [9], with mindset to explore the combined influence on perceptions of failure, emotions, and use of learning strategies. By explicitly modeling the joint roles of engineering identity and mindset, we examine whether engineering identity mediates links between fixed mindset and adaptive or maladaptive outcomes. In doing so, we move beyond single-factor explanations of failure to consider how multiple constructs and their interplay can provide a more holistic understanding of undergraduate engineering students' relationship with failure.

Our research questions (RQs) are the following: (1) *How do engineering identity and mindset relate to perceptions and fears of failure, achievement emotions, and learning strategies?* and (2) *Does engineering identity mediate the relationship between fixed mindset and these outcomes?*

2. Methodology

We developed a survey instrument that was informed by Henry's theoretical framework on how students approach academic challenge and respond to failure in STEM [10]. The survey included constructs and items related to Godwin's measure of engineering identity [11]; mindset (Dweck's implicit theories of intelligence beliefs) [12]; perceptions of failure and how to reduce its stigma [13], as well as the modified Performance Failure Appraisal Inventory (PFAI) measure for assessing fear of failure in STEM students [14]; the Achievement Emotions Questionnaire (AEQ) to assess emotions experienced by students in academic settings [15]; and the Motivated Strategies for Learning Questionnaire (MSLQ) [16]. Including 8 demographic questions, the survey contained a total of 116 items with Likert scale (range of 1 to 5), multiple response, and open-ended questions. We ran our survey with undergraduate engineering students at McGill University, a Canadian institution with R1 designation, during the spring of 2025. Students were invited to participate in the survey via an email sent by the student affairs office; two reminders were also sent. The survey was anonymous and participants could opt in to a draw for a $25 gift card (one drawn for every 10 participants who entered); email addresses for the draw were collected separately from the survey responses to ensure anonymity. We received 232 valid responses, corresponding to a response rate of ~ 7%, see Table A1 (Appendix A) for demographic details. The study was approved by McGill University's Research Ethics Board (REB#25-01-036).

In a companion work, we examined the student's fears and perceptions of failure, their suggestions for reducing stigma within and beyond the university context, and how the responses differed across demographic variables such as gender or the number of semesters of study completed [17]. To answer the RQs of this paper, we used SPSS for descriptive statistics, group comparisons (*t*-tests), and hierarchical regression analysis, as well as the PROCESS macro [18] for mediation analysis. The independent variables included measures of demographics, mindset, and engineering identity profiles. We examined constructs (output variables) related to perceptions and fears of failure, emotions, and learning strategies. The variables are summarized in Tables A2 and A3 (Appendix A). While we collected various demographic variables (e.g., first-generation status, disability, and ethnicity), we emphasize gender and number of semesters completed for group comparisons due to statistical power and space constraints; however, these factors are included in our hierarchical models.

3. Results

Table B1 (Appendix B) presents descriptive statistics for the variables. Where applicable, all have acceptable to excellent Cronbach's alpha reliability levels (acceptable > .70 to excellent > .90) and normal distributions (skewness < 2.0 and kurtosis < 7.0) [19]. Table 1 shows that a higher engineering identity profile (ENGID-PROFILE = 1) was reported amongst men and students in their later semesters, whereas a lower engineering identity profile was more common amongst women and students in earlier semesters. *t*-tests showed that students with ENGID-PROFILE = 1 were more open to experience failure (higher values of PERCEPTION-1) and less likely to 'study to avoid failure' (higher values of PERCEPTION-2) compared with ENGID-PROFILE = 0, with both differences being statistically significant, see Table B2 (Appendix B). Moreover, students with ENGID-PROFILE = 1 were significantly more likely to endorse positive views of failure, e.g., seeing it as *an important source of feedback* and *an opportunity to learn*. Table 2 shows the frequency distribution of the multiple select item PERCEPTION-3 while Table 3 summarizes the statistically significant chi-square tests.

Table 1. Frequency distribution of ENGID-PROFILE across demographic measures.

ENGID-PROFILE	Total	GENDER		SEMESTER	
		Women	Men	3 or less	4 or more
0 - Low	115	77	38	64	53
1 – High	109	49	60	41	69

Table 2. Frequency distribution of PERCEPTION-3 across engineering identity profile.

I see failure as… (PERCEPTION-3)	Total	ENGID-PROFILE	
		Low	High
something to avoid	149	61	86
a sign I'm doing something wrong	174	68	104
an important source of feedback	129	34	93
an opportunity to learn	126	40	85

Table 3. Chi-Square Tests of Independence for PERCEPTION-3 by engineering identity profile.

Profile Variable	Theme	$\chi^2(df, N)$	*p*	Cramer's V	Odds Ratio [95% CI]
ENGID-PROFILE	Important source of feedback	$\chi^2(1, 229) = 21.311$	$p < .001$	.305	3.61 [2.07, 6.28]
ENGID-PROFILE	Opportunity to learn	$\chi^2(1, 229) = 7.653$	$p = .006$	.183	2.13 [1.24, 3.64]

Note. Cramer's V effect size interpretation: small ≈ .10, medium ≈ .30, large ≈ .50 [20]. Odds ratios represent odds for the high-profile group (coded 1) relative to the low-profile group (coded 0).

In addition to more positive perceptions of failure, as shown in Table B2 (Appendix B), group comparisons revealed that students with ENGID-PROFILE = 1 used effective learning strategies, expressed more positive emotions, and reported significantly lower fears of failure on the PFAI scales and from society, shame and anxiety, and negative emotions. Moreover, students with ENGID-PROFILE = 1 endorsed a higher growth (GROWTH) mindset (mean = 3.575, SD = 1.013) compared to those with a low engineering identity profile (mean = 3.230, SD = .954), $t(223) = -2.628$, $p = .009$. They also reported a lower fixed (FIXED) mindset (mean = 2.449, SD = 1.034) compared to students with ENGID-PROFILE = 0 (mean = 2.872, SD = 1.064), $t(220) = 3.038$, $p = .003$ (note that given the exploratory nature of our study, we did not apply any formal correction for multiple comparisons, e.g., Bonferroni). Table 4 shows the comparisons on engineering identity (ENGIDENTITY) by mindset profiles. Students with a high growth profile (GROWTH-PROFILE) exhibited a significantly stronger engineering identity while those with a high fixed profile (FIXED-PROFILE) had lower engineering identity.

Table 4. Comparisons of ENGIDENTITY by mindset profiles.

	Low		High		*df*	*t*	*p*	*Cohen's d*
	M	*SD*	*M*	*SD*				
ENGIDENTITY by GROWTH-PROFILE	3.820	.657	4.071	.502	197.822	-3.194	.001	-.432
ENGIDENTITY by FIXED-PROFILE	4.056	.565	3.856	.606	220	2.530	.012	.341

Note. Cohen's *d* interpretation: small ≈ .20, medium ≈ .50, large ≈ .80 [20].

We conducted hierarchical regression analyses for the outcome variables using a three-step model: Step 1 included demographic controls (GENDER, SEMESTER, FIRSTGEN [first generation student = Yes], DOMESTIC [domestic student = Yes]), NOTDISABLED [no disability identified]), and WHITE [ethnic group = white]), Step 2 added mindset variables (FIXED, GROWTH), and Step 3 introduced ENGIDENTITY. Regression assumptions (normality, linearity, homoscedasticity, independence, multicollinearity, and influential cases) were examined. All models met assumptions except societal pressures (SOCIETAL-P), which showed moderate departures from normality and mild heteroscedasticity. Given the exploratory nature of the analysis, the model was retained. All final models were statistically significant based on the overall F-test ($F = 2.461 - 23.290$, $p < .05$), except for interpersonal pressures (INTERP-P), and explained between 16.3% and 51.8% of the total variance. Results are summarized in Tables B3 and B4 (Appendix B).

ENGIDENTITY emerged as a statistically significant predictor ($p < .05$) in all models except for INTERP-P and AUTHFIG-P, with standardized coefficients ranging from $\beta = -.489$ to $\beta = .678$ and contributed the largest incremental variance (ΔR^2) in nearly half of the outcomes. Specifically, ENGIDENTITY positively predicted the adaptive outcomes, including openness to experiencing failure (PERCEPTION-1), less likely to exhibit study to avoid failure behaviors (PERCEPTION-2), using effective learning strategies (LEARN-STRAT), and positive achievement emotions (POSITIVE-AEQ). It also negatively predicted maladaptive outcomes such as experiencing learning and failure related shame (SHAME-INDEX), experiencing learning and test related anxiety (ANXIETY-INDEX), negative achievement emotions (NEGATIVE-AEQ), fears of failure (PFAI-COMPOSITE), and societal pressures (SOCIETAL-P).

We then examined whether ENGIDENTITY (M) mediates the relationship between FIXED mindset (X) and the outcome variables (Y) shown in Table 5. We used Hayes' PROCESS v5.0 macro (Model 4) with 5,000 bias-corrected bootstrap samples and a fixed random seed (2025) to ensure reproducibility of bootstrap confidence intervals. In this model:

- *Path a* represents the effect of FIXED mindset (X) on ENGIDENTITY (M),
- *Path b* shows the effect of ENGIDENTITY (M) on the outcome variable (Y),
- The indirect effect (ab) is the product of paths a and b and represents the mediated effect, and
- The direct effect (c') refers to the relationship between FIXED mindset (X) and the outcome variable (Y) after accounting for ENGIDENTITY (M).

Indirect effects were considered significant if the 95% bootstrap confidence interval excluded zero. *Path a* was statistically significant ($p < .05$) across all models, with coefficients ranging from -0.138 to -0.150 due to variations in sample size. All indirect effects (ab) were significant except for INTERP-P. As shown in Table 5, eight outcomes exhibited full mediation (indirect-only), i.e., the indirect effect was significant while the direct effect was not. Two outcomes, negative achievement emotions (NEGATIVE-AEQ) and openness to experiencing failure (PERCEPTION-1), showed partial mediation, where the direct effect was significant alongside the indirect effect.

Table 5. Mediation results for fixed mindset via engineering identity

Outcome Variable	*N*	Path *b*	Direct Effect (*c′*)	Indirect Effect (*ab*)	95% Bootstrapped CI	Mediation Type
PERCEPTION-1	215	.459***	-.190***	-.065	[-.122, -.027]	Partial
PERCEPTION-2	219	1.120***	-.093 (ns)	-.155	[-.255, -.070]	Full
SOCIETAL-P	220	-.407***	-.015 (ns)	.057	[.016, .121]	Full
AUTHFIG-P	212	-.222*	.002 (ns)	.033	[.005, .081]	Full
INTERP-P	221	-.142 (ns)	.067 (ns)	.020	[-.007, .062]	No
PFAI-COMPOSITE	220	-.484***	.096 (ns)	.070	[.030, .130]	Full
POSITIVE-AEQ	222	.735***	-.022 (ns)	-.105	[-.168, -.048]	Full
NEGATIVE-AEQ	222	-.758***	.107*	.108	[.051, .175]	Partial
LEARN-STRAT	215	.413***	-.009 (ns)	-.061	[-.113, -.027]	Full
SHAME-INDEX	222	-.665***	.106 (ns)	.095	[.045, .163]	Full
ANXIETY-INDEX	222	-.626***	.059 (ns)	.089	[.041, .152]	Full

Note. Analyses used PROCESS v5.0 Model 4. Significance: $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$; ns = not significant. Indirect effects based on 5,000 bootstrap samples; CIs excluding zero indicate mediation.

4. Discussion and Limitations

Our findings underscore the critical role of engineering identity and mindset in shaping students' learning experiences in engineering. Specifically, our results have shown that a strong engineering identity is strongly associated with growth mindset tendencies and adaptive outcomes such as positive perceptions of failure, constructive achievement emotions, effective learning strategies, and intrinsic motivation, while being inversely related to fixed mindset tendencies and maladaptive responses to failure such as negative emotions, fear of failure, and shame and anxiety. Further, mediation analysis suggests that engineering identity plays an important mediating role in the relationship between mindset and these outcomes.

The limitations of this study include data collection from a single institution, a modest response rate, and the use of self-reported measures (which may be prone to social desirability bias on items related fears of failure, emotions, and learning strategies), as well as potential self-selection bias due to voluntary participation. Moreover, the responses lacked diversity, especially in terms of gender. Together, these may limit the generalizability of the findings to other engineering programs with different cultures or structures, may not capture the experiences of gender-diverse students, and may diminish (or magnify) relationships among the variables.

5. Implications and Next Steps

For educators, our findings suggest that interventions aimed at strengthening engineering identity, such as mentoring programs or authentic engineering experiences, could foster a growth mindset and resilience, and enable the use of effective learning strategies, increase motivation, and enhance emotional regulation in the face of failure. Moreover mindset-focused interventions, e.g., those that promote a growth mindset [21], [22] or normalize setbacks [23], [24], [25] may be more effective when complemented with opportunities that help students see themselves as capable contributors to engineering practice. Specific examples include structured mentorship and guidance, authentic design work, and explicit discussions about failure in professional practice. Approaches can be embedded in first-year courses, capstone design projects, and advising to normalize failure as a part of learning and reduce its stigma. Such efforts may also support retention in engineering programs, particularly among underrepresented groups such as women, who reported weaker engineering identity profiles compared to men. Overall, combining growth-mindset practices with identity-affirming experiences may provide a more holistic approach to supporting adaptive responses to failure.

As next steps, we aim to conduct surveys across multiple institutions and with larger and more diverse samples to enhance the generalizability of our findings, as well as longitudinal studies to see how identity and mindset develop over time. This will allow us to examine more fully how gender and other demographic factors interact with identity and mindset in shaping students' responses to failure. We will also be able to build on our companion qualitative analysis [17], which indicated meaningful differences in whether students internalize or externalize failure, e.g., self-attribution vs. external pressures, to examine these behavioural patterns more fully.

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Appendix A. Demographics and variables from survey.

Table A1. Demographic details of participants (n = 232).

	n	%
Gender		
Man	100	43.1
Woman	127	54.7
Other	1	<0.5
Prefer not to say	4	1.7
Student status		
Domestic	181	78.0
International	41	17.7
Other	5	2.2
Prefer not to say	4	1.7
Did not answer	1	<0.5
Number of semesters of study completed		
1-3	106	45.7
4+	124	54.3
Prefer not to say	2	<1
First-generation student		
No	207	89.2
Yes	22	9.5
Prefer not to say	2	<1
I do not know	1	<1
Ethnic or cultural group*		
Arab	16	
Asian	57	
Black	4	
Latino/Latina	12	
South Asian	11	
Southeast Asian	9	
West Asian	2	
White	120	
None of the above	4	
Prefer not to answer	17	
Other	5	
Disability		
No	135	58.2
At least one identified	61	26.3
Prefer not to say	8	3.4
No answer	28	12.1
Program		
Architecture	2	<1
Bioengineering	40	17.2
Chemical engineering	21	9.0
Civil engineering	37	15.9
Electrical, computer, or software engineering	66	28.4
Mechanical engineering	41	17.6
Mining and materials engineering	16	6.9
Prefer not to say	8	3.4
Did not respond	1	<0.5

*The survey item asking about ethnic or cultural group was multi-response, i.e., a student could select all options that applied; thus, the total count can exceed n = 232.

Table A2. Independent variables.

Variable name	Type	Description
GENDER*	Dichotomous	0 (woman) or 1 (man)
SEMESTER	Dichotomous	0 (3 or fewer semesters of study completed) or 1 (4 or more semesters of study completed)
GROWTH	Continuous	Average of four Likert scale items from Dweck's measure of incremental beliefs (growth mindset)
GROWTH-PROFILE	Dichotomous	0 (low) or 1 (high) whether GROWTH ≥ its median value of 3.5
FIXED	Continuous	Average of four Likert scale items from Dweck's measure of entity beliefs (fixed mindset)
FIXED-PROFILE	Dichotomous	0 (low) or 1 (high) whether FIXED ≥ its median value of 2.5
ENGIDENTITY	Continuous	Average of the following three scales from Godwin's measure of engineering identity (RECOGNITION, INTEREST, PERFORMANCE/COMPETENCE)
ENGID-PROFILE	Dichotomous	0 (low) or 1 (high) whether ENGIDENTITY ≥ its median value of 3.909.

***Using a dichotomous gender variable was a choice that reflects a limitation of the dataset rather than a conceptual position as apart from 4 participants that preferred not to say, only 1 identified outside the woman/man categories.

Table A3. Constructs (output variables) related to perceptions and fears of failure, emotions, and learning strategies.

Construct	Description
PERCEPTION-1	Average of three Likert scale items assessing attitudes toward learning from failure and openness to setbacks (a higher score indicates greater openness to experiencing failure)
PERCEPTION-2	Likert scale item, "*I study to avoid failure rather than to succeed*" (reverse coded so that higher values indicate a lower tendency to study to avoid failure)
PERCEPTION-3	Multiple select item assessing students' framing of failure
SOCIETAL-P	Likert scale item, "*Societal pressures contribute to my fear of failure*"
AUTHFIG-P	Composite factor derived from three Likert scale items related to fears of failure from family, friends, and peers
INTERP-P	Composite factor derived from three Likert scale items related to fears of failure from teachers, supervisors, and mentors
PFAI-COMPOSITE	Composite factor derived from four PFAI scales related to fears of uncertain future, important others' losing interest, upsetting important others, and experiencing shame and/or embarrassment when failing
POSITIVE-AEQ	Composite factor of positive achievement emotions derived from AEQ scales related to enjoying learning, feeling hopeful in learning, and having pride in learning
NEGATIVE-AEQ	Composite factor of negative achievement emotions derived from AEQ scales related to anger, anxiety, shame, hopelessness, and boredom
LEARN-STRAT	Composite factor of learning strategies derived from MSLQ scales related to elaboration, critical thinking, and self regulation
SHAME-INDEX	Composite factor of fear of experiencing shame derived from corresponding PFAI and AEQ scales
ANXIETY-INDEX	Composite factor of learning-related anxiety derived from corresponding AEQ and MSLQ scales

Appendix B. Analysis of survey data.

Table B1. Descriptive statistics for independent and constructed variables.

Variable / measure	Mean	SD	Skewness	Kurtosis	Cronbach's Reliability
ENGIDENTITY	3.942	.594	-.601	.899	.874
GROWTH	3.397	.992	-.173	-.839	.896
FIXED	2.665	1.135	.298	-.914	.904
PERCEPTION-1	3.368	.995	-.370	-.545	.715
PERCEPTION-2	2.903	1.392	.095	-1.325	-
SOCIETAL-P	4.188	1.049	-1.463	1.601	-
AUTHFIG-P	3.583	.894	-.559	.265	-
INTERP-P	3.596	.946	-.814	.411	-
PFAI-COMPOSITE	2.941	.880	-.437	-.776	.904
POSITIVE-AEQ	3.768	.687	-.672	.609	.874
NEGATIVE-AEQ	3.308	.896	-.109	-.435	.929
LEARN-STRAT	3.529	.636	-.097	.499	.849
SHAME-INDEX	3.373	1.051	-.296	-.759	.895
ANXIETY-INDEX	3.586	.927	-.461	-.364	.872

Table B2. Group comparisons of the outcome variables by ENGID-PROFILE.

Variable	Low		High		*df*	*t*	*p*	*Cohen's d*
	M	***SD***	***M***	***SD***				
GROWTH	3.230	.954	3.575	1.013	223	-2.628	.009**	-.351
FIXED	2.877	1.064	2.449	1.034	220	3.038	.003**	.408
PERCEPTION-1	3.133	.990	3.638	.911	219	-3.936	< .001***	-.530
PERCEPTION-2	2.371	1.269	3.477	1.295	223	-6.472	< .001***	-.863
SOCIETAL-P	4.381	.876	3.991	1.148	224	2.890	.004**	.385
AUTHFIG-P	3.675	.870	3.492	.877	215	1.546	.123 (ns)	.210
INTERP-P	3.650	.896	3.544	.969	225	.851	.396 (ns)	.113
PFAI-COMPOSITE	3.205	.830	2.777	.857	224	3.811	<.001***	.507
POSITIVE-AEQ	3.419	.652	4.121	.509	227	-9.020	< .001***	-1.193
NEGATIVE-AEQ	3.523	.702	2.714	.769	227	8.327	< .001***	1.101
LEARN-STRAT	3.357	.626	3.702	.583	214	-4.188	< .001***	-.570
SHAME-INDEX	3.691	.968	2.998	1.040	227	5.228	< .001***	.691
ANXIETY-INDEX	3.965	.800	3.236	.891	227	6.516	< .001***	.862

Note. Cohen's *d* interpretation: small ≈ .20, medium ≈ .50, large ≈ .80 [20]. Significance: **p* < .05, ***p* < .01, ****p* < .001; ns = not significant

Table B3. Variance explained by each step of the hierarchical regression and final model variance for the outcome variables.

Outcome Variable	**ΔR^2 (Step 1)**	**ΔR^2 (Step 2)**	**ΔR^2 (Step 3)**	**Final R^2**
PERCEPTION-1	.037	.076***	.051***	.163***
PERCEPTION-2	.109***	.038*	.129***	.277***
SOCIETAL-P	.095**	.008	.017*	.120*
AUTHFIG-P	.094*	.004	.004	.102
INTERP-P	.044	.01	.001	.055
PFAI-COMPOSITE	.127***	.054**	.060***	.242***
POSITIVE-AEQ	.070*	.082***	.365***	.518***
NEGATIVE-AEQ	.125***	.073***	.192***	.390***
LEARN-STRAT	.067*	.021	.120***	.208***
SHAME-INDEX	.132***	.040**	.072***	.243***
ANXIETY-INDEX	.107***	.035*	.088***	.230***

Note. ΔR^2 values reflect incremental models (Steps 1–3), and the final column shows overall R^2. Asterisks indicate significance: *$p < .05$, **$p < .01$, ***$p < .001$. Step 1 includes GENDER, SEMESTER, FIRSTGEN, DOMESTIC, NOTDISABLED, WHITE; Step 2 adds GROWTH and FIXED; Step 3 adds ENGIDENTITY.

Table B4. Final hierarchical regression results: overall model *F* statistics and significant predictors.

Outcome Variable	***F*(5, *df*)**	**Significant Predictors**
PERCEPTION-1	F(5, 199) = 4.313***	FIXED (β = -.201*) ENGIDENTITY (β = .251***)
PERCEPTION-2	F(5, 203) = 8.623***	NOTDISABLED (β = .182**) ENGIDENTITY (β = .402***)
SOCIETAL-P	F(5, 204) = 3.086**	GENDER (β = -.178*) WHITE (β = -.147*) ENGIDENTITY (β = -.146*)
AUTHFIG-P	F(5, 200) = 2.461*	GENDER (β = -.198**) DOMESTIC (β = -.177*)
INTERP-P	F(5, 205) = 1.334 (ns)	GENDER (β = -.169*)
PFAI-COMPOSITE	F(5, 190) = 6.742***	GENDER (β = -.149*) NOTDISABLED (β = -.238***) FIXED (β = .273**) ENGIDENTITY (β = -.300***)
POSITIVE-AEQ	F(5,195) = 23.290***	ENGIDENTITY (β = .678***)
NEGATIVE-AEQ	F(5, 194) = 13.794***	NOTDISABLED (β = -.175**) FIXED (β = .261**) ENGIDENTITY (β = -.489***)
LEARN-STRAT	F(5, 199) = 5.815***	ENGIDENTITY (β = .388***)
SHAME-INDEX	F(5, 197) = 7.037***	GENDER (β = -.198***) SEMESTER (β = -.152*) FIXED (β = .257*) GROWTH (β = .205*) ENGIDENTITY (β = -.299***)
ANXIETY-INDEX	F(5, 200) = 6.651***	GENDER (β = -.129*) NOTDISABLED (β = -.188**) FIXED (β =.215*) ENGIDENTITY (β = -.369***)

Note. Values are from the final hierarchical regression models, including demographic controls (GENDER, SEMESTER, FIRSTGEN, DOMESTIC, NOTDISABLED, WHITE), mindset variables (GROWTH, FIXED), and ENGIDENTITY. The table reports the overall model F-statistic and predictors that remained significant in the final model for each outcome variable. Coefficients are standardized (β). Significance levels are denoted as *$p < .05$, **$p < .01$, ***$p < .001$.