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A New Pathway to University Retention?

Identity Fusion with University Predicts Retention Independently of Grades

Sanaz Talaifar & Ashwini Ashokkumar*

James W. Pennebaker, Fortunato N. Medrano, David S. Yeager

William B. Swann, Jr.

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Abstract

Individuals who are “strongly fused” with a group view the group as self-defining. As such, they should be particularly reluctant to leave it. For the first time, we investigate the implications of identity fusion for university retention. We found that students who were strongly fused with their university (+1 SD) were 7% - 9% points more likely than weakly fused students (-1SD) to remain in school up to a year later. Fusion with university predicted subsequent retention in four samples (N = 3,193) and held while controlling for demographics, personality, prior academic performance, and belonging uncertainty. Interestingly, fusion with university was largely unrelated to grades, suggesting that identity fusion provides a novel pathway to retention independent of established pathways like academic performance. We discuss the theoretical and practical implications of these findings.

Keywords: retention, persistence, attrition, academic performance, identity fusion

Retention in college continues to be a serious national problem. Only about 40% of university students in the United States graduate in four years, and only 60% graduate in six years (National Center for Education Statistics). For students, failing to graduate is associated with less lifetime earnings (Carnevale, Jayasundera, & Cheah, 2011) and earlier mortality (Miech, Pampel, Kim, & Rogers, 2011). For universities, low graduation rates threaten their core educational mission and cause lost tuition dollars. For society, low graduate rates undermine efforts to produce an educated citizenry and workforce prepared for the modern global economy.

Building on early foundational work (e.g., Tinto, 1971), recent experimental work has identified a promising array of social-psychological interventions for increasing retention in college. Research on belonging uncertainty—defined as the worry that one’s membership in a negatively-stereotyped group could mean that one cannot belong in college— is of particular relevance here. This work has focused on removing the psychological barriers (e.g., identity threats) that stand in the way of achievement by redirecting people’s subjective perceptions of difficulty (Walton & Cohen, 2007; Yeager et al., 2016). Interventions that bolster students’ sense of belonging in academic settings are members of the larger class of “barrier-reducing” interventions (Yeager & Walton, 2011) that have a venerable history in social psychology. In particular, the barrier-reduction idea originated with Lewin’s (1951) proposal that when psychological barriers derail goal pursuit and cause underperformance, one should remove the barriers that are blocking goal pursuit.

As effective as barrier-reducing interventions have been, their effectiveness has led to the neglect of the complementary approach within the identity theorist’s mandate: an asset-promotion approach that focuses on cultivating feelings of academic agency. We propose that cultivating identity fusion with one’s university may be one such asset-promoting approach.

Students fused with a university integrate academic life into their emerging sense of self and long-term identities, a process that may have enduring effects on academic outcomes. In contrast, the effects of barrier-reducing approaches will tend to bolster performance only within the setting that occasions the barrier (Steele, 1997; Walton & Brady, 2017).

Whereas past work has primarily focused on identity fusion in political contexts, the fusion approach we present here focuses on the academic consequences of a visceral feeling of “oneness” with the university (Swann, Jetten, Gómez, Whitehouse, & Bastian, 2012). Because strongly fused people internalize the qualities of the group and regard the group as self-defining, they are reluctant to leave the group, even when remaining is personally costly (Whitehouse, McQuinn, Buhrmester, & Swann, 2014; Fredman et al., 2015) and fellow group members ostracize them (Gómez, Morales, Hart, Vázquez, & Swann, 2011). This suggests that students who are fused with their university will display loyalty to it (Talaifar & Swann, 2019) and high rates of retention.

Interestingly, whereas barrier-reducing approaches (e.g., belonging uncertainty interventions) tend to produce improvements in grades and retention concurrently (Wilson & Linville, 1982; Yeager et al., 2016), identity fusion with the university may provide a viable path to retention independent of academic performance. Consider that when students have been asked to reflect on their feelings of fusion with the university, they expound on themes like strong social bonds and school spirit (Buhrmester, 2013), aspects of the university that may keep people in school but bear little relation to what goes on in the classroom. The fusion approach to predicting retention therefore differs from extant work that assumes that retention depends on maximizing academic performance (for a review, see Harackiewicz & Priniski, 2018).

Overview of Current Research

Two studies examined whether identity fusion with university could prospectively predict retention and grade point average (GPA). We expected fusion with university to positively predict retention but not GPA, even when controlling for a wide array of variables that have been associated with academic outcomes in past research (e.g. Ivcevic & Brackett, 2014). The control variables included were demographics (year in school, gender, ethnicity, socioeconomic status), personality (Big 5 traits), belonging uncertainty, and prior academic performance (SAT scores in Study 1, prior cumulative GPA in Study 2). Unlike many studies that rely on intentions to remain enrolled and self-reported academic performance, we used behavioral measures of these variables in both studies. Using a prospective design, Study 1 investigated whether fusion would predict outcomes measured one semester later and if the timing of the fusion measure (i.e. pre- or post-matriculation) would matter. Using three archival cohorts, Study 2 attempted to replicate the results of Study 1 with outcomes measured one *and* two semesters later.¹ Both studies were conducted at a large, public university in the southwest United States. The university is considered “more selective” and had a 70% graduation rate in 2018, up from 53% in 2012.

Study 1 Methods

Table 1 depicts the timeline, sample sizes, and data sources for all Study 1 measures. Table 2 depicts the Study 1 correlations. For further methodological details of both studies, see the Supplemental Online Materials (SOM-I). The pre-matriculation analyses include all 5,722

¹ In both studies, GPA *collected* one semester later (e.g. in Spring 2016) actually reflects grades from the semester in which fusion was measured (e.g. Fall 2015). Similarly, in Study 2, GPA *collected* two semesters later (e.g. in Fall 2016) reflects grades from the previous semester (e.g. Spring 2016). Further, in all analyses we use semester GPA as the outcome rather than cumulative GPA because we were interested in whether fusion predicts GPA *prospectively*, and cumulative GPA includes grades from prior to when fusion was measured. Still, the results we report are essentially the same for cumulative GPA given the high correlation between semester and cumulative GPAs ($r_s > .93$). This is a result of the sample being mostly freshman, for whom semester and cumulative GPA are identical.

freshmen. The post-matriculation analyses include 875 students from an introductory psychology course, 358 of whom had also completed the pre-matriculation measures. For this latter subset of participants who completed fusion at both timepoints, we were able to examine the effect of change in fusion on retention and GPA. We report the fusion change analyses in SOM-II because sample size considerations prevented us from drawing strong inferences from these results.

Table 1. Study 1 Data Collection Procedure

	Pre-Matriculation: Summer 2017	Post-Matriculation: Fall 2017	One Semester Later: Spring 2018
Data source	Online orientation module	Intro. to Psychology course	Official university records
<i>N</i>	5,722 freshmen	875 students, including 358 freshmen from the summer sample	all 6,239 students from the summer and fall samples
Measures	Identity fusion with university Belonging uncertainty*	Identity fusion with university Big 5 personality traits* Belonging uncertainty*	Retention Semester GPA Demographics* SAT/ACT scores*

Note. Control variables are marked with an asterisk.

Pre-Matriculation: Summer 2017

The pre-matriculation survey was administered as part of an online orientation module that all freshmen at the university had to complete in summer 2017 before they came to college (see SOM-I). We surveyed 5,723 incoming freshmen. One participant who did not consent post-matriculation to their data being used for research was removed, leaving a final sample of 5,722 ($M_{age} = 18.5$; $SD_{age} = .55$; 57% female, 40.6% White). Participants completed the seven-item verbal identity fusion scale (Gómez et al., 2011; e.g., “*I am one with [the university]*”; see SOM-III) on a six-point scale (1 – *strongly disagree*, 6 – *strongly agree*). This pre-matriculation measure of identity fusion with university ($M = 4.13$; $SD = .89$; $\alpha = .91$, 95% CI = [.91, .92]) is our primary independent variable along with identity fusion measured post-matriculation. Participants also completed a four-item measure of belonging uncertainty (Yeager et al., 2016; e.g., “*I wonder if I*

will really fit in when I get to UT") on a five-point scale (1 – not at all true, 5 – completely true; $M = 3.60$, $SD = .83$, $\alpha = .83$, 95% CI = [.82, .84]).

Post-Matriculation: Fall 2017

Post-matriculation data was collected in Fall 2017 from 886 students who were enrolled in an introductory psychology course. Five students who did not consent to their data being used for research, two participants for whom there were no university records, and four post-graduate students were excluded, leaving a total post-matriculation sample size of 875 students ($M_{age} = 19.2$; $SD_{age} = 2.44$; 38.4% White; 67.7% female, 60.6% freshmen). Of the total post-matriculation sample, 358 freshmen ($M_{age} = 18.4$; $SD_{age} = .52$; 40.2% White; 76.8% female) had also been part of our pre-matriculation sample.

Participants completed the same identity fusion with university scale administered in the summer on a seven-point scale (1 - *strongly disagree*, 7 – *strongly agree*; $M = 3.83$, $SD = 1.28$, $\alpha = .91$, 95% CI = [.90, .92]). Because the pre- and post-matriculation identity fusion measures used different response scales, we standardized fusion scores at each time point and used z -scores in all analyses—except for those that include fusion at both time points (i.e. the fusion change models in SOM-II). In analyses that include fusion at both time points, we transformed each fusion score by converting it to the percent of maximum possible score (POMP; Cohen, Cohen, Aiken, & West, 1999) to maintain differences in level and variance of fusion variables. A paired t -test comparing the POMP scores revealed that fusion scores dropped from summer to fall among students who participated at both time points ($t(360) = 13.0$, $p < .001$).

To control for personality traits, we also accessed participants' scores from the 44-item Big-Five inventory (BFI; John, Donahue, & Kentle, 1991), which they had completed in class earlier in the semester. Participants also completed a two-item measure of belongingness

uncertainty (e.g. “To what degree do you feel that you belong at [the university]?”) on a five-point scale (*1 – not at all, 5 – completely*, $M = 3.43$, $SD = .95$, $\alpha = .83$, 95% CI = [.81, .85]), and their scores were standardized. We also used POMP scores for belonging uncertainty in correlation Tables 2 and 4 so that comparison to fusion scores are on a more meaningful scale.

To ease comparison with fusion, in both studies we reverse-coded belonging uncertainty so that higher numbers indicated greater certainty. Although identity fusion and belonging were moderately correlated, Table 2 provides evidence of differences between the two constructs: belonging (i.e. belonging uncertainty reverse coded) tended to be positively related to SES, GPA, and SAT while identity fusion tended to be negatively or non-significantly related to SES, GPA, and SAT. That is, lower SES students and those with weaker academic backgrounds felt *less* belonging but *similar* or *greater* amounts of fusion. Table 4 shows similar trends in Study 2. See SOM-IV for analyses regarding the discriminant validity of fusion and belonging uncertainty.

One Semester Later: Spring 2018

Once participants had completed one semester at the university (i.e., Spring 2018), we accessed their official records with the help of an education innovation project at the university. More specifically, we obtained the remaining control variables: demographics (year in school, gender, ethnicity, socioeconomic status) and SAT scores.

We also obtained outcome variables from university records: semester GPA and retention. A student was considered “retained” (code = 1) if they were enrolled in Fall 2017 and either were also enrolled at the university on the 12th class day of Spring 2018 or had graduated at the end of Fall 2017. (Only four students graduated, since most Study 1 participants were freshmen). Students were considered “not retained” (code = 0) if they did not enroll in Spring 2018 or dropped out before the 12th class day of Spring 2018. Fifty-four (10%) pre-matriculation

students, 28 (3%) post-matriculation students, and 6 (2%) students who participated at both timepoints were coded “not retained.” Note that students who were “not retained” could have dropped out or transferred to another school. A technical report on graduation rates at the university showed that of the students who were not retained, 70% did not complete their education either at our university or another university. This suggests that our retention measure is a viable, albeit imperfect, measure of degree completion.

Study 1 Results

Did Pre-Matriculation Identity Fusion with University Predict Retention or Grades?

Retention. In a logistic binomial regression, pre-matriculation (summer) fusion did not predict retention (OR = 1.12, 95% CI = [.94, 1.33], Wald $\chi^2 = 1.6$, $p = .21$), and this relationship remained non-significant even when we controlled for demographics, personality, SAT scores, and belonging uncertainty ($ps > .15$). See SOM-V for full results of pre-matriculation fusion predicting retention and grades.

Grades. In a linear regression, pre-matriculation (summer) fusion unexpectedly *negatively* predicted semester GPA ($b = -.06$, 95% CI [-.07, -.04], $t(5622) = -7.71$, $p < .001$, $R^2_{adj} = .01$). The effect remained negative and significant controlling for demographics, personality, SAT scores, and belonging uncertainty ($ps \leq .014$). However, the effect was small: the mean GPA of strongly fused students (+1SD above the mean) was 3.17 as compared to 3.27 for weakly fused students (1SD below the mean).

Did Post-Matriculation Identity Fusion with University Predict Retention or Grades?

Retention. As shown in Table 3, post-matriculation fusion significantly predicted retention in a logistic binomial regression. Fusion with university predicted future retention even when we controlled for demographics, personality, SAT scores, and belonging uncertainty.

Table 2. Study 1 Correlation Table

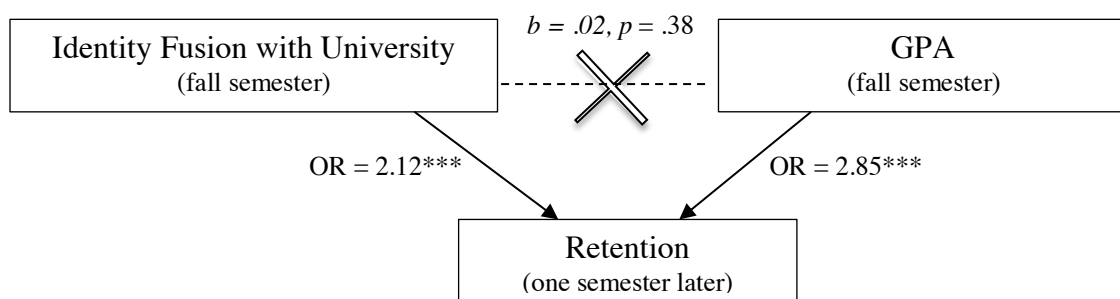
Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. T1 fusion with university	62.70	17.71											
2. T2 fusion with university	47.21	21.34	.49**										
3. T1 belonging uncertainty – reversed	65.09	20.61	.40**	.23**									
4. T2 belonging uncertainty – reversed	60.87	23.81	.18**	.34**	.39**								
5. Semester GPA	3.38	0.59	-.10**	.03	-.01	.11**							
6. SAT scores	1316.16	167.1	-.27**	-.10*	.07**	.15**	.32**						
7. SES	5.38	1.57	-.13**	.03	.09**	.16**	.22**	.48**					
8. Extraversion	3.12	0.82	.16**	.29**	.27**	.23**	.01	.04	.12**				
9. Agreeableness	3.76	0.61	.24**	.15**	.17**	.08*	-.01	-.16**	-.05	.07*			
10. Conscientiousness	3.46	0.64	.14**	.15**	.13**	.13**	.19**	-.05	.06	.13**	.29**		
11. Neuroticism	3.06	0.77	-.06	-.17**	-.26**	-.32**	-.00	.01	-.02	-.24**	-.27**	-.28**	
12. Openness	3.54	0.60	.09*	-.03	.08	.02	-.06	.02	-.02	.08**	.11**	.02	.00

Note. * indicates $p < .05$. ** indicates $p < .01$. Fusion and belonging uncertainty scores were transformed into the percent of maximum possible score (POMP) on a 0 to 100 scale to account for variations in the measurement scales used. Personality traits were measured with the BFI.

To illustrate the size of our effect, 99% of students in our sample who scored more than a standard deviation above the fusion mean remained enrolled the following semester (i.e. 1 of 137 strongly fused students dropped out or transferred). In comparison, 92% of students who scored less than a standard deviation below the mean remained enrolled a semester later (i.e. 12 of 150 weakly fused students dropped out or transferred).

Grades. In a second linear regression, consistent with our pre-registered hypothesis (see <https://osf.io/tw7sy>), we found no significant relationship between post-matriculation fusion and semester GPA, even controlling for demographics, personality, SAT scores, and belonging uncertainty. As depicted in Figure 1, semester GPA did predict retention (OR = 2.85, 95% CI [1.78, 4.51], $\chi^2 = 30.0$ $p < .001$) on its own, even though fusion and GPA were unrelated. Thus, we conclude that post-matriculation fusion and GPA represent independent paths to retention.

Figure 1. Identity Fusion and Academic Performance Provide Independent Paths to Retention



Note. *** indicates $p < .001$.

Table 3. Study 1 Results: Post-matriculation identity fusion predicted retention one but not grades one semester later

	Retention One Semester Later			Grades One Semesters Later			R^2_{adj}
	OR [95% CI]	Wald χ^2	p	AIC	b	t	
Model 1 – no controls				236			.00
Identity fusion with university (z)	2.13 [1.47, 3.14]	15.31	< .001		.02 [-0.02, .06]	.89	.38
Model 2 – with demographic controls				114			.08
Identity fusion with university (z)	3.53 [1.93, 7.11]	14.88	< .001		.02 [-0.03, .06]	.79	.42
Freshman status	2.24 [.68, 8.06]	1.69	.19		.14 [.04, .23]	2.91	.004
SES	.96 [.65, 1.34]	.05	.82		.07 [.04, .10]	4.76	< .001
Ethnicity	3.89 [1.17, 15.3]	4.50	.034		.17 [.07, .27]	3.43	< .001
Gender	1.80 [.54, 6.10]	.94	.33		.07 [-0.03, .16]	1.34	.18
Model 3 – with personality controls				215			.05
Identity fusion with university (z)	1.87 [1.23, 2.88]	8.44	.004		.01 [-0.05, .04]	-.38	.71
Openness	1.14 [.58, 2.25]	.13	.71		-.03 [-0.10, .04]	-.74	.46
Conscientiousness	1.11 [.56, 2.24]	.09	.76		.24 [.17, .31]	6.81	< .001
Extraversion	.81 [.48, 1.36]	.65	.42		.02 [-0.04, .07]	.57	.57
Agreeableness	.70 [.32, 1.47]	.85	.36		-.09 [-0.16, -.01]	-2.34	.02
Neuroticism	1.07 [.60, 1.93]	.06	.81		.03 [-0.03, .09]	1.13	.26
Model 4 – with SAT control				145			.19
Identity fusion with university (z)	2.81 [1.72, 4.82]	15.82	< .001		.04 [-0.003, .08]	1.85	.07
SAT	1.01 [1.00, 1.01]	11.36	< .001		.002 [.001, .002]	12.52	< .001
Model 5 – with belonging uncertainty control				237			.01
Identity fusion with university (z)	2.17 [1.46, 3.24]	14.68	< .001		-.007 [-0.05, .04]	-.29	.77
Belonging uncertainty	.96 [.64, 1.43]	.05	.83		.08 [.04, .13]	3.46	< .001

Note. Personality traits were measured with the BFI. Demographic controls were dummy coded as follows: freshman status (0 = non-freshman; 1 = freshman), ethnicity (0 = underrepresented minority; 1 = Asian or White), and gender (0 = male; 1 = female).

Discussion

Study 1 showed that students' identity fusion with the university predicted retention the following semester when it was measured post-matriculation (but not pre-matriculation), even after controlling for demographic variables, personality traits, SAT scores, and belonging uncertainty. Post-matriculation identity fusion did not predict semester GPA, reflecting our pre-registered hypothesis that fusion and grades would be unrelated. The finding that pre-matriculation fusion had a small, negative relationship with grades was unexpected but is consistent with the idea that, unlike belonging uncertainty, fusion provides a pathway to retention independent of the academic performance pathway to retention: strongly fused students remained in school even if they were not excelling academically.

Study 2 draws on three archival student cohorts to replicate the effects of fusion among currently enrolled students in Study 1 on retention and GPA measured both one *and* two semesters later. In Study 1, since most participants were freshmen, we used SAT scores to control for prior academic performance. In Study 2, we used cumulative GPA from the semester before participants were surveyed for an even more conservative test. All other control variables in Study 2 were identical to those in Study 1.

Study 2 Methods

Participants

We accessed archival data from students enrolled in three semesters of an introductory psychology course. We collected data from all participants who completed the identity fusion with university questionnaire in Fall 2015 ($N = 1117$), Spring 2016 ($N = 438$), and Fall 2016 ($N = 781$). An a priori power analysis conducted with G*Power 3.1 showed that we would need 478 participants to detect an effect of the size found in Study 1 (using retention probabilities

predicted from post-matriculation fusion) with 80% power and $\alpha = .05$. Thus, we had adequate power in each individual semester to test our primary hypothesis.² Here we report results from the combined sample of all semester, but results for each individual semester, which were largely consistent, are reported in SOM-VI.

From the total sample, we excluded two students who did not provide consent for their data to be analyzed for research purposes, nine students who were enrolled in either post-bachelor or graduate programs, and seven students whose academic records we could not access. We were left with a final sample of 2,318 participants ($M_{age} = 18.77$; $SD_{age} = 1.80$; 62.2% female, 36.7% White; 65.5% freshmen) from Fall 2015 ($N = 1110$), Spring 2016 ($N = 436$), and Fall 2016 ($N = 772$).

Procedure

Study 2's procedure followed Study 1's post-matriculation procedure. Table 4 depicts Study 2 correlations. Participants in each semester completed an abbreviated three-item identity fusion with university scale during the semester (e.g. "I have a deep emotional bond with the university"). Fusion was measured with slightly different items and response scales in different semesters, so we standardized each semester's fusion scores and used z -scores in all regression analyses. See the SOM-III for the fusion item wording in each semester. Participants in all three semesters completed the Big-Five Inventory as a control variable. In addition, students in the Fall 2016 semester completed a two-item measure of belonging uncertainty (e.g. "When you think about how you felt about being at UT, how often, if ever, do you wonder: 'Maybe I don't belong here?'") on a five-point scale ($1 - not at all, 5 - completely, M = 2.57, SD = .90, \alpha = .82$).

² With the exception of Spring 2016's, which falls just short of 80% power.

Other control variables (i.e. demographics and cumulative GPA from the semester before fusion was measured) and our dependent variables (semester GPA and retention) were accessed from university records as in Study 1. As specified in footnote 1, GPA collected one and two semesters later reflect grades in the concurrent and next semester, respectively. We used the protocol described in Study 1 to compute each student's retention one *and* two semesters later. Overall, 97 (4.19%) students were coded as “not retained” after one semester and 194 (8.37%) after two semesters.

Study 2 Results

Did Identity Fusion with University Predict Retention One and Two Semesters Later?

As shown in Table 5, students' mid-semester identity fusion with university predicted retention the following semester in a logistic binomial regression. Replicating our finding from Study 1, the relationship between fusion among currently enrolled students and retention a semester later remained significant when we controlled for demographics, personality, cumulative GPA from the previous semester, and belonging uncertainty.

Another logistic binomial regression predicting retention *two* semesters later, also shown in Table 5, revealed a significant effect of identity fusion with university even when we controlled for demographics, personality, and cumulative GPA from the previous semester. Identity fusion with university did not predict retention two semesters later, $OR = 1.14$, 95% CI [.84, 1.52], $\chi^2 = .72$, $p = .40$, when controlling for belonging uncertainty alone. However, when we accounted for the positive relationship between prior academic performance and belonging ($r(180) = .28$), fusion with university did predict retention two semesters later while belonging uncertainty did not (see Model 5). We are unable to assess the robustness of this finding because belonging uncertainty was only measured in one of the three semesters.

Table 4. Study 2 Correlation Table

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Identity fusion with university	51.43	26.87									
2. Belonging uncertainty – reversed	53.59	24.74	.50**								
3. Concurrent semester GPA	3.14	0.68	.01	.22**							
4. Next semester GPA	3.27	0.64	-.03	.16**	.67**						
5. SES	5.14	1.63	-.06**	.12**	.25**	.26**					
6. Extraversion	3.12	0.81	.30**	.18**	-.04	.00	.05*				
7. Agreeableness	3.75	0.63	.14**	.02	-.02	-.04	-.01	.16**			
8. Conscientiousness	3.47	0.64	.14**	.19**	.22**	.18**	.02	.15**	.25**		
9. Neuroticism	3.05	0.76	-.19**	-.32**	-.01	.00	-.04	-.28**	-.28**	-.27**	
10. Openness	3.62	0.61	.06**	.06	-.05*	-.05*	.03	.18**	.10**	.03	-.07**

Note. * indicates $p < .05$. ** indicates $p < .01$. Belonging uncertainty was only measured in Fall 2016; therefore row/column 2 correlations refer to Fall 2016 data only. All other correlations reflect data combined across the three semesters. Fusion and belonging uncertainty scores were transformed into the percent of maximum possible score (POMP) on a 0 to 100 to account for variations in the measurement scales used. Personality traits were measured with the BFI.

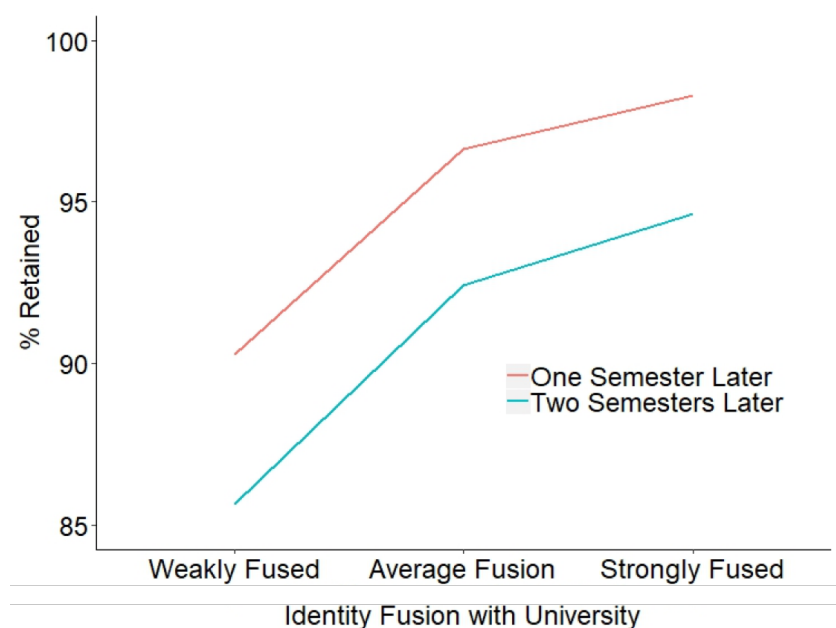
Table 5. Study 2 Results: Identity fusion predicted retention one and two semesters later

	One Semester Later				Two Semesters Later			
	OR [95% CI]	Wald χ^2	<i>p</i>	AIC	OR [95% CI]	Wald χ^2	<i>p</i>	AIC
Model 1 – no controls				769				1304
Identity fusion with university (z)	1.97 [1.59, 2.45]	38.33	< .001		1.55 [1.34, 1.81]	33.02	< .001	
Model 2 – with demographic controls				568				1069
Identity fusion with university (z)	2.15 [1.67, 2.81]	33.67	< .001		1.62 [1.37, 1.92]	31.57	< .001	
Freshman status	1.70 [1.03, 2.78]	4.44	.035		.91 [.64, 1.30]	.25	.61	
SES	1.16 [1.00, 1.36]	3.84	.05		1.14 [1.02, 1.26]	5.85	.016	
Ethnicity	1.35 [.80, 2.27]	1.27	.26		1.75 [1.23, 1.78]	9.77	.002	
Gender	1.45 [.88, 2.37]	2.14	.14		1.27 [1.02, 1.26]	1.86	.17	
Model 3 – with personality controls				663				1181
Identity fusion with university (z)	2.08 [1.63, 2.69]	32.75	< .001		1.62 [1.37, 1.92]	30.94	< .001	
Openness	1.11 [.77, 1.59]	.32	.57		.93 [.72, 1.20]	.34	.56	
Conscientiousness	1.57 [1.09, 2.26]	5.92	.015		1.62 [1.25, 2.09]	13.37	< .001	
Extraversion	.74 [.55, 1.00]	3.86	.049		.80 [.65, .99]	4.07	.044	
Agreeableness	.96 [.66, 2.69]	.04	.84		.92 [.70, 1.19]	.41	.52	
Neuroticism	.80 [.58, 1.10]	1.93	.16		.91 [.73, 1.13]	.73	.39	
Model 4 – with prior GPA control				303				353
Identity fusion with university (z)	1.85 [1.33, 2.61]	12.99	< .001		1.83 [1.36, 2.50]	15.2	< .001	
Prior cumulative GPA	3.82 [2.43, 6.10]	32.94	< .001		4.08 [2.68, 6.29]	42.16	< .001	
Model 5 – with belonging uncertainty control				273				98
Identity fusion with university (z)	1.94 [1.31, 2.90]	10.90	< .001		2.00 [1.08, 3.80]	4.78	.029	
Belonging uncertainty	1.47 [1.00, 2.20]	3.62	.057		1.44 [.79, 2.73]	1.38	.24	
Prior cumulative GPA	--	--	--		2.02 [.79, 5.21]	2.18	.14	

Note. Models 1 – 4 reflect logistic regressions conducted with the combined sample (N = 2,318). Model 5 reflects a logistic regression conducted with the Fall 2016 sample (N = 772), the only semester belonging uncertainty was measured. Personality traits were measured with the BFI. Demographic controls were dummy coded as follows: freshman status (0 = non-freshman; 1 = freshman), ethnicity (0 = underrepresented minority; 1 = White or Asian), and gender (0 = male; 1 = female).

To illustrate the size of our effects and as depicted by the orange line in Figure 2, 98.3% of students who scored a standard deviation above the fusion mean remained enrolled a semester later (i.e. 6 of 354 strongly fused students dropped out or transferred). In comparison, 90.3% of students who scored a standard deviation below the mean remained enrolled a semester later (i.e. 38 of 391 strongly fused students dropped out or transferred). Regarding results two semesters later, depicted by the blue line in Figure 2, 94.6% of students who scored more than a standard deviation above the fusion mean remained enrolled (i.e. 19 of 354 strongly fused students dropped out or transferred). In comparison, 85.7% of students who scored less than a standard deviation below the mean were enrolled two semesters later (i.e. 56 of 391 weakly fused students dropped out or transferred).

Figure 2. Percentage of Students Retained by Level of Identity Fusion with the University



Note. Identity fusion with university across all three semesters ($N = 2,318$) predicted retention one semester later (orange line) and two semesters later (blue line). “Weakly Fused” refers to students who scored less than 1 SD below the fusion mean, “Strongly Fused” refers to students who scored more than 1 SD above the mean, and “Average Fusion” refers to students who fall in between ± 1 SD. Fusion scores were standardized within semester.

Did Identity Fusion with University Predict Grades One and Two Semesters Later?

To test whether identity fusion with university would not predict academic performance, we conducted linear regressions examining the relationship between identity fusion and students' concurrent GPA (collected one semester after fusion was measured) and their next semester GPA (collected two semesters after fusion was measured). There was no relationship between fusion and GPA of the concurrent semester ($b = -.01$, 95% CI $[-.02, .03]$, $p = .65$) or the next semester ($b = -.02$, 95% CI $[-.05, .01]$, $p = .14$). These relationships remained non-significant when controlling for demographics, and cumulative GPA from the prior semester ($ps > .17$). When controlling for personality, fusion also predicted concurrent semester GPA non-significantly ($p = .88$) but next semester GPA slightly negatively ($b = -.03$, 95% CI $[-.06, -.01]$, $p = .02$). Controlling for belonging uncertainty, fusion's relationship with semester GPA also became slightly negative (concurrent semester $b = -.08$, 95% CI $[-.14, -.03]$, $p = .003$; for next semester $b = -.07$, 95% CI $[-.12, -.01]$, $p = .016$). Full results are reported in SOM-VII.

Replicating findings from Study 1, GPA predicted retention (see Model 4, Table 5) even though fusion and GPA were unrelated without control variables (see Table 4 or SOM-VII). We therefore conclude that fusion and academic excellence each provide an independent path to retention.

General Discussion

We proposed that when students become strongly fused to their university, they incorporate the university into their self-definitions and are thus more likely to remain enrolled. Two quasi-longitudinal studies involving four samples of students supported this reasoning. Specifically, relative to weakly fused students, those who were strongly fused with the university were 7 – 9% more likely to be enrolled up to a year later. It is noteworthy that our studies measured actual retention at the university, rather than self-reported intentions to persist or persistence in one class or major (e.g. Kizilcec, Saltarelli, Reich, & Cohen, 2017; Canning et al., 2017). One limitation of extant barrier-reducing strategies for promoting retention (Harackiewicz & Priniski, 2018) is their focus on relatively transitory or circumscribed aspects of student life—such as the relevance of course material to their goals, their construal of current obstacles, or doubts about whether they belong in a major or university. Overcoming these barriers will not necessarily foster persistence when they face new, unrelated challenges. In contrast, the fact that people’s identities tend to be stable and enduring (Swann, 1997) may explain why identity fusion’s effects on retention did not diminish over time.

The relationship between fusion with the university and retention were not due to strongly fused students’ demographics, personality, belonging uncertainty, or prior academic performance. In fact, the GPAs of strongly fused students were not any better than those of weakly fused students. Our evidence that grades did not underlie the relationship between fusion and retention challenges the assumption that all paths to retention must run through high academic performance. Note that grades *did* provide a reliable pathway to retention; it was just that the effect of fusion with the university followed an independent pathway to retention (see Figures 1). A grade-independent pathway to retention is viable and potentially important given

that graduating and going on to a successful career does not require being an academic superstar. In fact, grades have relatively little predictive power for career success (Roth, BeVier, Switzer, & Schippmann, 1996), especially when compared to the predictive power of degree attainment (Case & Deaton, 2017).

Our findings demonstrate four ways in which fusion differs from belonging. First, whereas belonging is believed to predict retention through grades, fusion predicted retention independently of grades. Relatedly, lower SES students and those with weaker academic backgrounds felt less belonging but equal or greater amounts of fusion. Second, fusion predicted retention even when we controlled for feelings of belonging uncertainty. Third, factor and principle components analyses in the supplemental materials show evidence of fusion and belongingness uncertainty's discriminant validity. Together, these data provide converging evidence for the unique properties of fusion and belonging uncertainty.

Given the long-term individual and societal benefits of university retention, we believe it is important to develop fusion-boosting interventions. The negative relationship between fusion with the university and grades in Study 1 should not prevent the development of such interventions because the effect size was negligible and did not reliably replicate. Furthermore, although improving retention is a worthy goal in and of itself, such interventions could always be coupled with interventions targeting academic performance. In fact, fusion interventions may be particularly useful for students who fail to respond to interventions targeting academic performance. Recent work linking fusion with university to higher well-being (Talaifar, Ashokkumar, Sarma, & Swann, in prep) further justifies developing fusion-boosting interventions.

Researchers have only recently begun to grapple with the challenge of bolstering fusion. Some have suggested that fusion is caused by shared ritualistic activities that are emotional, causally opaque, and symbolically charged (Jong, Whitehouse, Kavanaugh, & Lane, 2015; Whitehouse, 2018). Others have pointed to evidence of the links between perceptions of shared essence and fusion (Swann et al., 2014). This work suggests that fusion could be bolstered by systematically increasing the degree to which students feel that they share essential characteristics with other members of the academic community. In addition to developing new interventions inspired by research on fusion, existing university orientation programs and traditions, which are likely tailored to the school's unique culture and context, could be altered to augment fusion.

For administrators and policymakers concerned with retention, fusion with university could be used to identify students at risk for dropping out but who would otherwise be overlooked by conventional predictors of retention (e.g., poor grades). More specifically, administrators could flag weakly fused students even if they have adequate or good academic performance. The practical utility of using fusion for identifying at risk students is enhanced by the fact that, unlike prior retention-related scales that include as many as 53 items (e.g. Davidson, Beck, Milligan, 2009), in Study 2 fusion predicted retention using only three items.

Limitations, Generalizability, and Future Directions

We proposed that “identity fusion,” a deep emotional bond to a group, would predict retention in college. However, students' fusion scores *before* they arrived at the university—before they had experienced the reality of university life—had little predictive power, consistent with work showing that people have difficulty forecasting their future emotional reactions (Wilson & Gilbert, 2005). Furthermore, we suggested that because students might fuse with

non-academic dimensions of the university, fusion might predict retention in the absence of superior academic performance. However, because we have no information regarding what fusion with the university meant to students, we cannot rule out other explanations. One possibility is that students did fuse with academic dimensions of the university but not in ways that translated to higher GPA. (For example, strongly fused students may have been so dedicated that they enrolled in more challenging classes, increasing the difficulty of achieving a high GPA).

Before designing interventions, researchers should clarify the nature of students' fusion, which may vary across students and universities, to better understand mechanisms underlying fusion's relationship with retention and performance. For example, at universities that provide few opportunities for fusing with non-academic dimensions of the university, fusion may not have differential effects on grades and retention. And although we considered remaining at the university as a positive outcome in the present context, fusion may not be desirable when remaining at the university is not in the best interest of the student (e.g. for students enrolled in unaccredited for-profit institutions).

Another limitation is that the current data do not allow us to distinguish between students who stopped their education entirely and those who dropped out and enrolled elsewhere (Weissmann, 2014). There is a need for retention measures that can distinguish between these outcomes as well as measures that capture on-time degree completion. That said, we think whether a person drops out or transfers has less to do with "push factors" (i.e. factors concerned with the university, like weak fusion, pushing them out) and more to do with "pull factors" (i.e. factors outside the university pulling them away) (Doll, Eslami, & Walter, 2013). For example, a pull factor such as another more prestigious university may cause a weakly fused student to

transfer while a pull factor such as a job that allows the student to provide for their family may cause the same student to drop out. Finally, while the longitudinal design and extensive accounting for covariates are suggestive of causality, intervention studies with experimental designs are needed before making definitive causal claims.

Regarding generalizability, future research should examine whether fusion predicts retention at other educational levels (e.g. high school), non-academic settings (e.g. companies), and universities outside the United States. In non-U.S. contexts where low-cost universities reduce the burden of education, students may remain enrolled even when weakly fused.

Conclusion

Universities are facing many problems, including skepticism about the worth of a traditional education in an era marked by rising tuition, a rapidly evolving job market, and the proliferation of free information online. However, all available indicators suggest that a university education is worthwhile for students' future success and well-being. In light of the abundant evidence of the advantages of higher education, it is troubling that the probability of a given student graduating from college in the U.S. remains no better than a coin flip. We call for renewed appreciation of the importance of college graduation independent of other academic outcomes. We show that identity fusion with the university provides a robust and reliable pathway to retention. The challenge for future researchers is to design scalable interventions intended to increase retention by targeting students' identities.

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