Delayed Enrollment and Student Involvement: Linkages to College Degree Attainment

Thesis

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By

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Abstract

An increasing proportion of high school graduates are enrolling in higher education. However, a substantial share of students who enroll in higher education are delaying their enrollment after high school graduation. Recent research finds that students who delay enrolling in college are less likely to attain a college degree and are more likely to be managing significant adulthood transitions than non-delayed college students. Adult roles conflict with student roles in the lives of these delayers, but little is known about these students' actual college experiences. This paper attempts to explore delayers' involvement in high impact educational activities on campus in order to understand better why these students struggle to attain college degrees and whether participation in high impact activities facilitates college completion for students who delay enrollment.

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Chapter 1: Introduction

Scholars interested in students' transitions to postsecondary education are currently considering the topic of delayed entry into higher education. Limited research suggests that delaying entry into higher education can increase students' "academic momentum" depending on the activities in which the student engages during their "gap year[s]" (Martin 2010; Martin, Wilson, Liem & Gimms 2013). However, most of the research on delayed entry into college paints a grim picture. For example, once enrolled, delayers are less likely to obtain a college degree than their immediate enrollment peers (Bozick and Deluca 2005; Featherman and Carter 1976; Jacobs and King 2002; NCES 2005). Furthermore, students from lower-socioeconomic backgrounds are more likely to delay entry into higher education for a year or more (Bozick and Deluca 2005; Goldrick-Rab 2006; Hearn 1992; Jacobs and King 2002; Roksa and Velez 2012; Rowan-Kenyon 2007). Because students from lower-socioeconomic backgrounds are more likely to delay enrollment into higher education, social scientists are interested in answering the question, "Why does delay negatively impact degree attainment?"

Two recent studies suggest that delayed entry is negatively correlated with degree attainment because students who delay college enrollment frequently transition into adult roles that are incompatible with college responsibilities (Bozick and Deluca 2005; Roksa and Velez 2012). Additionally, literature on college student involvement in higher education suggests that the more college students are involved in campus

activities, the more likely they will obtain a college degree (Astin 1984; Kuh 2009; Tinto 1988). Does delaying entry into college affect student involvement on campus?

Answering this question could advance understanding of the mechanisms that accompany the relationship between delayed enrollment in college and degree attainment. While the literature on delayed college entry sufficiently documents who delays entry into college, we know little about the consequences of delayed enrollment beyond the fact that delayed enrollment is related to a lower likelihood of attaining a college degree. This paper considers one mechanism that may help explain the relationship between delayed enrollment and reduced likelihood of successful college completion by examining whether level of involvement in campus activities mediates this relationship. In other words, if students who delay college entry are also less involved in campus activities than non-delayed students, this may be one factor that explains why delayed enrollees have lower chances of completing their degree.

With data from the National Center for Education Statistics' (NCES) Education Longitudinal Study of 2002 (ELS: 2002), I investigate student involvement in "high impact" postsecondary activities. Because prior research finds a positive connection between student involvement and student success, understanding the degree to which delayers are involved in college activities will give scholars, administrators, and educators useful information to assist delayers to complete college. If we learn that student involvement in particular activities is especially conducive to staying in college and persisting to the degree, administrators might seek ways to ensure that students at risk for dropping out have access to such activities and participate in them. This

information will be particularly useful for retention efforts targeting students from lower-socioeconomic backgrounds because they are less likely to obtain a degree after they enroll in college compared to their higher-socioeconomic peers (Bozick and Deluca 2005; NCES 2005; Roksa and Velez 2012).

Chapter 2: Literature Review

Student pathways through postsecondary schooling are varied and changing (Goldrick-Rab 2006). Increasingly, college students pursue nontraditional¹ enrollment patterns following high school graduation. Since 1990, college student enrollment in public, 2-year and private, for-profit institutions has increased at a higher rate than student enrollment at public, 4-year and private, not-for-profit institutions (NCES 2011). These nontraditional pathways are often characterized by interruptions, attendance at multiple institutions, and less than full-time status (Goldrick-Rab 2006).

Variation in students' college enrollment and attendance patterns begins immediately upon high school graduation. Indeed, many high school graduates delay their enrollment into higher education; of those undergraduate students enrolled in 1999-2000, 37 percent had delayed their entry into college by at least one year after high school graduation (NCES, 2005).

Some scholars suggest that delaying enrollment in college is beneficial for some future college students (Martin 2010; Martin, Wilson, Liem & Ginns 2013). These studies extol the benefits of spending time outside the context of education while learning skills that are applicable to postsecondary experiences. Indeed, founded on Adelman's

¹ In this paper I consider "traditional" enrollment patterns as attendance into a four-year, likely residential postsecondary institution directly after high school graduation. Certainly, this definition might already be considered outdated due to the variety in student enrollment patterns in college that we observe today.

(1999; 2006) academic momentum theory, Martin and collaborators (2010; 2013) suggest that students who accomplish something significant before entry into college—particularly something related to their educational career—will have more academic momentum upon entry into college. They suggest that these students then have a higher chance to succeed in college via academic achievement and degree attainment (see also Attewell, Heil and Reisel 2012). Conversely, if students use their time between high school graduation and postsecondary enrollment in a non-educational way, “deferring entry to university disrupts momentum and is likely to have a negative effect” (Martin et al. 2013:646). Most of the research supports this latter proposition.

Prior research finds that lower-socioeconomic status students are more likely to have nontraditional pathways, including delayed entry, through higher education (Bozick and Deluca 2005; Goldrick-Rab 2006; Hearn 1992; Jacobs and King 2002; Roksa and Velez 2012; Rowan-Kenyon 2007). These pathways detract significantly from college students’ chances of earning a degree (Bozick and Deluca 2005; Featherman and Carter 1976; Jacobs and King 2002; NCES 2005). Indeed, Bozick and Deluca (2005) find that students who delay entry into college by a year or more have a 64 percent lower chance of completing a bachelor’s degree compared to their on-time enrollment counterparts, net of factors such as socioeconomic status, prior academic achievement and other demographic characteristics (p. 547).

What is the mechanism behind the relationship between delayed enrollment in college and the lower likelihood of college degree completion? Research dealing with this question is limited and in some cases contradictory. Using data from the National

Education Longitudinal Study of 1988 (NELS: 1988), Bozick and Deluca (2005) find an effect of delayed enrollment on degree attainment “net of academic achievement, socioeconomic support, institutional type and the co-occurrence of adult roles” (p. 549). Roksa and Velez (2012) address this question with data from the 1997 National Longitudinal Study of Youth (NLSY: 1997) and maintain that the NLSY has better measures for understanding adulthood transitions for students who delay enrollment in college. In contrast to Bozick and Deluca’s (2005) findings, Roksa and Velez find that adulthood roles such as “work, marriage/cohabitation and parenthood [while enrolled in] higher education underlie the negative relationship to degree completion” (2012:788). When Roksa and Velez (2012) consider student employment in addition to marital and parenthood status, the effect of delayed entry on degree attainment becomes statistically insignificant in their model. Their research corroborates prior research by Jacobs and King (2002) that suggests students who delay entry into college are less likely to obtain a degree because the “competing demands” in their life prevent them from dedicating adequate attention and effort to school.

Jacobs and King (2002) suggest that older students are not as socially integrated into campus life because of their social integration into environments outside of college (e.g., work and family), which causes these students to enroll in college part-time, leading to a higher attrition rate among this group of students. This work is an expansion of Tinto’s (1988) social integration theory of attrition. Tinto suggests that students who are less socially integrated into a campus context are more likely to leave college without a degree. He documents three important “stages of passage” from high school to college

that factor into students' attrition and degree attainment patterns. These stages are labeled as 1) separation, 2) transition, and 3) incorporation. Put simply, for students to move from one context (high school or the work force, etc.) to another (college), they must separate from the first context, transition fully into the college context, and subsequently be incorporated into their context at college. For students, this process is inhibited when they maintain significant connections to their first context, such as living at home as opposed to on campus, having family responsibilities, and continuing employment from their first context.

Researchers have yet to investigate a variety of plausible explanations to understand better the mechanism connecting delayed entry into college and degree attainment. While current research documents delayers' responsibilities outside of college, we know very little about how delayers might differ from students who enroll immediately after high school graduation in terms of their involvement in extra- and co-curricular activities during college.

Substantial research finds that student involvement (Astin 1984), integration (Tinto 1988), and engagement (Kuh 2009) in college activities—both in and out of the classroom—are positively related to degree attainment and other measures of success in college. Indeed, Terenzini, Springer, Pascarella and Nora (1995:39) suggest that “what happens to students *after* they matriculate has a substantially greater influence on what and how much they learn than does the precollege personal and academic baggage students bring with them to college.” Pascarella and Terenzini suggest that “students' institutional commitments exert an important and positive effect in shaping their

persistence decisions, both planned and actual” (2005:426), and that disadvantaged students benefit more from “social and academic engagement” (2005: 432) on campus when compared to other students (see also Kuh 2009).

Differences in the extent to which delayers are involved in college activities compared to non-delayers may provide insight into their disparate rates of degree attainment. If students who delay are less likely to participate in activities that would aid them toward degree completion, researchers and administrators might better understand how to aid delayers in their postsecondary experience and degree completion attempt. The literature on the negative consequences of delayed entry into college on degree attainment and research on the benefit of campus involvement for degree attainment have remained largely separate; this study seeks to bring these literatures together for a better understanding about one potential mechanism behind the reduced likelihood of college completion for students who delay their entry into college.

Chapter 3: The Current Study

College student involvement in campus activities is one possible mechanism connecting delayed enrollment in college and degree attainment. Bozick and Deluca (2005) and Roksa and Velez (2012) consider how delayers' transitions into adult roles impact college completion, but there may be additional factors that matter for college completion. If delayers are necessarily less involved in campus activities, for whatever reason, they may be less engaged in college and this may impact their persistence to completion. In fact, both studies essentially ignore the way these students might experience college differently than other students when considering involvement in campus activities.

In his seminal article on involvement theory, Astin (1984) defines involvement as “the amount of physical and psychological energy that the student devotes to the academic experience” (p. 518). Among other details of his involvement theory, Astin (1984) describes quantitative versus qualitative “features” of student involvement. That is, a student can have varying degrees of quantity and quality in their respective activities.

I utilize Astin's (1984) concept of involvement as opposed to the prevalent concept of engagement (Trowler 2010)² because the ELS data have measures of student

² Trowler documents the varying definitions of student engagement in her literature review of the literature. Ultimately, despite numerous definitions of the word, student engagement typically refers to two things: 1) student involvement in campus activities and 2) students' emotional connection to the university environment through these activities. With regard to the current study, ELS data have markers of the first characteristic of student engagement but not the second, hence the use of involvement instead of engagement.

involvement (i.e., student *participation* in an activity) but not measures of engagement. I focus on high-*quality* involvement activities, as defined by the ELS: 2002 dataset. ELS data include internships, co-ops, field experience, student teaching, clinical assignments, study abroad, community-based projects, mentoring, research projects with a faculty member outside of the course or program requirement, and culminating senior experiences within this “high-impact postsecondary activities” category. In addition to these activities, Kuh (2008) suggests first-year seminars and experiences, common intellectual experiences (e.g., a “core” curriculum), learning communities, collaborative assignments and projects, and writing-intensive courses are beneficial activities for increasing student engagement and success. The ELS data include some but not all of these activities.

I address the following research questions:

- 1) Do students who delay enrollment in college differ in their involvement in high impact postsecondary activities compared to students who enroll immediately after high school?

In response to this question, I hypothesize that students who delay enrollment in college will be, on average, less involved in high-impact postsecondary activities than students who enroll in college immediately after high school.

- 2) Do students who are involved in high-impact postsecondary activities experience a benefit that aids them toward bachelor’s degree completion?

In response to this question, I hypothesize that students who are more involved in high-impact postsecondary activities will be more likely to obtain a bachelor's degree than students who are less involved in high-impact postsecondary activities.

- 3) Do students who delay college enrollment get a larger benefit in likelihood of completing a bachelor's degree from participating in high impact postsecondary activities compared to non-delayers?

In response to this question, I hypothesize that though delayers will be less involved in high-impact postsecondary activities, they will experience a greater benefit from such involvement than students who did not delay enrollment with regard to completing a bachelor's degree.

To test these predictions, I will examine the overall effect of participation in high-impact activities on degree attainment, but will also consider individual activities in order to speak to which activities might benefit students most.

Chapter 4: Data

For this project, I utilize data from the Education Longitudinal Survey of 2002 (ELS: 2002). The ELS: 2002 is a nationally representative study that originally sampled tenth graders in 2002. Data from these respondents were collected at three additional points: 2004 – first follow up, 2006 – second follow up, and 2012 – third follow up. The ELS: 2002 data were collected with two main foci: 1) “What are students’ trajectories from the beginning of high school into postsecondary education, the workforce and beyond?” and 2) “What are the different patterns of college access and persistence that occur in the years following high school completion” (NCES 2014). The ELS: 2002 data are recent, nationally representative data and contain all the needed variables to address the research questions posed here. Other researchers who have studied delayed entry into higher education have used them in prior publications (Wells and Lynch 2012).

From the original sample ($n = 16,197$), I selected 7,521 respondents for whom ELS has information on the number of months between high school graduation and college enrollment, participation in high-impact postsecondary activities, and educational attainment as of the third follow up in 2012. Also, I restricted the sample to those respondents who graduated from high school in 2004 and entered a postsecondary institution by 2006 at the latest in order to provide adequate time for those who delay to complete a bachelor’s degree. By restricting the sample in this fashion, I give all

respondents six years to complete a bachelor's degree. Furthermore, I limit the sample to students who did not complete a degree within this six year window, completed an associate's degree, or completed a bachelor's degree in six years or less. That is, any respondents who completed a bachelor's degree in more than six years are left out of this sample. This restriction levels the playing field for time to degree so on-time enrollees do not have a higher chance of completing a bachelor's degree because they enrolled in college immediately after high school. Graduating high school in 2004 would give these respondents eight years to complete a bachelor's degree by the final data collection in 2012. Of the 7,521 respondents, 879 respondents (11.69 percent) delayed entry into college by seven months or more.

Chapter 5: Methods

Student involvement in what ELS: 2002 calls “High-impact postsecondary activities” serves as both a dependent and independent variable in the analysis. The data are grouped into several variables underneath this title: a conglomerate variable that reports “Number of high-impact educational activities in which R participated,” and several dichotomous variables that report whether or not students participated in specific high-impact activities, such as an internship or study abroad.

To analyze how delayed entry into college impacts student involvement in high-impact educational activities, I use student involvement as a dependent variable in several models, including cross tabulation, ordinary least squares regression, and logistic regression. I use ordinary least squares regression in order to understand the relationship between delay and the number of activities in which students are involved. I then use cross-tabulation and logistic regression to examine the extent to which delayers are involved in each specific activity compared to non-delayers. Understanding how delayers compare to non-delayers in their overall involvement in high-impact postsecondary activities will provide insights into the differences in college experiences between these two groups. Examining each activity will provide more nuanced information about which activities delayers are most and least involved in during college. For my second research question, “Do students who are involved in high-impact postsecondary activities experience a benefit that aids them toward bachelor’s degree

completion?” I use student involvement as an independent variable within a multinomial logistic regression model to analyze how student involvement in high-impact educational activities is related to student’s degree attainment. I operationalize degree attainment, the dependent variable in this analysis, into three categories: 1) no degree, 2) associate’s degree, and 3) bachelor’s degree. This variable measures which degree the student has attained within six years of enrolling in college by 2012. I calculate relative risk ratios for attaining a bachelor’s degree compared to attaining no degree as well as attaining a bachelor’s degree compared to attaining an associate’s degree. My research focuses on how respondents’ relative risks of attaining a bachelor’s degree compare to attaining no degree or an associate’s degree because of the level of interest around bachelor’s degree attainment in current research.

Finally, I add interaction terms in the multinomial logistic regression model in order to address my third research question—whether certain high-impact postsecondary activities have different effects on degree attainment for delayers compared to non-delayers. Specifically, I interact the variable that indicates whether the respondent delayed seven months or more with each high-impact postsecondary activity. I then run several models that include these interaction terms separately in order to explore which high-impact postsecondary activities are most important in aiding delayers to bachelor’s degree attainment.

Following prior research, control variables include socioeconomic status, sex, race, and level of institution the respondent initially attended. I operationalize socioeconomic status using the framework provided within the ELS data. All students

are divided into four socioeconomic quartiles based on five components: father's level of education, mother's level of education, family income, father's occupation, and mother's occupation. These five indicators are equally weighted and standardized. Sex, race, and institution variables are all dichotomous variables. The sex variable indicates whether a respondent is female while race variables include a series of dichotomous variables indicating students' racial identification (e.g., non-White = 0, White = 1, etc.). Finally, the institution level variable documents what type of institution (less than four-year or four-year) at which students *begin* their postsecondary experience. This variable is not a marker of experience at these different types of institutions, nor of where students complete their postsecondary education, but only where they begin.

Table 3 in Appendix A reports descriptive statistics for all variables. Finally, I control for institution level because students who attend four-year colleges may have more opportunities to participate in campus activities than students who attend less than four-year colleges. Recent research suggests that different institutional practices between four-year institutions and community colleges impact student success (Goldrick-Rab 2010). Just as less than four-year colleges have different coursework and administrative requirements than four-year colleges, less than four-year colleges might provide different levels of opportunities for students to get involved in high-impact educational activities.

I conduct a series of logistic regressions to consider which variables are related to student participation in each of the five high-impact educational activities. In these models, I include delay status, type of institution, and an interaction term for delay and type of institution along with control variables. If the interaction terms within these

models are significant, the results would suggest that delayers who attend a four-year institution are at a higher or lower risk (depending on the sign of the coefficient) for participation in the model's dependent variable activity, compared to non-delayers at four-year institutions.

The analyses cannot account for work and family variables shown to be important in prior research (Bozick & Deluca 2005; Roksa and Velez 2012) because the ELS data have no adequate measurement of student work and family responsibilities while they are in college. ELS provides data about employment and family responsibilities before and after the students' time in college, but does not adequately document those responsibilities while students are in college.

Chapter 6: Results

Delayed Entry into College

Who, precisely, are the 879 respondents in this sample who delay entry into college? How do they compare to their non-delaying peers? Basic descriptive statistics shed some light on the differences between these two groups. Delaying entry into college is more common among Black and Hispanic students than other racial and ethnic groups: 18.38 percent of Black students and 21.49 percent of Hispanic students delay entry into college. These students' delay rates are much higher than the delay rates of the other racial groups: 8.76 percent of Asian students, 13.27 percent of multiracial students, and 9.28 percent of White students delay entry into college. Men delay entry into college at a slightly higher rate than women: 12.15 percent of men delay while 11.33 percent of women delay. 20.94 percent of students in the lowest socioeconomic status quartile delay entry into college, compared to 17.26 percent in the second quartile, 10.51 percent in the third quartile, and 5.86 percent in the highest quartile.

The delayers in this sample are much more likely to initially attend a less than four-year institution than non-delayers. Indeed, 72.01 percent of delayers initially attend less than four-year institutions, compared to only 27.99 percent of on-time enrollees. Similarly, there are stark differences between delayers and non-delayers in degree attainment rates. Within six years, 54.61 percent of on-time enrollees attained a bachelor's degree, 9.47 percent attained an associate's degree, and 35.92 percent failed to

attain any degree. Comparatively, only 11.15 percent of delayers attained a bachelor's degree by within six years. Delayers have a higher rate of associate's degree attainment (12.29 percent) than non-delayers, likely due to their tendency to initially attend a less than four-year institution. Interestingly, 76.56 percent of students who delayed entry into college failed to attain any degree within six years.

These numbers corroborate prior research that claims delayed entry into college is more common among disadvantaged groups. Students who are at higher risk for delayed entry into college tend to be Black and Hispanic males from lower socioeconomic backgrounds. Asian females from higher socioeconomic backgrounds are at the lowest risk for delayed entry into college within this sample. It should be noted, however, that the risk for delayed entry into college among White students is similar to that of the Asian students in the sample. The data show higher rates of delay among students who are not White or Asian.

Student Involvement in High Impact Educational Activities

Figure 1 documents differences in student involvement based on the number of high-impact educational activities in which respondents have participated by 2012. The graph compares students who delay entry into college with on-time enrollees. Students who delay entry into college are clearly less involved in high-impact educational activities than their on-time enrollment peers. Indeed, 65.53 percent of delayers have participated in no high impact educational activities, compared to only 34.21 percent of non-delayers. For all remaining categories, the percentage of delayers involved is less

than the percentage of non-delayers involved. 83.16 percent of delayers are included in the first two categories: participation in one activity or less, compared to only 58 percent of non-delayers.

Figure 1. Number of Activities in which Students are Involved, Comparison of Delayers and Non-Delayers

Figure 2 displays the specific activities in which delayers and non-delayers participate. Interestingly, nearly half of the students in this sample participated in the internship category which includes activities such as an internship, a co-op, field experience, student teaching, or a clinical assignment.³ The high percentage of

³ Though varied, all of these activities provide students with opportunities to work in professional settings within their respective fields of research. While co-ops, student teaching, and clinical assignments are

participation in the internship category may be due to the wide definition of activities included. Indeed, the percentage of participation for the sample overall never exceeds 20 percent in any other category. And similar to the number of activities in which students participate, fewer delayers than non-delayers are involved in each activity.

Figure 2. Level of Student Involvement, by Individual Activities, Comparison of Delayers and Non-Delayers

Figures 3 and 4 provide similar bivariate relationships with regard to the level of institution the respondent initially attended. Students who initially attend four-year colleges are more involved than students who initially attend less than four-year colleges.

often limited to certain disciplines, internships and field experiences extend to a broader population of students.

This pattern may explain some of the reason for delayers' involvement levels, considering that about two-thirds of delayers initially attend a less than four-year college.

Figure 3. Number of Activities in which Students are Involved, Comparison of Institution Levels

Figure 4: Level of Student Involvement, by Individual Activities, Comparison of Institution Levels

To what extent do these activities benefit the students who participate in them?

Table 1 presents relative risk ratios from four multinomial logistic regression models. In all of these models, attaining no degree serves as the base category. Therefore, the coefficients in Table 1 represent the risk of attaining an associate's degree or a bachelor's degree relative to the risk of attaining no degree. Simply put, if the coefficient is greater than 1, the variable to which it is connected has an effect of increasing the risk of attaining an associate's degree or a bachelor's degree, relative to the risk of attaining no degree. Table 2 documents relative risk ratios in the same pattern with a different base category: associate's degree attainment. Including multinomial logistic regression results with associate's degree attainment as the base category is critical to understand students'

bachelor's degree attainment. In effect, while Table 1 compares the relative risk of attaining a bachelor's degree to attaining no degree, Table 2 compares the relative risk of attaining a bachelor's degree to attaining an associate's degree.

	Model 1		Model 2		Model 3		Model 4	
	<i>AA</i>	<i>BA</i>	<i>AA</i>	<i>BA</i>	<i>AA</i>	<i>BA</i>	<i>AA</i>	<i>BA</i>
Delay	.53***	.20***	.56***	.25***	.57***	.25***	.53***	.17***
	(.06)	(.02)	(.07)	(.03)	(.07)	(.03)	(.07)	(.03)
High Impact			1.27***	1.84***				
			(.05)	(.05)				
Community					1.30*	1.32***	1.29*	1.29**
					(.17)	(.11)	(.16)	(.11)
Internship					2.04***	3.15***	2.02**	3.10***
					(.19)	(.20)	*	(.20)
							(.19)	
Mentor					.84	1.23*	.82	1.20*
					(.12)	(.11)	(.12)	(.11)
Delay*Mentor							2.06*	5.03***
							(.70)	(1.49)
Research					1.03	1.35**	1.02	1.32**
					(.16)	(.13)	(.16)	(.13)
Study					.59*	2.32***	.57*	2.23***
					(.14)	(.26)	(.14)	(.25)
Abroad								
Institution	.57***	7.06***	.53***	5.73***	.56***	6.06***	.56***	6.10***
	(.05)	(.50)	(.05)	(.42)	(.05)	(.44)	(.05)	(.45)
SES	1.02	1.52***	1.00	1.42***	1.01	1.43***	1.01	1.42***
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Sex	1.21*	1.28***	1.16	1.10	1.12	1.05	1.13	1.07
	(.10)	(.07)	(.10)	(.07)	(.10)	(.06)	(.10)	(.07)
Asian	.68*	1.24*	.68*	1.25*	.67*	1.24*	.67*	1.24*
	(.11)	(.12)	(.11)	(.13)	(.11)	(.12)	(.11)	(.12)
Black	.64***	.46***	.63***	.45***	.65***	.48***	.64***	.47***
	(.09)	(.04)	(.09)	(.05)	(.09)	(.05)	(.09)	(.05)
Hispanic	.88	.74**	.89	.75**	.93	.76**	.93	.77**
	(.11)	(.07)	(.11)	(.08)	(.12)	(.08)	(.12)	(.08)
Multiracial	1.03	.77	1.03	.79	1.04	.82	1.04	.82
	(.21)	(.11)	(.21)	(.12)	(.21)	(.12)	(.21)	(.12)
Intercept	.33***	.15***	.29***	.09***	.27***	.10***	.27***	.10***
	(.04)	(.01)	(.03)	(.01)	(.03)	(.01)	(.03)	(.01)
Sample Size	7521	7521	7521	7521	7521	7521	7521	7521

* p < .05 ** p < .01 *** p < .001

Table 1. Multinomial Logistic Regression Relative Risk Ratios for Degree Attainment; Base Outcome: No Degree Attainment

	Model 1		Model 2		Model 3		Model 4	
	<i>No</i>	<i>BA</i>	<i>No Deg</i>	<i>BA</i>	<i>No Deg</i>	<i>BA</i>	<i>No Deg</i>	<i>BA</i>
	<i>Deg</i>							
Delay	1.87** * (.21)	.38*** (.06)	1.80*** (.21)	.44*** (.07)	1.77*** (.21)	.44*** (.07)	1.89*** (.23)	.32*** (.06)
High Impact			.79*** (.03)	1.45** * (.05)				
Community					.77* (.10)	1.01 (.13)	.78* (.10)	1.01 (.13)
Internship					.49*** (.05)	1.55*** (.15)	.50*** (.05)	1.54*** (.15)
Mentor					1.20 (.17)	1.47** (.21)	1.23 (.17)	1.47** (.21)
Delay*Mentor							.49* (.17)	2.45* (.95)
Research					.97 (.15)	1.30 (.20)	.98 (.15)	1.30 (.20)
Study Abroad					1.69* (.41)	3.93*** (.91)	1.75* (.42)	3.92*** (.90)
Institution	1.76** * (.16)	12.4** * (1.21)	1.88*** (.17)	10.8** * (1.07)	1.79*** (.16)	10.9*** (1.08)	1.79*** (.16)	10.9*** (1.08)
SES	.98 (.04)	1.50** * (.06)	1.00 (.04)	1.42** * (.06)	.99 (.04)	1.41*** (.06)	.99 (.04)	1.41*** (.06)
Sex	.83* (.07)	1.06 (.09)	.86 (.07)	.95 (.09)	.90 (.08)	.94 (.09)	.89 (.08)	.95 (.09)
Asian	1.46* (.24)	1.82** * (.30)	1.46* (.24)	1.82** * (.30)	1.48* (.24)	1.84*** (.31)	1.48* (.24)	1.84*** (.31)
Black	1.57** * (.21)	.72* (.11)	1.60*** (.22)	.71* (.11)	1.55*** (.21)	.74* (.11)	1.56*** (.21)	.74* (.11)
Hispanic	1.13 (.14)	.84 (.12)	1.12 (.14)	.84 (.12)	1.07 (.14)	.82 (.12)	1.07 (.13)	.82 (.12)
Multiracial	.97 (.19)	.74 (.16)	.97 (.19)	.77 (.16)	.96 (.19)	.79 (.17)	.96 (.19)	.79 (.17)
Intercept	3.00** * (.33)	.44** (.06)	3.44*** (.38)	.33*** (.04)	3.70*** (.42)	.36*** (.05)	3.67*** (.42)	.36*** (.05)
Sample Size	7521	7521	7521	7521	7521	7521	7521	7521

* p < .05 ** p < .01 *** p < .001

Table 2. Multinomial Logistic Regression Relative Risk Ratios for Degree Attainment; Base Outcome: Associate's Degree Attainment

The multinomial logistic regression model labels in Table 1 reflect those in Table 2. That is, Model 1 in Table 1 is the same model (i.e., contains the same variables) as Model 1 in Table 2. The only difference between Model 1 in Table 1 and Model 1 in Table 2 is the base outcome category, as previously mentioned. Each model contains two columns of relative risk ratios. Table 1 displays the relative risk ratio for attaining an associate's degree (*AA*) compared to attaining no degree in the first column of each model, and displays the relative risk ratio for attaining a bachelor's degree (*BA*) compared to attaining no degree in the second column of each model. Because the base outcome in Table 2 changes to associate's degree attainment, the first column of each model in Table 2 displays the relative risk ratio for attaining no degree (*No Deg*) compared to attaining an associate's degree, and the second column displays the relative risk ratio for attaining a bachelor's degree (*BA*) compared to attaining an associate's degree. For clarity, the comparison between no degree and associate's degree attainment is made in both Table 1 and Table 2, but bachelor's degree attainment is compared to attaining no degree in Table 1 and associate's degree attainment in Table 2. For the purpose of this paper, the relative risk ratios reported under the bachelor's degree column in both tables are of particular interest.

Model 1 is a skeleton model and provides base level effects for comparison when considering the subsequent models in each table. Effectively, Model 1 provides us with an understanding of the relationship between delayed enrollment in college and degree attainment, controlling for important variables of race, sex, socioeconomic status, and level of institution initially attended (less than four-year vs. four-year). Model 2

incorporates a variable that reports the number of high impact activities in which students participated. Model 3 breaks down this cumulative participation variable in Model 2 into five specific activities in which students participated. In essence, while Model 2 shows how participation in high impact activities relates to degree attainment, Model 3 documents which high impact activities are more likely to aid students in degree completion. Finally, Model 4 reflects Model 3, with the inclusion of a variable that interacts delayed enrollment in college and participation in mentoring.⁴

In Model 1 (Table 1), students who delay entry into college experience a risk of attaining an associate's degree .53 times their risk of attaining no degree. That is, delayers, compared to non-delayers, are 47 percent more likely to attain no degree, compared to attaining an associate's degree. Other significant effects in Model 1 suggest that females are more likely than males to attain an associate's degree than attain no degree. However, students who attend a four-year college, as well as students who identify as Asian or Black, are significantly less likely to attain an associate's degree compared to no degree.

⁴ I interacted each high impact activity variable with the delayed enrollment variable in order to explore whether certain activities benefit students who delay enrollment into college to a different degree when compared to on-time enrollees. Participation in mentoring provided the only significant interaction term, hence the inclusion of only one interaction term in Model 4.

After interacting these variables, I noticed that the variable interacting delayed entry into college and participation in a senior culminating experience is perfectly correlated with the variable term interacting delayed entry into college and participation in mentoring. This correlation does not necessarily mean that students who delay enrollment participate in mentoring as a senior culminating experience, but that every student in this sample who delayed and participated in a senior culminating experience had also participated in mentoring during their time in college. While it is possible that some—even all—of these delayers participated in mentoring through their senior culminating experience, the ELS codebook is unclear as to how interviewers handled overlapping categories for these activities. At any rate, this finding makes clear that participation in mentoring provides a benefit in terms of degree attainment particular to those students who delay entry into college.

It is difficult to fully understand these results, however, without considering the second column in Model 1: relative risk ratios for bachelor's degree attainment compared to attaining no degree. For instance, while delayers are 47 percent more likely to attain no degree compared to an associate's degree, this relationship is even more drastic when considering their bachelor's degree attainment. Specifically, students who delay enrollment in college experience a risk of attaining a bachelor's degree only .20 times their risk of attaining no degree. That is, delayers are 80 percent more likely to attain no degree than a bachelor's degree.

The second column in Model 1 also sheds light on the meaning of the results from column 1 with regard to the significant control variables. For instance, students who initially attend a four-year college, while less likely to attain an associate's degree compared to no degree, are much more likely to attain a bachelor's degree than no degree. These results likely reflect the lack of associate's degree offerings at most four-year colleges. Students from higher socioeconomic status backgrounds, females, and Asian students are all significantly more likely to attain a bachelor's degree than no degree. Black and Hispanic students are less likely to attain a bachelor's degree than no degree.

The remaining models in Table 1 show constant significant patterns among the control variables of institution level, socioeconomic status, and certain racial categories: Asian, Black and Hispanic at the *BA* level. After student involvement variables are added to Models 2 through 4, being female is no longer a significant marker for degree attainment.

Model 2 shows that participation in high-impact educational activities in college has a highly significant effect on degree attainment. With each additional activity, students' risk of attaining an associate's degree relative to no degree increases by a factor of 1.27 and their risk of attaining a bachelor's degree relative to no degree increases by a factor of 1.84. Including this participation variable in Model 2 also reduces the effect that delaying entry into college has on attaining both an associate's degree or a bachelor's degree, however, students who delay enrollment are still significantly less likely to complete either degree than students who enroll in college immediately after high school, net of their participation in high impact activities.

Model 3 results show that students who participate in certain activities are significantly more likely to attain both an associate's degree and a bachelor's degree compared to no degree. More specifically, students who participate in an internship are significantly more likely to attain an associate's degree compared to no degree. While participation in an internship is the only significant relationship when considering students' likelihood of attaining an associate's degree, students who participate in a community-based activity, an internship, research with a professor, or a study abroad experience are significantly more likely to attain a bachelor's degree compared to no degree. Out of these activities, participating in an internship has the strongest effect of aiding students toward bachelor's degree completion when compared with the other activities. Indeed, students who participate in an internship have a risk of attaining a bachelor's degree 3.15 times greater than their risk of attaining no degree.

Model 4, which includes the interaction term between delayed enrollment and mentoring, reflects the same patterns of significance as Model 3. Interestingly, participation in mentoring offers no significant benefit for degree attainment among the sample generally, but the interaction term reveals that mentoring has a significant, and positive, effect for students who delay entry into college compared to students who do not delay.

Table 2 reflects the same multinomial logistic regression models, but compares no degree attainment (column 1) and bachelor's degree attainment (column 2) to associate's degree attainment. Because Table 1 already makes the comparison between associate's degree attainment and no degree attainment, I will not consider column 1 of Table 2 in my discussion.

Similar to Table 1, Table 2 shows that students who delay enrollment in college are significantly less likely to attain a bachelor's degree compared to an associate's degree across all models. Model 2 shows that participation in high impact activities is significantly, positively related to attaining a bachelor's degree compared to an associate's degree. Model 3 shows which activities are particularly helpful: students who participate in an internship, mentoring, or a study abroad experience are significantly more likely to attain a bachelor's degree than an associate's degree. In this case, participation in a study abroad experience provides the greatest benefit to students; those who study abroad have a risk of attaining a bachelor's degree 3.93 times their risk of attaining an associate's degree. Model 4 also shows that delayers benefit more from their

participation in mentoring than on-time enrollees when considering their risk of attaining a bachelor's degree compared to an associate's degree.

As might be expected, students from higher socioeconomic backgrounds are significantly more likely to attain a bachelor's degree compared to an associate's degree; this pattern is also true for students who identify as Asian. Interestingly, institution level provides the greatest benefit for attaining a bachelor's degree compared to an associate's degree out of any variable included in Table 2. That is, students who attend a four-year college are significantly more likely to attain a bachelor's degree than an associate's degree. As mentioned previously, this pattern is likely due to the lack of associate's degree programs at four-year colleges and universities. However, these results provoke some interesting questions about differences in student involvement at a four-year institution compared to a less than four-year institution.

Less than four-year vs. Four-year Institutions

Does attending a four-year institution help students who delay enrollment get involved in college, relative to students who do not delay entry? Because I already control for institution level in Models 1-4, the findings suggest that institution level does not explain the entire picture of degree attainment; but does it have an effect on the activities in which students participate?

As discussed above, I tested an interaction term between delayed enrollment and initial level of institution attended within a series of logistic regression models that tested the outcome of participation in each high impact activity. That is, the interaction term provides the answer to the question, "Do students who delay enrollment in college but

initially attend a four-year college participate more in these activities simply by initially attending a four-year institution?” The interaction term was significant and negative for all activities, with the exception of mentoring. These results suggest that students who delay college entry but enroll in a four-year institution are no more likely to participate in these activities than non-delayers who also initially enroll in four-year institutions.

In fact, the interaction term suggests that on-time enrollees experience a higher risk of participating in these activities if they initially attend a four-year institution, but students who delay entry into college do not experience any benefit from initially attending a four-year institution. Because the interaction term is not significant for mentoring, the model suggests that delayers have a similar chance of participating in mentoring compared to non-delayers, controlling for institution level. It is possible that these delayers who participate in mentoring are participating for reasons beyond their institution type, but that is not a relationship that is testable using these data.

Chapter 7: Discussion and Conclusion

This paper finds that students who delay entry into college are less involved in high-impact educational activities during their postsecondary experience. Delayers' lack of involvement is problematic because I find that several high-impact educational activities are significantly and positively related to attaining a bachelor's degree within six years of beginning college. Since high-impact educational activities aid students in attaining a bachelor's degree and delayers are less likely to be involved in these activities, this paper suggests that the different experiences of these students while in college compared to their on-time enrollment peers are part of the connection between delayed entry into college and degree attainment.

While the multinomial logistic regression models found that participating in a community-based project, an internship, research with a professor outside of class requirements, and a study abroad experience all aid students in attaining a bachelor's degree within six years compared to attaining no degree, perhaps the most intriguing finding of this paper is that delayers benefit more from mentoring than non-delayers. For administrators and educators, the implications of this finding are tangible. Colleges should direct delayers into mentoring opportunities on their campuses in order to aid them toward bachelor's degree completion.

Despite the optimistic findings about these high-impact educational activities, the effect of delayed entry into college on degree attainment remains negative and significant in all analyses. Indeed, students who enter college on time and participate in no activities are still better off than delayers who participate in several activities. In this case, the best solution to the problem of reduced likelihood of degree attainment is to reduce the number of students who delay enrolling in college beyond six months of completing high school. High school teachers and counselors should place greater emphasis on attending college directly out of high school when discussing postsecondary education with their students.

Certainly, there are limitations to this study. Most notably, this study does not have the data to control for variables such as students' work and family responsibilities. This omission is particularly obvious when considering prior research on this topic (Bozick & Deluca 2005; Roksa and Velez 2012). Because I cannot control for these variables in my models, the effect of delayed entry into college on degree attainment may be overstated in that it may not be delayed entry per se that reduces the likelihood of completing college, but rather work and family responsibilities that hinder degree attainment. Furthermore, these responsibilities might also hinder delayers' time spent involved in high-impact educational activities, which would negatively affect degree attainment indirectly. Understanding student responsibilities off-campus might shed light on varying involvement levels on-campus, so future research should investigate how students divide their time between on- and off-campus activities.

These shortcomings notwithstanding, this study provides initial evidence that students who delay college enrollment have different experiences within college, particularly in terms of their involvement, from students who do not delay entry into college. These disparate experiences in involvement in campus activities are related to the stark differences in their degree attainment rates.

Considerable findings show that students who immediately enroll in a four-year institution experience a higher risk of participation in every high-impact educational activity other than mentoring compared to delayers who initially enroll in a four-year institution. Since this paper also finds that mentoring is the only activity in which delayers experience a greater benefit toward attaining a bachelor's degree than non-delayers, it is possible that delayers benefit more from involvement in high-impact educational activities when they are at a similar risk of participation in those activities compared to non-delayers.

For sociologists interested in the question, "What role does higher education play in reproducing inequality in society?" further research might investigate whether students who delay entry into college are less involved in these activities due to work and family responsibilities or due to administrator efforts, or lack thereof, to get these students involved. For higher education scholars interested in the effect of these activities on student retention and degree attainment, further research might investigate why mentoring has a positive effect for delayers above and beyond the effect it has on non-delayers. What types of mentoring are better suited to aid disadvantaged populations to attaining a bachelor's degree?

Recent research suggests that students from disparate backgrounds have different, often unequal experiences in college (Armstrong and Hamilton, 2013). This paper speaks to this topic, showing that disadvantaged groups are less likely to be involved in high-impact educational activities in college. Although this paper cannot fully explore what prevents students who delay entry into college from participating in high impact educational activities at a rate similar to their on-time enrollment counterparts, it provides a foundation for further research on how students from different backgrounds persist through college. Seemingly, students at the same institution can traverse very different educational pathways and end up in very different places at the end of their time in college. The important question to answer, then, is whether these educational pathways are socially constructed within higher education to maintain inequality.

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Appendix A: Descriptive Statistics

Variable	Coding	Mean	S.D.
<i>delay</i>	0 = entry into college < 7 months after HS graduation 1 = entry into college 7 months or more after HS graduation	0.161	0.368
<i>highimpact</i>	Number of high impact educational activities in which respondent participated while in college (0-6)	1.353	1.449
<i>degree</i>	0 = No degree 1 = Associate's degree 2 = Bachelor's degree	1.109	0.947
<i>capstone</i>	0 = Did not participate in culminating senior experience 1 = Participated in culminating senior experience	0.288	0.453
<i>community</i>	0 = Did not participate in community-based project 1 = Participated in community-based project	0.193	0.394
<i>internship</i>	0 = Did not participate in internship/co-op/field experience/student teaching/clinical assignment 1 = Participated in internship/co-op/field experience/student teaching/clinical assignment	0.459	0.498
<i>mentor</i>	0 = Did not participate in mentoring 1 = Participated in mentoring	0.165	0.372
<i>research</i>	0 = Did not participate in research project with faculty member outside course 1 = Participated in research project with faculty member outside course	0.137	0.344
<i>studyabroad</i>	0 = Did not participate in study abroad 1 = Participated in study abroad	0.111	0.314
<i>institution</i>	0 = Initially attended a less than four-year college 1 = Initially attended a 4-year college	0.665	0.472
<i>ses</i>	0 = Lowest quartile, ELS coding 1 = Second quartile, ELS coding 2 = Third quartile, ELS coding 3 = Highest quartile, ELS coding	1.844	1.093
<i>sex</i>	0 = Male 1 = Female	0.557	0.497
<i>white</i>	0 = Student did not identify as White, non-Hispanic 1 = Student identified as White, non-Hispanic	0.628	0.497
<i>black</i>	0 = Student did not identify as Black or African American, non-Hispanic 1 = Student identified as Black or African American, non-Hispanic	0.109	0.312
<i>asian</i>	0 = Student did not identify as Asian, Hawaii/Pacific Islander, non-Hispanic 1 = Student identified as Asian, Hawaii/Pacific Islander, non-Hispanic	0.104	0.306
<i>hispanic</i>	0 = Student did not identify as Hispanic 1 = Student identified as Hispanic	0.116	0.319
<i>multi</i>	0 = Student did not identify as more than one race, non-Hispanic 1 = Student identified as more than one race, non-Hispanic	0.043	0.203

Table 3. Descriptive Statistics