Advancement Via Individual Determination: The Relationship of Program Participation in Middle School with Behavioral Outcomes in Ninth Grade

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Abstract

Using the Coarsened Exact Matching approach, this study examines whether students who take AVID electives in middle school have better ninth-grade behavioral outcomes than comparable students who do not take AVID electives. Findings indicate that students who complete at least one AVID elective from sixth grade to ninth grade have fewer disciplinary referrals, miss fewer days of school, and take more advanced courses in ninth grade than comparable students who do not complete an AVID elective.

Keywords: AVID, evaluation, attendance, discipline, advanced coursework

Introduction

The AVID Program

The Advancement Via Individual Determination (AVID) program is designed to support students who have the potential to be first-generation college goers. Through extensive training of school staff (i.e., administers, site coordinators, and AVID elective teachers) the AVID program aims to create an environment where students are challenged by a rigorous curriculum. The program is designed around the AVID elective course series which equips students with the study and organizational skills that they will need to be successful in college and advanced coursework. The program also aims to foster student success by increasing student engagement and creating a supportive and collaborative learning environment (Bendall, Bollhoefer, & Koilpillai, 2015).

The School District of Palm Beach County offers the year-long AVID elective in middle and high school. Past research indicates that taking the AVID elective in secondary school is associated with increased rates of advanced course-taking (Day, 2012; Huerta, Watt & Butcher, 2013; Oswald, 2002), early enrollment in algebra, and higher attendance rates (Black, Little, McCoach, Purcell, & Siegle, 2008; Watt, Powell & Mendiola, 2004). Additional qualitative evidence indicates that students who take the AVID elective feel more supported by the adults in their school and gain confidence in their ability to succeed in the face of academic challenge (Llamas, López, & Quirk, 2014; Mendiola, Watt, & Huerta, 2010; Parker, Eliot, & Tart, 2013; Watt, Johnson, Huerta, Mendiola, & Alkan, 2008).

Study Goals

The primary goal of the AVID program is to increase enrollment in advanced courses among low-income and ethnic minority students. However, there may also be behavioral benefits to program participation such as reductions in disciplinary actions and chronic absenteeism (Bendall, 2015). This is because the program aims to foster student engagement through

emphasizing the importance of peer collaboration and student inquiry. Increased engagement, in turn, may lead to a greater interest in advanced coursework. Therefore, the focus of this study was to examine the relationship of AVID participation in middle school with student behavior and enrollment in advanced courses at the start of high school.

In summary, this study was designed to answer the following questions:

Compared to students who do not take AVID courses, do AVID course takers have:

1. Better attendance in ninth grade?
2. Fewer disciplinary referrals in ninth grade?
3. Higher rates of enrollment in advanced courses in ninth grade?

Method

Participants

To establish temporal ordering of the predictor and outcome variables, I used longitudinal data to track a cohort of students over time. I focused on the 2020 graduation cohort and compiled annual data that spanned from 2013, when students were in fifth grade, to 2017 when the same students were in ninth grade.

Only students who were enrolled in the district while in fifth grade and had all relevant baseline and outcome data were included in this study. The resulting sample for analysis consisted of 10,201 students. Of these students, 768 completed at least one AVID elective from sixth grade to ninth grade. Of the students who were enrolled in AVID, 52% were female, 41% were black, 39% were Hispanic, 16% were white, and 80% were free and reduced price lunch eligible. Most students enrolled in an AVID elective over the study period scored just at or just below proficiency (i.e., scored at an achievement level of two or three out of five on the Florida Standards Assessments) in English Language Arts (69%) and Mathematics (66%).

Description of Data

All data were drawn from the District's Education Data Warehouse. Baseline data were drawn at the end of the year when students were exiting fifth grade (pre AVID exposure). Outcome data were drawn at the end of the year when students were exiting ninth grade (post AVID exposure).

In the Methods and Results sections, I make group comparisons to determine the number of students who were positively impacted by AVID participation. For this reason, I converted all outcome variables to yes/no dichotomies (i.e., chronically absent vs. not chronically absent, took advanced coursework vs. did not take advanced coursework, etc.).

Chronic absenteeism was measured by counting the number of school days that students missed in ninth grade. Students who missed more than 10 days of school over the school year were counted as chronically absent.

Disciplinary referrals were measured by counting the number of referrals students received in ninth grade. Referrals were generated when a teacher or other school staff officially sanctioned students for serious misbehavior such as physical aggression or the possession of weapons or drugs. Students who received at least one disciplinary referral were counted as referred.

Advanced course taking was measured by counting the number of advanced courses students took in ninth grade. Advanced courses included honors and advanced placement courses and did not include AVID electives. Students who took at least one advanced course in ninth grade were counted as advanced course takers.

Analytic Approach

A limitation of past AVID research is that students who participate in AVID may be very different from students who do not participate in AVID, and selection bias has not been sufficiently addressed. For example, students who take an AVID elective may be more engaged with school than students who do not take an AVID elective. Therefore, it is plausible that differences in outcomes between AVID students and non-AVID students result from pre-existing student differences rather than the AVID intervention itself. In order to determine whether participation in AVID has a positive impact on behavioral outcomes, a control group is needed.

For this study, I used an advanced matching approach, Coarsened Exact Matching (CEM), to create a comparison group. I deemed a matching approach appropriate because many of the factors that determine whether students are selected into the AVID program (e.g., income status, achievement levels, and ethnicity) were measured at baseline, before AVID exposure. Matching on these selection factors helps to adjust their biasing of the associations of AVID participation and ninth-grade outcomes. CEM was chosen as the matching algorithm because of its advantages over the more commonly applied propensity score matching approach. These advantages include efficiency and robustness to measurement error, among many others (see Iacus, King, & Porro, 2012; King, Nielsen, Coberley, Pope, & Wells, 2011).

In this study, I exactly matched AVID and non-AVID students on key characteristics known to be related to treatment assignment and on additional available covariates until the two groups were balanced on 40 baseline student characteristics. A comprehensive list of these characteristics can be found in Table 1.

Through the matching process, the treatment and control groups were reduced to only include students with (a) exact matches on key variables (i.e., prior achievement levels, race and ethnicity, free and reduced lunch eligibility, disability status, and English language learner status) and (b) proximal matches on all other observed covariates. After matching, simple group comparisons were made to determine whether students who took AVID electives had more favorable behavioral outcomes than similar students who did not take AVID electives. Significance levels were derived from unconditional logistic regression models.

Results

Table 1 presents the mean differences between students who took at least one AVID elective and students who did not take an AVID elective before and after matching. After the matching procedure, the samples were reduced because perfect matches could not be found for all students. However, the multivariate imbalance (as measured by the L_1 distance) between the AVID and non-AVID groups was eliminated, and 85.0% of AVID participants were retained in the sample.

Table 1. *Baseline Group Differences (Means and Proportions) Between AVID and Non-AVID Students Before and After CE Matching*

	Pre CE Matching (L_1 = .63)			Post CE Matching (L_1 ~ .00)		
Student Characteristics	**AVID (*n*=768)**	**Non-AVID (*n*=9,433)**	**Difference**	**AVID (*n*=653)**	**Matched Control (*n*=4,027)**	**Difference**
Female	0.516	0.504	-0.012	0.510	0.513	0.003
White	0.160	0.351	0.191***	0.175	0.175	0.000
Black	0.406	0.272	-0.134***	0.407	0.407	0.000
Hispanic	0.388	0.310	-0.078***	0.391	0.391	0.000
Other race	0.046	0.066	0.020*	0.028	0.028	0.000
ELL enrolled	0.189	0.150	-0.039**	0.191	0.182	0.009
ELL follow-up	0.129	0.079	-0.050***	0.107	0.116	-0.009
Non-ELL	0.682	0.771	0.089***	0.701	0.701	0.000
Homeless	0.012	0.014	0.003	0.012	0.017	0.005
Free/reduced lunch	0.799	0.591	-0.208***	0.795	0.795	0.000
Primary Lang. English	0.587	0.686	0.098***	0.625	0.625	0.000
Primary Lang. Haitian-Creole	0.100	0.079	-0.022*	0.083	0.083	0.001
Primary Lang. Spanish	0.275	0.190	-0.084***	0.277	0.277	0.000
Primary Lang. Other	0.038	0.045	0.008	0.015	0.015	0.001
Born in US	0.882	0.907	0.026*	0.887	0.885	0.001
Born in Mexico	0.014	0.008	-0.007*	0.012	0.015	0.002
Born in Haiti	0.047	0.029	-0.018**	0.043	0.036	0.006
Born in other country	0.057	0.057	-0.001	0.058	0.064	-0.005
Gifted	0.022	0.103	0.081***	0.018	0.013	0.006
Non-ESE	0.898	0.765	-0.134***	0.920	0.920	0.000
Learn/behavioral disability	0.043	0.084	0.041***	0.037	0.036	0.001
Other disability	0.036	0.047	0.011	0.025	0.031	-0.006
Migrant	0.070	0.012	-0.058***	0.032	0.032	0.000
ELA level 1	0.095	0.133	0.037**	0.084	0.084	0.000
ELA level 2	0.288	0.240	-0.048**	0.291	0.291	0.000
ELA level 3	0.402	0.273	-0.129***	0.412	0.412	0.000
ELA level 4	0.188	0.234	0.047**	0.190	0.190	0.000
ELA level 5	0.027	0.120	0.093***	0.023	0.023	0.000
Math level 1	0.139	0.182	0.042**	0.144	0.144	0.000
Math level 2	0.284	0.227	-0.057***	0.280	0.280	0.000
Math level 3	0.380	0.270	-0.110***	0.383	0.383	0.000
Math level 4	0.168	0.202	0.035*	0.175	0.175	0.000
Math level 5	0.029	0.119	0.091**	0.018	0.018	0.000
ELA scale score	218.31	221.81	3.49***	218.50	218.75	-0.25
Math scale score	220.61	222.91	2.30**	220.32	220.23	0.09
No. disciplinary referrals	0.10	0.16	0.05*	0.09	0.12	-0.03
No. out of school suspensions	0.05	0.06	0.01	0.03	0.03	0.00
No. days absent	6.38	7.20	0.82**	6.29	6.26	0.03

Note. Significance levels are derived from unconditional OLS and logistic regression models.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2 presents the differences in outcomes between students who completed at least one AVID elective from sixth grade to ninth grade and comparable students who did not complete an AVID elective. Overall, fewer students in the AVID group had a disciplinary referral in ninth grade compared to students in the control group (six percentage point difference). AVID students also had lower rates of chronic absenteeism (four percentage point difference) and higher rates of advanced course taking (seven percentage point difference) than comparable non-AVID students.

All of these differences were significant at conventional levels as estimated by unconditional logistic regression models.

Table 2. *Differences in Ninth Grade Outcomes (Post CE Matching) Between AVID and Non-AVID Students*

Outcome	AVID Group (*n*=653)	Matched Comparison Group (*n*=4,027)	Difference
% had >10 absences	0.04	0.08	-0.04**
% had a disciplinary referral	0.14	0.20	-0.06***
% took an advanced course	0.74	0.67	0.07**

Note. Significance levels were derived from unconditional logistic regression models.
** $p < 0.01$, *** $p < 0.001$.

Limitations

For this study, a strong attempt was made to balance methodological rigor with the time constraints of applied school district research. Although this applied study improves upon past evaluations of the AVID program, continued academic research is needed to estimate true causal effects.

The matching procedure used in this study is designed to reduce selection bias and improve the estimation of the effect estimates. However, there are many pre-existing child characteristics that could not be included in the matching process. For example, in order to take the AVID elective, the parents or guardians of the participating students must meet with school staff and sign an AVID participation contract. If a parent or guardian is not available for this level of participation, the student is not eligible to take the AVID elective. Therefore, students who take an AVID elective may have higher levels of parental involvement than students who do not take an AVID elective.

It is plausible that students with high levels of parental involvement are more likely to graduate from high school and enroll in college than students with low levels of parental involvement, regardless of whether they take an AVID elective. Therefore, parental involvement is an important selection factor that could not be included in the study.

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