

Summer School, School Disengagement, and Substance Use During Adolescence

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Introduction: Youth who fall behind academically are at increased risk for school disengagement, school dropout, and substance use. Summer school is an opportunity for youth to complete needed coursework yet has not been utilized as a venue for substance use prevention. To date, little is known about the rates of summer school attendance among adolescents or the relationship between summer school attendance, school disengagement, and substance use. The purpose of this study is to assess the characteristics of summer school attendance over the past 20 years and to examine the associations between summer school attendance, indicators of school disengagement, and recent substance use among eighth-grade students.

Methods: Data from the Monitoring the Future cross-sectional study of eighth-grade students (1997–2016; $n=111,033$) was used to examine the association between summer school attendance and recent substance use (e.g., past 2-week/30-day marijuana use). Bivariate associations controlling for sociodemographics and school disengagement (e.g., truancy) were assessed. Analyses were completed in 2018.

Results: School disengagement and substance use were associated with summer school attendance; however, when controlling for indicators of school disengagement, summer school attendance was not associated with substance use. Interaction effect models found that summer school attendance weakened the association between indicators of school disengagement and substance use.

Conclusions: These findings suggest that students with a high propensity to use substances do attend summer school. Summer school may be a venue to deliver information on the risk of alcohol or other drugs to a population of at-risk students.

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INTRODUCTION

Dropping out of high school has a consistent, negative effect on the social, economic, and health conditions of individuals and their communities.^{1,2} Youth who drop out of high school are more likely to have a cannabis use disorder compared with traditional high school graduates,³ and in adulthood, are more likely to use illicit substances and have poorer health compared with high school graduates.⁴ In a national sample of young adults, prescription opioid and sedative/tranquilizer misuse were most prevalent among young adults who had dropped out of high school.⁵

In the U.S., youth who fall behind academically (e.g., course failure) in sixth through eighth grades are at

increased risk for school disengagement (i.e., a decline in interest, participation, and attention in school⁶) and leaving school prior to graduation.⁷ These youth may also have additional risk factors for school dropout (e.g., absenteeism, low educational expectations).⁷ These same risk factors are also linked to adolescent substance use.^{8–10} Youth who fall behind academically are often

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required to attend summer school to obtain credits needed to progress to the next grade. To date, little is known about rates of summer school attendance among adolescents or the relationship between summer school attendance, school disengagement, and substance use. Risk factors for school disengagement exacerbate during the middle school years,⁷ and youth who require summer academic remediation are at increased risk for dropping out of school prior to graduation.⁷ Thus, the purpose of this study is to assess characteristics of summer school attendance over the past 20 years and to examine the association between summer school attendance, school disengagement, and substance use in a national sample of eighth grade students.

METHODS

Study Sample

The present study uses nationally representative samples of 111,033 eighth-graders participating in cross-sectional Monitoring the Future (MTF) surveys between 1997 and 2016.¹¹ Table 1 provides sample characteristics. This study uses publicly available, de-identified data and is considered not regulated human research, not requiring review by the University of Michigan IRB.

Measures

Summer school attendance was measured with a single item: *Did you ever attend summer school to make up for poor grades or to keep from being held back?* Response options ranged from *no* to *yes, three or more summers*. The item was recoded as a dichotomous variable (i.e., 0=no summer school, and 1=any summer school).

Eight items assessed school disengagement: *ever held back, ever suspended, misbehaved in school during the past year, cut a full day of class in the past month, skipped class for part of the day during the past month, reported an average grade of C+ or lower, indicated that they will not graduate high school, and indicated that they will not go to college* (Table 1 provides additional information).

Recent substance use¹² included past 30-day cigarette use (i.e., *How frequently have you smoked cigarettes . . .?*); past 2-week binge drinking (i.e., *How many times have you had five or more drinks in a row . . .?*); or past 30-day marijuana use (i.e., *On how many occasions have you used marijuana or hashish . . .?*). Response categories were recoded and treated as dichotomous variables (i.e., *no use*=0, and *any use*=1).

Sociodemographic variables included sex, race/ethnicity, highest level of parental education, and cohort year (Table 1).

Statistical Analysis

Descriptive statistics, ORs, and AORs were used to assess the association between summer school attendance and recent substance use. AORs controlled for indicators of school disengagement and sociodemographic variables (Table 1). Interaction terms (e.g., summer school attendance X ever suspended) were also assessed to examine how summer school attendance moderated the association between substance use and the control variables included in

the multivariable models. All analyses were performed in Stata, version 15.0 in 2018 and were weighted to account for probability of selection into the MTF sample. Analyses used listwise deletion for ease of reproducibility. Results for parental education, urbanicity, and school region were not presented due to space restriction; results are available upon request.

RESULTS

A total of 17.4% of eighth graders indicated summer school attendance; roughly one third of black (28.8%) and other race (23.9%) youth indicated summer school attendance. Non-white racial groups had consistently higher rates of summer school attendance over this 20-year period when compared with whites (Table 1).

Bivariate analysis (Table 1) assessing summer school attendance and recent substance use shows that students who attended summer school had higher odds of binge drinking (OR=1.66, 95% CI=1.56, 1.76); cigarette use (OR=1.65, 95% CI=1.56, 1.76); and marijuana use (OR=1.76, 95% CI=1.66, 1.88) compared with students who have never attended summer school. Analytic models (Table 2) controlling for indicators of school disengagement mediated the positive associations between summer school attendance X substance use.

Models including interaction effects (Appendix Tables 1–6, available online) found that the positive association between certain types of school disengagement (i.e., suspended, misbehavior, cutting class, and skipping class) and substance use was modestly weakened (e.g., the interaction effect [summer school attendance X suspension] had a negative association) when respondents indicated going to summer school. Additionally, models including interaction effects found that the negative association between parental education (i.e., college degree or higher) and substance use was weakened (i.e., the interaction effect [summer school attendance X college degree or higher] had a positive association) when respondents indicated going to summer school.

DISCUSSION

School disengagement and substance use are associated with summer school attendance; however, unlike school disengagement, summer school attendance itself (when accounting for indicators of school disengagement) was not associated with substance use. Youth with a high propensity to use substances do attend summer school; however, summer school attendance weakened the association between indicators of school disengagement and substance use. These findings support summer school as an opportunity to reach youth at risk for substance use

Table 1. Characteristics of Summer School Attendance (Total Sample: n=111,033)

Characteristic	n (% missing)	Total %	Summer school attendance	
			%	OR (95% CI)
School disengagement				
Ever held back ^a	12,885 (4.4)	12.1	30.1	4.72*** (4.50, 4.95)
Ever suspended ^b	25,201 (4.5)	23.4	40.8	2.80*** (2.69, 2.91)
Misbehave in school ^c	8,002 (0.8)	7.2	12.9	2.40*** (2.26, 2.55)
Cut class ^d	10,755 (8.4)	10.3	14.3	1.59*** (1.50, 1.68)
Skip class ^e	12,090 (4.4)	11.1	17.3	1.95*** (1.85, 2.05)
C+ or lower ^f	24,541 (4.3)	22.8	45.2	3.79*** (3.64, 3.95)
Won't graduate high school ^g	1,880 (3.7)	1.8	4.0	3.42*** (3.05, 3.82)
Won't go to college ^h	7,509 (4.4)	7.0	12.6	2.33*** (2.19, 2.48)
Substance use				
Cigarettes (30 days)	10,212 (3.0)	9.4	13.3	1.65*** (1.56, 1.76)
Binge drinking (2 weeks)	9,024 (8.2)	8.9	12.7	1.66*** (1.56, 1.77)
Marijuana (30 days)	8,290 (3.4)	7.5	11.3	1.76*** (1.66, 1.88)
Sex				
Male (ref)	52,123 (4.0)	48.8	54.5	ref
Female	52,123 (4.0)	51.2	45.5	0.746*** (0.718, 0.775)
Race/ethnicity				
White (ref)	58,208 (0.0)	52.9	33.5	ref
Black	15,017 (0.0)	13.1	21.4	3.37*** (3.19, 3.55)
Other	37,808 (0.0)	34.0	45.1	2.61*** (2.50, 2.72)
Parental education				
Less than a BA (ref)	52,041 (4.1)	49.0	65.3	ref
BA or higher	54,474 (4.1)	51.0	34.7	0.440*** (0.423, 0.458)
Year				
1997–2001	29,709 (0.0)	26.7	22.4	ref
2002–2006	28,153 (0.0)	25.4	27.1	1.30*** (1.23, 1.37)
2007–2011	26,889 (0.0)	24.2	27.2	1.40*** (1.33, 1.48)
2012–2016	26,282 (0.0)	23.7	23.3	1.20*** (1.14, 1.27)

Note: Boldface indicates statistical significance (* $p < 0.05$; *** $p < 0.001$). All analyses used weights provided in the MTF public use files.

^aHave you ever had to repeat a grade in school? 1=No, 2=Yes, one time, 3=Yes, two or more times. All yes responses were coded as 1, no was coded as 0.

^bHave you ever been suspended or expelled from school? 1=No, 2=Yes, one time, 3=Yes, two or more times. All yes responses were coded as 1, no was coded as 0.

^cOver the past year in school, how often did you . . . get sent to the office, or have to stay after school, because you misbehaved? 1=Never, 2=Seldom, 3=Sometimes, 4=Often, 5=Almost always. Often and Almost always were coded as 1, all other responses were coded as 0.

^dDuring the LAST FOUR WEEKS, how many whole days of school have you missed . . . because you skipped or "cut"? 1=None, 2=1 day, 3=2 days, 4=3 days, 5=4–5 days, 6=6–10 days, 7=11 or more. 1 day through 11 or more days were coded as 1, None was coded as 0.

^eDuring the LAST FOUR WEEKS, how often have you gone to school, but skipped a class when you weren't supposed to? 1=Not at all, 2=1 or 2 times, 3=3–5 times, 4=6–10 times, 5=11–20 times, 6=More than 20 times. 1 or 2 times through More than 20 times were coded as 1, Not at all was coded as 0.

^fWhich one of the following best describes your average grade in this school year? 9=A, 8=A–, 7=B+, 6=B, 5=B–, 4=C+, 3=C, 2=C–, 1=D or lower. C+ through D or lower was coded as 1, A through B– was coded as 0.

^gHow likely is it that you will graduate from high school? And How likely is it that you go to college? 1=Definitely won't, 2=Probably won't, 3=Probably will, 4=Definitely will. Definitely won't and Probably won't were coded as 1, Probably will and Definitely will were coded as 0.

BA, bachelor's degree; MTF, Monitoring the Future.

(i.e., students who have a history of skipping school and suspension).

Limitations

This study includes a nationally representative diverse sample of U.S. eighth-grade students that allowed for a large sample of young substance users who attended

summer school prior to the modal dropout age. Yet, the cross-sectional nature of the study precludes conclusions about causal relationships between school disengagement, summer school attendance, and substance use. Another limitation to consider is that the MTF does not provide school-level information in order to determine academic schedules (e.g., year-round school schedules)

Table 2. Associations Between Characteristics of Summer School Attendance and Substance Use (Total Sample $n=111,033$)

Characteristic	Cigarette use, AOR (95% CI) ($n=91,779$)	Binge drinking, AOR (95% CI) ($n=87,286$)	Marijuana use, AOR (95% CI) ($n=91,891$)
Summer school	1.07 (0.989, 1.16)	1.06 (0.979, 1.15)	0.917* (0.843, 0.998)
School disengagement			
Ever held back ^a	1.31*** (1.21, 1.43)	1.16*** (1.06, 1.27)	1.30*** (1.18, 1.42)
Ever suspended ^b	2.73*** (2.54, 2.94)	2.28*** (2.11, 2.45)	3.20*** (2.97, 3.45)
Misbehave in school ^c	2.12*** (1.93, 2.32)	2.20*** (1.99, 2.42)	2.13*** (1.95, 2.35)
Cut class ^d	2.83*** (2.62, 3.06)	2.85*** (2.64, 3.09)	2.77*** (2.55, 3.01)
Skip class ^e	2.26*** (2.08, 2.45)	2.41*** (2.22, 2.62)	2.23*** (2.05, 2.44)
C+ or lower ^f	1.97*** (1.83, 2.12)	1.59*** (1.47, 1.71)	1.64*** (1.52, 1.77)
Won't graduate high school ^g	1.05 (1.49, 1.28)	0.941 (0.759, 1.16)	0.851 (0.701, 1.03)
Won't go to college ^g	1.65*** (1.41, 1.82)	1.42*** (1.27, 1.58)	1.64*** (1.47, 1.82)
Parental education			
Less than a BA	ref	ref	ref
BA or higher	0.848*** (0.795, 0.904)	0.900** (0.842, 0.961)	0.881*** (0.823, 0.944)
Sex			
Male	ref	ref	ref
Female	1.51*** (1.41, 1.60)	1.27*** (1.19, 1.36)	1.07 (0.997, 1.14)
Race/ethnicity			
White	ref	ref	ref
Black	0.276*** (0.245, 0.311)	0.418*** (0.372, 0.468)	0.698*** (0.627, 0.778)
Other	0.682*** (0.633, 0.735)	0.945 (0.878, 1.01)	0.991 (0.917, 1.07)
Year			
1997–2001	ref	ref	ref
2002–2006	0.490*** (0.455, 0.528)	0.593*** (0.549, 0.641)	0.735*** (0.675, 0.902)
2007–2011	0.318*** (0.292, 0.345)	0.493*** (0.453, 0.535)	0.691*** (0.631, 0.756)
2012–2016	0.208*** (0.188, 0.229)	0.287*** (0.260, 0.317)	0.775*** (0.707, 0.849)
Variance inflation factor	1.68	1.67	1.68

Note: Boldface indicates statistical significance ($*p < 0.05$; $***p < 0.001$). All analyses used weights provided in the MTF public use files.

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or if the sample of respondents had access to summer school programs. It should also be recognized that some important subgroups of the U.S. youth population are missing from the MTF data (e.g., students who were homeschooled, have dropped out of school prior to eighth grade, or were absent on the day of data collection). Finally, all measures were based on self-report and although prior work has found that these self-report measures in the MTF study have been found to be reliable and valid, studies on youth suggest that underreporting of sensitive behaviors, such as substance use, can occur.^{11–13}

CONCLUSIONS

This study supports summer school as a promising venue to reach youth at risk for substance use and suggests that the inclusion of alcohol or drug prevention content into summer school programs would reach a population of students at increased risk for substance use.

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SA Stoddard contributed to the initial envisioning of the study; drafted manuscript introduction and discussion sections; contributed to the interpretation of the results; reviewed, edited, and finalized complete manuscript; and submitted the manuscript for review. PT Veliz completed data analysis, contributed to the interpretation of results, created tables and figure, drafted methods and results, and reviewed complete manuscript.

SA Stoddard presented this content at the Interdisciplinary Association for Population Health Science Annual Meeting, October 2018, Washington DC.

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SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at <https://doi.org/10.1016/j.amepre.2019.01.014>.

REFERENCES

1. Amos J. The consequences of dropping out of high school: average high school dropout has a negative net fiscal contribution to society of \$5,200, says new report. Alliance For Excellent Education. <http://all4ed.org/articles/the-consequences-of-dropping-out-of-high-school-average-high-school-dropout-has-a-negative-net-fiscal-contribution-to-society-of-5200-says-new-report/>. Accessed February 6, 2017.
2. Russell W. *Dropping Out: Why Students Drop Out of High School and What Can Be Done About It*. Cambridge, MA: Harvard University, 2011.
3. Reingle Gonzalez JM, Salas-Wright CP, Connell NM, Jetelina KK, Clipper SJ, Businelle MS. The long-term effects of school dropout and GED attainment on substance use disorders. *Drug Alcohol Depend*. 2016;158:60–66. <https://doi.org/10.1016/j.drugalcdep.2015.11.002>.
4. Lansford JE, Dodge KA, Pettit GS, Bates JE. A Public health perspective on school dropout and adult outcomes: a prospective study of risk and protective factors from age 5 to 27 years. *J Adolesc Health*. 2016;58(6):652–658. <https://doi.org/10.1016/j.jadohealth.2016.01.014>.
5. McCabe SE, Teter CJ, Boyd CJ, Wilens TE, Schepis TS. Sources of prescription medication misuse among young adults in the United States: the role of educational status. *J Clin Psychiatry*. 2018;79(2):17m11958. <https://doi.org/10.4088/JCP.17m11958>.
6. Fredricks JA, Blumenfeld PC, Paris AH. School engagement: potential of the concept, state of the evidence. *Rev Educ Res*. 2004;74(1):59–109. <https://doi.org/10.3102/00346543074001059>.
7. Franklin BJ, Trouard SB. Comparing dropout predictors for two state-level panels using Grade 6 and Grade 8 data. *J Educ Res*. 2016;109(6):631–639. <https://doi.org/10.1080/00220671.2015.1016601>.
8. Henry KL, Huizinga DH. Truancy's effect on the onset of drug use among urban adolescents placed at risk. *J Adolesc Health*. 2007;40(4):358.e9–358.e17. <https://doi.org/10.1016/j.jadohealth.2006.11.138>.
9. Henry KL, Thornberry TP, Huizinga DH. A discrete-time survival analysis of the relationship between truancy and the onset of marijuana use. *J Stud Alcohol Drugs*. 2009;70(1):5–15. <https://doi.org/10.15288/jasad.2009.70.5>.
10. Trenz RC, Dunne EM, Zur J, Latimer WW. An investigation of school-related variables as risk and protective factors associated with problematic substance use among vulnerable urban adolescents. *Vulnerable Child Youth Stud*. 2015;10(2):131–140. <https://doi.org/10.1080/17450128.2015.1029034>.
11. Miech RA, Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE, Patrick ME. *Monitoring the Future National Survey Results on Drug Use, 1975–2017: Volume I, Secondary School Students. Vol 1*. Ann Arbor, MI: Institute for Social Research, University of Michigan; 2018. <http://monitoringthefuture.org/pubs.html#monographs>. Accessed September 21, 2018.
12. Bachman JG, Johnston LD, O'Malley PM, Schulenberg JE, Miech RA. The Monitoring the Future project after four decades: design and procedures (Monitoring the Future Occasional Paper No. 82). <https://deepblue.lib.umich.edu/handle/2027.42/137908>. Published 2015. Accessed 21 September 2018.
13. O'Malley PM, Bachman JG, Johnston LD. Reliability and consistency in self-reports of drug use. *Int J Addict*. 1983;18(6):805–824. <https://doi.org/10.3109/10826088309033049>.