Abstract Title Page
Not included in page count.

Presentation #1

Title: Dropout Prevention and Intervention Programs: Effects on School Completion and Dropout Among School-aged Children and Youth

Author(s):
Sandra Jo Wilson
Emily Tanner-Smith
Mark W. Lipsey

Abstract Body

Background / Context:
With the expansion of regional and national economies into a global marketplace, education has even greater importance as a primary factor in allowing young adults to enter the workforce and advance economically, as well as to share in the social, health, and other benefits associated with education and productive careers. Dropping out of school before completing the normal course of secondary education greatly undermines these opportunities and is associated with adverse personal and social consequences. Dropout rates in the United States vary by calculation method, state, ethnic background, and socioeconomic status (Cataldi, Laird, & KewelRamani, 2009). Across all states, the percentage of freshman who did not graduate from high school in four years ranges from 13.1% to 44.2% and averages 26.8%. The status dropout rate, which estimates the percentage of individuals in a certain age range who are not in high school and have not earned a diploma or credential, is slightly lower. In October 2007, the proportion of noninstitutionalized 18-24 year olds not in school without a diploma or certificate was 8.7%. Males are more likely to be dropouts than females (9.8% vs. 7.7%). Status dropout rates are much higher for racial/ethnic minorities (21.4% for Hispanics and 8.4% for Blacks vs. 5.3% for Whites). Event dropout rates illustrate single year dropout rates for high school students and show that students from low-income households drop out of high school more frequently than those from more advantaged backgrounds (8.8% for low-income vs. 3.5% for middle income and 0.9% for high income students). The National Dropout Prevention Center/Network reports that school dropouts in the United States earn an average of $9,245 a year less than those who complete high school, have unemployment rates almost 13 percentage points higher than high school graduates, are disproportionately represented in prison populations, are more likely to become teen parents, and more frequently live in poverty (2009). The consequences of school dropout are even worse for minority youth, further exacerbating the economic and structural disadvantage they often experience.

School dropout has implications not only for the lives and opportunities of those who experience it, but also has enormous economic and social implications for society at large. For instance, the National Dropout Prevention Center/Network (2009) reports that each annual cohort of dropouts costs the United States over $200 billion during their lifetime due to lost earnings and unrealized tax revenue; and even a 1% increase in high school graduation rates could save over $1 billion in incarceration costs. The Organisation for Economic Co-operation and Development (2009) has similarly documented the tremendous social and economic gains associated with secondary school completion in OECD member countries.

A relatively large number of intervention and prevention programs in the research literature give some attention to reducing dropout rates as a possible outcome. The National Dropout Prevention Center/Network, for instance, lists 192 “model programs.” Relatively few of those programs, however, bill themselves as dropout programs; many focus on academic performance, risk factors for dropout such as absences or truancy, or indirect outcomes like student engagement, but may also include dropout reduction as a program objective. The corresponding research domain includes evaluations of virtually any program provided to students for which dropout rates are measured as an outcome variable, regardless of whether they are billed as

dropout programs. To represent the full scope of relevant research on this topic, all such programs should be considered in a review of dropout programs.

There have been a handful of systematic reviews on the effects of prevention and intervention programs on school dropout and completion outcomes. However, the restrictive inclusion criteria and methodological weaknesses of these reviews preclude any confident conclusions about the effectiveness of the broad range of programs with dropout outcomes, or the potential variation of effectiveness for different program types or subject populations. For instance, the U.S. Department of Education's What Works Clearinghouse report on dropout prevention found only 15 qualifying studies that reported outcomes on direct measures of staying in school or completing school (http://ies.ed.gov/ ncee/wwc/reports/dropout/topic/#top). This report, however, restricted discussion to interventions in the United States and did not include a meta-analysis of program effectiveness or examine potential moderators of program effectiveness. Another review on best practices in dropout prevention summarized the results of 58 studies of dropout programs (ICF, International, 2008). That report presented effect sizes primarily for individual program types and did not examine potential moderators or examine the influence of study method on effect size. The report also presented a narrative review of important variables associated with implementation quality, but implementation quality was not analyzed in a meta-analysis framework.

Two other systematic reviews have focused on the effectiveness of prevention and intervention programs to reduce school dropout or increase school completion (Klima, Miller, & Nunlist, 2009; Lehr et al., 2003). In their review, Lehr et al. (2003) identified 17 experimental or quasi-experimental studies with enrollment status outcomes. This review was completed seven years ago, and thus does not include the most recent studies. The authors did not perform a meta-analysis because they felt that the dependent variables differed too greatly across studies to create meaningful aggregates. This circumstance prevented the authors from examining the differential effectiveness of programs with different treatment or participant characteristics, something we plan to do in the proposed systematic review. In a more recent review, Klima et al. (2009) identified 22 experimental or quasi-experimental studies with dropout, achievement, and truancy outcomes. However, this review excluded programs for general "at-risk" populations of students (e.g., minority or low socioeconomic status samples), as well as programs with general character-building, social-emotional learning, or delinquency/behavioral improvement components. These exclusion criteria therefore limited the conclusions that could be drawn about the broader range of programs that aim to influence school dropout and completion outcomes. Further, this review only presented mean effect sizes for different types of interventions, and did not examine the potential variation of effects for different subject populations.

The findings of the Klima et al., (2009) and Lehr et al., (2003) reviews have some similarities. Both teams highlight the dearth of high-quality research on dropout programs, and mention especially the lack of key outcomes such as enrollment (or presence) at school and dropout. Both reviews demonstrate that some of the included programs had positive effects on the students involved. Lehr and her colleagues do not identify specific programs that were particularly effective or ineffective, but focus rather on implementation integrity as a key variable and emphasize the importance of strong methodologies for future research on dropout programs. Klima and colleagues conclude that the programs they reviewed had overall positive effects on

dropout, achievement, and attendance/enrollment. They highlight alternative educational programs, such as schools-within-schools, as particularly effective. The Klima review also suggests that alternative school programs, that is, programs in separate school facilities, were ineffective. Overall, these two reviews identify several important potential moderators that will be included in the coding scheme for the proposed review. These include implementation quality, treatment modality, and whether programs are housed in typical school facilities or in alternative school locations.

Purpose / Objective / Research Question / Focus of Study:
The objective of the systematic review is to summarize the available evidence on the effects of prevention and intervention programs aimed at primary and secondary students for increasing school completion or reducing school dropout. Program effects on the closely related outcomes of school attendance (absences, truancy) will also be examined. Moreover, when accompanying dropout or attendance outcomes, effects on student engagement, academic performance, and school conduct are also included.

The primary focus of the analyses presented will be the comparative effectiveness of different programs and program approaches in an effort to identify those that have the largest and most reliable effects on the respective school participation outcomes, especially with regard to differences associated with treatment modality, implementation quality, and program location or setting. In addition, evidence of differential effects for students with different characteristics will be explored, e.g., in relation to age or grade, gender, race/ethnicity, and risk factors.

Setting:
Studies eligible for the systematic review involved both school- and community-based programs. The initial search criteria allowed for studies from all over the world, published in any language, to be included. In the final sample, the majority of studies are US-based but there are several non studies in the sample.

Population / Participants / Subjects:
Eligible interventions are directed toward school-aged youth, defined as those expected to attend preschool to 12th grade primary and secondary schools, or the equivalent in countries with a different grade structure, corresponding to approximately ages 4-18. The age or school participation of the sample must be presented in sufficient detail to allow reasonable inference that it meets this requirement. Recent dropouts who are between the ages of 18-21 may also be included if the program under study is explicitly oriented toward secondary school completion or the equivalent.

General population samples of school-age children are included. Samples from populations broadly at risk because of economic disadvantage, individual risk variables, and closely related factors are also included (e.g., inner city schools, students from low SES families, teen parents, students with poor attendance records, students who have low test scores or who are over-age for their grade).

Intervention / Program / Practice:
The interventions included in the systematic review must be school-based, school-affiliated, or

community-based psychological, educational, or behavioral prevention or intervention programs, broadly defined, that involve actions performed with the expectation that they will have beneficial effects on student recipients. School-based programs are those that are administered under the auspices of school authorities and delivered during school hours. School affiliated programs are those that are delivered with the collaboration of school authorities, possibly by other agents, e.g., community service providers, and which may take place before or after school hours and/or off the school grounds. Community-based programs that are explicitly presented as dropout prevention or intervention programs are also included. Table 1 presents a brief listing of the most common interventions in the systematic review (insert Table 1 about here).

Research Design:
The research reported here is a systematic review and meta-analysis of school dropout interventions and follows standard meta-analysis methodology (Cooper, Hedges, & Valentine, 2009; Hedges, Higgins, Rothstein, & Borenstein, 2009; Higgins & Green, 2008; Lipsey & Wilson, 2001). The methods are described briefly below.

Data Collection and Analysis:
We developed a detailed set of eligibility criteria to specify eligible interventions, subject populations, research designs and outcomes. A comprehensive literature search was performed and potentially eligible studies were screened for eligibility. Studies were coded into a computerized coding manual on variables related to study methods, the nature of the intervention and its implementation, the characteristics of the subject samples, the outcome variables and statistical findings, and contextual features such as setting, year of publication, and the like.

Effect size metrics. We used odds ratios as the effect size metric for dropout and other binary outcomes, measured as the odds of school completion/success divided by the odds of school dropout/failure. For outcomes measured on a continuous scale we calculated standardized mean difference effect sizes, measured as differences in treatment and comparison group means (e.g., group differences in average attendance rates). Standardized mean difference effect sizes will be adjusted with a small-sample correction factor that provides unbiased estimates of the effect size in small samples (Hedges, 1981). All effect sizes are coded such that larger effect sizes represent positive outcomes (e.g., less school dropout, higher attendance, less truancy).

Findings / Results:

Thus far, we have coded the study characteristics and results for 130 independent samples of students. The general characteristics of the programs in the coded studies are as follows:

- Community-based programs make up 15% of the sample; the remaining 85% are school-based or school-affiliated.
- Program duration averaged 77 weeks.
- The frequency of treatment varied, but over half of the programs involved daily contact.
- Implementation quality also varied: 29% experienced clear problems, 15% alluded to possible problems, and 56% experienced no problems or mentioned no problems.
- 75% were high school aged samples; 18% were middle school samples; 10 studies (7%) were younger students.

- Mixed ethnicity groups of students were common. 65% of the student samples were mostly minority students.
- With the exception of specialized programs for teenage mothers, most programs were delivered to mixed gender groups.
- Nearly all students were at risk for dropping out and were from low socioeconomic status families.

The weighted mean random effects odds ratio for the effects of treatment on high school dropout was 1.63 (95% CI 1.41-1.89). After treatment, the odds of completing school are 1.63 times greater for students in prevention programs than for students who received no special programming. The average control group dropout rate is 44%. An odds ratio of 1.63 means that dropout programs reduced this rate to about 32%. The distribution of dropout odds ratios evidenced significant heterogeneity (Q=238.6*; I^2 = 45.9%). That is, there are between-study differences in effect sizes that are greater than would be expected from the subject-level sampling error. To identify study characteristics associated with larger or smaller effects, a random effects meta-regression analysis was performed. The results are shown in Table 2 (please insert Table 2 here).

Conclusions:

The results of the regression analyses on the studies coded thus far find that unpublished research and higher quality methods produce significantly smaller treatment differences. Ethnic mix and grade level were not significantly associated with differential effects for treatment. Key program characteristics associated with less dropout among treated students included implementation quality, shorter duration programs, and community-based programs. When controlling for other influences on outcome (e.g., implementation), all program types produced positive results, though the mentoring and "other" programs fell short of significance. Attendance monitoring & incentives, child care, community service, and school restructuring programs produced best results.

Results will be discussed in terms of implications for policy and practice. Indeed, the ultimate objective of the systematic review is to provide school administrators and policymakers with an integrative summary of research evidence that is useful for guiding programmatic efforts to reduce school dropout and increase school completion.

Appendices

Appendix A. References

Cataldi, E. F., Laird, J., & KewalRamani, A. (2009). *High school dropout and completion rates in the United States: 2007* (NCES 2009-064). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved Jan 26, 2010 from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009064.

Duval, S., & Tweedie, R. (2000). A nonparametric 'trim and fill' method of accounting for publication bias in meta-analysis. *Journal of the American Statistical Association*, 95, 89-98.

Egger, M., Davey Smith, G., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *British Medical Journal*, 315, 629-634.

Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J. A. Schinka & W. F. Velicer (Eds.), *Handbook of psychology: Research methods in psychology*, Vol. 2. (pp. 87-114). Hoboken, NJ: John Wiley & Sons, Inc.

Hedges, L. V. (1981). Distribution theory for Glass's estimator of effect size and related estimators. *Journal of Educational Statistics*, 6, 107-128.

Hedges, L. V. (2007). Effect sizes in cluster-randomized designs. *Journal of Educational and Behavioral Statistics, 32,* 341-370.

Hedges, L. V., Tipton, E., & Johnson, M. C. (2010). Robust variance estimation in meta-regression with dependent effect size estimates. *Research Synthesis Methods, 1,* 39-65.

ICF International & National Dropout Prevention Center/Network. (2008). *Best practices in dropout prevention.* Fairfax, VA: ICF International.

Klima, T., Miller, M., & Nunlist, C. (2009). *What works? Targeted truancy and dropout programs in middle and high school*. Olympia: Washington State Institute for Public Policy, No. 09-06-2201. [http://www.wsipp.wa.gov/pub.asp?docid=09-06-2201]

Lehr, C. A., Hansen, A., Sinclair, M. F., & Christenson, S. L. (2003). Moving beyond dropout toward school completion: An integrative review of data-based interventions. *School Psychology Review*, 32, 342-364.

Long, D., Gueron, J. M., Wood, R. G., Fisher, R., & Fellerath, V. (1996). *LEAP: Three-year impacts of Ohio's welfare initiative to improve school attendance among teenage parents*. New York: MDRC.

Maynard, B. R., Tyson-McCrea, K., Pigott, T., & Kelly, M. (2009). *Interventions intended to increase school attendance in elementary and secondary school students.* Campbell Collaboration Protocol. Retrieved August 18, 2010 from http://campbellcollaboration.org/lib/index.php?basic_search=1&go=browse_small&search=attendance&search_criteria=title

National Dropout Prevention Center/Network. (2009). *Economic impacts of dropouts*. Retrieved Jan 26, 2010 from http://www.dropoutprevention.org/ndpcdefault.htm.

Organisation for Economic Co-operation and Development. (2009). *Education at a Glance 2009: OECD Indicators*. Paris, France: OECD Publishing. [Retrieved Jan 26, 2010 from www.oecd.org/edu/eag2009].

Sterne, J. A. C. (Ed.). (2009). *Meta-analysis in Stata: An updated collection from the Stata Journal*. College Station, TX: Stata Press.

Tukey, J. W. (1977). Exploratory data analysis. Reading, MA: Addison-Wesley.

U.S. Department of Education What Works Clearinghouse. *Topic report on dropout prevention*. [http://ies.ed.gov/ncee/wwc/reports/dropout/topic/#top]

Appendix B. Tables and Figures

Table 1. Dropout Programs in the Meta-Analysis		
Program	**Description**	**N**
Supplemental academic services	Remedial education, tutoring, homework assistance, etc.	9
School or class restructuring	Small learning communities, block schedules, career academies, small class size.	40
College preparation	College preparatory curriculum, college-oriented academic advising.	5
Vocational training	Coursework in secondary school oriented toward work or career interests.	9
Attendance monitoring & financial incentives	Monitoring and services to increase attendance for mixed gender groups or (for teenage moms) monitoring + financial incentives to increase attendance.	17
Child care services	Child care services provided for teenage moms.	2
CBT or skills training	Generally oriented toward improving self-esteem or attitudes about school, or preventing drug use.	6
Case management	Programs revolved around connecting students & families with appropriate services.	13
Mentoring, counseling	Programs provided adult mentors or trained counselors for students. Though mentors focused more on career/work, both mentors and counselors dealt with students' personal issues.	5
Community service	Series of affiliated programs that involve planning and carrying out a community service project coupled with a weekly life skills curriculum.	16

Table 2. Meta-Regression Results			
	B	**β**	**p**
Method Variables			
Unpublished	-.83	-.47	.00
Routine practice	.01	.01	.94
Method quality	-.17	-.19	.06
Subject Characteristics			
Ethnic mix	.17	.17	.13
Grade level	-.00	-.01	.95
Treatment Characteristics			
Implementation quality	.26	.28	.03
Tx duration	-.00	-.23	.03
Community-based	.91	.41	.00
Program Types			
Supplemental academic (9)	.90	.27	.04
School restructuring (40)	1.41	.81	.00
Attendance monitoring mixed (6)	2.01	.37	.00
Attendance monitoring teenage moms (11)	1.65	.58	.00
CBT or skills training (6)	1.35	.33	.01
Vocational (9)	.77	.27	.07
Case management (13)	1.03	.37	.03
College prep. (5)	1.34	.39	.00
Child care (2)	1.86	.25	.00
Mentoring, counseling (5)	.54	.11	.28
Community service (16)	1.74	.45	.00

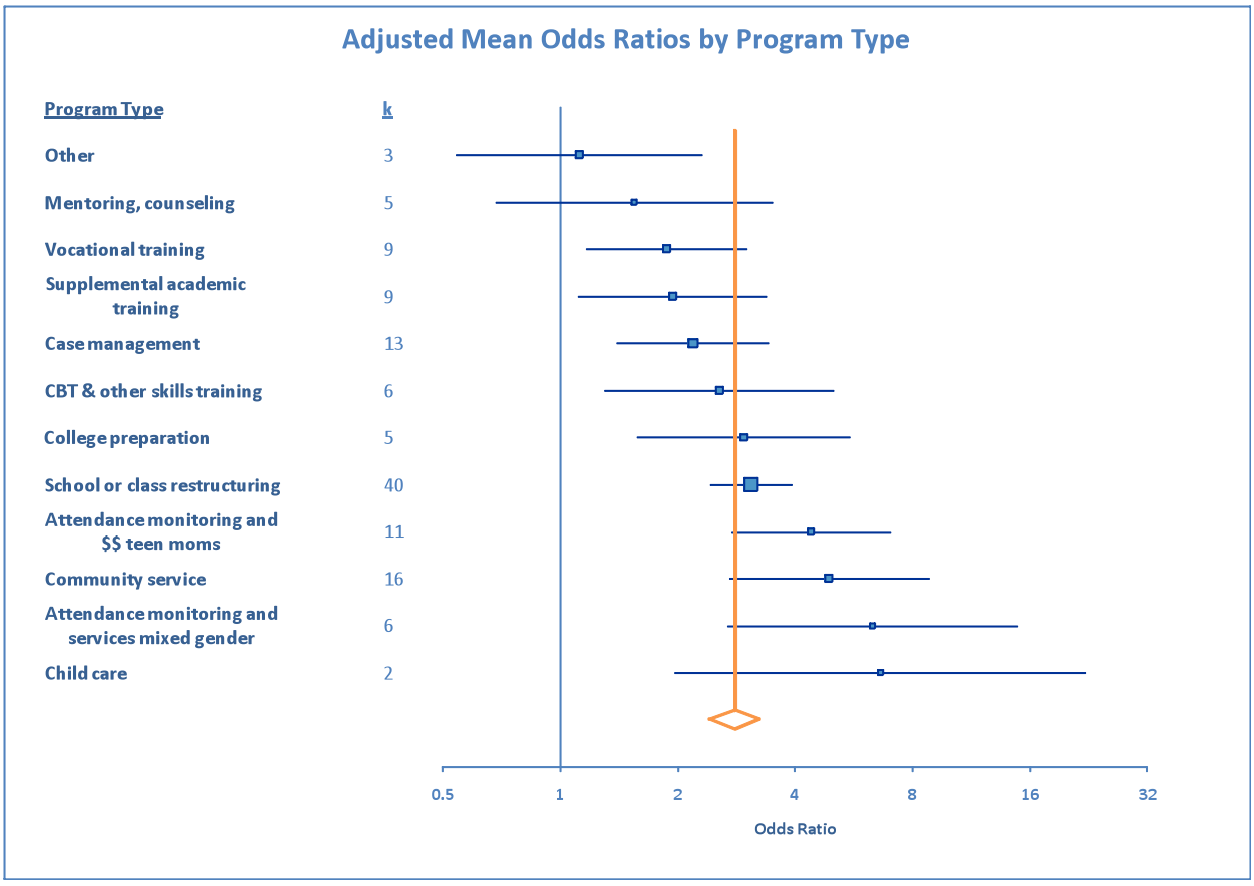

Figure 1.
Forest Plot of Adjusted Effect Sizes by Treatment Type