

Examining the Effectiveness of Year-Round School Calendars on Improving Educational Attainment Outcomes Within the Context of Advancement of Health Equity: A Community Guide Systematic Review

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ABSTRACT

Students may lose knowledge and skills achieved in the school year during the summer break, with losses greatest for students from low-income families. Community Guide systematic review methods were used to summarize evaluations (published 1965-2015) of the effectiveness of year-round school calendars (YRSCs) on academic achievement, a determinant of long-term health. In *single-track* YRSCs, all students participate in the same school calendar; summer breaks are replaced by short "intersessions" distributed evenly throughout the year. In *multi-track* YRSCs, cohorts of students follow separate calendar tracks, with breaks at different times throughout the year. An earlier systematic review reported modest gains with single-track calendars and no gains with multi-track calendars. Three studies reported positive and negative effects for single-track programs and potential harm with multi-track programs when low-income students were assigned poorly resourced tracks. Lack of clarity about the role of intersessions as simple school breaks or as additional schooling opportunities in YRSCs leaves the evidence on single-track programs insufficient. Evidence on multi-track YRSCs is also insufficient.

KEY WORDS: alternative school calendar, health equity, intersession, determinants of health, year-round education, year-round school

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Educational achievement is an established social determinant of long-term health^{1,2}; thus, an intervention that affects educational achievement can be assumed to also affect long-term health. In the United States, inequalities by race, ethnicity, and income in both educational achievement and health are substantial and persistent.³⁻¹⁰ One source of the educational achievement gap is learning loss during summer breaks experienced especially by students from low-income families, probably because they lack resources for educational summer activities available to more affluent students.¹¹⁻¹³ It is plausible that year-round school calendars (YRSCs), in which summer break is shortened

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and short breaks are more evenly distributed throughout the school year, may decrease the learning loss associated with a long summer break¹¹ and lead to improved academic achievement for low-income students. If YRSCs reduce the achievement gap, they may be expected to advance health equity.

Year-round schooling alters the school calendar by redistributing school and vacation days more evenly throughout the year, without changing the number of school days per year. YRSCs take two forms: In the *single-track* version, all students participate in the same school calendar. Short intersessions between school sessions replace long summer vacation and may provide remedial or advancement educational opportunities. Definitions of single-track versions do not clarify whether educational intersessions are essential or optional program components. In the *multi-track* version, several tracks of students participate separately in each school such that one track is on break when the others are in session and breaks occur throughout the year. Except for several holidays, the school remains open year-round. Single-track programs are commonly implemented to address the summer achievement loss,¹⁴ whereas multi-track programs are often implemented in overcrowded school districts to delay the construction of new school buildings by using available facilities year-round.^{14,15}

This review synthesizes available evidence on the effectiveness of single- and multi-track YRSCs in

improving academic outcomes. This review is one in a series evaluating the effects of educational programs on academic outcomes. Because these academic outcomes, along with other factors, have been shown to be related to long-term health outcomes and because the programs are often targeted toward low-income and at-risk racial communities, it is posited that the effective programs will advance health equity—the ultimate object of this series of reviews.

Conceptual Approach and Analytic Framework

Year-round schooling reduces the duration of traditional, long summer vacation associated with loss of academic learning, particularly among low-income students (Figure). It thus may promote more continuous learning by distributing breaks more evenly throughout the school year, leading to improved academic outcomes, reduced learning loss, and reduced grade repetition. Single-track year-round schooling may also lead to increased opportunities for learning through intersession classes. Multi-track year-round schooling may lead to reduced delinquency and vandalism since the school is continuously occupied. Multi-track year-round schooling may also lead to cost savings by making use of school facilities at all times throughout the year and delaying new school construction. If year-round schooling leads to improved academic outcomes, then income and

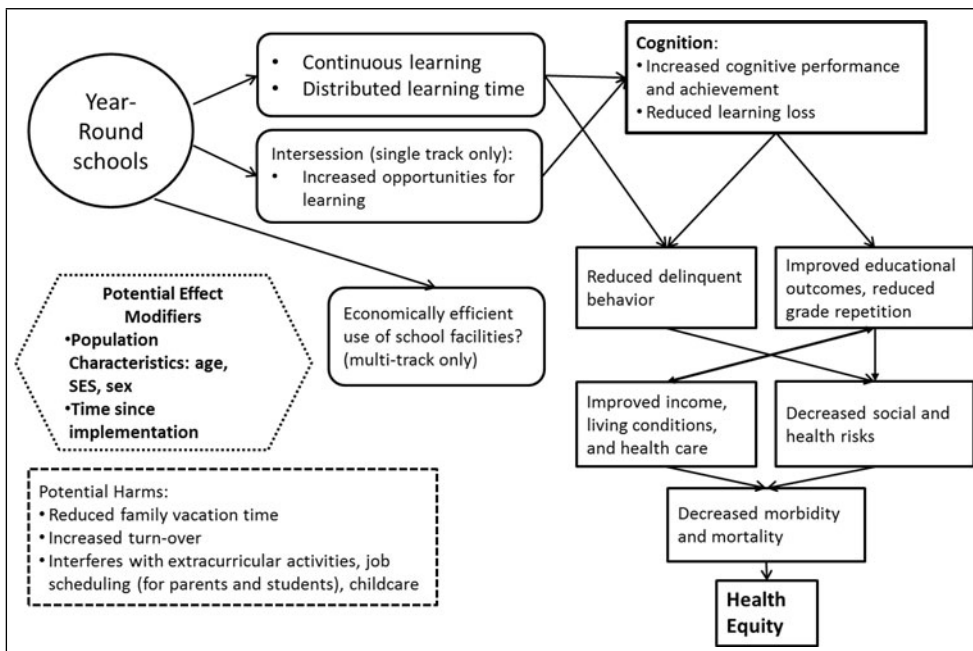


FIGURE Analytic Framework: How Year-Round Schooling Is Expected to Affect Academic Outcomes Directly and Health and Health Equity Because of Effects on Academic Outcomes
Abbreviation: SES, socioeconomic status.

employment, also associated with long-term health, will likely improve. Because educational achievement is a major social determinant of health, insofar as these programs are implemented in low-income communities, they could have an impact on health equity. See Supplemental Digital Content Appendix I (available at <http://links.lww.com/JPHMP/A519>) for the list of outcomes of interest.

Some observers have reported that year-round schools (YRSs) may lead to reduced family vacation time and interfere with extracurricular activities for students, job scheduling for parents and students, and difficulty arranging childcare.^{14,15} There is also the potential for increased teacher turnover due to burnout.¹⁴ Multi-track calendars may separate students from friends in other tracks.¹⁴

Inclusion Criteria, Evidence Acquisition, and Methods

See Supplemental Digital Content Appendix I (available at <http://links.lww.com/JPHMP/A519>) for description of methods.

Evidence Synthesis

See Supplemental Digital Content Appendix II and Appendix Table 1 (available at <http://links.lww.com/JPHMP/A519>) for description of study, intervention, and population.

Findings

Search results are shown in Supplemental Digital Content Appendix Figure 2 (available at <http://links.lww.com/JPHMP/A519>). A meta-analysis by Cooper and colleagues¹⁴ was found and used as a source for this review because it was recent and of good quality. All study estimates were for achievement scores. The summary effect estimate from 39 studies was small and significant—a weighted *d*-index of 0.06 (95% CI, 0.04-0.08). The 15 studies of single-track schools reported a modest and statistically significant gain compared with traditional calendar schools ($d = 0.19$; 95% CI, 0.07-0.31); the 8 studies of multi-track schools showed basically no difference compared with traditional calendar schools ($d = 0.04$; 95% CI, -0.12 to 0.2) (see Supplemental Digital Content Appendix Table 2, available at <http://links.lww.com/JPHMP/A519>). There was no significant difference of effect in standardized mean differences between studies mentioning and those not mentioning intersession: 0.10 (95% CI, -0.01 to 0.21) versus 0.08 (95% CI, -0.01 to 0.17). Additional stratified analyses demonstrated effectiveness for low socioeconomic status (SES) (vs higher SES), elementary (vs higher

grades), and predominantly nonwhite students (vs predominantly white student bodies). Programs implemented more than 1 year were also effective (compared with shorter implementation periods); other analyses favored YRSs but were not statistically significant.

We conducted a search of literature on the effects of YRSs on achievement published following Cooper's search period in the databases (ERIC and PsycINFO) used by Cooper and colleagues,¹⁴ from March 2002 through August 2015. Three studies, in four articles,¹⁵⁻¹⁸ compared single-track YRSs with traditional schools and reported mixed findings. A retrospective cohort¹⁸ of three elementary schools in which teachers and students within the same school could choose whether to be on a year-round or traditional calendar reported favorable results for the YRS in mathematics (5.2 percentile greater growth in National Percentile Rank) and little change for reading (1.6 greater percentile growth). A panel study¹⁵ of elementary and middle schools in California reported no change; most scores for mathematics, English, and reading remained negative but not statistically significant. The cross-sectional analysis of Virginia schools by Brown and colleagues¹⁶ reported that test scores of the general student population were similar at YRSs and traditional calendar schools, but found benefits for specific student populations (discussed later). Brown and colleagues attributed the benefits to intersession but did not evaluate this claim.

Three studies, in five articles^{15,17,19-21} compared academic achievement in multi-track YRSs to traditional schools and reported mostly negative findings. Graves¹⁵ reported main effects that were negative and statistically significantly negative for years 2 and 3 after changing to a multi-track calendar. McMullen and Rouse²⁰ reported a panel study of elementary and middle schools in a county of North Carolina. Analysis of change in student achievement in YRSs compared with non-YRSs found small, positive, and statistically significant effect for lowest-performing students but smaller changes in scores for higher-achieving students.²⁰ In addition, Mitchell and Mitchell²¹ found no difference between academic outcomes in schools with multi-track and traditional calendars but did find differences in resource allocation and academic achievement among tracks within the district compared with each other (see later).

Effects on Inequities

Three studies reported effects for specific student populations. Two^{16,17} reported mixed findings on single-track calendars. Brown and colleagues¹⁶ reported test scores of subgroups of students in Virginia,

mostly black students but also Hispanics and students from low-income families who showed increased achievement scores in schools with single-track YRSCs compared with schools with traditional calendars. Graves¹⁷ reported that single-track calendar programs had mostly negative outcomes for low-SES students but mixed outcomes for minority populations.

Two studies^{17,21} reported negative effects for multi-track calendars. Authors reported differences between schools by calendar type, the most notable being disparities in neighborhood characteristics of the areas surrounding multi-track schools (high percentage of adults without a high school degree, unemployment rate, urban concentrations, proportions of children in single-parent household, and limited English proficiency) compared with those of single-track or traditional schools. Even controlling for demographic differences, a multi-track year-round calendar had consistent statistically significant and negative effects on all subgroups. Similarly, Mitchell and Mitchell²¹ reported statistically significant and negative results of multi-track calendars for minority and low-SES students—differences that increased over time. In addition, more nonwhite, non-English-speaking, and low-SES students were assigned to tracks with less experienced teachers.

Limitations

See Supplemental Digital Content Appendix III (available at <http://links.lww.com/JPHMP/A519>) for a description of limitations.

Discussion

Summary of findings

Single-track YRSCs

Available evidence is insufficient to determine the effects of single-track YRSs on academic achievement because the role of intersession programs in single-track programs is unclear, hindering the ability to evaluate the program and rendering conclusions uncertain. It is not clear whether intersession is regarded as an essential or an optional element of single-track year-round schooling. If intersession is essential, single-track programs would substantially extend the number of days in school, thus inconsistent with the conceptualization of YRSCs as not expanding in-school time. It is not clear whether the apparent benefits of some single-track programs for at-risk populations are attributable to the change of calendar alone, to the addition of intersessions alone, or to a combination.

Implications for Policy & Practice

- *The role of intersession:* Policy and research statements about single-track year-round schooling are not clear about whether educational “intersessions” between periods of formal schooling are regarded as optional or essential elements of this intervention. If they are essential elements, then the length of the school year may in fact be extended, contrary to common perception. In addition, potential success of programs may be partially attributable to this component. Clarification of this conceptual issue is necessary to resolve these questions.
- *Implications for state of evidence:* Lack of clarity in the definition of single-track YRSCs leaves the current evidence about this program insufficient; it is not clear what is being investigated and what might be responsible for program effects.
- *Caution in the development of multi-track YRSCs:* Beyond definitional issues (the primary objective of many multi-track programs is to save money), if multi-track programs are to operate, it is critical that strategies be developed to ensure equitable track assignments.
- *Redressing summer academic loss:* Answers to these questions may open opportunities to redress summer academic loss, which is a critical contributor to persistent achievement gaps faced by students in low-income communities and an obstacle to health equity.

Multi-track YRSCs

Available evidence is insufficient to determine the effects of multi-track year-round calendars in improving academic achievement because of inconsistencies across studies. Effect sizes in the body of evidence were small, and information was lacking on how the intervention is implemented. In addition, evidence suggests that multi-track YRSs may be harmful for low-income students if they are assigned tracks with fewer academic resources, in which case health inequity may be increased.

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