
Single-track year-round education for improving academic achievement in US K-12 schools: results of a meta-analysis

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Submitted to the Coordinating Group of:

- Crime and Justice
- Education
- Disability
- International Development
- Nutrition
- Social Welfare
- Methods
- Knowledge Translation and Implementation
- Other:

Plans to co-register:

- No
- Yes Cochrane Other
- Maybe

Date submitted: 9 May 2017

Date revision submitted: 9 August 2017

Approval date:

Title of the review

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Background

Summer learning loss is a prominent concern in academic and public discussions of education. Summer learning loss refers to the fact that students forget material and show measurably decreased competency at the beginning of one school year than at the end of the preceding year. Concerns focus on not only what students forget over summer vacation, but also on the time that must be spent reviewing previously-taught material at the beginning of each school year. Overall, summer learning loss is worse in math than in reading (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996), likely because students read but do not do math during the summer. Cooper et al.'s (1996) meta-analytic estimate was that achievement declines by about one month of learning (.16 standard deviations in math and .11 in reading) during summer.

Summer learning loss appears to be worse for disadvantaged students. Research has documented that low-income students lose ground to higher-SES students during summer months when they cannot access school resources (Burkam, Ready, Lee, & LoGerfo 2004; Entwisle, Alexander, & Olson, 2001). The magnitude of this loss relative to their more-advantaged peers is substantial: low-income students lose as much as three months of learning in reading over the summer (Von Drehle, 2010). Summer learning loss among low-income students may account for as much as two-thirds of the income-based achievement gap (Alexander, Entwisle, & Olson, 2007).

The documented losses for disadvantaged students are consistent with research on differences in summer resources and opportunities. Low-income students typically attend lower-performing schools than their wealthier counterparts, but the resource differential in summer may be even greater (Downey, von Hippel, & Broh, 2004). During summer, less affluent children watch more television, converse less with parents, and benefit from less daily parental involvement than wealthier students (Gershenson, 2013). Wealthier students, in contrast, are more likely to engage in more stimulating activities, like taking lessons, visiting libraries, and attending museums, than less affluent students (Alexander et al., 2007).

Year-round education is seen as a way to combat summer learning loss by shortening or eliminating the long summer vacation. The logic is fairly simple: if there are fewer weeks for students to forget material, then they will forget less during the summer, need to spend fewer weeks on review, and make more progress in the following year. Year-round education refers to the policy intervention of shortening summer break in order to distribute instructional time more evenly throughout the year, while retaining the standard 180 instructional days. The National Association for Year-Round Education (NAYRE) defines YRE by saying that it provides “more continuous learning by breaking up the long summer vacation into shorter, more frequent vacations throughout the year...The year-round calendar is organized into instructional periods and vacation weeks that are more evenly balanced across 12 months than the traditional school calendar” (NAYRE, n.d.).

Objectives

Guided by prior research, this meta-analysis examines single-track YRE only. The main objective is to identify, across studies published in the post-NCLB era, how single-track YRE effects student learning. The first research question is therefore: (1) what is the estimated effect of single-track YRE for math achievement and for reading achievement? The summer learning loss literature shows that disadvantaged students fall further behind their advantaged peers over the summer. This disparity points to the possibility that the effect size of YRE, which derives in part from mitigating summer learning loss, will differ for subgroups of students. Thus, the second research question is: (2) what is the effect size (of math and reading achievement) for only low-income students and for only minority students? There may well also be differences in the effect of single-track YRE based on the characteristics of the calendar as implemented. The third research question is therefore: (3) what is the relationship between characteristics of YRE (calendar structure, duration of the longest remaining break) and the effect size estimate?

Existing reviews

Two prior meta-analyses have examined year-round education's effect on academic achievement, primarily with subjects merged into a single outcome. Kneese (1996) included both studies with comparison groups and pre/post studies, and found a positive effect on achievement varying from +0.11 to +0.2 standard deviations depending on the exact model and analysis used. Kneese also stated that single-track calendars appeared to have a larger effect than multi-track calendars. Cooper, Valentine, Charlton, and Melson (2003) included only studies with comparison groups, and found an overall effect size of +0.06, but +0.11 for studies that used statistical or matching controls. Cooper et al. (2003) disaggregated by calendar type, and in their fixed-effects unadjusted analyses found that, although multi-track YRE had an effect size of just -0.01 (± 0.05), single-track YRE had an effect size of +0.16.

These prior reviews provided important information on how YRE overall relates to student learning. However, the Cooper et al. (2003) study included research through 2000. Since 2001, in the NCLB and post-NCLB era, schooling in America has experienced a broad array of shifts and interventions. These may have introduced systemic differences in the effect of YRE. Perhaps more importantly, the prior reviews focused on YRE overall, and only examined single-track YRE as a whole compared to multi-track YRE as a whole. By focusing only on single-track year-round education, I will be able not just to arrive at an overall effect size estimate, but also to begin observing both qualities that make single-track YRE more effective and student populations for whom it is more effective.

Intervention

Year-round education is sometimes conflated with other calendar and instructional reforms, so it is worth delineating how it is distinct from seemingly similar policies. YRE is distinct from a reform that is typically called extended year, which consists of adding days to the standard American school year of 180 days. YRE also does not refer to after-school programming, tutoring, summer school for remediation, other summer programming, or lengthening the number of instructional hours in each school day. It refers exclusively to re-allocating the 180 instructional days more evenly throughout the year.

Year-round calendars are not all the same, and the most important distinction in type is whether a calendar is single-track or multi-track. On a single-track calendar, all students and teachers are on the same schedule (track). The school building either has all students present or none present on each day, and the building only has students in it 180 days per year. Single-track YRE is usually implemented as an academic reform to improve student

achievement. In contrast, multi-track YRE is typically implemented in response to overcrowding when there is no funding available for additional classroom space. On a multi-track calendar, some of the students (for example, 25%) are on vacation at any time, while the other students (in this example, 75%) are in school. The tracks rotate through their time in school and on vacation, which would allow a school with room for 900 students to serve 1,200 students on a rotating basis.

Individual studies that examined both single- and multi-track YRE have found that single-track schools showed larger performance gains (e.g., White & Cantrell, 2001). The effect of multi-track YRE may actually be negative (Graves, 2010; Graves, McMullen, & Rouse, 2013). In both the Kneese (1996) and Cooper et al. (2003) meta-analyses, the authors found a larger treatment effect for single-track than multi-track YRE. Estimating the effect of grouped single- and multi-track YRE as a single treatment of “year-round education” would require ignoring the important guidance provided by prior research findings. As a result, the current study excludes multi-track YRE and focuses only on single-track YRE, because it is an academic intervention previously shown to have a modest but significant effect.

Population

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Outcomes

The outcomes for this meta-analysis will be (i) math achievement scores and (ii) reading achievement scores. If possible, supplementary analyses will examine growth instead of single-year achievement scores, but initial review indicates that growth scores are not consistently available in studies that will be included in the final sample.

Study designs

Four selection criteria will be applied to identify studies that are viable evaluations of the effect of YRE in the U.S.:

1. studies cannot be evaluations of extended instructional time (e.g., lengthened school day or additional instructional days)
2. studies must include achievement data of some kind
3. studies must include a comparison group, which excludes comparing to prior performance at the same school(s)
4. studies must be of K-12 schooling in the United States

References

- Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2007). Lasting consequences of the summer learning gap. *American Sociological Review*, 72, 167-180. [doi:10.1177/000312240707200202](https://doi.org/10.1177/000312240707200202)
- Burkam, D. T., Ready, D. D., Lee, V. E., & LoGerfo, L. F. (2004). Social-class differences in summer learning between kindergarten and first grade: Model specification and estimation. *Sociology of Education*, 77, 1-31. [doi:10.1177/003804070407700101](https://doi.org/10.1177/003804070407700101)
- Cooper, H., Valentine, J. C., Charlton, K., & Melson, A. (2003). The effects of modified school calendars on student achievement and on school and community attitudes. *Review of Educational Research*, 73, 1-52. [doi:10.3102/00346543073001001](https://doi.org/10.3102/00346543073001001)
- Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research*, 66, 227-268. [doi:10.3102/00346543066003227](https://doi.org/10.3102/00346543066003227)
- Downey, D. B., von Hippel, P. T., & Broh, B. A. (2004). Are schools the great equalizer? Cognitive inequality during the summer months and the school year. *American Sociological Review*, 69, 613-635. [doi:10.1177/000312240406900501](https://doi.org/10.1177/000312240406900501)
- Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2001). Keep the faucet flowing: Summer learning and home environment. *American Educator*, 25(3), 10-15.
- Gershenson, S. (2013). Do summer time-use gaps vary by socioeconomic status? *American Educational Research Journal*, 50, 1219-1248. [doi:10.3102/0002831213502516](https://doi.org/10.3102/0002831213502516)
- Graves, J., McMullen, S., & Rouse, K. (2013). Multi-track year-round schooling as cost saving reform: Not just a matter of time. *Education Finance and Policy*, 8, 300-315. [doi:10.1162/edfp_a_00097](https://doi.org/10.1162/edfp_a_00097)
- Graves, J. (2010). The academic impact of multi-track year-round school calendars: A response to school overcrowding. *Journal of Urban Economics*, 67, 378-391. [doi:10.1016/j.jue.2009.11.004](https://doi.org/10.1016/j.jue.2009.11.004)
- Kneese, C. C. (1996). Review of research on student learning in year-round education. *Journal of Research and Development in Education*, 29, 60-72.
- National Association for Year-Round Education. (n.d.). Mission statement. Retrieved from <http://nayre.org/about.html>
- Von Drehle, D. (2010, August 02). The case against summer vacation. *Time*, 176, 1.

Review authors

Lead review author: The lead author is the person who develops and co-ordinates the review team, discusses and assigns roles for individual members of the review team, liaises with the editorial base and takes responsibility for the on-going updates of the review.

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Roles and responsibilities

Because of the narrowly-targeted scope of this review, the project is of a reasonable scope for most work to be completed by the first author. Since I initially began reviewing single-track year-round education in 2012, I have developed content knowledge sufficient for completing the review. While he is not an author, for questions about systematic review methods, I have consulted Spyros Konstantopoulos as needed. The analyses of the effect of single-track YRE rarely involve advanced statistical methods. If I do encounter a methodological practice or question that is beyond my own abilities, I will consult with Ken Frank. In order to ensure the quality of the work; Jason Burns will separately assess whether documents meet inclusion criteria in moving from search results to preliminary sample and in moving from preliminary sample to final sample, will review calculations, and will contribute to and review the report.

Funding

No support other than from Campbell

Potential conflicts of interest

None

Preliminary timeframe

Note, if the protocol or review is not submitted within six months and 18 months of title registration, respectively, the review area is opened up for other authors.

- Date you plan to submit a draft protocol: 5 September 2017
- Date you plan to submit a draft review: 31 October 2017

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Date: 5 August 2017