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journal homepage: www.elsevier.com/locate/econedurevJuvenile crime and the four-day school week[☆]Stefanie Fischer^{*,a}, Daniel Argyle^b^a Cal Poly State University, San Luis Obispo, United States^b FiscalNote, USA

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ABSTRACT

We leverage the adoption of a four-day school week across schools within the jurisdiction of rural law enforcement agencies in Colorado to examine the causal link between school attendance and youth crime. Those affected by the policy attend school for the same number of hours each week as students on a typical five-day week; however, treated students do not attend school on Friday. This policy allows us to learn about two aspects of the school-crime relationship that have previously been unstudied: one, the effects of a frequent and permanent schedule change on short-term crime, and two, the impact that school attendance has on youth crime in rural areas. Our difference-in-difference estimates show that following policy adoption, agencies containing students on a four-day week experience about a 20% increase in juvenile criminal offenses, where the strongest effect is observed for property crime.

1. Introduction

The Federal Office of Juvenile Justice and Delinquency Prevention reports that the majority of juvenile crimes are committed during non-school hours, peaking between 3 p.m. and 6 p.m. (Snyder & Sickmund, 2006). As such, a common belief among parents, policymakers, and school officials is that lengthening the time students are in school or expanding youth programs will keep youth out of trouble. While the intuition behind this belief is reasonable, little is known regarding the extent to which school or youth program participation changes youth criminal behavior in the short-term, if at all, and even less is known about the school-crime relationship in rural areas (Weisheit, Flacone, & Wells, 1994).

Establishing the causal link between school attendance and youth crime is challenging because often the unobservable characteristics of an individual that determine school attendance – e.g., patience, risk aversion, or motivation – also influence criminal behavior. One way to isolate the contemporaneous relationship between school attendance and crime is to exploit variation in school schedules. In this paper, we leverage the adoption of the four-day school week policy across schools

within the jurisdiction of rural law enforcement agencies in Colorado over the period 1997–2014. Those affected by the policy spend the same number of hours in school each year as students on a standard five-day week; however, treated students typically do not attend school on Friday. Since many school districts throughout the US have started to experiment with alternative schedules (e.g., year-round school or four-day weeks), understanding the impact of these changes on criminal behavior has important policy implications.

This study builds upon an area of empirical research examining the relationship between education and criminal behavior. A majority of this work focuses on the longer-run effects of educational attainment on crime.¹ Among the studies that estimate a causal relationship, the general finding is that more education reduces subsequent criminal behavior (Berthelon & Kruger, 2011; Lochner, 2004; Lochner & Moretti, 2004). These results, however, provide little insight into the contemporaneous effect of school attendance on youth crime because adult crime is temporally distinct from school attendance.

To this point, our study contributes to a growing body of literature aimed at understanding the short-term effects of school attendance on youth crime. Studies of this nature typically rely on exogenous variation

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¹ See Lochner (2011) for a thorough discussion of the education and crime literature.

in day-to-day school attendance.² In the foundational paper, [Jacob and Lefgren \(2003\)](#) use teacher in-service days to estimate a causal relationship between school attendance and crime in urban settings. They find that juvenile property crime declines by 14% on days when school is in session but violent crime for this same group increases by 28% on school days.

In a follow-on study, [Luallen \(2006\)](#) exploits school attendance variation caused by teacher strikes that resulted in canceled school days. He finds that juvenile property crimes increase on days with strikes but violent crimes decline, and that the results are solely driven by urban areas. [Akee, Halliday, and Kwak \(2014\)](#) estimate the school-crime relationship based on public school teacher furlough days in Hawaii and find that time off from school is associated with significantly fewer juvenile crimes.

In contrast to the three existing studies listed above, the day-to-day variation in school schedule used in this paper – the adoption of the four-day school week – allows one to learn about the short-term effects of a more permanent and intentional schedule change on youth crime. This schedule change is distinct because (1) families are made aware of the change in advance and, in principle, have more time to plan compared to changes brought on by strikes or furloughs which occur more spontaneously, and (2) this change occurs each week throughout the school year rather than affecting only a handful of weeks. Furthermore, because four-day school weeks are primarily adopted in rural areas, we are able to shed light on the short-term effects of school attendance on crime for areas that are relatively understudied.

There are several ways in which a four-day school week could affect juvenile crime patterns. On the one hand, crime may decrease as a result of the policy. Because students on a four-day week attend school longer on the days school is in session and because it is well documented that juvenile crime peaks between 3 p.m. and 6 p.m., it is possible that this schedule reduces juvenile crime. Assuming that parents work a standard 9 a.m. to 5 p.m. schedule, with the extended school day the amount of unsupervised time during peak crime committing hours is reduced Monday through Thursday. On the other hand, switching students to a four-day week schedule may increase juvenile crime. Students now have a full weekday off per week and are likely unsupervised, particularly if their parents work. They may also treat Thursday night as the new Friday night, essentially gaining another weekend night.

Using data on reported crimes and aggregating to the law enforcement agency-year level, we show that on average crimes in treated agencies increase as a result of the policy.³ In particular, property crimes increase substantially when four-day school weeks are adopted. Alternatively, we find no evidence that juvenile violent crime is affected. Our results are in line with a recent report from the US Department of Justice that shows larceny – one component of property crime – is the most common juvenile crime, especially in rural areas ([Puzzanchera, 2013](#)).⁴

The paper proceeds as follows. In [Section 2](#), we provide details on the policy setting. [Sections 3](#) and [4](#) describe the data and empirical

framework, respectively. The results are presented in [Section 5](#). This section includes results from the agency-year analysis, several sensitivity tests, and the day-of-week analysis. [Section 6](#) concludes.

2. The four-day school week policy

As of 2016, 21 states have a portion of their public schools on a four-day week schedule.⁵ The primary motivation for states to implement this policy is to reduce transportation costs, which are particularly large for rural school districts. The four-day school week became popular during the energy crisis in the 1970s, at which time many states began changing laws regarding the number of days spent in school. Over the following decades there was a slow shift towards the four-day week schedule in remote, rural districts.

During this period the Colorado legislature changed their law from a mandatory number of school days to a mandatory number of hours, enabling districts in the state to adopt a four-day week. To compensate for one fewer day of instruction, those on the four-day week schedule attend school for 7.5 hours per day for 144 days instead of the standard 6 hours per day for 180 days. Between 1980 and the present, Colorado school districts have continually switched to this schedule. In 1980, three districts adopted the policy but by 1992 thirty-seven districts had a least some schools on a four-day week. As of 2017, of the 178 school districts in Colorado, 98 operate on a four-day week schedule, though in some of these districts only a subset of the schools follow this schedule.⁶

Given that cost considerations are central to the decision to switch, research on four-day school weeks has primarily focused on financial savings. [Grau and Shaughnessy \(1987\)](#), using data from ten school districts in New Mexico, document that districts operating on a four-day week experience a 10–25% savings on fuel, electricity and transportation costs. [Griffith \(2011\)](#) examines six school districts that are either on the four-day week or in transition to that schedule and finds that the policy yields a maximum of about 5.5% savings.⁷ Despite their growing prevalence, little work has been done to understand the impact of this policy on students. To the best of our knowledge, the only published study is [Anderson and Walker \(2015\)](#). Their analysis focuses on the state of Colorado and they find a modest, but statistically significant, positive relationship between the policy and elementary school students' math and reading test scores. Their findings suggest that switching to a four-day week does not compromise student achievement, and may even improve it.⁸

3. Data

We combine several data sources to obtain the final analysis sample which is comprised of 63 Colorado law enforcement agencies, both sheriff and police, from 1997 to 2014. The outcome, crime counts, comes from the National Incident Based Reporting System (NIBRS). A

² An exception is [Anderson \(2014\)](#) which uses the minimum drop-out age and finds a negative relationship between education and youth arrests. Additionally, a related body of literature relies on experimental interventions in after-school programs to determine the impact of school attendance on youth criminal activity. Insight from these studies is limited due to selective participation; programs of this nature are typically not mandatory and those most at risk may avoid them ([Cross, Gottfredson, Wilson, Rorie, & Connell, 2009](#); [Rodríguez-Planas, 2012](#)).

³ We define an agency as “treated” if it contains at least one high school on a four-day week in a given year. For more detail on the coding of the treatment see [Section 3.2](#).

⁴ Property crime is defined as the unlawfully taking of property from the possession of another without the use of force, threat or fraud and comprises several types of theft including larceny, burglary, motor vehicle theft and occasionally arson. Larceny is the most common type of property crime committed by juveniles and includes shoplifting, pick-pocketing, bicycle theft, theft from a vehicle including vehicle parts, or theft from a building or structure where no break-in was involved.

⁵ States that have adopted this schedule, with the first adopters dating back to the 1930s, include: Arizona, California, Colorado, Georgia, Idaho, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Utah, Wisconsin and Wyoming. However, many of these programs are limited with only a subset of the state's schools following this schedule. Arkansas, Delaware, Pennsylvania, New Hampshire, Virginia and Washington also have approved a four-day week policy but have not yet implemented it. See <http://www.ncsl.org/research/education/school-calendar-four-day-school-week-overview.aspx> for background on specific state legislation regarding four-day schools.

⁶ For more information on the four-day week policy in Colorado see [Penn \(2017\)](#).

⁷ Four-day school weeks have been of interest in popular media as well and journalists have gone to some effort to examine specific cases of the policy change. A TIME Magazine article ([Kingsbury, 2008](#)) reports that some rural school districts experienced large savings on transportation, utility, and insurance costs as a result of the policy and a Wall Street Journal article ([Herring, 2010](#)) sheds light on the savings that the policy has brought to a rural district in Georgia.

⁸ Alternatively, in an unpublished manuscript, [Thompson \(2017\)](#) examines the effect of the four-day school week on student achievement in Oregon and finds that switching to this schedule leads to a decline in test scores.

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