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The Social Impact of Fiscal Crisis: Investigating the Effects of Furloughing Public School Teachers on Juvenile Crime in Hawaii

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Abstract

Due to the large social costs of juvenile crime, policymakers have long been concerned about its causes. In the 2009-10 school year, the State of Hawaii responded to fiscal strains by furloughing all school teachers employed by the Department of Education and cancelling class for seventeen instructional days. We examine the effects of this unusually short school year to draw conclusions about the relationship of time in school with crime rates. We calculate marginal effects from a negative binomial model and find that time off from school is associated with significantly fewer juvenile assault and drug-related arrests, although there are no changes in other types of crimes, such as thefts and burglaries. These results are more pronounced in rural parts of the islands which tend to have lower educated, lower income households.

JEL Classifications: J08, I24

Key words: Education, Crime, Inequality

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I. Introduction

Examinations of crime rates in the U.S. show that arrests for both violent crimes and property crimes rise sharply in adolescence before dropping to lower levels in later life. By at least one measure, 20 to 30 percent of all crimes in the U.S. are committed by adolescents (Levitt, 1998). The measured costs of these crimes are enormous: to the juveniles themselves; to their victims; and to the larger society. One study estimates the costs of youth crime to be as high as $300 billion per year (Miller, Cohen, and Rossman, 1999). Furthermore, the external costs to society are estimated to comprise, by far, the largest share of total costs (Levitt and Lochner, 2001).

Due to the large social costs, policy makers have long been concerned about the causes of juvenile crime. Levitt and Lochner (2001) review previous research and identify several determinants of juvenile crime including biological (Wilson and Herrnstein, 1985), social (Glaeser, Sacerdote, and Scheinkman, 1996), and economic factors (Grogger 1998). In particular, a rich literature documents the importance of educational attainment in determining criminal behavior (Lochner, 2010). According to theory, increased educational attainment and accompanying higher wages should deter crime by raising the opportunity cost of crime. Researchers find some empirical evidence for this effect. For example, Lochner and Moretti (2004) find that high school completion causally reduces crime rates and Anderson (2012) finds an effect of minimum dropout age policies on crime.

In related work, researchers also find tentative evidence of an effect of length of school years on crime rates. They find that shorter school years lead to an increase in property crimes, but a decrease in violent crimes (Jacob and Lefgren, 2003; Luallen, 2006). This work is of particular policy relevance, as state and local governments continue to search for ways to trim budgets. We confirm and build on this earlier work by studying the effect of an unusually short school year on juvenile crime in the State of Hawaii. In the 2009-10 school year, the State of Hawaii responded to fiscal strains by furloughing all school teachers employed by the Department of Education (DOE) and cancelling class for seventeen instructional days. It is important to note that all public schools on the island of O`ahu are part of a single school district. The budget cuts did not affect the Honolulu Police Department (HPD) which serves the entire

island of O`ahu, allowing us to isolate the effect of the shorter school year on crime separate from any changes in policing. In addition, the furlough days, which were all Fridays, were chosen arbitrarily. There is no evidence, either in newspaper reports or anecdotally, that these decisions were made with considerations about crime levels in mind. Therefore, by comparing a "furlough Friday" with an otherwise similar, non-furlough Friday in prior years, we are able to estimate a treatment effect that is not biased by omitted variables that might be correlated with both the choice of the furlough day and crime rates.

The Hawaii DOE announced furlough days toward the beginning of the school year, allowing parents some time to plan for their children's day off from school. Since an advance announcement to parents would be a natural component of any policy to cut school years, our estimates approximate the effect of a shorter school year on crime rates in a realistic policy setting. Anecdotally, there is variation in parental responses to the cuts in instructional days. For example, some parents were able to enroll their children in quickly established "after school" programs, while others did not. The lack of data prevents a more precise investigation of these responses. However, we find heterogeneity of effects on crime rates across neighborhoods and posit that some of these differences may be attributable to differences in parental responses to cuts.

Our results show that furlough days are associated with fewer juvenile assault arrests, confirming previously estimated effects in the literature. As is consistent with a causal effect of furloughs on crime, these effects occur entirely in the daytime with no significant change in evening arrests for juveniles. We also add to the existing literature by examining results by neighborhood in order to identify significant socioeconomic correlates of these effects. The results are most prominent in two regions of O`ahu, the western Waianae Coast and central O`ahu, which are, in general, slightly more rural and populated by households with less education and lower income than other areas on the island.

Notably, our estimates of the reduction in juvenile arrests on these furlough days are substantially larger than previous estimates in Lefgren and Jacob (2003) and Luallen (2006). Because the DOE furloughs often coincided with furloughs of state employees, we postulate that one reason for the large estimated effects is the increased ability of parents to monitor their children. We also show that arrests for drug-related crimes declined on the furlough Fridays. As with assaults, these effects, too, were concentrated during the daytime. This result is new to the

literature, and again we postulate that the magnitude of the estimates is at least partly explained by the coinciding furlough of state employees on DOE furlough Fridays. Unlike the effect on assault arrests, the reduction in drug-related arrests occurs mostly in metropolitan O`ahu and the windward side of the island which are generally more affluent than the rest of the island. The decline of drug violations but not assaults in higher income neighborhoods and the decline of assaults but not drug violations in lower income neighborhoods indicates the presence of significant distributional effects of policies that reduce time in school.

The remainder of the paper is organized as follows: section 2 describes the data and summarizes sample statistics; section 3 lays out the empirical strategy and research design; section 4 presents the results; and section 5 concludes.

II. Data

This paper uses data from the Honolulu Police Department which maintains jurisdiction over the entire island of O`ahu, including the cities of Honolulu, Kapolei, Kailua, Pearl City, Mililani Town, and others, as well as the outlying rural areas of the island. These data are a census of all arrests on O`ahu between January 2007 and August 2010. Included in this census is information on arrests for the following crimes: assault (both simple and aggravated), burglary, drug offense (sales/manufacturing, and possession), driving under the influence ("DUI") and violation of liquor laws including under-age drinking. The data include information on the age and gender of the person arrested, the time and date that the crime took place, and the police beat in which the arrest occurred. Detailed tabulations of these data are reported in Table 1 for our population of interest, people 18 and under. Between January 2007 and August 2010, there were 4,956 juvenile arrests in O`ahu. Of these, simple assaults constitute 46 percent of all crimes; drug possession constitutes 21 percent; and DUI arrests, burglaries, and aggravated assaults make up between five and 10 percent each.

To facilitate regression analysis and to allow for temporal patterns in crime, we use the raw data from HPD to create a new data set in which the unit of observation is a half-day (either "day" or "night"). Day is defined as 6 AM to 6 PM and night is 6 PM to 6 AM.[1] For each

[1] Note that our definition of night spans two calendar days as we collect all crimes that took place between 6PM and 6AM of the following morning.

observation, we tabulate the number of occurrences of five types of crimes: domestic violence; simple assault; any assault, a category which includes both simple and aggravated assault; burglary; and drug offenses, including sales, manufacturing, and possession. We do not consider violations of liquor laws or DUI arrests because these do not occur frequently enough to allow for precise estimates.

In Figures 1 to 5, we illustrate the temporal patterns in juvenile crime on O`ahu for each of the five different types of crime. Each figure displays the average numbers of each of the five crimes that we consider for day of the week. Each panel contains two figures, one for day and another for night. These figures show that drug and assault arrests are generally more common on weekdays and during the daytime.

Next, we construct additional dummy variables that enable us to control for seasonal patterns in the data. First, we construct dummy variables for day, month and year. Second, we construct a dummy variable for school being out of session based on the Hawaii Department of Education's ("DOE") calendars for academic years 2006/2007, 2007/2008, 2008/2009, 2009/2010 and 2010/2011. This dummy variable is set to one if school is out of session for a reason other than a state/federal holiday or a Furlough Friday; for example, this would include teaching in-service days, summer vacation, and parts of winter break other than Christmas and New Year's Day. Next, we create dummy variables for the seventeen Furlough Fridays and another dummy variable for state or federal holidays. Hawaii's school calendar typically includes 180 instructional days, although the school year for 2009/2010 was shortened to 163 days.

III. Empirical Strategy

Core Estimation Equation

To obtain our core results, we estimate the following benchmark model:

$$y_t = \alpha + \sum_{s=1}^{6} day_t^s \, \delta^s + \sum_{s=1}^{11} month_t^s \, \mu^s + \sum_{s=2007}^{2009} year_t^s \, \theta^s + outofschool_t \nu + holiday_t \eta + furlough_t \phi + u_t \quad (1)$$

The first term in (1) contains a set of binary indicator variables for day of the week (i.e. Sunday, Monday, Tuesday, etc.); the second term contains a set of indicator variables for month (i.e. January, February, March, etc.); and the third term contains indicator variables for year (i.e. 2007, 2008, 2009, or 2010). We also include binary indicator variables for whether the half-day in question is a holiday, a furlough day, or a day off for other reasons such as summer vacations. We estimate equation (1) separately for day arrests and for night arrests. For the day regressions, note that the subscript t corresponds to a specific calendar day in a specific year and is indexed from 1 to 1339, which is the total number of days in our time period (2007-2010). Similarly, for the night regressions, t is indexed from 1 to 1338, the total number of nights in our time period (2007-2010). We follow Jacob and Lefgren (2003) and estimate the benchmark model using the negative binomial model ("NBM"). However, the marginal effects from the NBM estimates are quantitatively similar to those from simple ordinary least squares ("OLS") regressions, and so we rely on OLS in our estimation of subsequent models.

The parameter of interest, ϕ, arguably identifies the causal impact of time in school on crime rates. There are a couple of important issues that may compromise this interpretation, however. First, there may be seasonal and temporal variations in crime rates that confound our estimates. For example, crime rates have been shown to increase in the summer and decrease in the winter (e.g. Anderson, et al. 2000). We are able to control for these seasonal and temporal differences by including dummy variables for day, month and year. We also include other dummy variables such as holidays or non-school days which further mitigates biases introduced by any seasonal temporal patterns in crime rates.

A second issue is the possible confounding of DOE furlough effects by the simultaneous State employee furloughs. Thirteen of the 17 DOE furlough days overlapped with State employee furloughs. Furthermore, there were nine days during which State employees were furloughed but DOE employees were not. As a result, the estimated effect of DOE employee furloughs on juvenile crime may be confounded by the furlough of non-DOE employees. For example, to the extent that some of these State employees had children in public schools, the parameter ϕ may reflect not only the impact of the DOE furloughs on juvenile propensity to commit crime but also that of the State employee furloughs. We provide a fuller discussion of these effects in Section 4.

Estimation Equation with Heterogeneous Effects

A third important issue is the possible heterogeneity of effects by geographic region. There is significant variation in socioeconomic status ("SES") across the different geographic regions of O`ahu, including differences in per capita income, unemployment rates, and educational attainment. In order to study this heterogeneity across regions, we group the police beats in the raw data into four socioeconomically more homogeneous geographic units. In addition to capturing broad socioeconomic similarities by region, these units also correspond to natural divisions on the island created by two different mountain ranges and the presence of Pearl Harbor. We refer to these four units as the "leeward" (or western) side of the island; the "windward" (or eastern) side of the island; "town" (or metropolitan Honolulu and its environs); and the "central" part of the island.

The leeward region incorporates the western-most part of the island and includes the rural communities of Waianae, Makaha, Ma`ili, and Nanakuli and some suburban areas such as Kapolei, Makakilo, Waipahu, and Waikele. The central region includes most of the central part of the island of O`ahu which also has a sizeable number of rural communities such as Hale`iwa, Waialua and suburban areas such as Wahiawa, Mililani Town, Pearl City and Aiea. The town region is the most urbanized area on the island and includes all of downtown Honolulu and the surrounding areas such as Waikiki and Kalihi. The windward region includes all of the eastern part of the island and consists of partly rural and partly suburban areas including towns like Kailua, Kaneohe and Waimanalo.

Generally, the leeward side of the island has lower income levels than the other regions of the island. The town region and, to a lesser extent, the windward side of the island have higher average socioeconomic status. Figure 6 shows that per capita income is highest on the town and windward sides of the island, reaching as high as $70,000-$79,999 in Kahala and $60,000-$69,999 in Kailua, Hawaii Kai, and parts of Honolulu. In contrast, per capita incomes are quite low on the leeward side: less than $20,000 in 2010 for towns like Makaha, Ma'ili,Nanakuli, and Waipahu; and less than $30,000 in Wai'anae and Kapolei. We find significant differences in the effects of the furloughs on juvenile crime across these four regions. A discussion of this heterogeneity and possible policy implications follows in Sections 4 and 5.

Estimation Equation with More General Seasonality

Finally, we address more complicated seasonality patterns that may not be fully accounted for by the use of simple binary indicator variables in equation (1). Specifically, we compare the number of juvenile arrests in a single region of the island on a given DOE furlough day with the same day (adjusted for leap years and the annual movement of days) in a different year in which there is no furlough. In order to do this, we number the days of 2007 as *d= 1,..,365*. Next, we number the days of 2008 (which was a leap year) as *d=2,…,367*. We start indexing days in 2008 with a "2" because the first day of 2008 was a Tuesday and the first Tuesday of 2007 was numbered with a "2." The days of 2009 are numbered in an analogous way. As a result, if *d* is "2", "9", "16", "23", etc. then the corresponding day of the week is a Tuesday no matter the year. In addition, a "23" in 2007, 2008, or 2009 corresponds to a Tuesday which occurred at approximately the same time of the year in each of 2007, 2008, and 2009.

This empirical strategy allows for heterogeneity in effects of DOE furloughs by region and more precisely accounts for possible seasonal patterns across these regions. To account for these two issues, we consider the following fixed-effects specification:

$$y_{rdt} = \alpha_{rd} + \sum_{s=2008}^{2010} year_t^s \, \theta^{rs} + outofschool_t \nu^r + holiday_t \eta^r + furlough_t \phi^r + u_{rdt} \qquad (2)$$

where *r* denotes one of the four regions of the island. In this equation, the variables are defined as they were in equation (1) above: "holiday," "furlough," and "out of school" are dummy variables for whether the half-day in question is a holiday, a furlough day, or a day off for other reasons such as summer vacations, respectively. We also include dummy variables for year and individual fixed-effects for each day of the year and region. We regress the incidence of the various crime variables on the year dummy variables and the three not-in-school variables. This analysis is conducted separately for each region to allow for heterogeneous effects across the four regions of the island. As a result, we are able to draw conclusions concerning the impact of socioeconomic variables on the estimates of interest.

The results from NBM and OLS estimation of equation (2) are quite similar. However, the interpretation of the OLS estimates is more straightforward than the NBM estimates. Analysis using the NBM requires estimation of over 350 parameters for each regression, along

with calculation of their corresponding marginal effects. Therefore, we employ OLS regressions in our analysis that follows.

IV. Empirical Results

In this section we discuss findings from estimation of the two models described in Section III.

Core Results

We present the NBM estimates of equation (1) in Table 2. We see that there is a reduction in the number of juvenile arrests for drug violations and assaults on days when students were not in school due to DOE employee furloughs. There is no statistically significant change in other types of arrests for minors on these days. We also observe no change in the number of arrests for crimes committed in the evening on DOE furlough days relative to evenings when there were no DOE furloughs. These results strongly suggest that the DOE employee furloughs disrupted normal student schedules mainly in the daytime and therefore affected juvenile crime arrests during the day. Because the DOE furloughs did not change student schedules in the evening, there was no causal impact of the furloughs on crimes committed after 6 PM.

As discussed in section 3 above, a possible confounding issue is the simultaneous State employee furloughs that occurred with 13 of the 17 DOE school furlough days. Because we are interested in isolating the effect of the DOE furloughs on juvenile crime rates, we estimate an additional model that includes dummy variables for the nine state furlough days that were not also DOE furlough days. These estimates are also presented in Table 2. We see that the results for drug and assault arrests are essentially identical to those estimated without the additional dummy variables. Interestingly, the coefficient on the dummy variable for the nine state furlough days is only 40 percent as large as the magnitude of the coefficient for DOE furloughs in the

regression for simple assaults, but is of the same magnitude for drug arrests.[2] In both regressions, the coefficient is not significant, but this may likely be due to the fact that there are only nine of these days and we are unable to estimate effects precisely. If these estimates are meaningful however, the difference in magnitudes implies that the state furloughs are more closely associated with the decline in drug arrests than they are with the decline in assaults. While not conclusive, this evidence is suggestive of differences in the effects of parental monitoring for different types of infractions, such as drug versus assault arrests.

In Table 2, we also report estimates combining all juvenile arrests that take place in the day and the evening. These estimates are somewhat attenuated compared to previous results for assault and drug violations that examine effects for day and night separately, but are still significant. We present these results in order to provide comparisons to those from the previous literature. Our results are quite a bit larger in magnitude than previous estimates in the literature. For example, the NBM yields an estimate of -0.86 for simple assault, which can be interpreted as an 86% reduction in simple assaults. Jacob and Lefgren (2003) also use a negative binomial model to estimate a reduction of 37% in simple assaults. We will discuss some possible reasons why our results are larger in the next section.

In Table 3, we report the marginal effects for the NBM and we see that the results are, in fact, quite close in magnitude to the results reported in Table 2. During the daytime hours, the DOE furloughs reduce juvenile assault arrests by approximately 1.23 arrests, relative to the mean number of assault arrests during days with no DOE furloughs which is about 1.33 assault arrests on average. Drug arrests fall by an average of 0.85 incidents on a given day with a DOE employee furlough. These effects are quite large. As can be seen in Figures 2 and 5, the average incidence of daytime simple assaults is 1.28 on a typical Friday and the corresponding average incidence of daytime drug arrests is 0.76. If we further restrict the averages to days in which school is in session, the average incidence of arrests is even greater: 1.53 arrests for simple assaults and 0.92 arrests for drug violations. Thus, on average, the DOE employee furloughs resulted in an almost complete elimination of assault and drugs arrests on a typical Friday in which school was in session.

In Table 4, we report results using alternative models. We estimate a linear model via OLS and a Poisson model using Maximum Likelihood Estimation ("MLE") methods. Our core

[2] We do not report these estimates but they are available upon request.

conclusions are unaffected; on days with DOE employee furloughs, we see that arrests for assault and drug-related offenses decrease. We also note that the magnitude of the OLS estimates is roughly the same as that of the marginal effects from the NBM.

Fixed Effects Results by Region

In Table 5, we report OLS results by region using equation (2) and the more detailed fixed effects defined in the previous section. Here we report only results for those crimes that were significantly affected by the DOE employee furloughs: simple assaults and drug offenses. It is important to note that these results disaggregate the results from Tables 3 and 4 by region of the island. Assuming no interactions between the total numbers of arrests by region, we let y denote the total number of crimes island-wide on a given day and write:

$$y = y_1 + y_2 + y_3 + y_4$$

where y_r (for $r = 1, \ldots, 4$) is the total number of crimes in one of O`ahu's four regions. Using this notation, we decompose the marginal effect of some variable x on y as follows:

$$\frac{\partial E[y|x]}{\partial x} = \sum_{r=1}^{4} \frac{\partial E[y_r|x]}{\partial x}$$

so that the sum of the marginal effects in Table 5 should approximately equal the island-wide marginal effects in Table 3.

A comparison of Tables 3 and 5 shows that the marginal effects in Table 5 do in fact approximately add up to the total effects in Table 3. The sums of the marginal effects in Table 5 are -1.24 for simple assault arrests and -0.69 for drug offense arrests. Similarly, the corresponding marginal effects in Table 3 are -1.10 and -0.85. Note because of the differing estimation methods and the inclusion of fixed effects in Table 5, these sums, while close, are not exactly so.

In addition to providing a check on the previous results, Table 5 provides evidence of substantial heterogeneity in effects by region. We observe that furloughs reduce assault arrests in

the two relatively poorer parts of O`ahu (leeward and central areas) but do not have a statistically significant impact in the relatively economically more prosperous areas of the island (town and windward areas). These effects are particularly large in the leeward region, an area which includes some of the poorest regions on O`ahu – the Waianae Coast. In fact, 46 percent of the total island-wide effect of the furloughs on assault arrests is concentrated in the rural western part of O`ahu. In other words, when students are not in school there is a relatively large reduction in the incidence of arrests for assaults in poorer neighborhoods. We speculate that some of these effects may be due, at least in part, to what is termed a "concentration effect" in the literature. In other words, because students are less likely to be in close proximity to one another on days when there is no school, they do not experience concentrated time together, and are therefore less likely to commit crimes involving physical contact with other students. Our results further suggest that socioeconomic status ("SES") may play an important role in the potency of what is termed "the concentration effect" in the literature.

In contrast to assault arrests, the effects of the furloughs on arrests for drug offenses are most prevalent in the more economically prosperous town and windward regions. While not conclusive, we posit that drugs are available island wide and in proximity to schools across all regions. However, parents in the town and windward neighborhoods typically have more resources to monitor their children during DOE furlough days. For example, the Hawaii Chamber of Commerce provided parents with a list of alternative activities and programs for students.[3] The modal program listed on this site cost between $30 and $40 per day, with the preponderance of programs located in town and windward locations. In addition, residents who live in town and on the windward side of the island have relatively shorter commuting times than those who live in leeward and central neighborhoods. The modal commutes are typically less than 30 minutes one way for windward residents and town residents (with the average being less than 30 minutes for both) , whereas the modal commutes for residents on the western side of the island are in excess of 60 minutes one way (with the average around 40 minutes).[4] Overall, this suggests that parents from the town and windward regions would have more resources and time to spend with or monitor their children during furlough days.

[3] http://cochawaii.com/furlough-friday.asp

[4] US Census Bureau. American Community Survey, 2006-2010 5-Year Averages

Because working parents on the western side of the island have tighter budget constraints and longer commutes, they may have a harder time monitoring students when school is out of session. We term this "the monitoring effect" and posit that the relative lack of monitoring in socioeconomically poorer neighborhoods may account for the lack of any effect on drug-related arrests in these neighborhoods. By contrast, parents in higher SES neighborhoods may be more likely to enroll students in special furlough day programs and to make other arrangements to increase monitoring and thereby reduce drug-related arrests. By increasing monitoring, these parents in higher SES neighborhoods mitigate the concentration effects experienced by those students in lower SES neighborhoods. As a result, we see a pattern of estimates in which furloughs lead to lower drug-related arrests in higher SES neighborhoods, but do not affect assault arrests. Our results are consistent with the importance of the concentration effect in regulating assault infractions and the importance of the monitoring effect in regulating drug-related infractions.

V. Discussion and Conclusion

We now conclude and offer a discussion of our findings. We begin by noting that, as shown in Table 2, the effects of the furloughs were completely concentrated during the daytime. This is a useful check for false treatments since both the concentration and monitoring effects are either related to work or school. As such, we should only see effects during the daytime. This suggests that the responsible mechanisms are related to school or parental work.

Next, when we compare our findings to comparable results using comparable methods in Jacob and Lefgren (2003), we see that ours are substantially larger. In Table 4 of their paper, the coefficient estimates for simple assault and drug violations -0.37 and -0.09, whereas the estimates in Table 2 of this paper are -1.02 and -1.35. It is important to point out that the effects on drug offense in Jacob and Lefgren (2003) are not statistically significant. One possible reason why our results are much larger is that the other paper looked at in-service days whereas ours includes furloughs of both DOE and state employees. We would expect the former to reduce crimes through concentration effects and the latter through monitoring effects. Moreover, we found that, by themselves, the state furloughs were most closely associated with declines in drug arrests as compared to assaults -- underscoring the possible importance of parental monitoring

for the observed declines in drug-related crime. Thus, the compounding of the two treatments could be one reason why our effects are larger.

We now turn to the differential results by region. It is important to note that we can exclude differences in school district expenditures as one explanation since, as mentioned previously, all public schools on the island of O`ahu are under a single school district and are provided equitable funding per student. Our analysis allowed us to compare the incidence of crimes on furlough days to comparable days within the same region in prior years. As we discussed, one possible mechanism for the finding that the effects on drug-related offenses occurred in the relatively more prosperous parts of the island is that parents in these regions may have been better able to afford supplementary programs to fill the void caused by the Furlough Fridays. Such programs were actually quite common as a response to the furloughs and were provided by many community organizations. In addition, more affluent household may have been better poised to rearrange their schedules to accommodate the furloughs since they are substantially less likely to have multiple jobs and long commutes. Hence, because families in these parts of the island tend to be wealthier, they may have been better able to monitor their children during the furloughs. In contrast, assaults declined dramatically in the central and, particularly, the western parts of the island. This suggests that the concentration effects are particularly acute in the poorer regions of the island. We do not attribute this result to the monitoring effects being stronger in these regions, however. If they were, then we would have seen a lower incidence of drug arrests as well but we did not.

The fact that assault arrests were essentially eliminated on the Furlough Fridays in these areas suggests that adequate steps are not being taken to curb fighting and assaults in the poorer schools on O`ahu by either the families or the schools. On the other hand, it appears that drug use could be curbed in these same parts of the island on weekdays when school is not in session. Overall, these results highlight the important role that resources can play in affecting student outcomes and suggest some avenues through which policy makers can remediate social inequalities.

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US Census Bureau. American Community Survey, 2006-2010 5-Year Averages**.**

Table 1: Crime Numbers in the City and County of Honolulu, 2007-2010

	All	Leeward	Central	Town	Windward
Aggravated Assault	286	73	46	131	37
	(5.77%)	(7.13%)	(4.49%)	(6.57%)	(4.46%)
w/ firearm	7	0	2	5	0
	(0.14%)	(0%)	(0.18%)	(0.25%)	(0%)
w/ knife	34	2	10	21	1
	(0.69%)	(4.98%)	(0.92%)	(1.05%)	(0.12%)
w/ other weapon	96	19	10	51	16
	(1.94%)	(1.86%)	(0.92%)	(2.59%)	(1.93%)
w/ hands	149	51	24	54	20
	(3.01%)	(4.98%)	(2.22%)	(2.71%)	(2.41%)
Simple Assault	2278	584	482	829	371
	(45.96%)	(57.03%)	(44.51%)	(41.55%)	(44.70%)
non-family member	1758	441	366	652	287
	(35.47%)	(43.07%)	(33.80%)	(32.68%)	(34.58%)
police officer	28	5	3	17	3
	(0.56%)	(0.49%)	(0.28%)	(0.85%)	(0.36%)
family member	492	138	113	160	81
	(9.93%)	(13.48%)	(10.43%)	(8.02%)	(9.76%)
Burglary	375	133	97	90	55
	(7.56%)	(12.99%)	(8.96%)	(4.51%)	(6.67%)
forcible entry	286	102	74	66	44
	(5.77%)	(9.96%)	(6.83%)	(3.31%)	(5.30%)
unlawful entry - no force	76	24	20	22	10
	(1.53%)	(2.34%)	(1.85%)	(1.10%)	(1.20%)
attempted forcible	13	7	3	2	1
	(0.26%)	(0.68%)	(0.28%)	(0.10%)	(0.12%)
Drugs - Sales/Manufacturing	63	10	10	28	14
	(1.27%)	(0.9%)	(0.92%)	(1.40%)	(1.69%)
opium	7	4	0	3	0
	(0.14%)	(0.39%)	(0%)	(0.15%)	(0%)
marijuana	41	6	10	12	12
	(0.83%)	(0.59%)	(0.92%)	(0.60%)	(1.45%)
synthetic	7	0	0	6	1
	(0.14%)	(0%)	(0%)	(0.30%)	(0.12%)
other dangerous substance	8	0	0	7	1
	(0.16%)	(0%)	(0%)	(0.35%)	(0.12%)
Drugs - Possession	1017	117	275	417	202
	(20.52%)	(11.43%)	(25.39%)	(20.90%)	(24.33%)
opium	20	2	3	13	2
	(0.40%)	(0.20%)	(0.28%)	(0.65%)	(0.24%)
marijuana	943	105	259	378	195
	(19.03%)	(10.25%)	(23.92%)	(18.95%)	(23.49%)
synthetic	9	0	4	5	0
	(0.18%)	(0%)	(0.37%)	(0.25%)	(0%)
other dangerous substance	45	10	9	21	5
	(0.91%)	(0.98%)	(0.83%)	(1.05%)	(0.60%)

Table 2: Negative Binomial Estimation Results

	Domestic Violence	Simple Assault	Any Assault	Burglary	Drugs[1]
Day	0.11	-1.02***	-1.11***	-0.84	-1.35***
	(0.20)	(-2.80)	(-3.06)	(-0.66)	(-3.01)
Day[2]	0.06	-1.03***	-1.12***	-0.81	-1.38***
	(0.10)	(-2.83)	(-3.10)	(-0.64)	(-3.07)
Night	-0.22	-0.45	-0.61	-16.90	-0.18
	(-0.29)	(-0.97)	(-1.29)	(-0.00)	(-0.26)
Day and Night	-0.01	-0.86***	-0.97***	-1.54	-1.08***
	(-0.03)	(-2.81)	(-3.17)	(-1.32)	(-2.69)

Each cell corresponds to a separate negative binomial regression. We report coefficient estimates on the Furlough Friday dummy and their t-statistics in each cell. In addition to the controls listed in the table, the models also include day, month, and year dummies as well as a dummy for school being out of session. The dependent variable is the number of occurrences by the relevant age group of each type crime during a half day. An observation is a half day: day (6AM to 6PM) or night (6PM to 6AM of the following day) except for the results in the last column where an observation spans 6AM to 6AM of the following day. Each day regression contains 1339 observations and each night regression contains 1338 observations. The regressions in the last row contain 2677 observations.

[1] This category includes all types of drug infractions, including sales, manufacturing, and possession.
[2] These results also include a dummy variable for the state furlough days that were not DOE furlough days.
* 10% significance, ** 5% significance, *** 1% significance

Table 3: Marginal Effects

	Domestic Violence	Simple Assault	Any Assault	Burglary	Drugs[1]
Day	0.02	-1.10	-1.23	-0.12	-0.85
	(0.19)	(-4.14)***	(-4.65)***	(-0.94)	(-4.84)***
Night	-0.03	-0.24	-0.36	+	-0.05
	(-0.31)	(-1.16)	(-1.65)*		(-0.28)

This table reports the marginal effects of Furlough Friday relative to a typical Friday in which school was in session on crime using the coefficient estimates from Table 4. t-statistics are in parentheses.

[1] This category includes all types of drug infractions, including sales, manufacturing, and possession.
[+] STATA could not compute this marginal effect.
* 10% significance, ** 5% significance, *** 1% significance

Table 4: Alternate Regression Models

	Domestic Violence	Simple Assault	Any Assault	Burglary	Drugs[1]
OLS	0.02	-1.16	-1.31	-0.11	-0.89
	(0.18)	(-3.08)***	(-3.30)***	(-0.68)	(-3.79)***
Poisson	-0.27	-1.02	-1.11	-1.05	-1.35
	(-0.64)	(-3.13)***	(-3.41)***	(-1.03)	(-3.20)***

This table reports the coefficient estimates from alternative regression models. Each regression includes the same controls as the regressions in Table 4. For additional details see the notes of Table 3. We only estimate models using crimes committed during the daytime.

[1] This category includes all types of drug infractions, including sales, manufacturing, and possession.

* 10% significance, ** 5% significance, *** 1% significance

Table 5: Effects by Region

	Leeward	Central	Town	Windward
Simple Assault	-0.57***	-0.23**	-0.24	-0.20
	(3.42)	(2.54)	(1.32)	(1.07)
Drugs (S/M +	-0.11	-0.03	-0.22***	-0.33***
Poss.)	(-1.40)	(-0.14)	(-3.33)	(2.97)

This table reports estimates of the coefficient on the Furlough Friday dummy from the specification in equation (2). Each cell corresponds to a separate OLS regression containing 1339 observations. t-statistics are reported in parentheses. We only estimate models using crimes committed during the daytime.

* 10% significance, ** 5% significance, *** 1% significance

Figure 1: Temporal Patterns in Domestic Violence

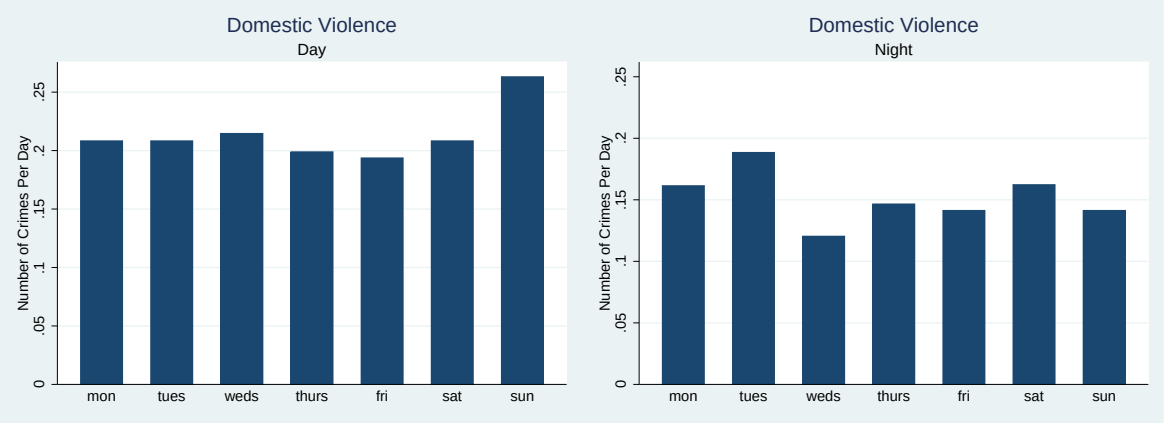


Figure 2: Temporal Patterns in Simple Assault

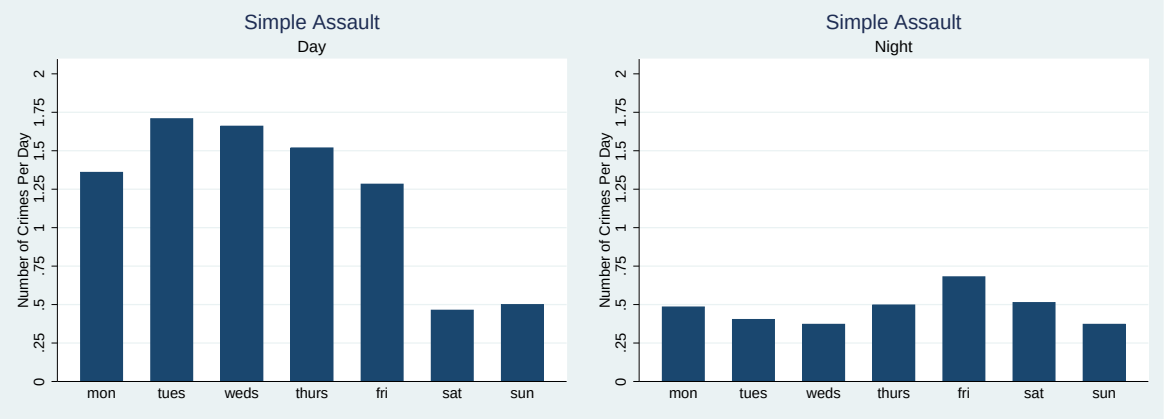


Figure 3: Temporal Patterns in Any Assault

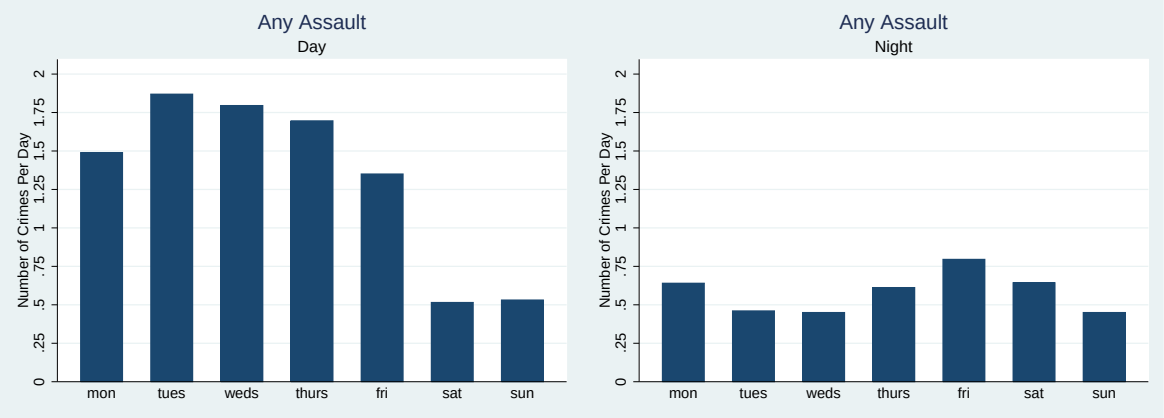


Figure 4: Temporal Patterns in Burglary

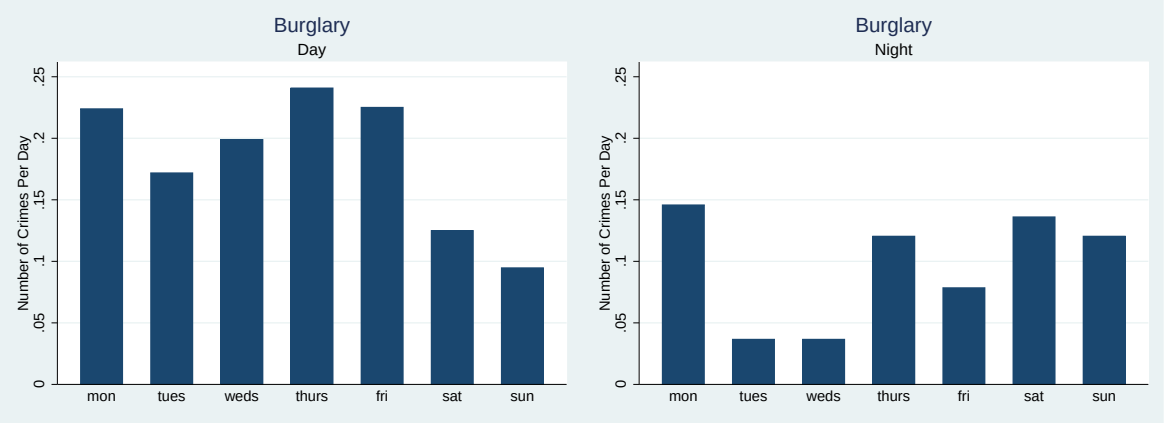


Figure 5: Temporal Patterns in Drugs

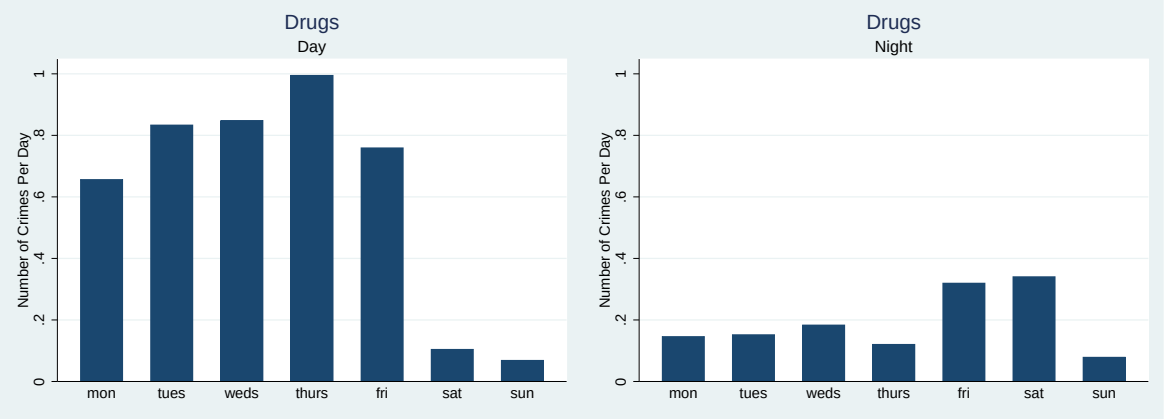
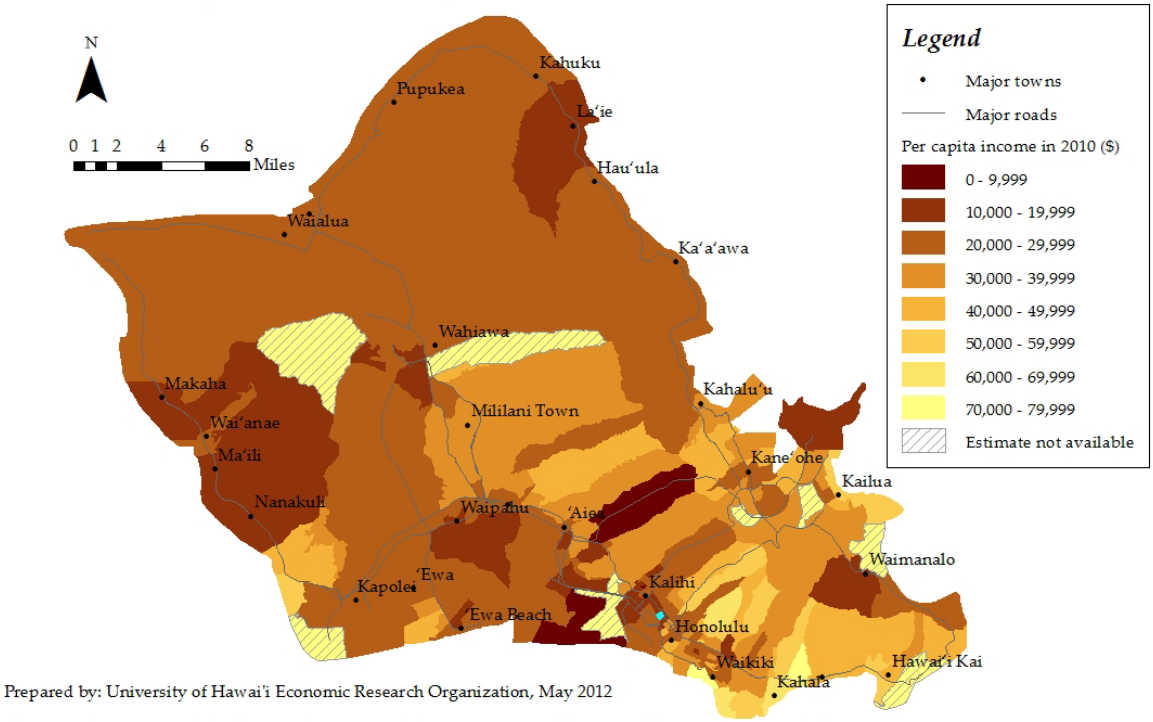


Figure 6: Per Capita Income by Census Tract on O'ahu, 2010



Prepared by: University of Hawai'i Economic Research Organization, May 2012

NOTE: "Per capita income for past 12 months" data comes from 2006-2010 American Community Survey 5-Year Estimates
http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_5YR_B19301&prodType=table