Fall 2016 Update

for

Ferguson, Gray, and Davis

**An Analysis of Recorded Crime Incidents
and Arrests in Baltimore City,
March 2010 through October 2016**

Stephen L. Morgan
Johns Hopkins University

Original date: November 15, 2016

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Guide to the PDF file posted to SocArXiv

1. Document for the main report

Pages 3-32 in the pdf file

The same document can also be downloaded [here](#) or [here](#).

2. Appendix 2 for the updated analysis of crime incidents

Pages 33-380 in the pdf file

The same document can also be downloaded [here](#) or [here](#).

3. Appendix 3 for the updated analysis of arrests

Pages 381-432 in the pdf file

The same document can also be downloaded [here](#) or [here](#).

Note: The updated reported does not have an Appendix 1 (because the Appendix 1 from the original report is not relevant for the updated reported, which does not break down total arrests by type of arrest).

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March 2010 through ~~December 2015~~ **October 2016**

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This document can be downloaded from this link:

<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016FallUpdate.pdf>

The original report can be downloaded from this link:

<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016.pdf>

See also for the Fall 2016 update:

- Updated Appendix 2 for the comprehensive analysis of crime incidents:
<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix2FallUpdate.pdf>
- Updated Appendix 3 for the comprehensive analysis of arrests:
<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix3FallUpdate.pdf>

See also for the original report:

- Appendix 1 for details of the coding of arrest groups:
<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix1.pdf>
- Appendix 2 for the comprehensive analysis of crime incidents:
<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix2.pdf>
- Appendix 3 for the comprehensive analysis of arrests:
<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix3.pdf>

Original Report (March 15, 2016)

Morgan, Stephen L. and Joel A. Pally. 2016. "Ferguson, Gray, and Davis: An Analysis of Recorded Crime Incidents and Arrests in Baltimore City, March 2010 through December 2015." A Report Prepared for the 21st Century Cities Initiative at Johns Hopkins University. Baltimore, MD: Johns Hopkins University.
(URL: <http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016.pdf>)

Updated Findings (November 15, 2016)

All of the conclusions from the original report hold, but in this Fall 2016 Update I am able to draw additional conclusions from the analysis of crime and arrest data from January 1st, 2016 through October 30th, 2016. The conclusions are:

1. During the period between the appointment of Kevin Davis as Interim Police Commissioner in July 2015 and his confirmation as the 38th Police Commissioner of Baltimore in October 2015, crime rates decreased substantially from the levels that prevailed in the months following the April 2015 death of Freddie Gray while in police custody.

Adjusting for the seasonality of crime, shootings and homicides decreased by 64% and 26%, respectively, between Monday, July 13, 2015 and Sunday, October 18, 2015. Street robbery, commercial robbery, and aggravated assault declined by 16%, 66%, and 11%.

In this same period, most categories of property crime changed only modestly. Although automobile theft declined by 15%, burglary and larceny from automobiles declined by only 2%, while other types of larceny increased by 4%.

2. During the first full year of Kevin Davis' five-year term as the 38th Police Commissioner of Baltimore, progress on reducing both violent and property crime was substantial in many categories but uneven overall.

Homicides declined by an additional 23% for the one-year interval beginning on October 19, 2015, in comparison to the transition period before it, and after adjusting for seasonal differences. However, in this same time period, shootings did not decline. In addition, street robbery and residential robbery increased by 9% and 18% while carjacking soared by 117%.

In contrast, property crime declined consistently. Automobile theft declined by 25%, burglary by 5%, larceny from automobiles by 15%, and other types of larceny by 11%.

3. Even after the progress in many categories of crime during the first year of Kevin Davis' appointment, violent crime remained much higher than before the national dialogue on policing began in the summer of 2014. The absolute level of violent crime presents a continuing challenge for Baltimore, its police, and its residents.

Averaged over a year from October 19, 2015 onward, and in comparison to levels of crime that prevailed before the national dialogue on policing began in the summer of 2014, violent crime rates remained much higher. Homicides remained at 140% of prior levels, and shootings at 190%. Street robbery, commercial robbery, and aggravated assault stood at 127%, 137%, and 132% of prior levels. And, finally, carjacking soared to 313% of prior levels.

4. The fall-off in arrests of 31% during the period following the death of Freddie Gray was turned around by an increase of 23% during the transition period when Kevin Davis was Interim Police Commissioner. Levels of arrests then changed very modestly during the first full year of Kevin Davis' term as the 38th Police Commissioner of Baltimore, declining by 4% during the year. As of the end of his first year, the arrest level stood at 67% of its prior level before the national dialogue on policing began, with most of the decline explained in the original report.

Additional Detail on These Findings

The results in the original report were based on crime and arrest data, released by the Baltimore Police Department, through December 2015. In this Fall 2016 Update, I offer models that incorporate additional data through Sunday, October 30th, 2016.

On the pages that follow, I offer updated tables and figures from the original report that reflect the same basic analysis but that include the additional 10 months of data. Comprehensive results are available in two online appendices:

Appendix 2 for the comprehensive analysis of crime incidents:

<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix2FallUpdate.pdf>

Appendix 3 for the comprehensive analysis of arrests:

<http://socweb.soc.jhu.edu/faculty/morgan/papers/MorganPally2016Appendix3FallUpdate.pdf>

As shown in the online appendices, and as revealed in the tables and figures below, the analysis strategy is the same as in the original report. I first model the prevailing cyclical crime and arrest trends through August 10, 2014, which I continue to label as the “pre-Ferguson” period. I then use that estimated model to predict counterfactual trends, as if the protest events and any changes in police practice from August 11, 2014 onward had not occurred. Finally, I estimate period effects as average differences between observed and counterfactual values from August 11, 2014 onward in distinct time intervals.

Unlike the original report, with the availability of additional data it is reasonable to now divide the interval after Police Commissioner Anthony Batts was fired into (1) a transition period while Kevin Davis was the Interim Police Commissioner and (2) a final period after Kevin Davis was sworn in as Batts’ permanent replacement and with a five-year contract as the city’s 38th Police Commissioner. The transition period begins with the week of Monday, July 13, 2015 and ends on Sunday, October 18, 2015. The period for Davis as commissioner encompasses the first full year of his term, from the week of Monday, October 19, 2015 (10/19/15 to 10/25/15) through the week of Monday, October 24, 2016 (10/24/16 to 10/30/16). These two intervals are labeled “Transition Period” and “Davis Period” in the tables below.

In addition, for this update, I do not offer results for arrests that separate those arrests by type of arrest. The primary reason is that the BPD changed its categorization for the reporting of arrests at the end of July, 2016. Although it will be possible to develop a revised method for sorting arrests into categories similar to the categories used for the original report (since most of the changes appear to be different choices on the capitalization of words), for this updated report I have not done so. The reasoning is contained in the introduction to Appendix 3. In short, an analysis of arrest data from January through July 2016 suggested that the most important findings on arrests are already captured in the original report, and thus that the results on total arrests in this updated report are sufficient for now.

Figure 1. Total Weekly Recorded Crime Incidents (gray dots) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 2. Seasonal Adjustment Variables Utilized in Subsequent Models

Table 1. Coefficients from Three Models for Total Weekly Recorded Crime Incidents

	3/1/2010 – 8/10/2014 Model	Preferred Model	Alternative Model
Time Counter (in weeks)	-0.14		-0.13
After Ferguson Protests Begin (week of 8/11/14 onward)		-36.62	-38.29
After Gray Protests Begin (week of 4/20/15 onward)		117.57	113.97
Unrest and National Guard (during week of 4/27/15)		106.68	118.16
After Batts Fired (week of 7/13/15 onward)		-44.00	-44.38
After Davis Sworn In (week of 10/19/15 onward)		-48.00	-46.68
Average Maximum Temperature to 50 Degrees	4.69		4.65
Plus Degrees in the 50s	4.75		5.11
Plus Degrees in the 60s	-2.69		-3.31
Plus Degrees in the 70s	-4.35		-1.50
Plus Degrees Greater Than 80	-0.92		-3.23
Snowfall (inches)	-65.84		-57.39
Precipitation (inches)	-25.98		-23.23
Darkness Before Midnight (hours)	20.82		24.22
School Days (proportion of week)	-5.18		20.77
Observations (weeks)	232	348	348
Proportion of variance explained (R-squared)	0.67	0.15	0.72

Notes: The outcome variable for the first and third columns is the same – the total weekly recorded crime count – but the R-squared values cannot be compared across the two columns because the weeks for the model differ. Relatedly, the outcome for the second column is a residualized total weekly crime count, and as such the R-squared value of 0.13 cannot be meaningfully compared to either 0.67 or 0.71 in the first and third columns, even though the models in the second and third columns are estimated for the same weeks.

Figure 3. Total Weekly Recorded Crime Incidents (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Table 2. Baseline and Percentage Change in the Weekly Count of Recorded Crime Incidents

	Baseline Count Per Week	Ferguson Period (percent change)	Gray Period (percent change)	Unrest Period (percent change)	Transition Period (percent change)	Davis Period (percent change)
Homicide	4.3	-3.5	92.8	19.8	-26.4	-22.7
Shooting	7.1	13.6	139.8	-39.4	-64.2	0.5
Rape	5.3	-1.6	26.2	-34.0	-35.6	17.5
Robbery (carjacking)	2.6	66.7	35.6	389.6	-6.0	117.1
Robbery (street)	51.3	0.8	32.4	-32.3	-15.5	9.2
Robbery (commercial)	11.0	20.1	87.1	-6.3	-65.5	-4.4
Robbery (residence)	9.8	-11.3	19.2	12.7	-26.9	17.6
Aggravated assault	82.1	6.2	30.1	57.0	-11.1	6.5
Assault by threat	10.9	-4.4	4.8	-63.8	20.9	-5.0
Common assault	157.3	-12.4	1.6	-30.6	-2.4	5.5
Burglary	138.6	0.0	12.5	190.2	-1.9	-4.5
Larceny from auto	123.0	3.3	12.0	-54.7	-1.9	-14.8
Larceny	224.4	-11.2	-15.1	-25.5	4.3	-10.9
Auto theft	85.5	-6.2	54.5	-49.4	-15.0	-25.0
Arson	4.3	18.0	21.8	648.5	8.5	-5.5
Total	917.5	-4.0	12.8	11.6	-4.8	-5.2

Table 3. Baseline Weekly Count of Recorded Crime Incidents and Estimated Cumulative Percentage of the Baseline Weekly Count in Subsequent Periods

	Baseline Count Per Week	Ferguson Period (percent)	Gray Period (percent)	Unrest Period (percent)	Transition Period (percent)	Davis Period (percent)
Homicide	4.3	96.5	189.3	--	162.9	140.2
Shooting	7.1	113.6	253.3	--	189.1	189.7
Rape	5.3	98.4	124.6	--	89.0	106.5
Robbery (carjacking)	2.6	166.7	202.2	--	196.3	313.4
Robbery (street)	51.3	100.8	133.1	--	117.6	126.8
Robbery (commercial)	11.0	120.1	207.2	--	141.7	137.4
Robbery (residence)	9.8	88.7	108.0	--	81.1	98.7
Aggravated assault	82.1	106.2	136.2	--	125.1	131.6
Assault by threat	10.9	95.6	100.4	--	121.4	116.4
Common assault	157.3	87.6	89.1	--	86.7	92.2
Burglary	138.6	100.0	112.4	--	110.6	106.1
Larceny from auto	123.0	103.3	115.3	--	113.4	98.6
Larceny	224.4	88.8	73.7	--	78.0	67.1
Auto theft	85.5	93.8	148.3	--	133.3	108.3
Arson	4.3	118.0	139.8	--	148.2	142.7
Total	917.5	96.0	108.8	--	104.0	98.8

Notes: The unrest period is modeled with a “spike” specification, and this modeling choice removes it from the calculation of cumulative change. The Gray period is therefore an artificial period with the week of unrest removed, and subsequent periods do not incorporate the week of unrest in the calculation of cumulative change.

Figure 4. Total Weekly Homicide Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 5. Total Weekly Shootings Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 6. Total Weekly Carjacking Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 7. Total Weekly Street Robbery Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 8. Total Weekly Aggravated Assault Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 9. Total Weekly Burglary Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 10. Total Weekly Larceny from Automobiles Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 11. Total Weekly Larceny Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 12. Total Weekly Automobile Theft Count (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Table 4. Baseline and Raw Change in the Weekly Count of Shootings and Homicides by Police District

	Baseline Count Per Week	Ferguson Period (raw change)	Gray Period (raw change)	Unrest Period (raw change)	Transition Period (raw change)	Davis Period (raw change)
Shootings						
Northwestern	0.7	0.5	0.1	3.0	0.4	-0.3
Northern	0.4	0.1	0.1	-0.4	1.0	-0.7
Northeastern	0.9	0.0	0.8	1.5	-0.4	0.4
Western	1.2	0.4	3.3	-2.7	-3.2	0.6
Central	0.5	-0.3	0.9	-0.9	-0.9	0.6
Eastern	1.1	0.0	3.1	-4.0	-2.4	0.4
Southwestern	1.0	0.2	0.5	0.4	0.9	-0.8
Southern	0.7	-0.1	1.0	-0.9	0.1	-0.2
Southeastern	0.5	0.1	0.2	1.3	0.0	0.0
Homicide						
Northwestern	0.6	-0.1	0.4	1.8	-0.2	-0.2
Northern	0.4	0.0	0.1	-0.2	0.2	-0.3
Northeastern	0.5	0.5	0.3	-1.1	-0.2	-0.1
Western	0.6	-0.2	1.0	0.5	0.1	-0.4
Central	0.3	-0.1	0.0	-0.5	0.1	-0.1
Eastern	0.6	-0.1	0.7	-1.3	-0.3	0.2
Southwestern	0.6	0.0	0.8	-0.2	-0.6	-0.2
Southern	0.4	-0.1	0.6	1.2	-0.3	0.1
Southeastern	0.3	-0.1	0.1	0.8	0.1	0.1

Figure 13. Total Weekly Shootings in the Western District (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 14. Total Weekly Homicides in the Western District (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 15. Total Weekly Shootings in the Eastern District (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 16. Total Weekly Homicides in the Eastern District (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Table 5. Coefficients from Three Models for Total Weekly Recorded Arrests

	1/1/2013 – 8/10/2014 Model	Preferred Model	Alternative Model
Time Counter (in weeks)	-0.28		-1.16
After Ferguson Protests Begin (week of 8/11/14 onward)		-150.56	-95.49
After Gray Protests Begin (week of 4/20/15 onward)		-247.70	-231.39
Unrest and National Guard (during week of 4/27/15)		182.92	188.71
After Batts Fired (week of 7/13/15 onward)		166.96	162.92
After Davis Sworn In (week of 10/19/15 onward)		-29.74	9.37
Average Maximum Temperature to 50 Degrees	-0.59		-0.49
Plus Degrees in the 50s	-2.36		2.96
Plus Degrees in the 60s	-0.48		-5.16
Plus Degrees in the 70s	8.45		5.86
Plus Degrees Greater Than 80	-11.15		-6.95
Snowfall (inches)	-75.09		-23.66
Precipitation (inches)	-158.65		-89.11
Darkness Before Midnight (hours)	-38.30		-26.68
School Days (proportion of week)	71.14		38.30
Observations (weeks)	83	199	199
Proportion of variance explained (R-squared)	0.51	0.77	0.85

Notes: The outcome variable for the first and third columns is the same – the total weekly recorded arrest count – but the R-squared values cannot be compared across the two columns because the weeks for the model differ. Relatedly, the outcome for the second column is a residualized total weekly arrest count, and as such the R-squared value of 0.77 cannot be meaningfully compared to either 0.51 or 0.85 in the first and third columns, even though the models in the second and third columns are estimated for the same weeks.

Figure 17. Total Weekly Arrests (gray dots) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Figure 18. Total Weekly Arrests (three-week moving average, blue line) with Predicted Values from the Model Before the Ferguson Protests Began (black line) and Extrapolated Counterfactual Values After the Ferguson Protests Began (red line)

Table 6. Baseline and Percentage Change in the Weekly Count of Arrests

	Baseline Count Per Week	Ferguson Period (percent change)	Gray Period (percent change)	Unrest Period (percent change)	Transition Period (percent change)	Davis Period (percent change)
Total	797.0	-18.9	-31.1	23.0	20.9	-3.7

Table 7. Baseline Weekly Count of Arrests and Estimated Cumulative Percentage of the Baseline Weekly Count in Subsequent Periods

	Baseline Count Per Week	Ferguson Period (percent)	Gray Period (percent)	Unrest Period (percent)	Transition Period (percent)	Davis Period (percent)
Total	797.0	81.1	50.0	--	71.0	67.2

Notes: See Table 5. In addition, the unrest period is modeled with a “spike” specification, and this modeling choice removes it from the calculation of cumulative change. The Gray period is therefore an artificial period with the week of unrest removed, and subsequent periods do not incorporate the week of unrest in the calculation of cumulative change. The four negative values are implausible and should be interpreted as zero (because the true cumulative change is bounded by zero, even though the model does not have this constraint); note that these values are only present for the categories that we have placed in gray.

Appendix 2 (Fall 2016 Update)

Comprehensive Analysis of BPD Crime Data

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November 11, 2016

Navigation of this Document

In order to jump to results of interest, display the Table of Contents for this pdf file in the left pane of your pdf viewer. The top level of the Table of Contents contains labeled sections for each outcome, within which subsections are nested for each piece of the analysis. Clicking the items in the pane will take you to the relevant set of results.

1 Introduction

For this updated analysis of BPD's crime data, I offer comprehensive results that extend the results summarized in the report:

- Morgan, Stephen L. and Joel A. Pally. 2016. "Ferguson, Gray, and Davis: An Analysis of Recorded Crime Incidents and Arrests in Baltimore City, March 2010 through December 2015." A Report Prepared for the 21st Century Cities Initiative at Johns Hopkins University. Baltimore, MD: Johns Hopkins University, March 15, 2016. (URL: <http://socweb.soc.jhu.edu/faculty/morgan/reports.html>)

The results in the original report were based on crime data through the end of 2015. In this Fall 2016 Update to Appendix 2, I offer models that incorporate data through Sunday, October 30th, 2016.

The basic analysis strategy is the same as in the original report. I first model the prevailing cyclical crime trend from Monday, March 1st, 2010 through Sunday, August 10, 2014. Then, I use that estimated model to predict a counterfactual crime trend, as if the protest events and any changes in police practice from August 11, 2014 onward had not occurred. I then estimate period effects as average differences between observed and counterfactual values from August 11, 2014 onward in distinct time intervals.

Unlike the original report, with the availability of additional data it is reasonable to now divide the interval after Police Commissioner Anthony Batts was fired into (1) a transition period while Kevin Davis was the Interim Police Commissioner and (2) a final period after Kevin Davis was sworn in as Batts' permanent replacement and with a five-year contract as the city's 38th Police Commissioner. For the analysis reported here, the transition period begins with the week of Monday, July 13, 2015 and ends on Sunday, October 18, 2015. The period for Davis as commissioner encompasses the first full year of his term, from the week of Monday, October 19, 2015 (10/19/15 to 10/25/15) through the week of Monday, October 24, 2016 (10/24/16 to 10/30/16).

Descriptive Summary of the Data

The outcomes analyzed in subsequent sections are listed and summarized in Table 2.1 in the Data section, after which a breakdown of totals across all outcomes is provided by police district in Table 2.2. Finally, a five-panel figure displays the distribution of the five variables utilized to represent weather, hours of darkness, and school days for the full time series.

Results for Each Outcome

For each outcome, I first offer a table with coefficients from four estimated models:

- Model 1 is a naive model with five estimated coefficients for the period indicator variables for the full time series;
- Model 2 is a "pretreatment" model, estimated only for data prior to August 11, 2014, that fits coefficients for weather, hours of darkness, and school days;
- Model 3 is analogous to Model 1 but utilizes an outcome variable for the full time series that has been de-trended using coefficients for weather, hours of darkness, and school days estimated by Model 2 using data from the "pretreatment" period only;
- Model 4 is an alternative to Model 3 that fits coefficients for weather, hours of darkness, and school days simultaneously with coefficients for the five period indicator variables.

The period effects estimated for Model 3 are my preferred estimates, and the period effects estimated for Model 4 are plausible alternatives.

I then offer two figures that depict the fit of Model 2 as well as the variation that generates the period effects estimated for the preferred Model 3. For both figures, the black line is the predicted time series from Model 2 while the red line is an extrapolated cyclical trend, generated by forming the predictions from the coefficients for Model 2 applied to the observed values for weather, hours of darkness, and school days from August 11, 2014 onward. The first figure overlays gray dots for the observed weekly total for each outcome, and the second figure substitutes a light blue line for the three-week moving average of the observed weekly totals. The differences between the gray dots (or the light blue line) and the red line is the source of variation that generates the period effects estimated for the preferred Model 3.

Finally, for each outcome a diagnostic model is also fit to assess the extent to which the least squares estimation of Model 2 adequately represents the underlying time series up through August 10, 2014. For this alternative model, a poisson distribution is assumed for the outcome because it is a weekly count bounded by zero. In general, these alternative models support the decision to utilize the simpler Model 2 to estimate the underlying time series that structures the extrapolated counterfactual trend. In addition to R output for the estimated poisson regression, analogous figures are offered to demonstrate the near equivalence of Model 2 and its poisson regression alternative.

2 Data

Table 2.1: Descriptive Statistics for Weekly Reported Incidents of Victim-Based Crime, with Breakdown by Type of Crime

Statistic	Min	Median	Max
homicide	0	4	17
shooting	0	8	33
rape	0	5	16
robbery.carjacking	0	3	19
robbery.street	24	52.5	102
robbery.commercial	2	12	44
robbery.residence	1	9	27
aggravated.assault	40	93	161
assault.by.threat	1	11	28
common.assault	78	157	241
burglary	74	147	403
larceny.from.auto	52	128	207
larceny	103	202	302
auto.theft	47	85	182
arson	0	5	33
total	558	952	1,141

Table 2.2: Descriptive Statistics for Weekly Reported Incidents of Victim-Based Crime, with Breakdown by District

Statistic	Min	Median	Max
northwestern	56	94	152
northern	55	105	174
northeastern	79	148.5	207
western	42	77	200
central	52	112	193
eastern	41	78	120
southwestern	42	85	147
southern	54	110.5	228
southeastern	62	126	187
total	558	952	1,141

Adjustment Variables for Subsequent Models

- tmax.f is the weekly average of the daily maximum temperature, measured in degrees Fahrenheit
- snow.in is the weekly average of total daily snowfall, measured in inches
- precip.in is the weekly average of total daily precipitation, measured in inches
- dark.before.12 is the weekly average of daily hours between sunset and midnight
- school is the proportion of days of the week when school was scheduled for Baltimore City Schools

3 Results for total

3.1 Summary Values for total

Table 3.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
total	232	946.983	97.107	626	960	1,119

Table 3.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
total	116	920.810	127.054	558	932.5	1,141

3.2 Four Models for total

Table 3.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.27	−0.14		−0.13
After Ferguson Protests Begin (week of 8/11/14 onward)	−68.92		−36.62	−38.29
After Gray Protests Begin (week of 4/20/15 onward)	212.57		117.57	113.97
Unrest and National Guard (4/27/15 - 5/3/2015)	88.12		106.68	118.16
After Batts Fired (week of 7/13/15 onward)	−17.33		−44.00	−44.38
After Davis Sworn In (week of 10/19/15 onward)	−101.22		−48.00	−46.68
Average Maximum Temperature to 50 Degrees		4.69		4.65
Plus Degrees in the 50s		4.75		5.11
Plus Degrees in the 60s		−2.69		−3.31
Plus Degrees in the 70s		−4.35		−1.50
Plus Degrees Greater Than 80		−0.92		−3.23
Snowfall (inches)		−65.84		−57.39
Precipitation (inches)		−25.98		−23.23
Darkness Before Midnight (hours)		20.82		24.22
School Days (proportion of week)		−5.18		20.77
Observations	348	232	348	348
R ²	0.18	0.67	0.13	0.71

3.3 Least Squares Model (2) for total

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

3.4 A Poisson Regression Model as an Alternative to Model (2) for total

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-4.6457	-1.3814	0.0252	1.2298	6.3215

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	6.377e+00	4.642e-02	137.389	< 2e-16 ***
t	-1.491e-04	3.294e-05	-4.527	5.98e-06 ***
tmax.f.spline1	5.464e-03	8.566e-04	6.379	1.78e-10 ***
tmax.f.spline2	4.803e-03	1.706e-03	2.816	0.00487 **
tmax.f.spline3	-3.239e-03	2.036e-03	-1.591	0.11164
tmax.f.spline4	-4.565e-03	1.879e-03	-2.429	0.01514 *
tmax.f.spline5	-1.035e-03	1.626e-03	-0.636	0.52469
snow.in	-9.287e-02	1.198e-02	-7.750	9.22e-15 ***
precip.in	-2.728e-02	1.195e-02	-2.282	0.02251 *
dark.before.12	2.229e-02	3.139e-03	7.101	1.24e-12 ***
school	-6.920e-03	9.465e-03	-0.731	0.46469

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 2364.05 on 231 degrees of freedom
Residual deviance: 758.72 on 221 degrees of freedom
AIC: 2795.8

Number of Fisher Scoring iterations: 3

4 Results for homicide

4.1 Summary Values for homicide

Table 4.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide	232	4.203	2.164	0	4	11

Table 4.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide	116	5.905	3.067	1	6	17

4.2 Four Models for homicide

Table 4.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001		0.002
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.31		−0.15	−0.16
After Gray Protests Begin (week of 4/20/15 onward)	4.65		3.96	3.98
Unrest and National Guard (4/27/15 - 5/3/2015)	0.37		0.84	0.80
After Batts Fired (week of 7/13/15 onward)	−1.14		−1.13	−1.38
After Davis Sworn In (week of 10/19/15 onward)	−1.35		−0.97	−0.84
Average Maximum Temperature to 50 Degrees		−0.05		−0.05
Plus Degrees in the 50s		0.12		0.14
Plus Degrees in the 60s		−0.09		−0.09
Plus Degrees in the 70s		0.13		0.10
Plus Degrees Greater Than 80		−0.15		−0.06
Snowfall (inches)		−0.77		−0.87
Precipitation (inches)		−1.27		−1.26
Darkness Before Midnight (hours)		0.01		0.08
School Days (proportion of week)		0.27		0.22
Observations	348	232	348	348
R ²	0.21	0.08	0.17	0.27

4.3 Least Squares Model (2) for homicide

homicide

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

4.4 A Poisson Regression Model as an Alternative to Model (2) for homicide

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.09562	-0.87689	-0.06265	0.57269	2.85382

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.8596694	0.6857653	2.712	0.00669 **
t	0.0002678	0.0004920	0.544	0.58620
tmax.f.spline1	-0.0136166	0.0126536	-1.076	0.28188
tmax.f.spline2	0.0328932	0.0260781	1.261	0.20719
tmax.f.spline3	-0.0226152	0.0312322	-0.724	0.46900
tmax.f.spline4	0.0299412	0.0286227	1.046	0.29553
tmax.f.spline5	-0.0338043	0.0240380	-1.406	0.15964
snow.in	-0.2479227	0.1931382	-1.284	0.19926
precip.in	-0.3181263	0.1933957	-1.645	0.09998 .
dark.before.12	0.0029241	0.0480517	0.061	0.95148
school	0.0597310	0.1408388	0.424	0.67149

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 268.52 on 231 degrees of freedom
Residual deviance: 247.66 on 221 degrees of freedom
AIC: 1002.9

Number of Fisher Scoring iterations: 5

homicide

homicide

5 Results for shooting

5.1 Summary Values for shooting

Table 5.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting	232	7.534	3.620	0	7	22

Table 5.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting	116	11.681	5.796	1	11	33

5.2 Four Models for shooting

Table 5.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.004	−0.01		−0.004
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.13		0.96	0.91
After Gray Protests Begin (week of 4/20/15 onward)	12.21		9.94	9.54
Unrest and National Guard (4/27/15 - 5/3/2015)	−5.02		−2.80	−2.74
After Batts Fired (week of 7/13/15 onward)	−4.81		−4.56	−4.45
After Davis Sworn In (week of 10/19/15 onward)	−1.31		0.04	0.11
Average Maximum Temperature to 50 Degrees		0.07		0.04
Plus Degrees in the 50s		−0.07		−0.03
Plus Degrees in the 60s		0.13		0.06
Plus Degrees in the 70s		0.21		0.31
Plus Degrees Greater Than 80		−0.64		−0.60
Snowfall (inches)		−0.99		−1.24
Precipitation (inches)		−1.41		−1.80
Darkness Before Midnight (hours)		0.24		0.01
School Days (proportion of week)		−2.00		−0.61
Observations	348	232	348	348
R ²	0.35	0.24	0.43	0.49

5.3 Least Squares Model (2) for shooting

shooting

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

5.4 A Poisson Regression Model as an Alternative to Model (2) for shooting

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.3420	-0.9140	-0.1548	0.7434	2.8998

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.3528871	0.5566616	2.430	0.0151 *
t	-0.0006893	0.0003657	-1.885	0.0594 .
tmax.f.spline1	0.0103792	0.0103464	1.003	0.3158
tmax.f.spline2	-0.0122373	0.0205737	-0.595	0.5520
tmax.f.spline3	0.0225001	0.0246063	0.914	0.3605
tmax.f.spline4	0.0183431	0.0217054	0.845	0.3981
tmax.f.spline5	-0.0728578	0.0175203	-4.158	3.2e-05 ***
snow.in	-0.2566309	0.1658629	-1.547	0.1218
precip.in	-0.1912046	0.1362160	-1.404	0.1604
dark.before.12	0.0369308	0.0369819	0.999	0.3180
school	-0.2506422	0.1015206	-2.469	0.0136 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 409.56 on 231 degrees of freedom
Residual deviance: 310.95 on 221 degrees of freedom
AIC: 1200.8

Number of Fisher Scoring iterations: 5

shooting

shooting

6 Results for rape

6.1 Summary Values for rape

Table 6.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
rape	232	5.638	2.582	0	5	16

Table 6.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
rape	116	5.353	2.489	0	5	13

6.2 Four Models for rape

Table 6.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.003	−0.002		−0.003
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.36		−0.08	−0.08
After Gray Protests Begin (week of 4/20/15 onward)	2.03		1.38	1.34
Unrest and National Guard (4/27/15 - 5/3/2015)	−1.83		−1.79	−2.00
After Batts Fired (week of 7/13/15 onward)	−1.71		−1.88	−1.65
After Davis Sworn In (week of 10/19/15 onward)	0.50		0.92	0.71
Average Maximum Temperature to 50 Degrees		0.05		0.07
Plus Degrees in the 50s		−0.06		−0.07
Plus Degrees in the 60s		0.08		0.02
Plus Degrees in the 70s		−0.11		−0.05
Plus Degrees Greater Than 80		0.12		0.05
Snowfall (inches)		−0.41		−0.03
Precipitation (inches)		0.42		−0.30
Darkness Before Midnight (hours)		−0.04		−0.15
School Days (proportion of week)		0.09		0.29
Observations	348	232	348	348
R ²	0.02	0.05	0.01	0.06

6.3 Least Squares Model (2) for rape

rape

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

6.4 A Poisson Regression Model as an Alternative to Model (2) for rape

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.2428  -0.7690  -0.0789   0.5461   3.3316

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   1.3096601   0.6075365   2.156  0.0311 *
t             -0.0004330   0.0004271  -1.014  0.3106
tmax.f.spline1 0.0091335   0.0111683   0.818  0.4135
tmax.f.spline2 -0.0111209   0.0221531  -0.502  0.6157
tmax.f.spline3 0.0135718   0.0266630   0.509  0.6107
tmax.f.spline4 -0.0182326   0.0244718  -0.745  0.4562
tmax.f.spline5 0.0191591   0.0209616   0.914  0.3607
snow.in       -0.0967201   0.1563694  -0.619  0.5362
precip.in      0.0711936   0.1514479   0.470  0.6383
dark.before.12 -0.0075881   0.0407851  -0.186  0.8524
school         0.0147669   0.1230912   0.120  0.9045
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 287.55  on 231  degrees of freedom
Residual deviance: 274.45  on 221  degrees of freedom
AIC: 1099

Number of Fisher Scoring iterations: 4
```

rape

rape

7 Results for robbery.carjacking

7.1 Summary Values for robbery.carjacking

Table 7.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.carjacking	232	3.155	2.071	0	3	11

Table 7.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.carjacking	116	5.845	3.366	0	5.5	19

7.2 Four Models for robbery.carjacking

Table 7.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.01	−0.01		−0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	1.54		1.73	1.76
After Gray Protests Begin (week of 4/20/15 onward)	1.47		0.92	0.97
Unrest and National Guard (4/27/15 - 5/3/2015)	9.79		10.11	10.17
After Batts Fired (week of 7/13/15 onward)	−0.10		−0.15	−0.32
After Davis Sworn In (week of 10/19/15 onward)	2.56		3.04	3.04
Average Maximum Temperature to 50 Degrees		−0.03		0.01
Plus Degrees in the 50s		0.02		−0.02
Plus Degrees in the 60s		0.16		0.12
Plus Degrees in the 70s		−0.14		−0.13
Plus Degrees Greater Than 80		−0.03		0.02
Snowfall (inches)		−0.12		−0.47
Precipitation (inches)		0.72		1.01
Darkness Before Midnight (hours)		0.13		0.16
School Days (proportion of week)		−0.15		−0.94
Observations	348	232	348	348
R ²	0.34	0.11	0.46	0.37

7.3 Least Squares Model (2) for robbery.carjacking

robbery.carjacking

robbery.carjacking

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

7.4 A Poisson Regression Model as an Alternative to Model (2) for robbery.carjacking

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.8859	-0.8446	-0.1236	0.5623	3.0046

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.3982542	0.8108040	1.725	0.084613 .
t	-0.0019587	0.0005686	-3.445	0.000572 ***
tmax.f.spline1	-0.0111690	0.0148900	-0.750	0.453194
tmax.f.spline2	0.0076692	0.0313239	0.245	0.806583
tmax.f.spline3	0.0541631	0.0383133	1.414	0.157453
tmax.f.spline4	-0.0492818	0.0328721	-1.499	0.133822
tmax.f.spline5	-0.0071229	0.0272833	-0.261	0.794036
snow.in	-0.0593475	0.2011582	-0.295	0.767972
precip.in	0.1979733	0.1921123	1.031	0.302772
dark.before.12	0.0479398	0.0572685	0.837	0.402533
school	-0.0511976	0.1621547	-0.316	0.752205

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 346.44 on 231 degrees of freedom
Residual deviance: 310.61 on 221 degrees of freedom
AIC: 965.16

Number of Fisher Scoring iterations: 5

robbery.carjacking

robbery.carjacking

8 Results for robbery.street

8.1 Summary Values for robbery.street

Table 8.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.street	232	50.621	12.474	24	50	97

Table 8.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.street	116	63.655	17.211	24	64.5	102

8.2 Four Models for robbery.street

Table 8.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.01	0.02		0.03
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.67		0.40	0.44
After Gray Protests Begin (week of 4/20/15 onward)	18.08		16.60	14.80
Unrest and National Guard (4/27/15 - 5/3/2015)	-20.03		-16.56	-15.81
After Batts Fired (week of 7/13/15 onward)	-2.33		-7.97	-8.19
After Davis Sworn In (week of 10/19/15 onward)	1.09		4.72	5.42
Average Maximum Temperature to 50 Degrees		0.63		0.60
Plus Degrees in the 50s		-0.41		-0.11
Plus Degrees in the 60s		0.91		0.57
Plus Degrees in the 70s		-0.85		-0.57
Plus Degrees Greater Than 80		-0.23		-0.32
Snowfall (inches)		-6.12		-4.67
Precipitation (inches)		5.01		3.14
Darkness Before Midnight (hours)		6.12		6.09
School Days (proportion of week)		-4.61		-2.22
Observations	348	232	348	348
R ²	0.25	0.21	0.19	0.43

8.3 Least Squares Model (2) for robbery.street

robbery.street

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

8.4 A Poisson Regression Model as an Alternative to Model (2) for robbery.street

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.5648	-1.1086	-0.0602	0.9894	4.8631

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	2.4938087	0.1991196	12.524	< 2e-16 ***
t	0.0004288	0.0001437	2.985	0.002840 **
tmax.f.spline1	0.0126913	0.0036727	3.456	0.000549 ***
tmax.f.spline2	-0.0087399	0.0073473	-1.190	0.234229
tmax.f.spline3	0.0192579	0.0089215	2.159	0.030881 *
tmax.f.spline4	-0.0175956	0.0082267	-2.139	0.032449 *
tmax.f.spline5	-0.0044547	0.0071131	-0.626	0.531137
snow.in	-0.1668873	0.0544354	-3.066	0.002171 **
precip.in	0.0957153	0.0500479	1.912	0.055815 .
dark.before.12	0.1225102	0.0136504	8.975	< 2e-16 ***
school	-0.0936187	0.0407435	-2.298	0.021576 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 703.34 on 231 degrees of freedom
Residual deviance: 545.36 on 221 degrees of freedom
AIC: 1897.9

Number of Fisher Scoring iterations: 4

robbery.street

9 Results for robbery.commercial

9.1 Summary Values for robbery.commercial

Table 9.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.commercial	232	10.569	4.376	2	10	25

Table 9.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.commercial	116	15.828	5.634	4	15	44

9.2 Four Models for robbery.commercial

Table 9.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.003	0.005		0.004
After Ferguson Protests Begin (week of 8/11/14 onward)	2.89		2.21	2.40
After Gray Protests Begin (week of 4/20/15 onward)	8.07		9.58	9.20
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.99		-0.69	-0.38
After Batts Fired (week of 7/13/15 onward)	-5.61		-7.20	-7.03
After Davis Sworn In (week of 10/19/15 onward)	-0.90		-0.48	-0.37
Average Maximum Temperature to 50 Degrees		-0.09		-0.08
Plus Degrees in the 50s		0.06		0.09
Plus Degrees in the 60s		0.45		0.42
Plus Degrees in the 70s		-0.53		-0.49
Plus Degrees Greater Than 80		0.11		0.004
Snowfall (inches)		-0.60		-1.40
Precipitation (inches)		2.75		3.35
Darkness Before Midnight (hours)		1.69		1.72
School Days (proportion of week)		-2.56		-2.90
Observations	348	232	348	348
R ²	0.27	0.13	0.26	0.36

9.3 Least Squares Model (2) for robbery.commercial

robbery.commercial

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

9.4 A Poisson Regression Model as an Alternative to Model (2) for robbery.commercial

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.3481	-0.9092	-0.1272	0.7183	4.0851

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	1.7397756	0.4027665	4.320	1.56e-05	***
t	0.0004580	0.0003147	1.456	0.14547	
tmax.f.spline1	-0.0076588	0.0072386	-1.058	0.29003	
tmax.f.spline2	0.0046290	0.0155889	0.297	0.76651	
tmax.f.spline3	0.0451916	0.0199440	2.266	0.02346	*
tmax.f.spline4	-0.0518994	0.0183232	-2.832	0.00462	**
tmax.f.spline5	0.0101545	0.0160573	0.632	0.52713	
snow.in	-0.0517243	0.0952641	-0.543	0.58716	
precip.in	0.2449823	0.1067537	2.295	0.02174	*
dark.before.12	0.1653790	0.0302018	5.476	4.36e-08	***
school	-0.2422098	0.0891908	-2.716	0.00661	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 415.77 on 231 degrees of freedom
Residual deviance: 362.02 on 221 degrees of freedom
AIC: 1340.4

Number of Fisher Scoring iterations: 4

robbery.commercial

robbery.commercial

10 Results for robbery.residence

10.1 Summary Values for robbery.residence

Table 10.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.residence	232	10.276	4.052	1	10	27

Table 10.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
robbery.residence	116	8.871	3.348	1	9	19

10.2 Four Models for robbery.residence

Table 10.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.01	−0.01		−0.005
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.74		−1.11	−0.87
After Gray Protests Begin (week of 4/20/15 onward)	0.85		1.89	1.29
Unrest and National Guard (4/27/15 - 5/3/2015)	1.52		1.25	1.64
After Batts Fired (week of 7/13/15 onward)	−1.74		−2.65	−2.68
After Davis Sworn In (week of 10/19/15 onward)	1.67		1.73	2.03
Average Maximum Temperature to 50 Degrees		−0.12		−0.03
Plus Degrees in the 50s		0.24		0.08
Plus Degrees in the 60s		−0.10		−0.03
Plus Degrees in the 70s		−0.07		−0.05
Plus Degrees Greater Than 80		0.16		0.18
Snowfall (inches)		1.21		0.13
Precipitation (inches)		−1.08		−0.77
Darkness Before Midnight (hours)		0.50		0.40
School Days (proportion of week)		−1.05		−1.11
Observations	348	232	348	348
R ²	0.04	0.05	0.02	0.07

10.3 Least Squares Model (2) for robbery.residence

robbery.residence

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

10.4 A Poisson Regression Model as an Alternative to Model (2) for robbery.residence

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.8712  -0.9062  -0.0710   0.8086   3.4583

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.6356167  0.4106356   6.418 1.38e-10 ***
t            -0.0005600  0.0003171  -1.766  0.0774 .
tmax.f.spline1 -0.0109176  0.0073918  -1.477  0.1397
tmax.f.spline2  0.0226700  0.0155726   1.456  0.1455
tmax.f.spline3 -0.0096253  0.0194205  -0.496  0.6202
tmax.f.spline4 -0.0073328  0.0184310  -0.398  0.6907
tmax.f.spline5  0.0156800  0.0161003   0.974  0.3301
snow.in       0.1030275  0.0887610   1.161  0.2458
precip.in     -0.1110084  0.1197258  -0.927  0.3538
dark.before.12 0.0498115  0.0301261   1.653  0.0982 .
school        -0.1041550  0.0914435  -1.139  0.2547
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 377.06  on 231  degrees of freedom
Residual deviance: 358.53  on 221  degrees of freedom
AIC: 1331.1

Number of Fisher Scoring iterations: 4
```

robbery.residence

robbery.residence

11 Results for aggravated.assault

11.1 Summary Values for aggravated.assault

Table 11.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
aggravated.assault	232	95.315	19.169	47	94	150

Table 11.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
aggravated.assault	116	91.233	21.059	40	88	161

11.2 Four Models for aggravated.assault

Table 11.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.14	−0.13		−0.13
After Ferguson Protests Begin (week of 8/11/14 onward)	−1.74		5.07	4.65
After Gray Protests Begin (week of 4/20/15 onward)	41.95		24.68	23.66
Unrest and National Guard (4/27/15 - 5/3/2015)	46.24		46.81	48.74
After Batts Fired (week of 7/13/15 onward)	−12.89		−9.12	−9.01
After Davis Sworn In (week of 10/19/15 onward)	−1.23		5.33	5.66
Average Maximum Temperature to 50 Degrees		0.45		0.44
Plus Degrees in the 50s		−0.11		−0.17
Plus Degrees in the 60s		−0.10		−0.15
Plus Degrees in the 70s		0.005		0.59
Plus Degrees Greater Than 80		−0.19		−0.65
Snowfall (inches)		−2.34		−5.97
Precipitation (inches)		−13.13		−14.56
Darkness Before Midnight (hours)		−5.41		−5.18
School Days (proportion of week)		5.04		8.79
Observations	348	232	348	348
R ²	0.30	0.59	0.46	0.63

11.3 Least Squares Model (2) for aggravated.assault

aggravated.assault

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

11.4 A Poisson Regression Model as an Alternative to Model (2) for aggravated.assault

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.4840	-0.8587	-0.0178	0.7169	3.1934

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	4.6725377	0.1502506	31.098	< 2e-16 ***
t	-0.0013900	0.0001033	-13.452	< 2e-16 ***
tmax.f.spline1	0.0056061	0.0027699	2.024	0.042979 *
tmax.f.spline2	-0.0012138	0.0054530	-0.223	0.823846
tmax.f.spline3	-0.0023977	0.0064448	-0.372	0.709861
tmax.f.spline4	0.0004600	0.0058831	0.078	0.937677
tmax.f.spline5	-0.0025995	0.0050388	-0.516	0.605919
snow.in	-0.0444424	0.0380514	-1.168	0.242824
precip.in	-0.1374390	0.0386242	-3.558	0.000373 ***
dark.before.12	-0.0579628	0.0099692	-5.814	6.09e-09 ***
school	0.0499195	0.0297875	1.676	0.093767 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 895.77 on 231 degrees of freedom
Residual deviance: 361.81 on 221 degrees of freedom
AIC: 1863.1

Number of Fisher Scoring iterations: 4

aggravated.assault

aggravated.assault

12 Results for assault.by.threat

12.1 Summary Values for assault.by.threat

Table 12.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
assault.by.threat	232	12.366	4.351	1	12	28

Table 12.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
assault.by.threat	116	10.759	4.083	4	11	23

12.2 Four Models for assault.by.threat

Table 12.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.01	−0.01		−0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.99		−0.48	−0.88
After Gray Protests Begin (week of 4/20/15 onward)	1.78		0.52	1.00
Unrest and National Guard (4/27/15 - 5/3/2015)	−5.07		−6.97	−6.74
After Batts Fired (week of 7/13/15 onward)	0.96		2.29	1.59
After Davis Sworn In (week of 10/19/15 onward)	0.01		−0.55	−0.37
Average Maximum Temperature to 50 Degrees		0.23		0.15
Plus Degrees in the 50s		−0.31		−0.18
Plus Degrees in the 60s		0.09		0.11
Plus Degrees in the 70s		−0.08		−0.14
Plus Degrees Greater Than 80		−0.03		0.07
Snowfall (inches)		−0.61		0.07
Precipitation (inches)		−2.40		−2.00
Darkness Before Midnight (hours)		−0.90		−0.41
School Days (proportion of week)		3.87		3.99
Observations	348	232	348	348
R ²	0.08	0.21	0.05	0.18

12.3 Least Squares Model (2) for assault.by.threat

assault.by.threat

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

12.4 A Poisson Regression Model as an Alternative to Model (2) for assault.by.threat

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-4.2225  -0.7279  -0.1221   0.6603   3.0439

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   1.9089066   0.4132764   4.619 3.86e-06 ***
t             -0.0011327   0.0002878  -3.935 8.32e-05 ***
tmax.f.spline1 0.0212658   0.0076326   2.786 0.005333 **
tmax.f.spline2 -0.0283909   0.0145439  -1.952 0.050928 .
tmax.f.spline3 0.0075405   0.0170780   0.442 0.658828
tmax.f.spline4 -0.0053699   0.0159719  -0.336 0.736713
tmax.f.spline5 -0.0026227   0.0146416  -0.179 0.857839
snow.in       -0.0802887   0.1092269  -0.735 0.462301
precip.in     -0.1937018   0.1083212  -1.788 0.073741 .
dark.before.12 -0.0694852   0.0265065  -2.621 0.008756 **
school        0.3202507   0.0855318   3.744 0.000181 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 361.75  on 231  degrees of freedom
Residual deviance: 285.46  on 221  degrees of freedom
AIC: 1304.6

Number of Fisher Scoring iterations: 4
```

assault.by.threat

assault.by.threat

13 Results for common.assault

13.1 Summary Values for common.assault

Table 13.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
common.assault	232	170.216	25.479	100	170.5	241

Table 13.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
common.assault	116	135.595	19.973	78	138	183

13.2 Four Models for common.assault

Table 13.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.13	−0.11		−0.10
After Ferguson Protests Begin (week of 8/11/14 onward)	−24.32		−19.58	−20.40
After Gray Protests Begin (week of 4/20/15 onward)	20.56		2.48	3.07
Unrest and National Guard (4/27/15 - 5/3/2015)	−38.07		−48.16	−44.92
After Batts Fired (week of 7/13/15 onward)	−7.79		−3.80	−5.62
After Davis Sworn In (week of 10/19/15 onward)	5.13		8.67	9.78
Average Maximum Temperature to 50 Degrees		1.08		0.93
Plus Degrees in the 50s		−0.23		−0.09
Plus Degrees in the 60s		0.29		0.44
Plus Degrees in the 70s		−1.46		−1.20
Plus Degrees Greater Than 80		0.66		0.44
Snowfall (inches)		−17.35		−11.55
Precipitation (inches)		−11.96		−11.93
Darkness Before Midnight (hours)		−2.77		−1.39
School Days (proportion of week)		32.58		32.11
Observations	348	232	348	348
R ²	0.39	0.52	0.20	0.67

13.3 Least Squares Model (2) for common.assault

common.assault

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

13.4 A Poisson Regression Model as an Alternative to Model (2) for common.assault

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.2350  -0.8779  -0.1088   0.7249   3.7003

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  4.800e+00  1.097e-01  43.748  < 2e-16 ***
t            -6.134e-04  7.761e-05  -7.904  2.69e-15 ***
tmax.f.spline1  7.080e-03  2.028e-03   3.492  0.00048 ***
tmax.f.spline2 -2.129e-03  3.996e-03  -0.533  0.59424
tmax.f.spline3  1.139e-03  4.731e-03   0.241  0.80981
tmax.f.spline4 -7.749e-03  4.366e-03  -1.775  0.07591 .
tmax.f.spline5  3.868e-03  3.865e-03   1.001  0.31688
snow.in       -1.456e-01  2.961e-02  -4.916  8.82e-07 ***
precip.in     -6.798e-02  2.840e-02  -2.393  0.01671 *
dark.before.12 -1.676e-02  7.314e-03  -2.291  0.02198 *
school        1.918e-01  2.272e-02   8.442  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 887.35  on 231  degrees of freedom
Residual deviance: 409.74  on 221  degrees of freedom
AIC: 2047.5

Number of Fisher Scoring iterations: 4
```

common.assault

14 Results for burglary

14.1 Summary Values for burglary

Table 14.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
burglary	232	149.711	25.754	85	149	241

Table 14.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
burglary	116	143.871	35.121	74	145	403

14.2 Four Models for burglary

Table 14.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.12	−0.09		−0.09
After Ferguson Protests Begin (week of 8/11/14 onward)	−1.94		−0.02	−0.40
After Gray Protests Begin (week of 4/20/15 onward)	21.43		17.26	16.04
Unrest and National Guard (4/27/15 - 5/3/2015)	252.40		263.65	263.27
After Batts Fired (week of 7/13/15 onward)	12.60		−2.59	1.14
After Davis Sworn In (week of 10/19/15 onward)	−15.36		−6.23	−8.42
Average Maximum Temperature to 50 Degrees		1.07		1.02
Plus Degrees in the 50s		0.77		0.94
Plus Degrees in the 60s		0.05		−0.72
Plus Degrees in the 70s		−0.94		0.19
Plus Degrees Greater Than 80		−0.66		−1.29
Snowfall (inches)		−11.07		−5.32
Precipitation (inches)		14.16		11.62
Darkness Before Midnight (hours)		15.57		13.22
School Days (proportion of week)		−16.35		−4.50
Observations	348	232	348	348
R ²	0.32	0.41	0.36	0.51

14.3 Least Squares Model (2) for burglary

burglary

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

14.4 A Poisson Regression Model as an Alternative to Model (2) for burglary

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-4.2239  -0.9836  -0.0638   0.9001   6.1987

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  4.049e+00  1.151e-01  35.175  < 2e-16 ***
t            -6.284e-04  8.333e-05  -7.542  4.63e-14 ***
tmax.f.spline1  7.109e-03  2.121e-03   3.352  0.000802 ***
tmax.f.spline2  5.239e-03  4.256e-03   1.231  0.218380
tmax.f.spline3  1.091e-03  5.130e-03   0.213  0.831545
tmax.f.spline4 -6.952e-03  4.763e-03  -1.460  0.144371
tmax.f.spline5 -4.434e-03  4.120e-03  -1.076  0.281822
snow.in       -1.043e-01  3.038e-02  -3.434  0.000595 ***
precip.in      8.834e-02  2.919e-02   3.026  0.002475 **
dark.before.12  1.067e-01  7.950e-03  13.428  < 2e-16 ***
school        -1.113e-01  2.371e-02  -4.693  2.69e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 1022.54  on 231  degrees of freedom
Residual deviance:  587.57  on 221  degrees of freedom
AIC: 2194.8

Number of Fisher Scoring iterations: 4
```

burglary

burglary

15 Results for larceny.from.auto

15.1 Summary Values for larceny.from.auto

Table 15.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
larceny.from.auto	232	132.961	26.707	71	131	207

Table 15.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
larceny.from.auto	116	122.319	26.865	52	126	172

15.2 Four Models for larceny.from.auto

Table 15.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.11	−0.08		−0.08
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.96		4.03	4.45
After Gray Protests Begin (week of 4/20/15 onward)	28.32		14.81	13.47
Unrest and National Guard (4/27/15 - 5/3/2015)	−66.15		−67.35	−63.13
After Batts Fired (week of 7/13/15 onward)	2.33		−2.36	−3.02
After Davis Sworn In (week of 10/19/15 onward)	−25.10		−18.19	−17.10
Average Maximum Temperature to 50 Degrees		0.45		0.85
Plus Degrees in the 50s		2.21		1.54
Plus Degrees in the 60s		−2.52		−1.83
Plus Degrees in the 70s		−0.82		−0.41
Plus Degrees Greater Than 80		0.91		−0.23
Snowfall (inches)		−5.19		−6.63
Precipitation (inches)		−5.85		−3.96
Darkness Before Midnight (hours)		1.50		3.99
School Days (proportion of week)		−17.72		−13.94
Observations	348	232	348	348
R ²	0.15	0.30	0.06	0.38

15.3 Least Squares Model (2) for larceny.from.auto

larceny.from.auto

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

15.4 A Poisson Regression Model as an Alternative to Model (2) for larceny.from.auto

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-4.1986  -1.3533  -0.2113   1.2302   6.2812

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  4.643e+00  1.249e-01  37.179 < 2e-16 ***
t            -6.352e-04  8.782e-05  -7.234 4.71e-13 ***
tmax.f.spline1  3.921e-03  2.311e-03   1.697 0.089688 .
tmax.f.spline2  1.687e-02  4.565e-03   3.696 0.000219 ***
tmax.f.spline3 -1.986e-02  5.363e-03  -3.702 0.000214 ***
tmax.f.spline4 -5.644e-03  4.973e-03  -1.135 0.256431
tmax.f.spline5  6.020e-03  4.326e-03   1.392 0.164030
snow.in       -5.708e-02  3.180e-02  -1.795 0.072639 .
precip.in     -4.529e-02  3.206e-02  -1.413 0.157655
dark.before.12 1.236e-02  8.373e-03   1.476 0.139925
school        -1.326e-01  2.512e-02  -5.277 1.32e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 1238.05  on 231  degrees of freedom
Residual deviance:  859.77  on 221  degrees of freedom
AIC: 2438.2

Number of Fisher Scoring iterations: 4
```

larceny.from.auto

larceny.from.auto

16 Results for larceny

16.1 Summary Values for larceny

Table 16.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
larceny	232	206.086	32.555	115	205	302

Table 16.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
larceny	116	195.983	28.782	103	198.5	258

16.2 Four Models for larceny

Table 16.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.22	0.26		0.25
After Ferguson Protests Begin (week of 8/11/14 onward)	-32.35		-25.07	-24.92
After Gray Protests Begin (week of 4/20/15 onward)	-7.26		-33.97	-33.03
Unrest and National Guard (4/27/15 - 5/3/2015)	-58.49		-57.24	-57.24
After Batts Fired (week of 7/13/15 onward)	11.89		9.59	9.84
After Davis Sworn In (week of 10/19/15 onward)	-35.73		-24.43	-24.76
Average Maximum Temperature to 50 Degrees		1.37		1.06
Plus Degrees in the 50s		0.52		1.18
Plus Degrees in the 60s		-0.52		-0.99
Plus Degrees in the 70s		-0.63		-0.51
Plus Degrees Greater Than 80		-0.50		-0.43
Snowfall (inches)		-21.26		-17.81
Precipitation (inches)		-14.11		-11.22
Darkness Before Midnight (hours)		1.64		1.73
School Days (proportion of week)		12.45		14.33
Observations	348	232	348	348
R ²	0.21	0.58	0.67	0.59

16.3 Least Squares Model (2) for larceny

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

16.4 A Poisson Regression Model as an Alternative to Model (2) for larceny

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.7241  -1.0073  -0.0080   0.9357   3.7877

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  4.619e+00  1.003e-01  46.065  < 2e-16 ***
t            1.241e-03  7.088e-05  17.513  < 2e-16 ***
tmax.f.spline1 7.994e-03  1.855e-03   4.309 1.64e-05 ***
tmax.f.spline2 1.008e-03  3.673e-03   0.275  0.78367
tmax.f.spline3 -2.498e-03  4.377e-03  -0.571  0.56823
tmax.f.spline4 -3.357e-03  4.035e-03  -0.832  0.40549
tmax.f.spline5 -1.464e-03  3.494e-03  -0.419  0.67509
snow.in      -1.285e-01  2.607e-02  -4.929 8.27e-07 ***
precip.in    -6.604e-02  2.592e-02  -2.548  0.01083 *
dark.before.12 7.889e-03  6.686e-03   1.180  0.23806
school       6.094e-02  2.033e-02   2.997  0.00273 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 1204.08  on 231  degrees of freedom
Residual deviance:  494.62  on 221  degrees of freedom
AIC: 2176.4

Number of Fisher Scoring iterations: 4
```

17 Results for auto.theft

17.1 Summary Values for auto.theft

Table 17.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
auto.theft	232	83.052	18.133	47	81	146

Table 17.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
auto.theft	116	98.793	26.525	56	93.5	182

17.2 Four Models for auto.theft

Table 17.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.03	0.04		0.04
After Ferguson Protests Begin (week of 8/11/14 onward)	−9.08		−5.31	−5.90
After Gray Protests Begin (week of 4/20/15 onward)	56.39		46.58	47.75
Unrest and National Guard (4/27/15 - 5/3/2015)	−53.59		−42.22	−40.96
After Batts Fired (week of 7/13/15 onward)	−6.93		−12.83	−14.05
After Davis Sworn In (week of 10/19/15 onward)	−30.80		−21.37	−21.36
Average Maximum Temperature to 50 Degrees		−0.55		−0.46
Plus Degrees in the 50s		2.06		1.88
Plus Degrees in the 60s		−1.38		−1.18
Plus Degrees in the 70s		0.66		0.73
Plus Degrees Greater Than 80		−0.12		−0.13
Snowfall (inches)		−0.25		−1.46
Precipitation (inches)		2.82		6.08
Darkness Before Midnight (hours)		2.54		4.03
School Days (proportion of week)		−15.73		−13.35
Observations	348	232	348	348
R ²	0.36	0.35	0.27	0.54

17.3 Least Squares Model (2) for auto.theft

auto.theft

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

17.4 A Poisson Regression Model as an Alternative to Model (2) for auto.theft

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-4.7324	-1.1946	-0.0779	0.9045	4.3016

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	4.4277961	0.1548779	28.589	< 2e-16	***
t	0.0004524	0.0001112	4.069	4.73e-05	***
tmax.f.spline1	-0.0073949	0.0028410	-2.603	0.00924	**
tmax.f.spline2	0.0273797	0.0058390	4.689	2.74e-06	***
tmax.f.spline3	-0.0180857	0.0070761	-2.556	0.01059	*
tmax.f.spline4	0.0075562	0.0065211	1.159	0.24656	
tmax.f.spline5	-0.0024558	0.0054121	-0.454	0.65001	
snow.in	-0.0005651	0.0361285	-0.016	0.98752	
precip.in	0.0326381	0.0402438	0.811	0.41736	
dark.before.12	0.0341799	0.0108572	3.148	0.00164	**
school	-0.1830027	0.0315077	-5.808	6.32e-09	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 891.40 on 231 degrees of freedom
Residual deviance: 574.64 on 221 degrees of freedom
AIC: 2043.5

Number of Fisher Scoring iterations: 4

auto.theft

auto.theft

18 Results for arson

18.1 Summary Values for arson

Table 18.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
arson	232	5.280	2.896	0	5	15

Table 18.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
arson	116	5.121	3.735	0	5	33

18.2 Four Models for arson

Table 18.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.01	−0.01		−0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	0.25		0.77	0.70
After Gray Protests Begin (week of 4/20/15 onward)	2.06		0.93	0.89
Unrest and National Guard (4/27/15 - 5/3/2015)	27.04		27.78	27.47
After Batts Fired (week of 7/13/15 onward)	−0.06		0.36	0.45
After Davis Sworn In (week of 10/19/15 onward)	−0.39		−0.24	−0.23
Average Maximum Temperature to 50 Degrees		0.13		0.11
Plus Degrees in the 50s		−0.08		−0.08
Plus Degrees in the 60s		−0.13		−0.04
Plus Degrees in the 70s		0.27		0.15
Plus Degrees Greater Than 80		−0.33		−0.29
Snowfall (inches)		0.03		−0.20
Precipitation (inches)		−0.65		−0.61
Darkness Before Midnight (hours)		−0.01		−0.08
School Days (proportion of week)		0.70		0.62
Observations	348	232	348	348
R ²	0.27	0.14	0.31	0.33

18.3 Least Squares Model (2) for arson

arson

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

18.4 A Poisson Regression Model as an Alternative to Model (2) for arson

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.2618  -0.8961  -0.1708   0.7326   2.9374

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   0.2325578   0.6722015   0.346  0.72937
t             -0.0020594   0.0004413  -4.666 3.06e-06 ***
tmax.f.spline1  0.0317094   0.0125831   2.520  0.01174 *
tmax.f.spline2 -0.0235547   0.0233293  -1.010  0.31266
tmax.f.spline3 -0.0211348   0.0266550  -0.793  0.42783
tmax.f.spline4  0.0469344   0.0248685   1.887  0.05912 .
tmax.f.spline5 -0.0572901   0.0216123  -2.651  0.00803 **
snow.in        -0.0416203   0.1821037  -0.229  0.81922
precip.in      -0.1198980   0.1609743  -0.745  0.45638
dark.before.12 -0.0004010   0.0416903  -0.010  0.99233
school         0.1202408   0.1261332   0.953  0.34045
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 377.59  on 231  degrees of freedom
Residual deviance: 322.42  on 221  degrees of freedom
AIC: 1121.8

Number of Fisher Scoring iterations: 4
```

arson

arson

19 Results for northwestern

19.1 Summary Values for northwestern

Table 19.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
northwestern	232	95.621	15.068	56	94	152

Table 19.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
northwestern	116	91.905	15.327	56	91.5	122

19.2 Four Models for northwestern

Table 19.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0003	0.01		0.02
After Ferguson Protests Begin (week of 8/11/14 onward)	-8.91		-6.46	-7.37
After Gray Protests Begin (week of 4/20/15 onward)	16.79		11.97	11.81
Unrest and National Guard (4/27/15 - 5/3/2015)	11.46		13.12	13.00
After Batts Fired (week of 7/13/15 onward)	-7.41		-12.53	-12.85
After Davis Sworn In (week of 10/19/15 onward)	-4.71		-0.97	-0.59
Average Maximum Temperature to 50 Degrees		1.26		0.87
Plus Degrees in the 50s		-0.84		-0.27
Plus Degrees in the 60s		0.62		0.43
Plus Degrees in the 70s		-0.68		-0.74
Plus Degrees Greater Than 80		-0.32		0.11
Snowfall (inches)		-6.65		-5.57
Precipitation (inches)		-0.52		0.01
Darkness Before Midnight (hours)		5.74		5.26
School Days (proportion of week)		-0.10		2.56
Observations	348	232	348	348
R ²	0.05	0.25	0.08	0.28

19.3 Least Squares Model (2) for northwestern

northwestern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

19.4 A Poisson Regression Model as an Alternative to Model (2) for northwestern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.4973  -0.9942  -0.0596   0.8690   4.2311

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   3.4611937   0.1454427  23.798 < 2e-16 ***
t              0.0001266   0.0001042   1.216  0.2241
tmax.f.spline1 0.0141335   0.0026816   5.271 1.36e-07 ***
tmax.f.spline2 -0.0102558   0.0052981  -1.936  0.0529 .
tmax.f.spline3  0.0070383   0.0063753   1.104  0.2696
tmax.f.spline4 -0.0073450   0.0059352  -1.238  0.2159
tmax.f.spline5 -0.0032620   0.0051900  -0.629  0.5297
snow.in        -0.0950201   0.0379575  -2.503  0.0123 *
precip.in      -0.0045926   0.0373791  -0.123  0.9022
dark.before.12 0.0595006   0.0097975   6.073 1.26e-09 ***
school         -0.0028769   0.0298558  -0.096  0.9232
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 549.05  on 231  degrees of freedom
Residual deviance: 406.10  on 221  degrees of freedom
AIC: 1910

Number of Fisher Scoring iterations: 4
```

northwestern

20 Results for northern

20.1 Summary Values for northern

Table 20.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
northern	232	104.216	17.691	56	104	150

Table 20.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
northern	116	106.371	22.530	55	105	174

20.2 Four Models for northern

Table 20.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.02	0.03		0.03
After Ferguson Protests Begin (week of 8/11/14 onward)	-7.10		-2.55	-2.74
After Gray Protests Begin (week of 4/20/15 onward)	35.30		22.13	22.09
Unrest and National Guard (4/27/15 - 5/3/2015)	-16.18		-9.49	-11.32
After Batts Fired (week of 7/13/15 onward)	-12.36		-14.90	-15.42
After Davis Sworn In (week of 10/19/15 onward)	-23.29		-15.99	-15.99
Average Maximum Temperature to 50 Degrees		0.41		0.59
Plus Degrees in the 50s		0.93		0.61
Plus Degrees in the 60s		-0.85		-0.49
Plus Degrees in the 70s		0.63		0.17
Plus Degrees Greater Than 80		-1.27		-0.88
Snowfall (inches)		-6.79		-7.21
Precipitation (inches)		-5.04		-6.95
Darkness Before Midnight (hours)		2.78		2.79
School Days (proportion of week)		0.01		0.80
Observations	348	232	348	348
R ²	0.13	0.33	0.13	0.42

20.3 Least Squares Model (2) for northern

northern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

20.4 A Poisson Regression Model as an Alternative to Model (2) for northern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-4.0874	-1.0053	-0.0479	0.9049	3.6726

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	4.107e+00	1.406e-01	29.221	< 2e-16	***
t	2.978e-04	9.929e-05	2.999	0.00271	**
tmax.f.spline1	4.409e-03	2.599e-03	1.697	0.08974	.
tmax.f.spline2	9.033e-03	5.184e-03	1.742	0.08146	.
tmax.f.spline3	-8.650e-03	6.182e-03	-1.399	0.16178	
tmax.f.spline4	5.443e-03	5.695e-03	0.956	0.33918	
tmax.f.spline5	-1.137e-02	4.879e-03	-2.330	0.01979	*
snow.in	-8.412e-02	3.588e-02	-2.344	0.01906	*
precip.in	-4.714e-02	3.624e-02	-1.301	0.19333	
dark.before.12	2.735e-02	9.502e-03	2.878	0.00400	**
school	-1.018e-03	2.842e-02	-0.036	0.97142	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 706.93 on 231 degrees of freedom
Residual deviance: 471.31 on 221 degrees of freedom
AIC: 1994.5

Number of Fisher Scoring iterations: 4

northern

northern

21 Results for northeastern

21.1 Summary Values for northeastern

Table 21.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
northeastern	232	149.828	20.160	91	149	207

Table 21.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
northeastern	116	141.638	23.293	79	146	189

21.2 Four Models for northeastern

Table 21.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.02	−0.001		−0.0004
After Ferguson Protests Begin (week of 8/11/14 onward)	−2.63		−0.57	−0.98
After Gray Protests Begin (week of 4/20/15 onward)	19.74		11.11	10.92
Unrest and National Guard (4/27/15 - 5/3/2015)	8.79		10.18	11.39
After Batts Fired (week of 7/13/15 onward)	−3.71		−7.36	−7.04
After Davis Sworn In (week of 10/19/15 onward)	−27.60		−23.42	−23.63
Average Maximum Temperature to 50 Degrees		0.53		0.24
Plus Degrees in the 50s		0.89		1.62
Plus Degrees in the 60s		−1.11		−1.77
Plus Degrees in the 70s		−0.15		0.40
Plus Degrees Greater Than 80		0.05		−0.26
Snowfall (inches)		−20.44		−17.96
Precipitation (inches)		3.73		5.03
Darkness Before Midnight (hours)		3.69		4.00
School Days (proportion of week)		−0.04		4.19
Observations	348	232	348	348
R ²	0.14	0.23	0.17	0.35

21.3 Least Squares Model (2) for northeastern

northeastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

21.4 A Poisson Regression Model as an Alternative to Model (2) for northeastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.2814	-1.0011	-0.1294	0.8399	4.4817

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	4.636e+00	1.144e-01	40.518	< 2e-16 ***
t	-2.974e-06	8.299e-05	-0.036	0.97141
tmax.f.spline1	3.566e-03	2.104e-03	1.695	0.09007 .
tmax.f.spline2	5.686e-03	4.211e-03	1.350	0.17691
tmax.f.spline3	-7.211e-03	5.058e-03	-1.426	0.15396
tmax.f.spline4	-1.024e-03	4.733e-03	-0.216	0.82871
tmax.f.spline5	3.053e-04	4.147e-03	0.074	0.94132
snow.in	-1.777e-01	3.098e-02	-5.734	9.78e-09 ***
precip.in	2.432e-02	2.976e-02	0.817	0.41387
dark.before.12	2.420e-02	7.822e-03	3.095	0.00197 **
school	-1.361e-03	2.391e-02	-0.057	0.95462

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 627.78 on 231 degrees of freedom
Residual deviance: 474.51 on 221 degrees of freedom
AIC: 2083.2

Number of Fisher Scoring iterations: 4

22 Results for western

22.1 Summary Values for western

Table 22.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
western	232	77.797	13.259	45	77	113

Table 22.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
western	116	76.216	18.167	42	76.5	200

22.2 Four Models for western

Table 22.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.04	−0.03		−0.03
After Ferguson Protests Begin (week of 8/11/14 onward)	−6.19		−4.35	−4.22
After Gray Protests Begin (week of 4/20/15 onward)	21.23		13.79	13.28
Unrest and National Guard (4/27/15 - 5/3/2015)	113.52		112.87	115.23
After Batts Fired (week of 7/13/15 onward)	−6.25		−7.19	−7.48
After Davis Sworn In (week of 10/19/15 onward)	−0.30		2.56	3.32
Average Maximum Temperature to 50 Degrees		0.15		0.24
Plus Degrees in the 50s		1.10		0.69
Plus Degrees in the 60s		−0.83		−0.39
Plus Degrees in the 70s		−0.28		−0.24
Plus Degrees Greater Than 80		0.07		−0.10
Snowfall (inches)		−2.41		−3.65
Precipitation (inches)		−0.10		3.42
Darkness Before Midnight (hours)		1.36		1.73
School Days (proportion of week)		7.82		6.44
Observations	348	232	348	348
R ²	0.28	0.29	0.29	0.46

22.3 Least Squares Model (2) for western

western

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

22.4 A Poisson Regression Model as an Alternative to Model (2) for western

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.5748	-0.8291	-0.0227	0.8029	3.5438

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	4.0012104	0.1613202	24.803	< 2e-16 ***
t	-0.0003869	0.0001148	-3.369	0.000754 ***
tmax.f.spline1	0.0020641	0.0029840	0.692	0.489117
tmax.f.spline2	0.0147160	0.0059469	2.475	0.013339 *
tmax.f.spline3	-0.0118170	0.0070350	-1.680	0.093005 .
tmax.f.spline4	-0.0031444	0.0064916	-0.484	0.628118
tmax.f.spline5	0.0008207	0.0056902	0.144	0.885317
snow.in	-0.0422185	0.0401663	-1.051	0.293216
precip.in	-0.0004484	0.0414236	-0.011	0.991364
dark.before.12	0.0176653	0.0109055	1.620	0.105264
school	0.0994027	0.0333475	2.981	0.002875 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 524.95 on 231 degrees of freedom
Residual deviance: 371.52 on 221 degrees of freedom
AIC: 1827.1

Number of Fisher Scoring iterations: 4

western

23 Results for central

23.1 Summary Values for central

Table 23.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
central	232	116.108	23.922	52	115	193

Table 23.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
central	116	103.569	20.202	60	103	158

23.2 Four Models for central

Table 23.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.11	−0.09		−0.09
After Ferguson Protests Begin (week of 8/11/14 onward)	−10.33		−2.07	−3.07
After Gray Protests Begin (week of 4/20/15 onward)	21.08		−0.17	0.07
Unrest and National Guard (4/27/15 - 5/3/2015)	0.30		0.45	2.96
After Batts Fired (week of 7/13/15 onward)	5.64		4.35	4.57
After Davis Sworn In (week of 10/19/15 onward)	−3.74		6.99	6.36
Average Maximum Temperature to 50 Degrees		0.71		0.64
Plus Degrees in the 50s		0.64		0.86
Plus Degrees in the 60s		−0.06		−0.59
Plus Degrees in the 70s		−1.52		−0.51
Plus Degrees Greater Than 80		0.33		−0.21
Snowfall (inches)		−5.11		−2.67
Precipitation (inches)		−12.63		−12.17
Darkness Before Midnight (hours)		−1.40		−0.94
School Days (proportion of week)		−6.15		0.18
Observations	348	232	348	348
R ²	0.17	0.51	0.04	0.53

23.3 Least Squares Model (2) for central

central

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

23.4 A Poisson Regression Model as an Alternative to Model (2) for central

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-4.5560	-1.0789	-0.1847	0.9649	4.9906

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	4.431e+00	1.380e-01	32.101	< 2e-16	***
t	-7.883e-04	9.368e-05	-8.415	< 2e-16	***
tmax.f.spline1	7.499e-03	2.566e-03	2.923	0.00347	**
tmax.f.spline2	5.508e-03	5.026e-03	1.096	0.27310	
tmax.f.spline3	-2.492e-03	5.871e-03	-0.425	0.67120	
tmax.f.spline4	-1.223e-02	5.312e-03	-2.302	0.02136	*
tmax.f.spline5	1.948e-03	4.543e-03	0.429	0.66812	
snow.in	-7.469e-02	3.597e-02	-2.076	0.03786	*
precip.in	-1.095e-01	3.461e-02	-3.163	0.00156	**
dark.before.12	-1.188e-02	9.066e-03	-1.310	0.19003	
school	-5.383e-02	2.682e-02	-2.007	0.04477	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 1150.80 on 231 degrees of freedom
Residual deviance: 547.31 on 221 degrees of freedom
AIC: 2094

Number of Fisher Scoring iterations: 4

central

24 Results for eastern

24.1 Summary Values for eastern

Table 24.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
eastern	232	79.069	13.914	41	78	116

Table 24.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
eastern	116	77.276	15.523	45	78.5	120

24.2 Four Models for eastern

Table 24.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.01	−0.004		−0.003
After Ferguson Protests Begin (week of 8/11/14 onward)	−9.75		−6.59	−7.24
After Gray Protests Begin (week of 4/20/15 onward)	21.04		11.66	12.23
Unrest and National Guard (4/27/15 - 5/3/2015)	2.66		4.56	5.24
After Batts Fired (week of 7/13/15 onward)	−6.54		−6.61	−6.76
After Davis Sworn In (week of 10/19/15 onward)	−0.98		3.23	3.05
Average Maximum Temperature to 50 Degrees		0.04		−0.003
Plus Degrees in the 50s		0.84		0.81
Plus Degrees in the 60s		−1.04		−0.92
Plus Degrees in the 70s		0.41		0.68
Plus Degrees Greater Than 80		−0.05		−0.37
Snowfall (inches)		−10.12		−7.76
Precipitation (inches)		−3.59		−6.08
Darkness Before Midnight (hours)		−1.06		−0.52
School Days (proportion of week)		0.03		4.08
Observations	348	232	348	348
R ²	0.08	0.24	0.04	0.27

24.3 Least Squares Model (2) for eastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

24.4 A Poisson Regression Model as an Alternative to Model (2) for eastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.9428  -1.1036  -0.0811   1.0114   3.4445

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  4.347e+00  1.599e-01  27.190 < 2e-16 ***
t            -5.502e-05  1.138e-04  -0.483  0.6289
tmax.f.spline1  5.597e-04  2.945e-03   0.190  0.8493
tmax.f.spline2  1.078e-02  5.884e-03   1.833  0.0669 .
tmax.f.spline3 -1.353e-02  7.017e-03  -1.928  0.0539 .
tmax.f.spline4  5.206e-03  6.518e-03   0.799  0.4244
tmax.f.spline5 -7.431e-04  5.622e-03  -0.132  0.8948
snow.in       -1.690e-01  4.293e-02  -3.937 8.24e-05 ***
precip.in     -4.557e-02  4.171e-02  -1.092  0.2746
dark.before.12 -1.401e-02  1.085e-02  -1.291  0.1967
school        3.270e-05  3.276e-02   0.001  0.9992
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 566.51  on 231  degrees of freedom
Residual deviance: 424.37  on 221  degrees of freedom
AIC: 1883.5

Number of Fisher Scoring iterations: 4
```

25 Results for southwestern

25.1 Summary Values for southwestern

Table 25.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
southwestern	232	83.849	13.489	51	83	121

Table 25.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
southwestern	116	88.776	16.978	42	89.5	147

25.2 Four Models for southwestern

Table 25.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.01	0.004		0.003
After Ferguson Protests Begin (week of 8/11/14 onward)	−2.80		−1.51	−0.69
After Gray Protests Begin (week of 4/20/15 onward)	13.45		8.21	7.11
Unrest and National Guard (4/27/15 - 5/3/2015)	−5.05		−4.44	−0.82
After Batts Fired (week of 7/13/15 onward)	4.91		1.60	1.02
After Davis Sworn In (week of 10/19/15 onward)	−5.87		−2.18	−1.51
Average Maximum Temperature to 50 Degrees		0.26		0.65
Plus Degrees in the 50s		0.49		0.04
Plus Degrees in the 60s		0.001		−0.07
Plus Degrees in the 70s		−0.60		0.15
Plus Degrees Greater Than 80		0.02		−0.63
Snowfall (inches)		−6.71		−2.81
Precipitation (inches)		−2.31		−1.67
Darkness Before Midnight (hours)		3.05		4.15
School Days (proportion of week)		0.90		2.60
Observations	348	232	348	348
R ²	0.09	0.18	0.05	0.28

25.3 Least Squares Model (2) for southwestern

southwestern

southwestern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

25.4 A Poisson Regression Model as an Alternative to Model (2) for southwestern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.2923	-0.9845	-0.1546	0.9012	3.2835

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	3.963e+00	1.533e-01	25.851	< 2e-16 ***
t	4.242e-05	1.109e-04	0.383	0.702013
tmax.f.spline1	3.153e-03	2.820e-03	1.118	0.263637
tmax.f.spline2	5.994e-03	5.675e-03	1.056	0.290844
tmax.f.spline3	-2.342e-04	6.835e-03	-0.034	0.972669
tmax.f.spline4	-7.111e-03	6.331e-03	-1.123	0.261291
tmax.f.spline5	1.688e-04	5.511e-03	0.031	0.975562
snow.in	-1.006e-01	3.946e-02	-2.549	0.010800 *
precip.in	-2.707e-02	4.026e-02	-0.672	0.501295
dark.before.12	3.667e-02	1.052e-02	3.485	0.000492 ***
school	9.227e-03	3.192e-02	0.289	0.772517

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 503.78 on 231 degrees of freedom
Residual deviance: 412.89 on 221 degrees of freedom
AIC: 1886.2

Number of Fisher Scoring iterations: 4

southwestern

southwestern

26 Results for southern

26.1 Summary Values for southern

Table 26.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
southern	232	113.591	20.501	57	112	185

Table 26.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
southern	116	105.302	23.957	54	105.5	228

26.2 Four Models for southern

Table 26.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.13	−0.12		−0.12
After Ferguson Protests Begin (week of 8/11/14 onward)	−3.05		1.47	2.09
After Gray Protests Begin (week of 4/20/15 onward)	25.44		13.31	9.14
Unrest and National Guard (4/27/15 - 5/3/2015)	−11.83		−11.56	−8.45
After Batts Fired (week of 7/13/15 onward)	−0.03		−1.21	−0.27
After Davis Sworn In (week of 10/19/15 onward)	0.39		6.56	8.37
Average Maximum Temperature to 50 Degrees		0.29		0.37
Plus Degrees in the 50s		0.87		0.53
Plus Degrees in the 60s		−0.20		0.26
Plus Degrees in the 70s		−0.70		−0.48
Plus Degrees Greater Than 80		−0.34		−0.84
Snowfall (inches)		−4.62		−4.55
Precipitation (inches)		−7.93		−7.50
Darkness Before Midnight (hours)		1.10		0.37
School Days (proportion of week)		2.83		5.41
Observations	348	232	348	348
R ²	0.19	0.42	0.18	0.44

26.3 Least Squares Model (2) for southern

southern

southern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

26.4 A Poisson Regression Model as an Alternative to Model (2) for southern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-4.3446  -1.0016  -0.0202   0.8755   4.3849

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  4.533e+00  1.342e-01  33.780  <2e-16 ***
t            -1.086e-03  9.497e-05 -11.434  <2e-16 ***
tmax.f.spline1  2.799e-03  2.476e-03   1.130   0.2583
tmax.f.spline2  8.228e-03  4.942e-03   1.665   0.0959 .
tmax.f.spline3 -2.833e-03  5.873e-03  -0.482   0.6295
tmax.f.spline4 -5.896e-03  5.386e-03  -1.095   0.2736
tmax.f.spline5 -3.119e-03  4.676e-03  -0.667   0.5048
snow.in       -6.211e-02  3.433e-02  -1.809   0.0704 .
precip.in     -6.967e-02  3.477e-02  -2.003   0.0451 *
dark.before.12 1.077e-02  9.098e-03   1.184   0.2363
school        2.236e-02  2.737e-02   0.817   0.4140
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 860.35  on 231  degrees of freedom
Residual deviance: 493.96  on 221  degrees of freedom
AIC: 2036.8

Number of Fisher Scoring iterations: 4
```

southern

southern

27 Results for southeastern

27.1 Summary Values for southeastern

Table 27.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
southeastern	232	126.595	20.132	82	126	181

Table 27.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
southeastern	116	129.500	26.020	62	126.5	187

27.2 Four Models for southeastern

Table 27.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.04	0.07		0.06
After Ferguson Protests Begin (week of 8/11/14 onward)	−18.50		−14.24	−14.36
After Gray Protests Begin (week of 4/20/15 onward)	37.97		24.81	26.68
Unrest and National Guard (4/27/15 - 5/3/2015)	−14.90		−8.45	−8.54
After Batts Fired (week of 7/13/15 onward)	8.57		0.06	0.05
After Davis Sworn In (week of 10/19/15 onward)	−35.01		−24.53	−25.85
Average Maximum Temperature to 50 Degrees		1.08		1.06
Plus Degrees in the 50s		−0.26		0.18
Plus Degrees in the 60s		0.90		0.30
Plus Degrees in the 70s		−1.57		−1.01
Plus Degrees Greater Than 80		0.65		−0.01
Snowfall (inches)		−2.66		−4.99
Precipitation (inches)		2.52		2.72
Darkness Before Midnight (hours)		5.44		7.30
School Days (proportion of week)		−10.65		−5.66
Observations	348	232	348	348
R ²	0.18	0.38	0.16	0.46

27.3 Least Squares Model (2) for southeastern
southeastern

southeastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

27.4 A Poisson Regression Model as an Alternative to Model (2) for southeastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-3.0903	-1.0030	-0.0793	0.8500	4.1192

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	3.980e+00	1.279e-01	31.121	< 2e-16	***
t	5.265e-04	9.037e-05	5.827	5.65e-09	***
tmax.f.spline1	9.664e-03	2.357e-03	4.100	4.14e-05	***
tmax.f.spline2	-3.086e-03	4.698e-03	-0.657	0.51130	
tmax.f.spline3	7.384e-03	5.664e-03	1.304	0.19231	
tmax.f.spline4	-1.288e-02	5.201e-03	-2.477	0.01324	*
tmax.f.spline5	4.906e-03	4.428e-03	1.108	0.26792	
snow.in	-2.392e-02	3.124e-02	-0.766	0.44397	
precip.in	2.016e-02	3.240e-02	0.622	0.53383	
dark.before.12	4.463e-02	8.639e-03	5.166	2.40e-07	***
school	-8.382e-02	2.572e-02	-3.259	0.00112	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 744.55 on 231 degrees of freedom
Residual deviance: 454.97 on 221 degrees of freedom
AIC: 2023.8

Number of Fisher Scoring iterations: 4

southeastern

southeastern

28 Results for homicide.northwestern

28.1 Summary Values for homicide.northwestern

Table 28.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.northwestern	232	0.539	0.749	0	0	4

Table 28.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.northwestern	116	0.759	0.861	0	1	3

28.2 Four Models for homicide.northwestern

Table 28.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.002		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.08		−0.11	−0.08
After Gray Protests Begin (week of 4/20/15 onward)	0.45		0.37	0.35
Unrest and National Guard (4/27/15 - 5/3/2015)	1.91		1.79	1.79
After Batts Fired (week of 7/13/15 onward)	−0.11		−0.23	−0.19
After Davis Sworn In (week of 10/19/15 onward)	−0.35		−0.23	−0.26
Average Maximum Temperature to 50 Degrees		−0.01		−0.01
Plus Degrees in the 50s		0.01		0.03
Plus Degrees in the 60s		0.06		0.01
Plus Degrees in the 70s		−0.09		−0.05
Plus Degrees Greater Than 80		0.04		0.04
Snowfall (inches)		−0.19		−0.03
Precipitation (inches)		−0.03		−0.13
Darkness Before Midnight (hours)		0.08		0.03
School Days (proportion of week)		0.10		0.13
Observations	348	232	348	348
R ²	0.06	0.06	0.03	0.09

28.3 Least Squares Model (2) for homicide.northwestern

homicide.northwestern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

28.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.northwestern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.5021  -1.0167  -0.8016   0.5661   2.6247

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   -1.302540   1.968442  -0.662   0.5082
t               0.003071   0.001402   2.190   0.0285 *
tmax.f.spline1 -0.024925   0.037128  -0.671   0.5020
tmax.f.spline2  0.023839   0.080920   0.295   0.7683
tmax.f.spline3  0.120834   0.099023   1.220   0.2224
tmax.f.spline4 -0.160211   0.079543  -2.014   0.0440 *
tmax.f.spline5  0.076042   0.065554   1.160   0.2460
snow.in        -0.588518   0.666476  -0.883   0.3772
precip.in      -0.036131   0.496019  -0.073   0.9419
dark.before.12  0.169068   0.139761   1.210   0.2264
school         0.160949   0.404798   0.398   0.6909
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 238.52  on 231  degrees of freedom
Residual deviance: 223.03  on 221  degrees of freedom
AIC: 455.61

Number of Fisher Scoring iterations: 6
```

homicide.northwestern

homicide.northwestern

29 Results for homicide.northern

29.1 Summary Values for homicide.northern

Table 29.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.northern	232	0.345	0.612	0	0	3

Table 29.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.northern	116	0.362	0.610	0	0	3

29.2 Four Models for homicide.northern

Table 29.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0002	−0.0001		0.0001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.07		−0.03	−0.02
After Gray Protests Begin (week of 4/20/15 onward)	0.23		0.11	0.11
Unrest and National Guard (4/27/15 - 5/3/2015)	−0.54		−0.23	−0.29
After Batts Fired (week of 7/13/15 onward)	0.02		0.21	0.12
After Davis Sworn In (week of 10/19/15 onward)	−0.26		−0.30	−0.23
Average Maximum Temperature to 50 Degrees		−0.01		−0.001
Plus Degrees in the 50s		0.02		−0.001
Plus Degrees in the 60s		−0.06		−0.02
Plus Degrees in the 70s		0.11		0.07
Plus Degrees Greater Than 80		−0.10		−0.07
Snowfall (inches)		−0.12		−0.08
Precipitation (inches)		0.14		−0.01
Darkness Before Midnight (hours)		−0.05		−0.02
School Days (proportion of week)		0.21		0.09
Observations	348	232	348	348
R ²	0.01	0.06	0.01	0.05

29.3 Least Squares Model (2) for homicide.northern

homicide.northern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

29.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.northern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.4426	-0.8489	-0.6897	0.6018	2.6525

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.9442832	2.2765476	0.415	0.67830
t	-0.0001292	0.0016963	-0.076	0.93927
tmax.f.spline1	-0.0321513	0.0412131	-0.780	0.43532
tmax.f.spline2	0.0691718	0.0846606	0.817	0.41390
tmax.f.spline3	-0.2038400	0.1051112	-1.939	0.05247 .
tmax.f.spline4	0.3644634	0.1153810	3.159	0.00158 **
tmax.f.spline5	-0.3043986	0.0946333	-3.217	0.00130 **
snow.in	-0.3905750	0.6428697	-0.608	0.54349
precip.in	0.4066041	0.5767222	0.705	0.48079
dark.before.12	-0.1488985	0.1625209	-0.916	0.35957
school	0.5911381	0.4893379	1.208	0.22703

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 212.31 on 231 degrees of freedom
Residual deviance: 196.76 on 221 degrees of freedom
AIC: 358.64

Number of Fisher Scoring iterations: 6

homicide.northern

homicide.northern

30 Results for homicide.northeastern

30.1 Summary Values for homicide.northeastern

Table 30.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.northeastern	232	0.625	0.849	0	0	5

Table 30.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.northeastern	116	0.897	1.033	0	1	5

30.2 Four Models for homicide.northeastern

Table 30.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.002	−0.002		−0.002
After Ferguson Protests Begin (week of 8/11/14 onward)	0.52		0.51	0.52
After Gray Protests Begin (week of 4/20/15 onward)	0.40		0.30	0.25
Unrest and National Guard (4/27/15 - 5/3/2015)	−1.28		−1.14	−1.15
After Batts Fired (week of 7/13/15 onward)	−0.25		−0.20	−0.22
After Davis Sworn In (week of 10/19/15 onward)	−0.15		−0.12	−0.06
Average Maximum Temperature to 50 Degrees		−0.02		−0.03
Plus Degrees in the 50s		0.04		0.05
Plus Degrees in the 60s		−0.05		−0.01
Plus Degrees in the 70s		0.06		0.01
Plus Degrees Greater Than 80		−0.03		−0.03
Snowfall (inches)		0.08		−0.20
Precipitation (inches)		−0.11		0.14
Darkness Before Midnight (hours)		−0.04		0.01
School Days (proportion of week)		0.40		0.22
Observations	348	232	348	348
R ²	0.04	0.05	0.08	0.06

30.3 Least Squares Model (2) for homicide.northeastern

homicide.northeastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

30.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.northeastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.5725	-1.0827	-0.9128	0.4964	3.2224

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.347176	1.726529	0.780	0.4352
t	-0.002445	0.001277	-1.914	0.0556 .
tmax.f.spline1	-0.037289	0.031561	-1.182	0.2374
tmax.f.spline2	0.075319	0.066991	1.124	0.2609
tmax.f.spline3	-0.079920	0.079694	-1.003	0.3159
tmax.f.spline4	0.096912	0.074896	1.294	0.1957
tmax.f.spline5	-0.040680	0.062204	-0.654	0.5131
snow.in	0.108237	0.365943	0.296	0.7674
precip.in	-0.146959	0.494548	-0.297	0.7663
dark.before.12	-0.066507	0.126035	-0.528	0.5977
school	0.637035	0.378731	1.682	0.0926 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 267.85 on 231 degrees of freedom
Residual deviance: 255.64 on 221 degrees of freedom
AIC: 505.4

Number of Fisher Scoring iterations: 6

homicide.northeastern

homicide.northeastern

31 Results for homicide.western

31.1 Summary Values for homicide.western

Table 31.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.western	232	0.621	0.813	0	0	3

Table 31.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.western	116	1.034	1.149	0	1	5

31.2 Four Models for homicide.western

Table 31.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0003	0.0003		0.0004
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.19		-0.18	-0.20
After Gray Protests Begin (week of 4/20/15 onward)	0.98		1.02	1.00
Unrest and National Guard (4/27/15 - 5/3/2015)	0.55		0.50	0.59
After Batts Fired (week of 7/13/15 onward)	0.11		0.06	0.01
After Davis Sworn In (week of 10/19/15 onward)	-0.41		-0.43	-0.36
Average Maximum Temperature to 50 Degrees		0.001		-0.01
Plus Degrees in the 50s		0.02		0.01
Plus Degrees in the 60s		-0.04		-0.01
Plus Degrees in the 70s		0.02		0.01
Plus Degrees Greater Than 80		-0.01		-0.0003
Snowfall (inches)		-0.27		-0.25
Precipitation (inches)		-0.28		-0.32
Darkness Before Midnight (hours)		0.04		0.05
School Days (proportion of week)		-0.22		-0.12
Observations	348	232	348	348
R ²	0.10	0.02	0.09	0.12

31.3 Least Squares Model (2) for homicide.western

homicide.western

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

31.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.western

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.3162  -1.1056  -0.9827   0.4677   2.4660

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  -0.4542002   1.7302404  -0.263   0.793
t              0.0004694   0.0012979   0.362   0.718
tmax.f.spline1 -0.0012202   0.0319508  -0.038   0.970
tmax.f.spline2  0.0265114   0.0633296   0.419   0.675
tmax.f.spline3 -0.0509698   0.0747992  -0.681   0.496
tmax.f.spline4  0.0253191   0.0737789   0.343   0.731
tmax.f.spline5 -0.0099915   0.0662246  -0.151   0.880
snow.in       -0.8560853   0.7247323  -1.181   0.238
precip.in      -0.5051673   0.5295817  -0.954   0.340
dark.before.12  0.0460196   0.1194498   0.385   0.700
school         -0.3560523   0.3655227  -0.974   0.330

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 259.40  on 231  degrees of freedom
Residual deviance: 253.76  on 221  degrees of freedom
AIC: 505.03

Number of Fisher Scoring iterations: 6
```

homicide.western

homicide.western

32 Results for homicide.central

32.1 Summary Values for homicide.central

Table 32.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.central	232	0.289	0.595	0	0	3

Table 32.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.central	116	0.371	0.598	0	0	3

32.2 Four Models for homicide.central

Table 32.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.08		-0.06	-0.07
After Gray Protests Begin (week of 4/20/15 onward)	0.07		-0.03	0.01
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.36		-0.49	-0.50
After Batts Fired (week of 7/13/15 onward)	0.13		0.13	0.11
After Davis Sworn In (week of 10/19/15 onward)	-0.11		-0.09	-0.08
Average Maximum Temperature to 50 Degrees		-0.01		-0.004
Plus Degrees in the 50s		0.03		0.01
Plus Degrees in the 60s		-0.04		-0.01
Plus Degrees in the 70s		-0.005		-0.02
Plus Degrees Greater Than 80		0.04		0.04
Snowfall (inches)		0.01		0.002
Precipitation (inches)		-0.17		-0.28
Darkness Before Midnight (hours)		-0.08		-0.05
School Days (proportion of week)		0.08		0.15
Observations	348	232	348	348
R ²	0.01	0.05	0.01	0.04

32.3 Least Squares Model (2) for homicide.central

homicide.central

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

32.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.central

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.1993  -0.8003  -0.6291  -0.4512   2.8041

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    0.762019   3.028861   0.252   0.801
t               0.002509   0.001885   1.331   0.183
tmax.f.spline1 -0.026178   0.057625  -0.454   0.650
tmax.f.spline2  0.119864   0.108709   1.103   0.270
tmax.f.spline3 -0.141055   0.110968  -1.271   0.204
tmax.f.spline4 -0.010673   0.101096  -0.106   0.916
tmax.f.spline5  0.127263   0.088430   1.439   0.150
snow.in         0.119623   0.641400   0.187   0.852
precip.in       -0.756001   0.839801  -0.900   0.368
dark.before.12 -0.297754   0.183526  -1.622   0.105
school          0.328731   0.562291   0.585   0.559

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 210.12  on 231  degrees of freedom
Residual deviance: 196.20  on 221  degrees of freedom
AIC: 330.93

Number of Fisher Scoring iterations: 6
```

homicide.central

homicide.central

33 Results for homicide.eastern

33.1 Summary Values for homicide.eastern

Table 33.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.eastern	232	0.634	0.805	0	0	3

Table 33.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.eastern	116	0.853	1.007	0	1	4

33.2 Four Models for homicide.eastern

Table 33.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.001	−0.0005		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.15		−0.06	−0.07
After Gray Protests Begin (week of 4/20/15 onward)	0.99		0.72	0.81
Unrest and National Guard (4/27/15 - 5/3/2015)	−1.37		−1.31	−1.24
After Batts Fired (week of 7/13/15 onward)	−0.36		−0.32	−0.36
After Davis Sworn In (week of 10/19/15 onward)	0.06		0.15	0.12
Average Maximum Temperature to 50 Degrees		0.02		0.02
Plus Degrees in the 50s		−0.01		−0.004
Plus Degrees in the 60s		−0.01		−0.04
Plus Degrees in the 70s		0.02		0.06
Plus Degrees Greater Than 80		−0.04		−0.05
Snowfall (inches)		0.02		−0.01
Precipitation (inches)		−0.42		−0.54
Darkness Before Midnight (hours)		−0.03		−0.005
School Days (proportion of week)		−0.03		−0.02
Observations	348	232	348	348
R ²	0.07	0.06	0.06	0.10

33.3 Least Squares Model (2) for homicide.eastern

homicide.eastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

33.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.eastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.4040  -1.1442  -0.7179   0.4670   2.2550

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   -3.278380   2.335139  -1.404   0.160
t              -0.000742   0.001260  -0.589   0.556
tmax.f.spline1  0.064752   0.044798   1.445   0.148
tmax.f.spline2 -0.052933   0.075817  -0.698   0.485
tmax.f.spline3 -0.016398   0.079774  -0.206   0.837
tmax.f.spline4  0.031929   0.071382   0.447   0.655
tmax.f.spline5 -0.048094   0.059246  -0.812   0.417
snow.in        -0.035967   0.661357  -0.054   0.957
precip.in      -0.729641   0.533904  -1.367   0.172
dark.before.12 -0.057499   0.123396  -0.466   0.641
school         -0.058016   0.353886  -0.164   0.870

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 258.61  on 231  degrees of freedom
Residual deviance: 242.93  on 221  degrees of freedom
AIC: 498.15

Number of Fisher Scoring iterations: 6
```

homicide.eastern

homicide.eastern

34 Results for homicide.southwestern

34.1 Summary Values for homicide.southwestern

Table 34.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.southwestern	232	0.526	0.720	0	0	4

Table 34.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.southwestern	116	0.802	0.887	0	1	3

34.2 Four Models for homicide.southwestern

Table 34.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.03		−0.02	−0.04
After Gray Protests Begin (week of 4/20/15 onward)	0.85		0.82	0.83
Unrest and National Guard (4/27/15 - 5/3/2015)	−0.45		−0.24	−0.26
After Batts Fired (week of 7/13/15 onward)	−0.46		−0.55	−0.60
After Davis Sworn In (week of 10/19/15 onward)	−0.26		−0.15	−0.16
Average Maximum Temperature to 50 Degrees		−0.01		−0.01
Plus Degrees in the 50s		0.01		0.02
Plus Degrees in the 60s		0.01		−0.02
Plus Degrees in the 70s		0.02		0.03
Plus Degrees Greater Than 80		−0.04		0.01
Snowfall (inches)		−0.33		−0.22
Precipitation (inches)		−0.09		0.14
Darkness Before Midnight (hours)		0.09		0.08
School Days (proportion of week)		−0.14		−0.02
Observations	348	232	348	348
R ²	0.06	0.04	0.04	0.09

34.3 Least Squares Model (2) for homicide.southwestern

homicide.southwestern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

34.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.southwestern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.3058  -1.0413  -0.8088   0.5406   2.7285

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  -0.610227   1.868436  -0.327   0.744
t              0.001407   0.001409   0.998   0.318
tmax.f.spline1 -0.028375   0.034001  -0.835   0.404
tmax.f.spline2  0.026728   0.075005   0.356   0.722
tmax.f.spline3  0.023628   0.096009   0.246   0.806
tmax.f.spline4  0.037482   0.087655   0.428   0.669
tmax.f.spline5 -0.067024   0.068406  -0.980   0.327
snow.in       -1.304174   0.920747  -1.416   0.157
precip.in      -0.176023   0.532060  -0.331   0.741
dark.before.12  0.201728   0.144668   1.394   0.163
school         -0.265790   0.386720  -0.687   0.492

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 232.05  on 231  degrees of freedom
Residual deviance: 220.75  on 221  degrees of freedom
AIC: 450.81

Number of Fisher Scoring iterations: 5
```

homicide.southwestern

homicide.southwestern

35 Results for homicide.southern

35.1 Summary Values for homicide.southern

Table 35.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.southern	232	0.379	0.598	0	0	3

Table 35.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.southern	116	0.483	0.679	0	0	3

35.2 Four Models for homicide.southern

Table 35.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0002	−0.0002		0.0001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.18		−0.13	−0.15
After Gray Protests Begin (week of 4/20/15 onward)	0.59		0.58	0.58
Unrest and National Guard (4/27/15 - 5/3/2015)	1.18		1.19	1.15
After Batts Fired (week of 7/13/15 onward)	−0.32		−0.28	−0.34
After Davis Sworn In (week of 10/19/15 onward)	0.05		0.07	0.07
Average Maximum Temperature to 50 Degrees		0.01		0.01
Plus Degrees in the 50s		−0.04		−0.02
Plus Degrees in the 60s		0.05		0.02
Plus Degrees in the 70s		−0.01		−0.01
Plus Degrees Greater Than 80		−0.04		−0.003
Snowfall (inches)		0.16		0.14
Precipitation (inches)		−0.31		−0.25
Darkness Before Midnight (hours)		−0.004		−0.005
School Days (proportion of week)		−0.16		−0.18
Observations	348	232	348	348
R ²	0.05	0.03	0.06	0.06

35.3 Least Squares Model (2) for homicide.southern

homicide.southern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

35.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.southern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.1361  -0.9016  -0.7740   0.6966   2.3965

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  -1.7197736  2.2562755  -0.762   0.446
t             -0.0005443  0.0016287  -0.334   0.738
tmax.f.spline1  0.0283446  0.0395974   0.716   0.474
tmax.f.spline2 -0.1092169  0.0842756  -1.296   0.195
tmax.f.spline3  0.1467349  0.1150850   1.275   0.202
tmax.f.spline4 -0.0453566  0.1003132  -0.452   0.651
tmax.f.spline5 -0.0943454  0.0842187  -1.120   0.263
snow.in       0.3656316  0.4348308   0.841   0.400
precip.in     -0.9595713  0.7362314  -1.303   0.192
dark.before.12 -0.0061123  0.1592608  -0.038   0.969
school        -0.4066674  0.4469402  -0.910   0.363

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 207.70  on 231  degrees of freedom
Residual deviance: 200.84  on 221  degrees of freedom
AIC: 380.59

Number of Fisher Scoring iterations: 6
```

homicide.southern

homicide.southern

36 Results for homicide.southeastern

36.1 Summary Values for homicide.southeastern

Table 36.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.southeastern	232	0.246	0.505	0	0	2

Table 36.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
homicide.southeastern	116	0.345	0.576	0	0	2

36.2 Four Models for homicide.southeastern

Table 36.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.0001	0.0001		0.0000
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.04		−0.08	−0.06
After Gray Protests Begin (week of 4/20/15 onward)	0.08		0.07	0.04
Unrest and National Guard (4/27/15 - 5/3/2015)	0.73		0.76	0.72
After Batts Fired (week of 7/13/15 onward)	0.09		0.06	0.09
After Davis Sworn In (week of 10/19/15 onward)	0.09		0.13	0.12
Average Maximum Temperature to 50 Degrees		−0.02		−0.03
Plus Degrees in the 50s		0.04		0.04
Plus Degrees in the 60s		−0.01		−0.01
Plus Degrees in the 70s		−0.0005		−0.01
Plus Degrees Greater Than 80		0.001		0.002
Snowfall (inches)		−0.13		−0.21
Precipitation (inches)		−0.01		0.01
Darkness Before Midnight (hours)		0.01		−0.01
School Days (proportion of week)		0.03		−0.01
Observations	348	232	348	348
R ²	0.03	0.02	0.02	0.05

36.3 Least Squares Model (2) for homicide.southeastern

homicide.southeastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

36.4 A Poisson Regression Model as an Alternative to Model (2) for homicide.southeastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-0.9567	-0.7431	-0.6754	-0.4863	2.4529

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	2.1524696	2.6431179	0.814	0.415
t	0.0004584	0.0020230	0.227	0.821
tmax.f.spline1	-0.0988750	0.0490850	-2.014	0.044 *
tmax.f.spline2	0.1707144	0.1169897	1.459	0.145
tmax.f.spline3	-0.0509631	0.1397271	-0.365	0.715
tmax.f.spline4	-0.0042621	0.1204551	-0.035	0.972
tmax.f.spline5	0.0012256	0.0976847	0.013	0.990
snow.in	-0.5516201	0.7670596	-0.719	0.472
precip.in	-0.0082031	0.7591454	-0.011	0.991
dark.before.12	0.0756840	0.2132804	0.355	0.723
school	0.1137080	0.5926209	0.192	0.848

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 182.20 on 231 degrees of freedom
Residual deviance: 176.41 on 221 degrees of freedom
AIC: 301.32

Number of Fisher Scoring iterations: 6

homicide.southeastern

homicide.southeastern

37 Results for shooting.northwestern

37.1 Summary Values for shooting.northwestern

Table 37.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.northwestern	232	0.806	1.101	0	0	6

Table 37.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.northwestern	116	1.172	1.294	0	1	6

37.2 Four Models for shooting.northwestern

Table 37.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.001	−0.001		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.35		0.52	0.49
After Gray Protests Begin (week of 4/20/15 onward)	0.39		0.07	0.16
Unrest and National Guard (4/27/15 - 5/3/2015)	2.63		2.95	2.94
After Batts Fired (week of 7/13/15 onward)	0.22		0.36	0.27
After Davis Sworn In (week of 10/19/15 onward)	−0.44		−0.32	−0.32
Average Maximum Temperature to 50 Degrees		0.06		0.05
Plus Degrees in the 50s		−0.12		−0.08
Plus Degrees in the 60s		0.10		0.06
Plus Degrees in the 70s		0.01		0.04
Plus Degrees Greater Than 80		−0.14		−0.13
Snowfall (inches)		−0.05		−0.05
Precipitation (inches)		−0.24		−0.43
Darkness Before Midnight (hours)		0.02		0.09
School Days (proportion of week)		−0.41		−0.23
Observations	348	232	348	348
R ²	0.05	0.08	0.09	0.10

37.3 Least Squares Model (2) for shooting.northwestern

shooting.northwestern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

37.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.northwestern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.0420	-1.1868	-0.4632	0.3960	2.8263

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-4.487120	2.038287	-2.201	0.02771 *
t	-0.001702	0.001119	-1.522	0.12809
tmax.f.spline1	0.099655	0.038396	2.595	0.00945 **
tmax.f.spline2	-0.195197	0.067184	-2.905	0.00367 **
tmax.f.spline3	0.158675	0.080036	1.983	0.04742 *
tmax.f.spline4	-0.009281	0.068143	-0.136	0.89166
tmax.f.spline5	-0.147570	0.054963	-2.685	0.00725 **
snow.in	-0.483533	0.716893	-0.674	0.50000
precip.in	-0.281741	0.408508	-0.690	0.49039
dark.before.12	0.022947	0.112069	0.205	0.83776
school	-0.456583	0.299889	-1.523	0.12788

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 324.57 on 231 degrees of freedom
Residual deviance: 294.11 on 221 degrees of freedom
AIC: 581.24

Number of Fisher Scoring iterations: 6

shooting.northwestern

shooting.northwestern

38 Results for shooting.northern

38.1 Summary Values for shooting.northern

Table 38.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.northern	232	0.517	0.800	0	0	4

Table 38.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.northern	116	0.845	1.296	0	0	8

38.2 Four Models for shooting.northern

Table 38.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.001	−0.0004		−0.0004
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.02		0.05	0.06
After Gray Protests Begin (week of 4/20/15 onward)	0.24		0.10	0.05
Unrest and National Guard (4/27/15 - 5/3/2015)	−0.64		−0.44	−0.46
After Batts Fired (week of 7/13/15 onward)	1.09		0.99	1.01
After Davis Sworn In (week of 10/19/15 onward)	−0.73		−0.65	−0.62
Average Maximum Temperature to 50 Degrees		0.03		0.02
Plus Degrees in the 50s		−0.03		−0.01
Plus Degrees in the 60s		−0.01		−0.02
Plus Degrees in the 70s		0.04		0.04
Plus Degrees Greater Than 80		−0.02		0.01
Snowfall (inches)		−0.14		0.02
Precipitation (inches)		0.09		0.07
Darkness Before Midnight (hours)		0.09		0.02
School Days (proportion of week)		0.07		0.25
Observations	348	232	348	348
R ²	0.08	0.05	0.08	0.11

38.3 Least Squares Model (2) for shooting.northern

shooting.northern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

38.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.northern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.2636	-1.0533	-0.8730	0.4758	2.7549

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-5.7127187	2.6923681	-2.122	0.0339 *
t	-0.0006452	0.0014378	-0.449	0.6536
tmax.f.spline1	0.0883822	0.0526470	1.679	0.0932 .
tmax.f.spline2	-0.1053757	0.0848158	-1.242	0.2141
tmax.f.spline3	0.0051666	0.0876377	0.059	0.9530
tmax.f.spline4	0.0639876	0.0833009	0.768	0.4424
tmax.f.spline5	-0.0341093	0.0677059	-0.504	0.6144
snow.in	-3.1559088	2.3464399	-1.345	0.1786
precip.in	0.1639742	0.4787205	0.343	0.7320
dark.before.12	0.1415719	0.1367601	1.035	0.3006
school	0.1048492	0.4017334	0.261	0.7941

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 267.08 on 231 degrees of freedom
Residual deviance: 248.34 on 221 degrees of freedom
AIC: 458.44

Number of Fisher Scoring iterations: 6

shooting.northern

shooting.northern

39 Results for shooting.northeastern

39.1 Summary Values for shooting.northeastern

Table 39.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.northeastern	232	0.974	1.158	0	1	6

Table 39.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.northeastern	116	1.276	1.484	0	1	7

39.2 Four Models for shooting.northeastern

Table 39.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.001	−0.001		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.07		0.02	0.03
After Gray Protests Begin (week of 4/20/15 onward)	1.03		0.78	0.78
Unrest and National Guard (4/27/15 - 5/3/2015)	1.18		1.52	1.42
After Batts Fired (week of 7/13/15 onward)	−0.59		−0.38	−0.44
After Davis Sworn In (week of 10/19/15 onward)	0.27		0.41	0.45
Average Maximum Temperature to 50 Degrees		−0.01		−0.02
Plus Degrees in the 50s		−0.04		−0.03
Plus Degrees in the 60s		0.09		0.10
Plus Degrees in the 70s		0.02		−0.01
Plus Degrees Greater Than 80		−0.13		−0.12
Snowfall (inches)		−0.39		−0.54
Precipitation (inches)		−0.24		−0.38
Darkness Before Midnight (hours)		−0.08		−0.03
School Days (proportion of week)		−0.22		−0.41
Observations	348	232	348	348
R ²	0.04	0.06	0.07	0.10

39.3 Least Squares Model (2) for shooting.northeastern

shooting.northeastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

39.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.northeastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.7940	-1.2911	-0.1992	0.5890	3.0348

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.684458	1.407224	1.197	0.2313
t	-0.001209	0.001008	-1.200	0.2302
tmax.f.spline1	-0.015538	0.024718	-0.629	0.5296
tmax.f.spline2	-0.063538	0.055712	-1.140	0.2541
tmax.f.spline3	0.129044	0.075649	1.706	0.0880 .
tmax.f.spline4	-0.002446	0.064253	-0.038	0.9696
tmax.f.spline5	-0.117208	0.050463	-2.323	0.0202 *
snow.in	-0.579501	0.459336	-1.262	0.2071
precip.in	-0.237405	0.384303	-0.618	0.5367
dark.before.12	-0.093583	0.104394	-0.896	0.3700
school	-0.215541	0.280715	-0.768	0.4426

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 327.12 on 231 degrees of freedom
Residual deviance: 307.04 on 221 degrees of freedom
AIC: 638.61

Number of Fisher Scoring iterations: 5

shooting.northeastern

shooting.northeastern

40 Results for shooting.western

40.1 Summary Values for shooting.western

Table 40.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.western	232	1.250	1.382	0	1	7

Table 40.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.western	116	2.164	2.155	0	1.5	10

40.2 Four Models for shooting.western

Table 40.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.001	−0.001		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.25		0.43	0.39
After Gray Protests Begin (week of 4/20/15 onward)	3.78		3.28	3.31
Unrest and National Guard (4/27/15 - 5/3/2015)	−3.18		−2.71	−2.75
After Batts Fired (week of 7/13/15 onward)	−3.39		−3.20	−3.14
After Davis Sworn In (week of 10/19/15 onward)	0.38		0.57	0.47
Average Maximum Temperature to 50 Degrees		−0.03		−0.03
Plus Degrees in the 50s		0.08		0.10
Plus Degrees in the 60s		−0.09		−0.15
Plus Degrees in the 70s		0.11		0.15
Plus Degrees Greater Than 80		−0.14		−0.13
Snowfall (inches)		−0.22		−0.16
Precipitation (inches)		−0.15		−0.01
Darkness Before Midnight (hours)		−0.08		−0.13
School Days (proportion of week)		−0.35		0.03
Observations	348	232	348	348
R ²	0.18	0.07	0.18	0.21

40.3 Least Squares Model (2) for shooting.western

shooting.western

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

40.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.western

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.1199	-1.4068	-0.1667	0.6368	3.1908

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.8621467	1.3436568	1.386	0.1658
t	-0.0006629	0.0008891	-0.746	0.4560
tmax.f.spline1	-0.0297898	0.0251681	-1.184	0.2366
tmax.f.spline2	0.0811568	0.0514969	1.576	0.1150
tmax.f.spline3	-0.0798770	0.0586736	-1.361	0.1734
tmax.f.spline4	0.0802544	0.0527392	1.522	0.1281
tmax.f.spline5	-0.0943989	0.0427241	-2.209	0.0271 *
snow.in	-0.2733709	0.3822716	-0.715	0.4745
precip.in	-0.1210020	0.3323176	-0.364	0.7158
dark.before.12	-0.0660338	0.0915683	-0.721	0.4708
school	-0.2466599	0.2492204	-0.990	0.3223

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 368.94 on 231 degrees of freedom
Residual deviance: 344.80 on 221 degrees of freedom
AIC: 725.83

Number of Fisher Scoring iterations: 5

shooting.western

shooting.western

41 Results for shooting.central

41.1 Summary Values for shooting.central

Table 41.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.central	232	0.552	0.910	0	0	5

Table 41.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.central	116	0.638	0.982	0	0	5

41.2 Four Models for shooting.central

Table 41.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.0004	−0.0001		0.0001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.31		−0.28	−0.28
After Gray Protests Begin (week of 4/20/15 onward)	0.81		0.91	0.76
Unrest and National Guard (4/27/15 - 5/3/2015)	−1.00		−0.93	−0.93
After Batts Fired (week of 7/13/15 onward)	−0.50		−0.90	−0.80
After Davis Sworn In (week of 10/19/15 onward)	0.42		0.59	0.62
Average Maximum Temperature to 50 Degrees		0.01		0.01
Plus Degrees in the 50s		0.02		0.003
Plus Degrees in the 60s		−0.02		0.01
Plus Degrees in the 70s		−0.03		−0.02
Plus Degrees Greater Than 80		0.09		0.05
Snowfall (inches)		0.42		0.18
Precipitation (inches)		0.08		−0.29
Darkness Before Midnight (hours)		0.19		0.13
School Days (proportion of week)		−0.29		−0.07
Observations	348	232	348	348
R ²	0.05	0.09	0.05	0.10

41.3 Least Squares Model (2) for shooting.central

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

41.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.central

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.9745	-1.0061	-0.8031	0.6265	2.8097

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-4.0473978	2.0129334	-2.011	0.0444 *
t	-0.0002926	0.0014170	-0.206	0.8364
tmax.f.spline1	0.0193993	0.0372241	0.521	0.6023
tmax.f.spline2	0.0420324	0.0736475	0.571	0.5682
tmax.f.spline3	-0.0405003	0.0887141	-0.457	0.6480
tmax.f.spline4	-0.0356468	0.0845115	-0.422	0.6732
tmax.f.spline5	0.1178637	0.0662426	1.779	0.0752 .
snow.in	0.6373629	0.3388245	1.881	0.0600 .
precip.in	0.1265629	0.5119502	0.247	0.8047
dark.before.12	0.3988640	0.1427390	2.794	0.0052 **
school	-0.6337797	0.3969185	-1.597	0.1103

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 298.03 on 231 degrees of freedom
Residual deviance: 269.39 on 221 degrees of freedom
AIC: 480.53

Number of Fisher Scoring iterations: 6

shooting.central

shooting.central

42 Results for shooting.eastern

42.1 Summary Values for shooting.eastern

Table 42.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.eastern	232	1.185	1.394	0	1	8

Table 42.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.eastern	116	1.888	2.101	0	1	11

42.2 Four Models for shooting.eastern

Table 42.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.0005	−0.001		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.23		0.04	0.01
After Gray Protests Begin (week of 4/20/15 onward)	3.67		3.10	3.02
Unrest and National Guard (4/27/15 - 5/3/2015)	−4.55		−4.00	−4.01
After Batts Fired (week of 7/13/15 onward)	−2.68		−2.43	−2.39
After Davis Sworn In (week of 10/19/15 onward)	0.21		0.44	0.44
Average Maximum Temperature to 50 Degrees		−0.01		−0.003
Plus Degrees in the 50s		0.03		0.02
Plus Degrees in the 60s		−0.03		−0.02
Plus Degrees in the 70s		0.08		0.09
Plus Degrees Greater Than 80		−0.18		−0.17
Snowfall (inches)		−0.31		−0.34
Precipitation (inches)		0.02		0.07
Darkness Before Midnight (hours)		−0.04		−0.09
School Days (proportion of week)		−0.59		−0.19
Observations	348	232	348	348
R ²	0.16	0.09	0.16	0.21

42.3 Least Squares Model (2) for shooting.eastern

shooting.eastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

42.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.eastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.2942	-1.3095	-0.2214	0.6021	3.7789

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.8688805	1.4665591	0.592	0.55354
t	-0.0009619	0.0009112	-1.056	0.29114
tmax.f.spline1	-0.0087566	0.0276352	-0.317	0.75135
tmax.f.spline2	0.0330503	0.0546526	0.605	0.54536
tmax.f.spline3	-0.0254545	0.0622705	-0.409	0.68271
tmax.f.spline4	0.0544537	0.0541785	1.005	0.31486
tmax.f.spline5	-0.1260040	0.0438605	-2.873	0.00407 **
snow.in	-0.6289179	0.5394547	-1.166	0.24368
precip.in	0.0042904	0.3219615	0.013	0.98937
dark.before.12	-0.0431526	0.0950080	-0.454	0.64969
school	-0.4356910	0.2511225	-1.735	0.08275 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 363.15 on 231 degrees of freedom
Residual deviance: 329.39 on 221 degrees of freedom
AIC: 702.54

Number of Fisher Scoring iterations: 7

shooting.eastern

shooting.eastern

43 Results for shooting.southwestern

43.1 Summary Values for shooting.southwestern

Table 43.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.southwestern	232	0.948	1.123	0	1	6

Table 43.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.southwestern	116	1.819	1.757	0	1	8

43.2 Four Models for shooting.southwestern

Table 43.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.07		0.19	0.22
After Gray Protests Begin (week of 4/20/15 onward)	0.75		0.48	0.29
Unrest and National Guard (4/27/15 - 5/3/2015)	0.10		0.41	0.56
After Batts Fired (week of 7/13/15 onward)	1.01		0.90	0.96
After Davis Sworn In (week of 10/19/15 onward)	-1.00		-0.78	-0.73
Average Maximum Temperature to 50 Degrees		0.01		0.02
Plus Degrees in the 50s		0.02		-0.01
Plus Degrees in the 60s		0.01		0.001
Plus Degrees in the 70s		0.04		0.08
Plus Degrees Greater Than 80		-0.08		-0.09
Snowfall (inches)		0.09		0.09
Precipitation (inches)		-0.31		-0.38
Darkness Before Midnight (hours)		0.20		0.08
School Days (proportion of week)		0.57		0.56
Observations	348	232	348	348
R ²	0.13	0.08	0.09	0.20

43.3 Least Squares Model (2) for shooting.southwestern

shooting.southwestern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

43.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.southwestern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.8893  -1.2614  -0.2433   0.5460   3.3334

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  -2.5178006  1.5798803  -1.594   0.1110
t              0.0008725  0.0010412   0.838   0.4020
tmax.f.spline1 0.0040242  0.0301732   0.133   0.8939
tmax.f.spline2 0.0280344  0.0609407   0.460   0.6455
tmax.f.spline3 0.0115164  0.0711556   0.162   0.8714
tmax.f.spline4 0.0269089  0.0607306   0.443   0.6577
tmax.f.spline5 -0.0705336  0.0487829  -1.446   0.1482
snow.in       0.0761887  0.3800873   0.200   0.8411
precip.in     -0.2979349  0.4000259  -0.745   0.4564
dark.before.12 0.2289599  0.1056773   2.167   0.0303 *
school        0.5114365  0.2963419   1.726   0.0844 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 323.11  on 231  degrees of freedom
Residual deviance: 297.49  on 221  degrees of freedom
AIC: 622.55

Number of Fisher Scoring iterations: 5
```

shooting.southwestern

shooting.southwestern

44 Results for shooting.southern

44.1 Summary Values for shooting.southern

Table 44.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.southern	232	0.776	1.058	0	0	5

Table 44.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.southern	116	1.284	1.376	0	1	6

44.2 Four Models for shooting.southern

Table 44.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.0002	−0.0003		−0.0000
After Ferguson Protests Begin (week of 8/11/14 onward)	−0.17		−0.06	−0.07
After Gray Protests Begin (week of 4/20/15 onward)	1.24		0.97	0.94
Unrest and National Guard (4/27/15 - 5/3/2015)	−0.82		−0.89	−0.90
After Batts Fired (week of 7/13/15 onward)	0.04		0.11	0.07
After Davis Sworn In (week of 10/19/15 onward)	−0.35		−0.21	−0.19
Average Maximum Temperature to 50 Degrees		−0.01		−0.001
Plus Degrees in the 50s		0.01		−0.01
Plus Degrees in the 60s		0.03		0.05
Plus Degrees in the 70s		−0.04		−0.05
Plus Degrees Greater Than 80		−0.01		0.01
Snowfall (inches)		−0.27		−0.23
Precipitation (inches)		−0.36		−0.32
Darkness Before Midnight (hours)		−0.06		−0.07
School Days (proportion of week)		−0.20		−0.01
Observations	348	232	348	348
R ²	0.10	0.04	0.10	0.13

44.3 Least Squares Model (2) for shooting.southern

shooting.southern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

44.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.southern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.5535  -1.1861  -0.8930   0.4011   3.6811

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   0.9120436  1.7779347   0.513   0.608
t             -0.0003273  0.0011297  -0.290   0.772
tmax.f.spline1 -0.0124119  0.0334913  -0.371   0.711
tmax.f.spline2  0.0152043  0.0668322   0.227   0.820
tmax.f.spline3  0.0388445  0.0765388   0.508   0.612
tmax.f.spline4 -0.0555989  0.0644444  -0.863   0.388
tmax.f.spline5 -0.0151079  0.0540069  -0.280   0.780
snow.in       -0.9768393  0.7890552  -1.238   0.216
precip.in     -0.4876208  0.4544471  -1.073   0.283
dark.before.12 -0.0961645  0.1152394  -0.834   0.404
school        -0.2557203  0.3203512  -0.798   0.425

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 326.06  on 231  degrees of freedom
Residual deviance: 309.43  on 221  degrees of freedom
AIC: 584.18

Number of Fisher Scoring iterations: 6
```

shooting.southern

shooting.southern

45 Results for shooting.southeastern

45.1 Summary Values for shooting.southeastern

Table 45.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.southeastern	232	0.526	0.863	0	0	5

Table 45.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
shooting.southeastern	116	0.595	0.791	0	0	3

45.2 Four Models for shooting.southeastern

Table 45.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.001	−0.001		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.004		0.06	0.06
After Gray Protests Begin (week of 4/20/15 onward)	0.30		0.24	0.23
Unrest and National Guard (4/27/15 - 5/3/2015)	1.27		1.30	1.39
After Batts Fired (week of 7/13/15 onward)	−0.005		−0.01	−0.002
After Davis Sworn In (week of 10/19/15 onward)	−0.08		−0.02	0.001
Average Maximum Temperature to 50 Degrees		0.02		−0.002
Plus Degrees in the 50s		−0.04		−0.01
Plus Degrees in the 60s		0.05		0.02
Plus Degrees in the 70s		−0.02		−0.003
Plus Degrees Greater Than 80		−0.03		−0.03
Snowfall (inches)		−0.11		−0.22
Precipitation (inches)		−0.30		−0.14
Darkness Before Midnight (hours)		0.01		−0.003
School Days (proportion of week)		−0.58		−0.54
Observations	348	232	348	348
R ²	0.02	0.04	0.03	0.05

45.3 Least Squares Model (2) for shooting.southeastern

shooting.southeastern

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

45.4 A Poisson Regression Model as an Alternative to Model (2) for shooting.southeastern

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.5309	-1.0083	-0.8973	0.5348	3.5880

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.325472	2.049648	-0.647	0.51784
t	-0.001295	0.001391	-0.931	0.35168
tmax.f.spline1	0.032211	0.037087	0.869	0.38510
tmax.f.spline2	-0.081391	0.073351	-1.110	0.26717
tmax.f.spline3	0.091899	0.092520	0.993	0.32057
tmax.f.spline4	-0.049328	0.082773	-0.596	0.55121
tmax.f.spline5	-0.050650	0.069186	-0.732	0.46412
snow.in	-0.489126	0.703945	-0.695	0.48716
precip.in	-0.594194	0.567392	-1.047	0.29499
dark.before.12	0.010226	0.137435	0.074	0.94069
school	-0.989370	0.369222	-2.680	0.00737 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 281.78 on 231 degrees of freedom
Residual deviance: 269.91 on 221 degrees of freedom
AIC: 478.3

Number of Fisher Scoring iterations: 6

shooting.southeastern

shooting.southeastern

Appendix 3 (Fall 2016 Update)

Comprehensive Analysis of BPD Arrest Data

Stephen L. Morgan
Johns Hopkins University

November 11, 2016

Navigation of this Document

In order to jump to results of interest, display the Table of Contents for this pdf file in the left pane of your pdf viewer. The top level of the Table of Contents contains labeled sections for each outcome, within which subsections are nested for each piece of the analysis. Clicking the items in the pane will take you to the relevant set of results.

1 Introduction

For this updated analysis of BPD's arrest data, I offer comprehensive results that extend the results summarized in the report:

- Morgan, Stephen L. and Joel A. Pally. 2016. "Ferguson, Gray, and Davis: An Analysis of Recorded Crime Incidents and Arrests in Baltimore City, March 2010 through December 2015." A Report Prepared for the 21st Century Cities Initiative at Johns Hopkins University. Baltimore, MD: Johns Hopkins University, March 15, 2016. (URL: <http://socweb.soc.jhu.edu/faculty/morgan/reports.html>)

The results in the original report were based on arrest data through the end of 2015. In this Fall 2016 Update to Appendix 2, I offer models that incorporate data through Sunday, October 30th, 2016.

The basic analysis strategy is the same as in the original report. I first model the prevailing cyclical arrest trend from Monday, January 7, 2013 through Sunday, August 10, 2014. Then, I use that estimated model to predict a counterfactual arrest trend, as if the protest events and any changes in police practice from August 11, 2014 onward had not occurred. I then estimate period effects as average differences between observed and counterfactual values from August 11, 2014 onward in distinct time intervals.

Unlike the original report, with the availability of additional data it is reasonable to now divide the interval after Police Commissioner Anthony Batts was fired into (1) a transition period while Kevin Davis was the Interim Police Commissioner and (2) a final period after Kevin Davis was sworn in as Batts' permanent replacement and with a five-year contract as the city's 38th Police Commissioner. For the analysis reported here, the transition period begins with the week of Monday, July 13, 2015 and ends on Sunday, October 18, 2015. The period for Davis as commissioner encompasses the first full year of his term, from the week of Monday, October 19, 2015 (10/19/15 to 10/25/15) through the week of Monday, October 24, 2016 (10/24/16 to 10/30/16).

In addition, for this updated Appendix 3, I do not offer results for arrests that separate those arrests by type of arrest. The primary reason is that the BPD changed its categorization for the reporting of arrests at the end of July, 2016. Although it will be possible to develop a revised method for sorting arrests into categories similar to the categories used for the original report (since most of the changes appear to be different choices on the capitalization of words), for this updated appendix I have not revised the underlying code for two reasons. First, changes to the hierarchical categorization algorithm based on keyword recognition (see the description in Appendix 1 of the original report) might also change how arrests are categorized before July, 2016. These changes could result in a mismatch with the results already reported, necessitating a reconciliation effort. Second, an analysis of the results up through Sunday, July

24, 2016 (the Sunday of the last full week with the older categories) suggested that the first seven months of 2016 were "more of the same" that is already documented in the original report and in the results for the total arrest count offered in this updated Appendix 3. My conclusion, therefore, is that most of the important findings on arrests are already captured in the original report, and that the results on total arrests in this updated Appendix 3 are sufficient for now.

Descriptive Summary of the Data

The outcomes analyzed in subsequent sections are listed and summarized in Table 2.1 in the Data section, after which a breakdown of totals across all outcomes is provided by police district in Table 2.2. Finally, a five-panel figure displays the distribution of the five variables utilized to represent weather, hours of darkness, and school days for the full time series.

Results for Each Outcome

For each outcome, I first offer a table with coefficients from four estimated models:

- Model 1 is a naive model with five estimated coefficients for the period indicator variables for the full time series;
- Model 2 is a "pretreatment" model, estimated only for data prior to August 11, 2014, that fits coefficients for weather, hours of darkness, and school days;
- Model 3 is analogous to Model 1 but utilizes an outcome variable for the full time series that has been de-trended using coefficients for weather, hours of darkness, and school days estimated by Model 2 using data from the "pretreatment" period only;
- Model 4 is an alternative to Model 3 that fits coefficients for weather, hours of darkness, and school days simultaneously with coefficients for the five period indicator variables.

The period effects estimated for Model 3 are my preferred estimates, and the period effects estimated for Model 4 are plausible alternatives.

I then offer two figures that depict the fit of Model 2 as well as the variation that generates the period effects estimated for the preferred Model 3. For both figures, the black line is the predicted time series from Model 2 while the red line is an extrapolated cyclical trend, generated by forming the predictions from the coefficients for Model 2 applied to the observed values for weather, hours of darkness, and school days from August 11, 2014 onward. The first figure overlays gray dots for the observed weekly total for each outcome, and the second figure substitutes a light blue line for the three-week moving average of the observed weekly totals. The differences between the gray dots (or the light blue line) and the red line is the source of variation that generates the period effects estimated for the preferred Model 3.

Finally, for each outcome a diagnostic model is also fit to assess the extent to which the least squares estimation of Model 2 adequately represents the underlying time series up through August 10, 2014. For this alternative model, a poisson distribution is assumed for the outcome because it is a weekly count bounded by zero. In general, these alternative models support the decision to utilize the simpler Model 2 to estimate the underlying time series that structures the extrapolated counterfactual trend. In addition to R output for the estimated poisson regression, analogous figures are offered to demonstrate the near equivalence of Model 2 and its poisson regression alternative.

2 Data

Table 2.1: Descriptive Statistics for Weekly Reported Arrests, with Breakdown by Type of Charge

Statistic	Min	Median	Max
murder.g	0	5	13
robbery	0	15	35
aggravated.assault	0	23	46
burglary	0	19	99
larceny	0	35	64
arson	0	1	5
common.assault	0	81	116
drug.distribution	0	57	116
deadly.weapon	0	16	37
non.deadly.weapon	0	1	19
property.destruction	0	6	14
police.non.compliance	0	8	27
court.non.compliance	0	101	200
drug.possession	0	112	340
driving.violation	0	11	25
prostitution	0	7	27
trespass	0	9	23
forgery.fraud.extortion	0	4	14
domestic	0	6	16
sex.offense.g	0	3	9
disorderly.conduct	0	14	184
loitering.vagabond	0	1	9
only.temp.detained	0	8	20
unknown	0	39	123
ungrouped	0	6	518
total	294	625	928

Table 2.2: Descriptive Statistics for Weekly Reported Arrests, with Breakdown by District

Statistic	Min	Median	Max
northwestern	8	31	95
northern	10	25	56
northeastern	15	39	93
western	11	48	113
central	10	39	92
eastern	11	46	116
southwestern	8	35	65
southern	12	55	109
southeastern	10	46	93
total	294	625	928

Adjustment Variables for Subsequent Models

- tmax.f is the weekly average of the daily maximum temperature, measured in degrees Fahrenheit
- snow.in is the weekly average of total daily snowfall, measured in inches
- precip.in is the weekly average of total daily precipitation, measured in inches
- dark.before.12 is the weekly average of daily hours between sunset and midnight
- school is the proportion of days of the week when school was scheduled for Baltimore City Schools

3 Results for total

3.1 Summary Values for total

Table 3.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
total	83	807.735	73.469	565	819	928

Table 3.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
total	116	535.897	102.297	294	519.5	882

3.2 Four Models for total

Table 3.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.79	−0.28		−1.16
After Ferguson Protests Begin (week of 8/11/14 onward)	−136.20		−150.56	−95.49
After Gray Protests Begin (week of 4/20/15 onward)	−185.87		−247.70	−231.39
Unrest and National Guard (4/27/15 - 5/3/2015)	195.67		182.92	188.71
After Batts Fired (week of 7/13/15 onward)	127.34		166.96	162.92
After Davis Sworn In (week of 10/19/15 onward)	−11.32		−29.74	9.37
Average Maximum Temperature to 50 Degrees		−0.59		−0.49
Plus Degrees in the 50s		−2.36		2.96
Plus Degrees in the 60s		−0.48		−5.16
Plus Degrees in the 70s		8.45		5.86
Plus Degrees Greater Than 80		−11.15		−6.95
Snowfall (inches)		−75.09		−23.66
Precipitation (inches)		−158.65		−89.11
Darkness Before Midnight (hours)		−38.30		−26.68
School Days (proportion of week)		71.14		38.30
Observations	199	83	199	199
R ²	0.79	0.51	0.77	0.85

3.3 Least Squares Model (2) for total

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

3.4 A Poisson Regression Model as an Alternative to Model (2) for total

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-5.6792	-1.3057	0.3186	1.3820	2.9960

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	7.0137063	0.0747858	93.784	< 2e-16	***
t	-0.0003348	0.0001719	-1.948	0.051445	.
tmax.f.spline1	-0.0007504	0.0013027	-0.576	0.564577	
tmax.f.spline2	-0.0032712	0.0030439	-1.075	0.282521	
tmax.f.spline3	-0.0002603	0.0043555	-0.060	0.952341	
tmax.f.spline4	0.0104313	0.0039943	2.612	0.009013	**
tmax.f.spline5	-0.0137097	0.0035331	-3.880	0.000104	***
snow.in	-0.1058575	0.0148175	-7.144	9.06e-13	***
precip.in	-0.2035128	0.0256332	-7.939	2.03e-15	***
dark.before.12	-0.0485446	0.0056064	-8.659	< 2e-16	***
school	0.0872107	0.0172911	5.044	4.57e-07	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 570.72 on 82 degrees of freedom
Residual deviance: 284.20 on 72 degrees of freedom
AIC: 1014

Number of Fisher Scoring iterations: 3

4 Results for b

4.1 Summary Values for b

Table 4.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
b	83	660.663	66.281	450	674	772

Table 4.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
b	116	435.974	83.272	232	430.5	693

4.2 Four Models for b

Table 4.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.89	−0.56		−1.22
After Ferguson Protests Begin (week of 8/11/14 onward)	−106.00		−110.24	−70.34
After Gray Protests Begin (week of 4/20/15 onward)	−141.11		−194.14	−180.46
Unrest and National Guard (4/27/15 - 5/3/2015)	189.07		176.90	180.58
After Batts Fired (week of 7/13/15 onward)	108.35		145.23	140.78
After Davis Sworn In (week of 10/19/15 onward)	5.21		−3.62	23.52
Average Maximum Temperature to 50 Degrees		−0.33		−0.09
Plus Degrees in the 50s		−4.75		0.40
Plus Degrees in the 60s		4.27		−1.23
Plus Degrees in the 70s		4.42		3.09
Plus Degrees Greater Than 80		−9.01		−5.57
Snowfall (inches)		−62.90		−18.27
Precipitation (inches)		−137.37		−76.84
Darkness Before Midnight (hours)		−35.61		−24.76
School Days (proportion of week)		57.28		34.97
Observations	199	83	199	199
R ²	0.78	0.51	0.69	0.84

4.3 Least Squares Model (2) for b

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

4.4 A Poisson Regression Model as an Alternative to Model (2) for b

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-5.6375  -1.2823   0.3196   1.2079   2.9923

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   6.8702428  0.0827094  83.065  < 2e-16 ***
t             -0.0008309  0.0001898  -4.377  1.20e-05 ***
tmax.f.spline1 -0.0005041  0.0014389  -0.350  0.726079
tmax.f.spline2 -0.0076500  0.0033736  -2.268  0.023353 *
tmax.f.spline3  0.0069337  0.0048493   1.430  0.152764
tmax.f.spline4  0.0066753  0.0044297   1.507  0.131829
tmax.f.spline5 -0.0136070  0.0039050  -3.484  0.000493 ***
snow.in       -0.1094045  0.0164611  -6.646  3.01e-11 ***
precip.in     -0.2164387  0.0284384  -7.611  2.72e-14 ***
dark.before.12 -0.0551503  0.0062068  -8.885  < 2e-16 ***
school        0.0858198  0.0191317   4.486  7.27e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 569.66  on 82  degrees of freedom
Residual deviance: 283.54  on 72  degrees of freedom
AIC: 996.59

Number of Fisher Scoring iterations: 4
```

5 Results for w

5.1 Summary Values for w

Table 5.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
w	83	127.157	16.150	96	127	172

Table 5.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
w	116	85.319	22.051	43	79	174

5.2 Four Models for w

Table 5.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.07	0.20		0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	−24.55		−31.29	−19.01
After Gray Protests Begin (week of 4/20/15 onward)	−38.46		−47.33	−44.78
Unrest and National Guard (4/27/15 - 5/3/2015)	9.43		7.89	9.84
After Batts Fired (week of 7/13/15 onward)	14.44		18.43	18.29
After Davis Sworn In (week of 10/19/15 onward)	−13.20		−19.74	−10.05
Average Maximum Temperature to 50 Degrees		−0.45		−0.51
Plus Degrees in the 50s		2.21		2.19
Plus Degrees in the 60s		−3.37		−2.86
Plus Degrees in the 70s		2.72		1.92
Plus Degrees Greater Than 80		−2.22		−1.19
Snowfall (inches)		−11.47		−5.96
Precipitation (inches)		−19.50		−11.80
Darkness Before Midnight (hours)		−2.63		−2.49
School Days (proportion of week)		11.24		3.85
Observations	199	83	199	199
R^2	0.68	0.36	0.83	0.73

5.3 Least Squares Model (2) for w

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

5.4 A Poisson Regression Model as an Alternative to Model (2) for w

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.76063  -0.72361   0.05082   0.74250   2.75805

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   5.0067413   0.1889289  26.501  < 2e-16 ***
t              0.0015360   0.0004355   3.527 0.000421 ***
tmax.f.spline1 -0.0037391   0.0033118  -1.129 0.258888
tmax.f.spline2  0.0174476   0.0076614   2.277 0.022766 *
tmax.f.spline3 -0.0261183   0.0107373  -2.432 0.014996 *
tmax.f.spline4  0.0207887   0.0099293   2.094 0.036288 *
tmax.f.spline5 -0.0168691   0.0089100  -1.893 0.058321 .
snow.in        -0.0998627   0.0369768  -2.701 0.006920 **
precip.in      -0.1556834   0.0635338  -2.450 0.014270 *
dark.before.12 -0.0208139   0.0141360  -1.472 0.140913
school         0.0881013   0.0434485   2.028 0.042589 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 166.18  on 82  degrees of freedom
Residual deviance: 104.65  on 72  degrees of freedom
AIC: 680.82

Number of Fisher Scoring iterations: 4
```

6 Results for i

6.1 Summary Values for i

Table 6.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
i	83	1.795	1.386	0	2	7

Table 6.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
i	116	1.922	1.653	0	2	8

6.2 Four Models for i

Table 6.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	−0.0004	0.01		−0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.09		−0.63	0.01
After Gray Protests Begin (week of 4/20/15 onward)	−0.12		−0.75	0.18
Unrest and National Guard (4/27/15 - 5/3/2015)	1.27		1.05	0.97
After Batts Fired (week of 7/13/15 onward)	1.28		1.35	1.30
After Davis Sworn In (week of 10/19/15 onward)	−1.28		−1.89	−1.49
Average Maximum Temperature to 50 Degrees		−0.07		−0.09
Plus Degrees in the 50s		0.24		0.25
Plus Degrees in the 60s		−0.42		−0.28
Plus Degrees in the 70s		0.21		0.10
Plus Degrees Greater Than 80		0.13		−0.002
Snowfall (inches)		−0.57		−0.09
Precipitation (inches)		−0.53		−0.77
Darkness Before Midnight (hours)		−0.59		−0.08
School Days (proportion of week)		0.01		−0.86
Observations	199	83	199	199
R ²	0.05	0.28	0.21	0.13

6.3 Least Squares Model (2) for i

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

6.4 A Poisson Regression Model as an Alternative to Model (2) for i

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.08853  -0.56347  -0.05131   0.37132   2.56465

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    4.353099   1.694723   2.569  0.01021 *
t               0.007282   0.003663   1.988  0.04684 *
tmax.f.spline1 -0.047100   0.029004  -1.624  0.10439
tmax.f.spline2  0.121161   0.062676   1.933  0.05322 .
tmax.f.spline3 -0.184156   0.079903  -2.305  0.02118 *
tmax.f.spline4  0.085297   0.081399   1.048  0.29469
tmax.f.spline5  0.070959   0.071632   0.991  0.32188
snow.in        -0.347005   0.346325  -1.002  0.31636
precip.in      -0.400226   0.550359  -0.727  0.46710
dark.before.12 -0.337894   0.127653  -2.647  0.00812 **
school         0.021640   0.370220   0.058  0.95339
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 93.941  on 82  degrees of freedom
Residual deviance: 70.324  on 72  degrees of freedom
AIC: 271.69

Number of Fisher Scoring iterations: 5
```

i

i

7 Results for a

7.1 Summary Values for a

Table 7.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
a	83	2.036	1.526	0	2	5

Table 7.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
a	116	1.457	1.295	0	1	6

7.2 Four Models for a

Table 7.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.01	0.01		0.002
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.69		-0.90	-0.36
After Gray Protests Begin (week of 4/20/15 onward)	-0.69		-1.02	-1.05
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.15		-0.14	0.26
After Batts Fired (week of 7/13/15 onward)	0.10		0.20	-0.001
After Davis Sworn In (week of 10/19/15 onward)	-0.20		-0.11	0.33
Average Maximum Temperature to 50 Degrees		-0.09		-0.06
Plus Degrees in the 50s		0.04		0.14
Plus Degrees in the 60s		0.11		-0.09
Plus Degrees in the 70s		-0.04		0.04
Plus Degrees Greater Than 80		-0.03		0.08
Snowfall (inches)		-0.44		-0.35
Precipitation (inches)		-0.95		1.02
Darkness Before Midnight (hours)		-0.16		0.02
School Days (proportion of week)		0.85		0.93
Observations	199	83	199	199
R ²	0.06	0.11	0.26	0.15

7.3 Least Squares Model (2) for a

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

7.4 A Poisson Regression Model as an Alternative to Model (2) for a

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.3014  -0.8459  -0.1450   0.7805   1.8668

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.730313    1.489008   1.834  0.0667 .
t               0.004740    0.003439   1.379  0.1680
tmax.f.spline1 -0.043649    0.025481  -1.713  0.0867 .
tmax.f.spline2  0.021172    0.065875   0.321  0.7479
tmax.f.spline3  0.060873    0.096902   0.628  0.5299
tmax.f.spline4 -0.023830    0.082426  -0.289  0.7725
tmax.f.spline5 -0.011213    0.068545  -0.164  0.8701
snow.in        -0.213743    0.277338  -0.771  0.4409
precip.in      -0.478669    0.528627  -0.905  0.3652
dark.before.12 -0.081702    0.119813  -0.682  0.4953
school         0.432971    0.347540   1.246  0.2128
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 112.46  on 82  degrees of freedom
Residual deviance: 101.61  on 72  degrees of freedom
AIC: 307.38

Number of Fisher Scoring iterations: 5
```

8 Results for u

8.1 Summary Values for u

Table 8.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
u	83	16.084	5.301	5	15	32

Table 8.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Median	Max
u	116	11.224	4.304	3	10.5	28

8.2 Four Models for u

Table 8.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.03	0.06		0.04
After Ferguson Protests Begin (week of 8/11/14 onward)	-5.05		-7.50	-5.79
After Gray Protests Begin (week of 4/20/15 onward)	-5.48		-4.46	-5.28
Unrest and National Guard (4/27/15 - 5/3/2015)	-3.94		-2.77	-2.94
After Batts Fired (week of 7/13/15 onward)	3.17		1.76	2.55
After Davis Sworn In (week of 10/19/15 onward)	-1.85		-4.38	-2.95
Average Maximum Temperature to 50 Degrees		0.35		0.26
Plus Degrees in the 50s		-0.10		-0.02
Plus Degrees in the 60s		-1.08		-0.71
Plus Degrees in the 70s		1.14		0.71
Plus Degrees Greater Than 80		-0.02		-0.26
Snowfall (inches)		0.29		1.01
Precipitation (inches)		-0.31		-0.71
Darkness Before Midnight (hours)		0.69		0.62
School Days (proportion of week)		1.76		-0.58
Observations	199	83	199	199
R ²	0.26	0.25	0.65	0.33

8.3 Least Squares Model (2) for u

Autocorrelation Function for the Observed Outcome for Model (2)

Autocorrelation Function for the Residuals from Model (2)

8.4 A Poisson Regression Model as an Alternative to Model (2) for u

```
Call:
glm(formula = model.formula, family = poisson, data = df.windowed.pre)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.7169  -0.7635  -0.1975   0.7101   3.4906

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   1.4238333   0.5205646   2.735  0.00623 **
t              0.0040732   0.0012457   3.270  0.00108 **
tmax.f.spline1 0.0210578   0.0090998   2.314  0.02066 *
tmax.f.spline2 -0.0091349   0.0202625  -0.451  0.65211
tmax.f.spline3 -0.0613775   0.0287404  -2.136  0.03271 *
tmax.f.spline4  0.0688393   0.0286229   2.405  0.01617 *
tmax.f.spline5 -0.0004767   0.0257541  -0.019  0.98523
snow.in        0.0183129   0.0953312   0.192  0.84767
precip.in      -0.0066280   0.1817279  -0.036  0.97091
dark.before.12  0.0396964   0.0377297   1.052  0.29274
school         0.1112108   0.1221802   0.910  0.36271
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 142.11  on 82  degrees of freedom
Residual deviance: 106.54  on 72  degrees of freedom
AIC: 507.95

Number of Fisher Scoring iterations: 4
```