

# Appendix 2

## Comprehensive Analysis of BPD Crime Data

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### **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, we offer comprehensive results that extend the results summarized in a Spring 2016 report and its Fall 2016 update:

- 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: <https://osf.io/preprints/socarxiv/nshme/>)
- Morgan, Stephen L. 2016. "Fall 2016 Update for Ferguson, Gray, and Davis: An Analysis of Recorded Crime Incidents and Arrests in Baltimore City, March 2010 through October 2016." Baltimore, MD: Johns Hopkins University, November 15, 2016. (URL: <https://osf.io/preprints/socarxiv/6gdra/>)

The results in the original report and its update were based on crime data through December 2015 and October 2016, respectively. In this final report, we offer models that incorporate crime data through Sunday, March 1, 2020.

The basic analysis strategy is the same as in the original report. We first model the prevailing cyclical crime trend from Monday, March 1st, 2010 through Sunday, August 10, 2014. Then, we 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. We 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) two additional periods 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 first 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 10, 2016 (10/10/16 to 10/16/16). The second period for Davis begins with the second full year of his term, from the week of Monday, October 17, 2016 (10/17/16 to 10/23/16) through his final week as commissioner, Monday, January 15, 2018 (1/15/18 to 1/21/18).

More than three full years have passed since 2016, and the city has had three new police commissioners since then, necessitating three new periods for a parallel structure of models. The fourth period for De

Sousa as commissioner commences with the week of Monday, January 22, 2018 (1/22/18 to 1/28/18) and ends with the week of Monday, May 7, 2018 (5/7/18 to 5/13/18). The fifth period for Tuggle as commissioner commences with the week of Monday, May 14, 2018 (5/14/18 to 5/20/18) and ends with the week of Monday, February 4, 2019 (2/4/19 to 2/10/19). Finally, the sixth period for Harrison as commissioner commences with the week of Monday, February 11, 2019 (2/11/19 to 2/17/19) and ends with the week of February 24, 2020 (2/24/20 to 3/1/20), which is the final full week before Governor Hogan declared a state of emergency because of the COVID-19 pandemic. Thus, the final period is approximately the first full year of Harrison's term as commissioner.

### **Descriptive Summary of the Data**

The types of crime incidents analyzed in subsequent sections are listed and summarized in Table 2.1 in the Data section, after which a breakdown of all types of crime incidents is provided by police district in Table 2.2. For this final report, we have moved the crime incident category of assaults by threat to the end of this appendix. At some point in the last three years, the BPD changed its categorization of incidents, back-coding some of the data on assaults by threat that we analyzed for the prior two reports. As shown below, under this new categorization assaults by threat declined abruptly to zero in the pre-Ferguson period and remained at zero through March 1, 2020. We have handled this change by allowing assaults by threat, which number only about 10 per week when categorized for the first portion of the time series, to continue to count as a category within the total crime incident count that we analyze. We then estimate models for assault by threat for completeness in order to show when the coding change occurred, but we do not include conclusions about assaults by treat in the main document of this report.

Two figures then display the distributions of the variables utilized for subsequent models: (1) variables for weather and hours of darkness; (2) variables that parameterize types of days per week, such as holidays, vacations, and other days without school in the Baltimore City Schools. For this final report, we introduce a new set of variables for types of days within each week, separating holidays and vacation days from other types of non-school days.

### **Results for Each Outcome**

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

- Model 1 is a naive model with nine 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 time, weather, hours of darkness, and types of 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 time, weather, hours of darkness, and types of 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 types of days simultaneously with coefficients for the six period indicator variables.

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

We 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 predictions that utilize the coefficients from Model 2 and the observed values for weather, hours of darkness, and school days from August 11, 2014 onward.

For this final report, we only allow the time trend coefficient to structure the counterfactual red line through the first year of Davis' term as commissioner. Beginning with his second year, the contribution

from the time trend coefficient is fixed for the rest of the time series. The cyclical pattern of the counterfactual red trend line continues to be generated by the other variables specified as predictors for Model 2.

The first figure of each pair 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. Additional details of Model 3 are offered in the main document for this updated report.

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 this final report, we continue to offer the R output for the estimated poisson regression so that it can be checked against the similar results in the original report. However, we no longer offer analogous figures to demonstrate the near equivalence of results based on Model 2 and its poisson regression alternative. Interested readers can consult the close similarity from the original report, which holds for this updated analysis as well.

## 2 Data

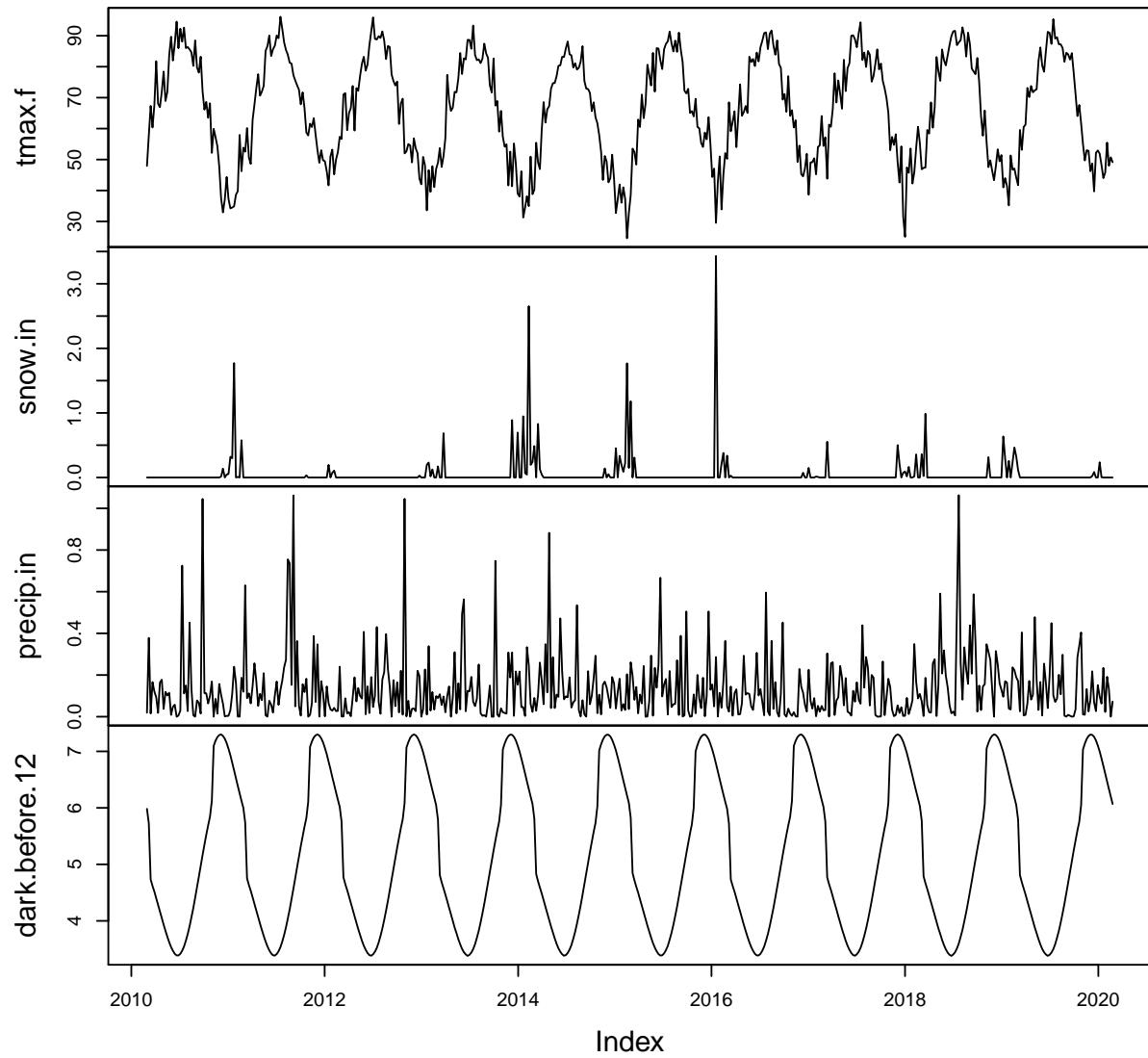
Table 2.1: Descriptive Statistics for Weekly Reported Incidents of Victim-Based Crime, with Breakdown by Type of Crime

Statistic	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide	5.3	2.7	0	3	5	7	17
shooting	10.4	5.5	0	6	9	14	33
rape	5.8	2.7	0	4	5	7	16
robbery.carjacking	6.2	4.7	0	3	5	8	30
robbery.street	60.0	17.7	24	46	57.5	71	128
robbery.commercial	14.1	6.2	2	10	13	18	44
robbery.residence	9.8	3.9	1	7	9	12	27
aggravated.assault	98.7	21.0	41	83	98.5	112.8	178
common.assault	159.7	26.4	78	141	159	178	241
burglary	140.5	31.6	66	120	141	158.8	403
larceny.from.auto	127.2	27.8	52	108	125	145	217
larceny	205.6	30.4	105	186	206	227.8	302
auto.theft	81.6	17.4	46	69	79	92	146
arson	4.6	3.1	0	2	4	6	33
total	934.4	110.8	539	859.5	949.5	1,021.8	1,161

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

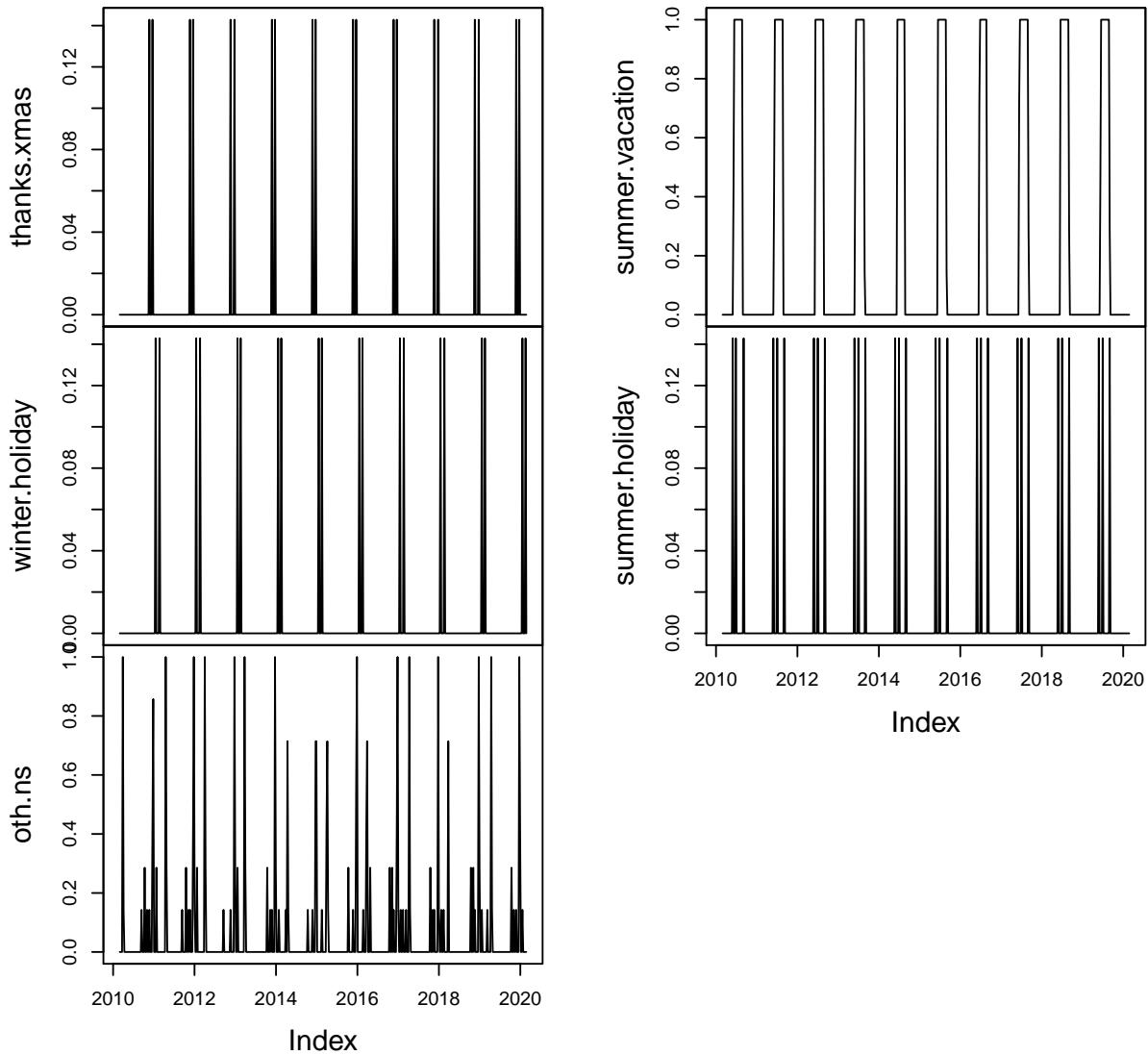
Statistic	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northwestern	93.0	16.0	51	83	92.5	103	181
northern	103.0	19.6	56	90	103	116	172
northeastern	142.8	22.3	79	130	144	156	207
western	75.4	14.9	43	65	75	84	220
central	111.3	22.5	56	95	111	127	193
eastern	80.0	14.4	41	70	79	90	119
southwestern	90.6	17.5	42	78	90	103	150
southern	108.0	21.6	50	94	108	123	226
southeastern	129.2	23.2	63	114	129	145	233
total	934.4	110.8	539	859.5	949.5	1,021.8	1,161

## Weather and Darkness 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

## Types of Day Variables for Subsequent Models



- thanks.xmas is the proportion of days of the week that are either Thanksgiving or Christmas
- winter.holiday is the proportion of days of the week that are a winter holiday other than Thanksgiving or Christmas
- other.ns is the proportion of days of the week that are other types of non-school days for the Baltimore City Schools (e.g., professional development days and winter vacation days)
- summer.vacation is the proportion of days of the week that are summer vacation for the Baltimore City Schools
- summer.holiday is the proportion of days of the week that are a summer holiday (e.g., 4th of July)

### 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	Pctl(25)	Median	Pctl(75)	Max
total	232	945.272	98.921	612	875.5	960	1,023.2	1,119

Table 3.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
total	290	925.724	118.939	539	851	943	1,014.8	1,161

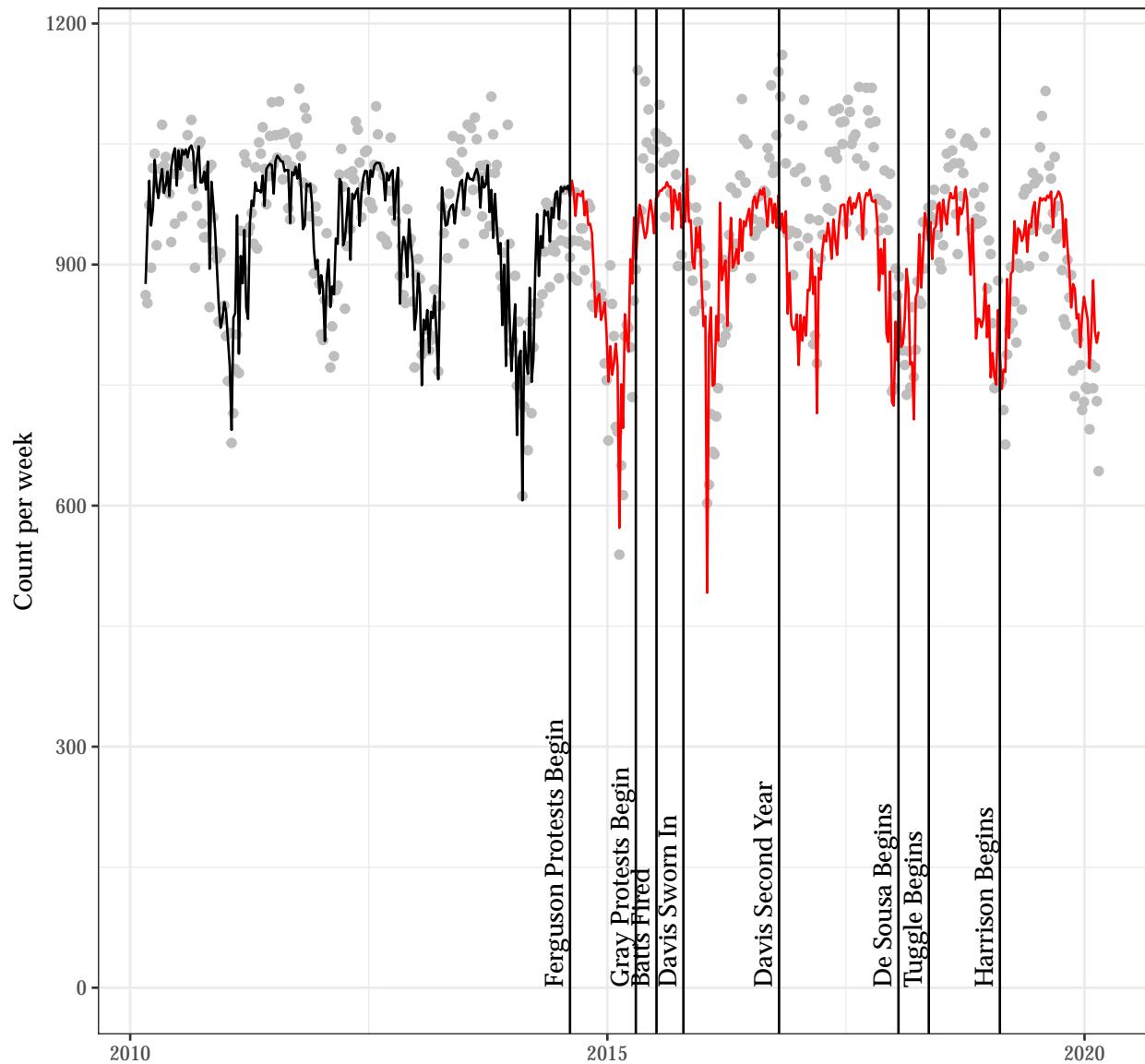
### 3.2 Four Models for total

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

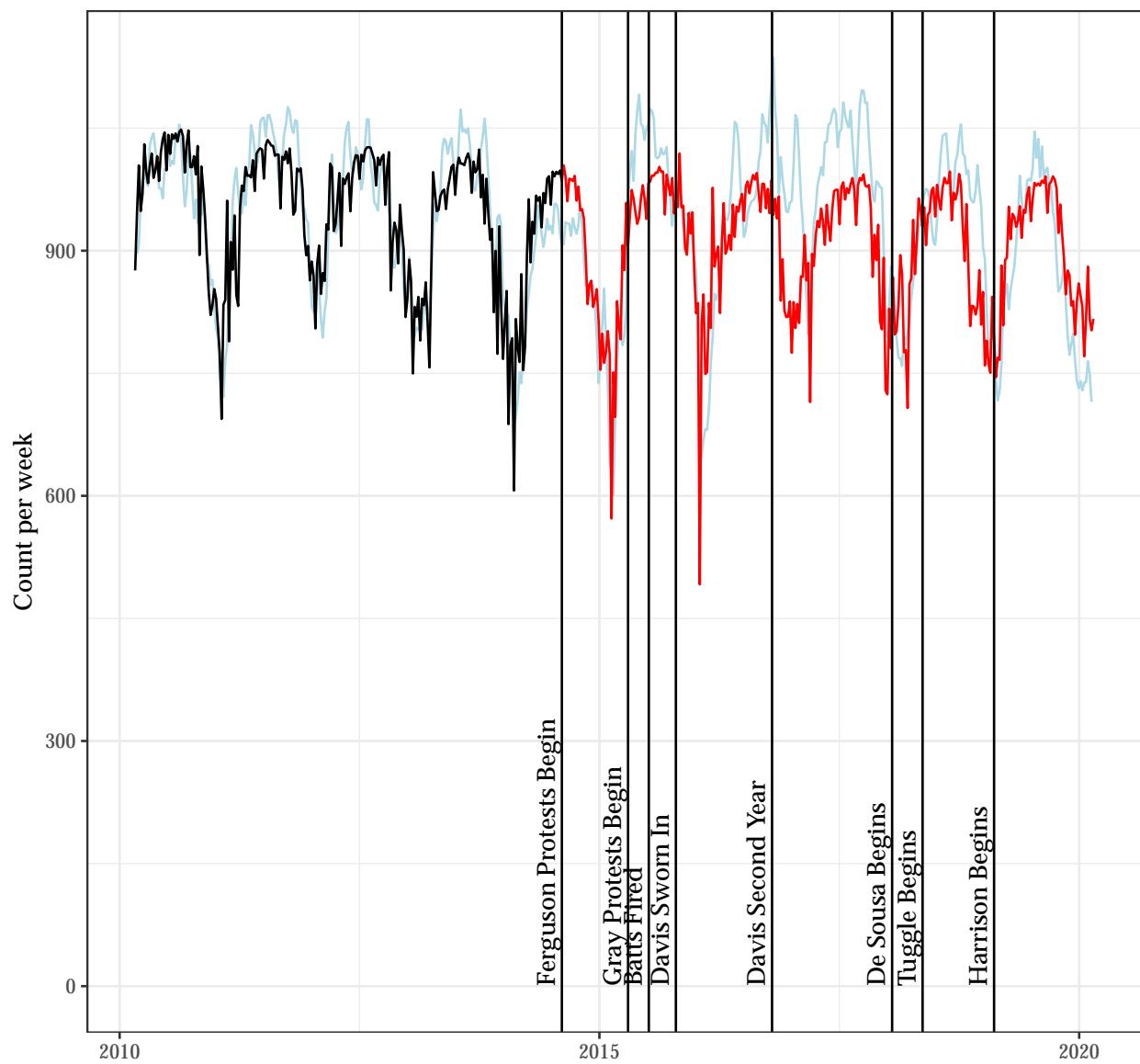
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.35	-0.19		-0.20
After Ferguson Protests Begin (week of 8/11/14 onward)	-65.98		-37.35	-34.85
After Gray Protests Begin (week of 4/20/15 onward)	202.45		110.13	107.27
Unrest and National Guard (4/27/15 - 5/3/2015)	113.57		126.39	139.87
After Batts Fired (week of 7/13/15 onward)	-11.78		-46.13	-46.39
After Davis Confirmed (week of 10/19/15 onward)	-82.96		-24.64	-20.69
After Davis First Year (week of 10/17/16 onward)	99.87		88.41	94.98
After De Sousa Begins (week of 1/19/18 onward)	-149.35		-114.06	-104.99
After Tuggle Begins (week of 5/14/18 onward)	140.41		77.84	76.09
After Harrison Begins (week of 2/11/19 onward)	-79.34		-88.03	-75.08
Average Maximum Temperature to 50 Degrees		4.49		5.94
Plus Degrees in the 50s		5.35		0.95
Plus Degrees in the 60s		-2.89		1.28
Plus Degrees in the 70s		-4.90		-4.00
Plus Degrees Greater Than 80		-1.02		-2.35
Snowfall (inches)		-65.58		-47.26
Precipitation (inches)		-28.96		-23.24
Darkness Before Midnight (hours)		23.87		26.38
Thanksgiving/Christmas (proportion of week)		-32.28		-44.45
Winter Holiday (proportion of week)		-211.39		-269.33
Other Out-of-School Days (proportion of week)		-27.91		-54.92
Summer Vacation (proportion of week)		20.88		1.81
Summer Holiday (proportion of week)		-261.19		-222.81
Observations	522	232	522	522
R <sup>2</sup>	0.23	0.70	0.30	0.71

### 3.3 Least Squares Updated Model (2) for total

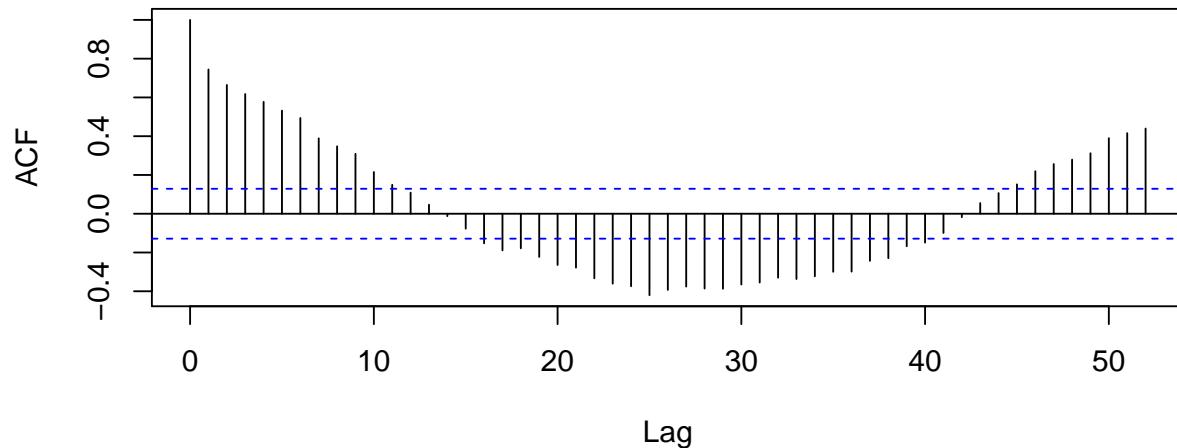
total



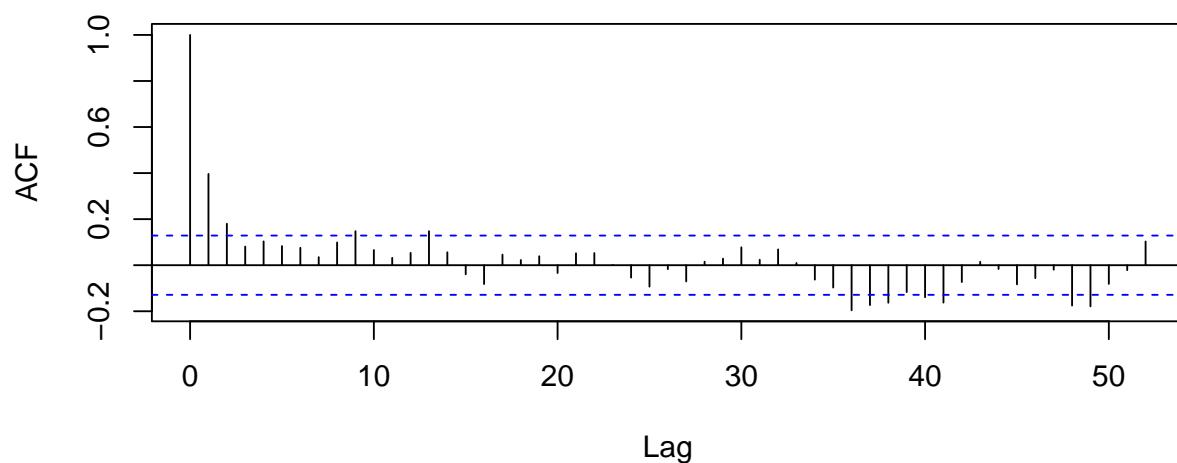
total



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-4.9053 -1.3392 -0.0299  1.1424  5.9381  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 6.370e+00 4.797e-02 132.779 < 2e-16 ***  
t            -1.985e-04 3.315e-05 -5.988 2.13e-09 ***  
tmax.f.spline1 5.237e-03 8.827e-04  5.933 2.97e-09 ***  
tmax.f.spline2 5.475e-03 1.738e-03  3.150 0.001634 **  
tmax.f.spline3 -3.456e-03 2.066e-03 -1.673 0.094320 .  
tmax.f.spline4 -5.162e-03 1.972e-03 -2.617 0.008864 **  
tmax.f.spline5 -1.133e-03 1.630e-03 -0.695 0.486975  
snow.in       -9.347e-02 1.211e-02 -7.721 1.15e-14 ***  
precip.in      -3.057e-02 1.211e-02 -2.523 0.011623 *  
dark.before.12 2.570e-02 3.267e-03  7.867 3.63e-15 ***  
thanks.xmas    -4.067e-02 9.554e-02 -0.426 0.670311  
summer.holiday -2.599e-01 6.919e-02 -3.756 0.000172 ***  
winter.holiday -2.512e-01 9.686e-02 -2.593 0.009512 **  
summer.vacation 2.228e-02 8.952e-03  2.489 0.012819 *  
oth.ns         -3.017e-02 1.240e-02 -2.433 0.014955 *  
---  
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 2459.93 on 231 degrees of freedom  
Residual deviance: 720.41 on 217 degrees of freedom  
AIC: 2765  
  
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	Pctl(25)	Median	Pctl(75)	Max
homicide	232	4.198	2.159	0	2.8	4	6	11

Table 4.2: Descriptives for Outcome After Ferguson Protests Begin

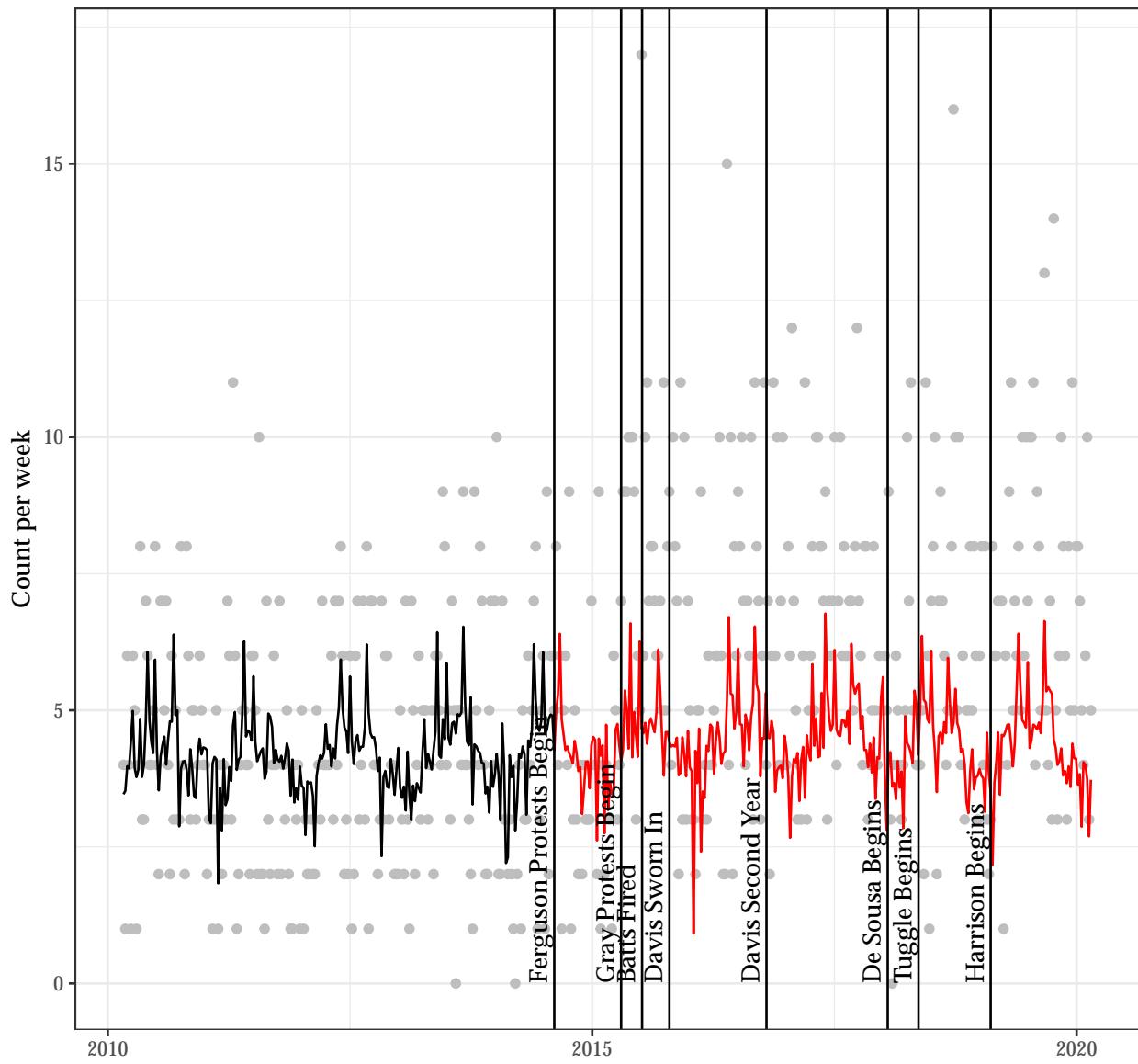
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide	290	6.183	2.846	0	4	6	8	17

## 4.2 Four Models for homicide

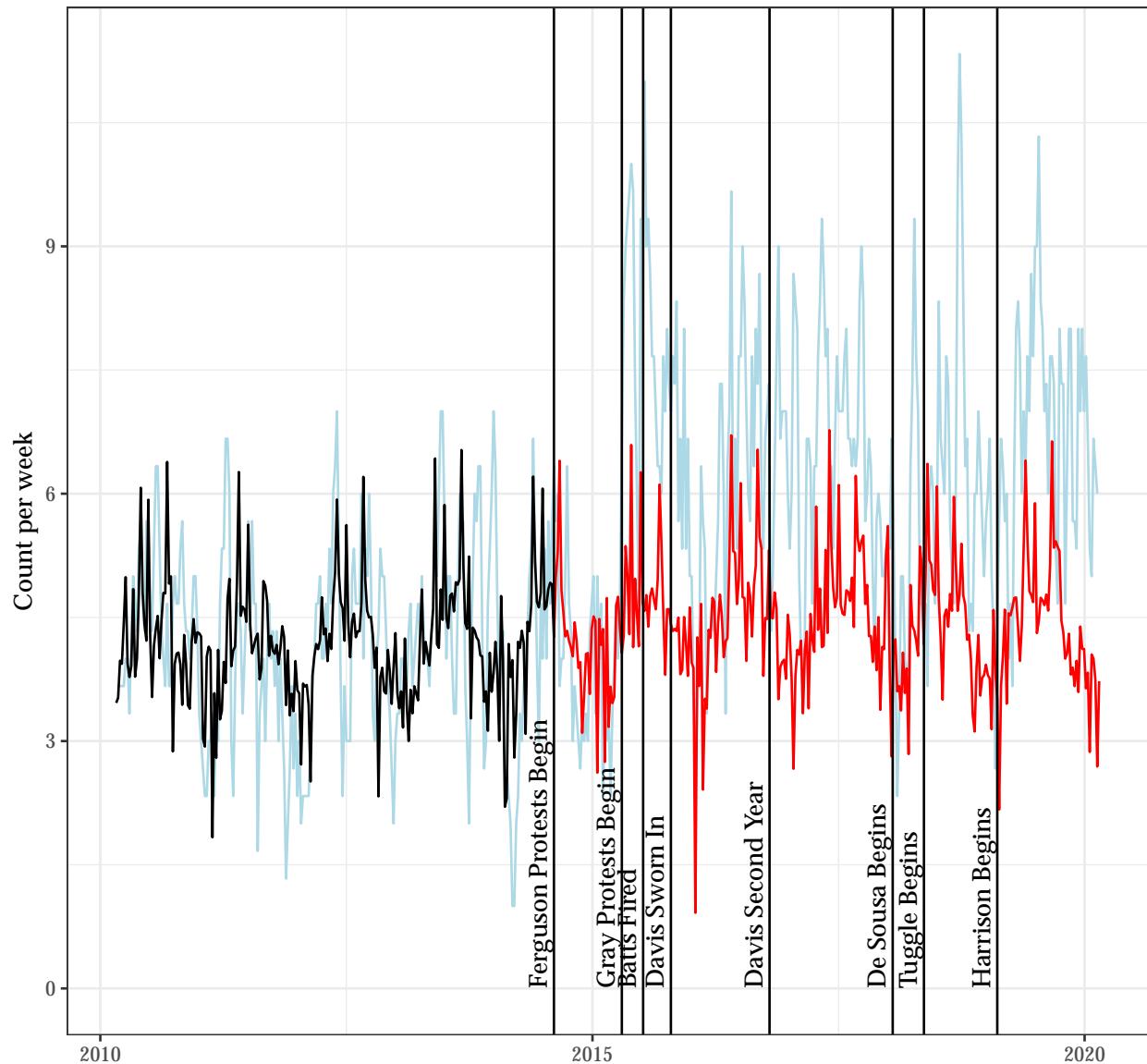
Table 4.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0005	0.001		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.29		-0.20	-0.14
After Gray Protests Begin (week of 4/20/15 onward)	4.65		3.92	3.98
Unrest and National Guard (4/27/15 - 5/3/2015)	0.37		1.00	0.76
After Batts Fired (week of 7/13/15 onward)	-1.14		-0.98	-1.34
After Davis Confirmed (week of 10/19/15 onward)	-1.32		-0.99	-0.82
After Davis First Year (week of 10/17/16 onward)	0.25		0.22	0.20
After De Sousa Begins (week of 1/19/18 onward)	-1.18		-0.77	-0.76
After Tuggle Begins (week of 5/14/18 onward)	0.75		0.42	0.24
After Harrison Begins (week of 2/11/19 onward)	0.63		0.71	0.66
Average Maximum Temperature to 50 Degrees		-0.07		-0.03
Plus Degrees in the 50s		0.16		0.09
Plus Degrees in the 60s		-0.11		-0.01
Plus Degrees in the 70s		0.14		0.01
Plus Degrees Greater Than 80		-0.15		-0.03
Snowfall (inches)		-0.82		-0.59
Precipitation (inches)		-1.29		-1.02
Darkness Before Midnight (hours)		0.04		0.18
Thanksgiving/Christmas (proportion of week)		-3.06		-6.90
Winter Holiday (proportion of week)		-7.92		-3.86
Other Out-of-School Days (proportion of week)		0.61		0.12
Summer Vacation (proportion of week)		-0.29		0.01
Summer Holiday (proportion of week)		9.71		6.70
Observations	522	232	522	522
R <sup>2</sup>	0.21	0.12	0.18	0.27

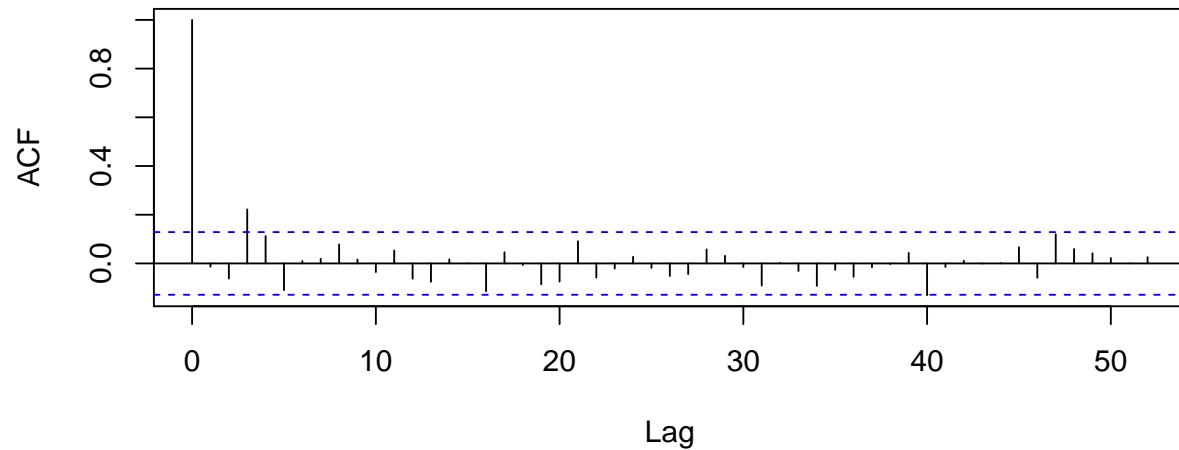
#### 4.3 Least Squares Updated Model (2) for homicide homicide



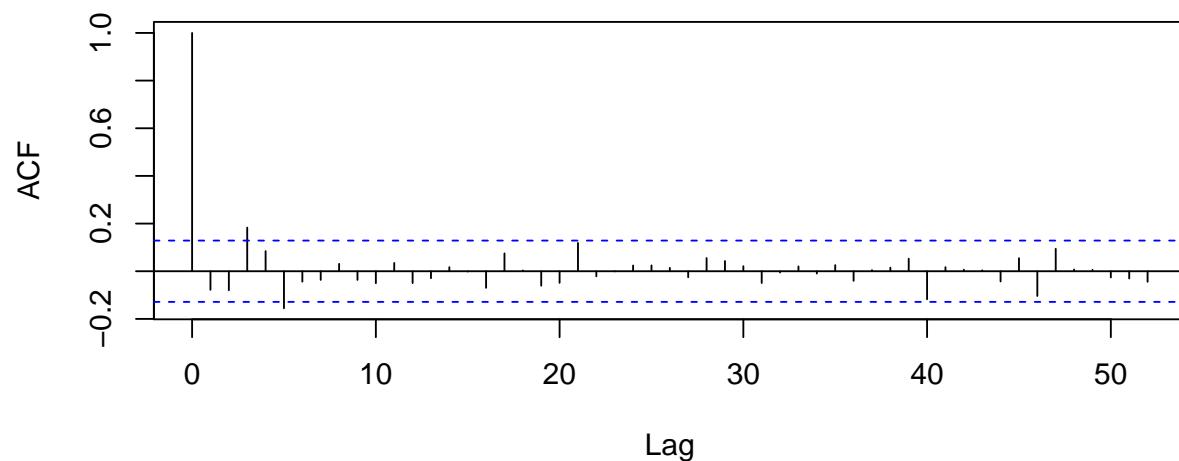
## homicide



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.0202 -0.8057 -0.1045  0.5375  2.4263  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.1516512  0.7086429  3.036  0.0024 **  
t            0.0002920  0.0004939  0.591  0.5545  
tmax.f.spline1 -0.0201432  0.0130817 -1.540  0.1236  
tmax.f.spline2  0.0434211  0.0266851  1.627  0.1037  
tmax.f.spline3 -0.0287628  0.0316112 -0.910  0.3629  
tmax.f.spline4  0.0315944  0.0298694  1.058  0.2902  
tmax.f.spline5 -0.0346440  0.0241572 -1.434  0.1515  
snow.in       -0.2486599  0.1897609 -1.310  0.1901  
precip.in      -0.3216257  0.1939985 -1.658  0.0973 .  
dark.before.12  0.0100915  0.0497306  0.203  0.8392  
thanks.xmas     -0.8052147  1.4861707 -0.542  0.5880  
summer.holiday   1.8533016  0.9165516  2.022  0.0432 *  
winter.holiday  -2.4085700  1.6171944 -1.489  0.1364  
summer.vacation -0.0563899  0.1280171 -0.440  0.6596  
oth.ns          0.1574253  0.1817325  0.866  0.3864  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 267.65 on 231 degrees of freedom  
Residual deviance: 237.56 on 217 degrees of freedom  
AIC: 1000.6  
  
Number of Fisher Scoring iterations: 5
```

## 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	Pctl(25)	Median	Pctl(75)	Max
shooting	232	7.526	3.623	0	5	7	10	22

Table 5.2: Descriptives for Outcome After Ferguson Protests Begin

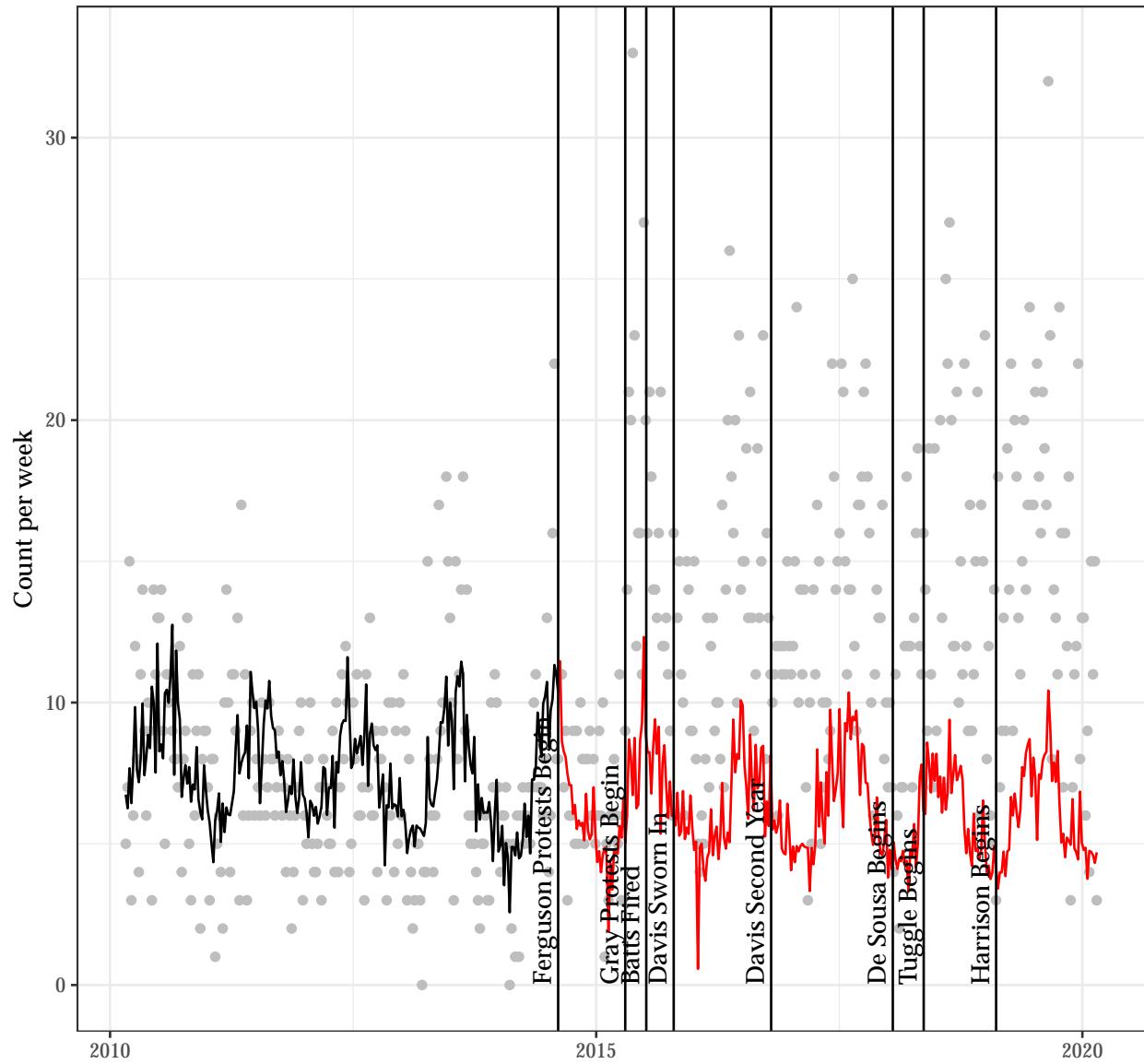
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting	290	12.703	5.704	1	8.2	12	16	33

## 5.2 Four Models for shooting

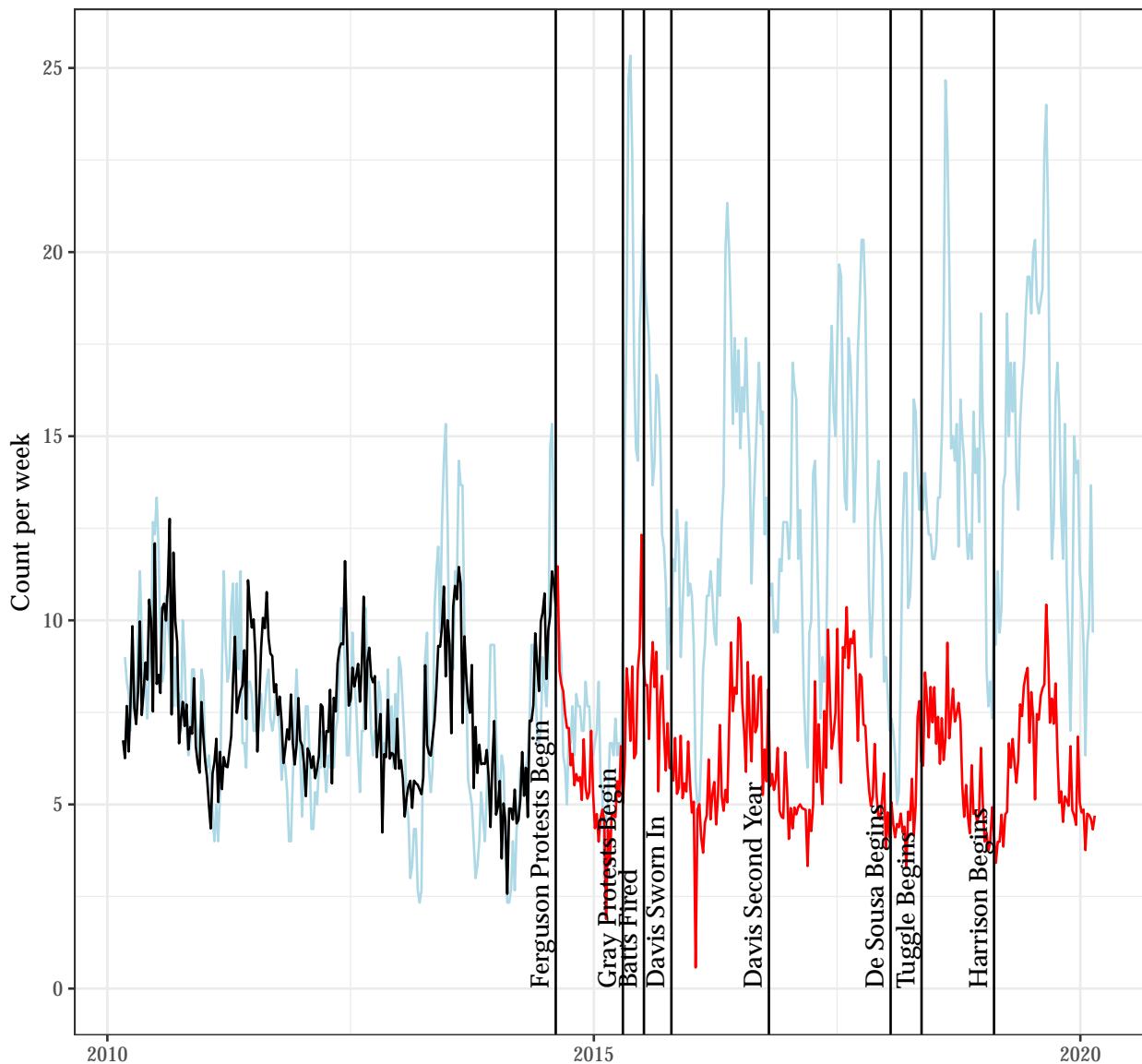
Table 5.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.004	-0.01		-0.003
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.13		0.97	0.97
After Gray Protests Begin (week of 4/20/15 onward)	12.15		9.84	9.42
Unrest and National Guard (4/27/15 - 5/3/2015)	-4.93		-2.87	-3.00
After Batts Fired (week of 7/13/15 onward)	-4.86		-4.40	-5.01
After Davis Confirmed (week of 10/19/15 onward)	-1.08		0.21	0.71
After Davis First Year (week of 10/17/16 onward)	0.29		-0.03	0.16
After De Sousa Begins (week of 1/19/18 onward)	-2.12		-0.94	-0.77
After Tuggle Begins (week of 5/14/18 onward)	3.60		2.17	2.05
After Harrison Begins (week of 2/11/19 onward)	0.48		0.46	0.67
Average Maximum Temperature to 50 Degrees		0.05		0.06
Plus Degrees in the 50s		-0.04		-0.03
Plus Degrees in the 60s		0.12		0.12
Plus Degrees in the 70s		0.13		0.11
Plus Degrees Greater Than 80		-0.62		-0.44
Snowfall (inches)		-0.74		-0.80
Precipitation (inches)		-1.80		-2.38
Darkness Before Midnight (hours)		0.24		0.16
Thanksgiving/Christmas (proportion of week)		9.55		4.43
Winter Holiday (proportion of week)		-4.16		-2.62
Other Out-of-School Days (proportion of week)		0.34		0.03
Summer Vacation (proportion of week)		2.43		1.94
Summer Holiday (proportion of week)		10.66		-0.76
Observations	522	232	522	522
R <sup>2</sup>	0.34	0.26	0.45	0.47

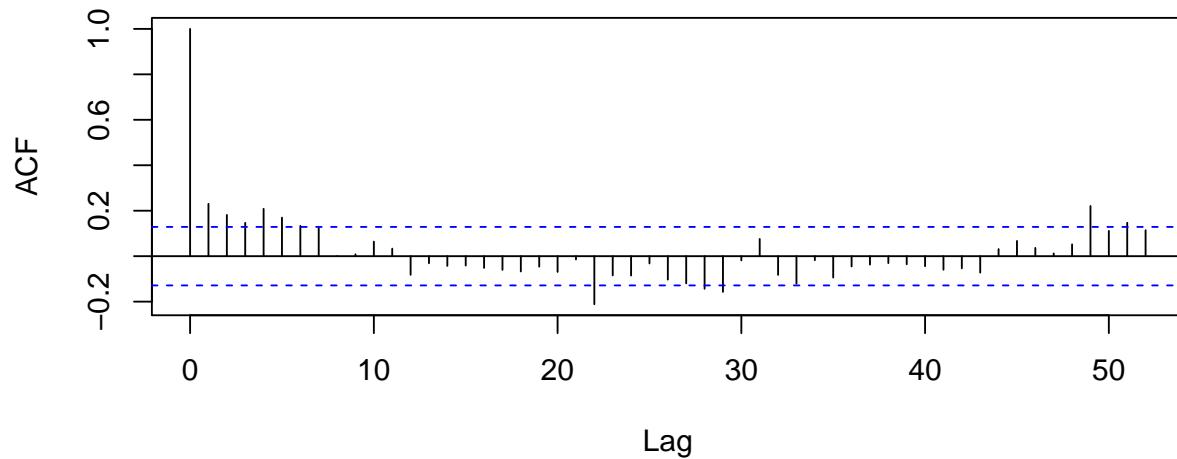
### 5.3 Least Squares Updated Model (2) for shooting shooting



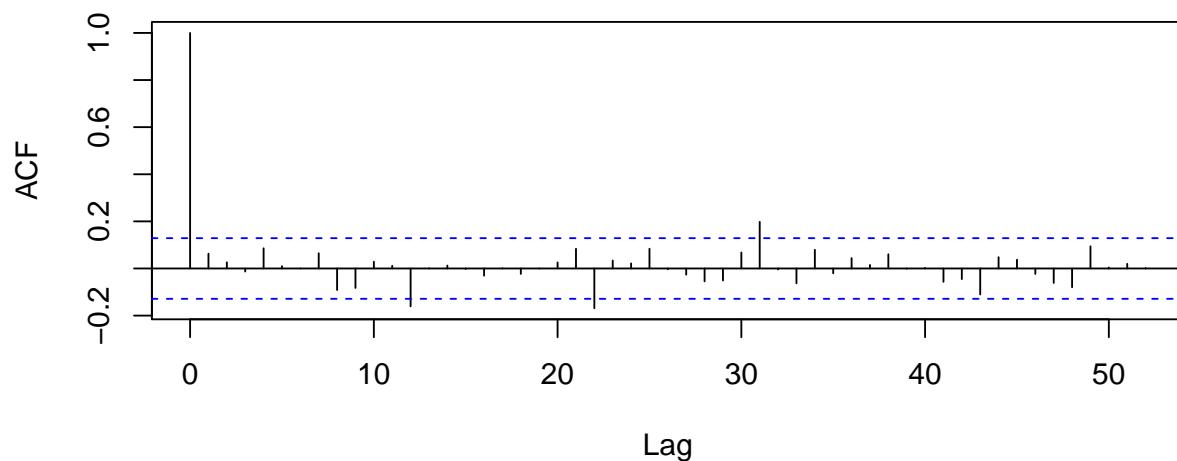
## shooting



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.3182 -0.8726 -0.1089  0.7463  2.8431  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.2898789  0.5749371  2.244  0.02486 *  
t            -0.0007615  0.0003678 -2.071  0.03840 *  
tmax.f.spline1 0.0080046  0.0106785  0.750  0.45350  
tmax.f.spline2 -0.0056872  0.0210822 -0.270  0.78734  
tmax.f.spline3 0.0184669  0.0249693  0.740  0.45955  
tmax.f.spline4 0.0104846  0.0227692  0.460  0.64518  
tmax.f.spline5 -0.0709481  0.0175947 -4.032 5.52e-05 ***  
snow.in       -0.2023314  0.1627364 -1.243  0.21375  
precip.in      -0.2357533  0.1376990 -1.712  0.08688 .  
dark.before.12 0.0362542  0.0385667  0.940  0.34720  
thanks.xmas    1.3681297  1.0516340  1.301  0.19327  
summer.holiday 1.1794216  0.7009708  1.683  0.09246 .  
winter.holiday -0.7220203  1.2206635 -0.591  0.55419  
summer.vacation 0.2675868  0.0931704  2.872  0.00408 **  
oth.ns         0.0568306  0.1410106  0.403  0.68693  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 410.47 on 231 degrees of freedom  
Residual deviance: 304.88 on 217 degrees of freedom  
AIC: 1202.4  
  
Number of Fisher Scoring iterations: 5
```

## 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	Pctl(25)	Median	Pctl(75)	Max
rape	232	5.647	2.530	0	4	5	7	16

Table 6.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
rape	290	5.838	2.855	0	4	6	8	14

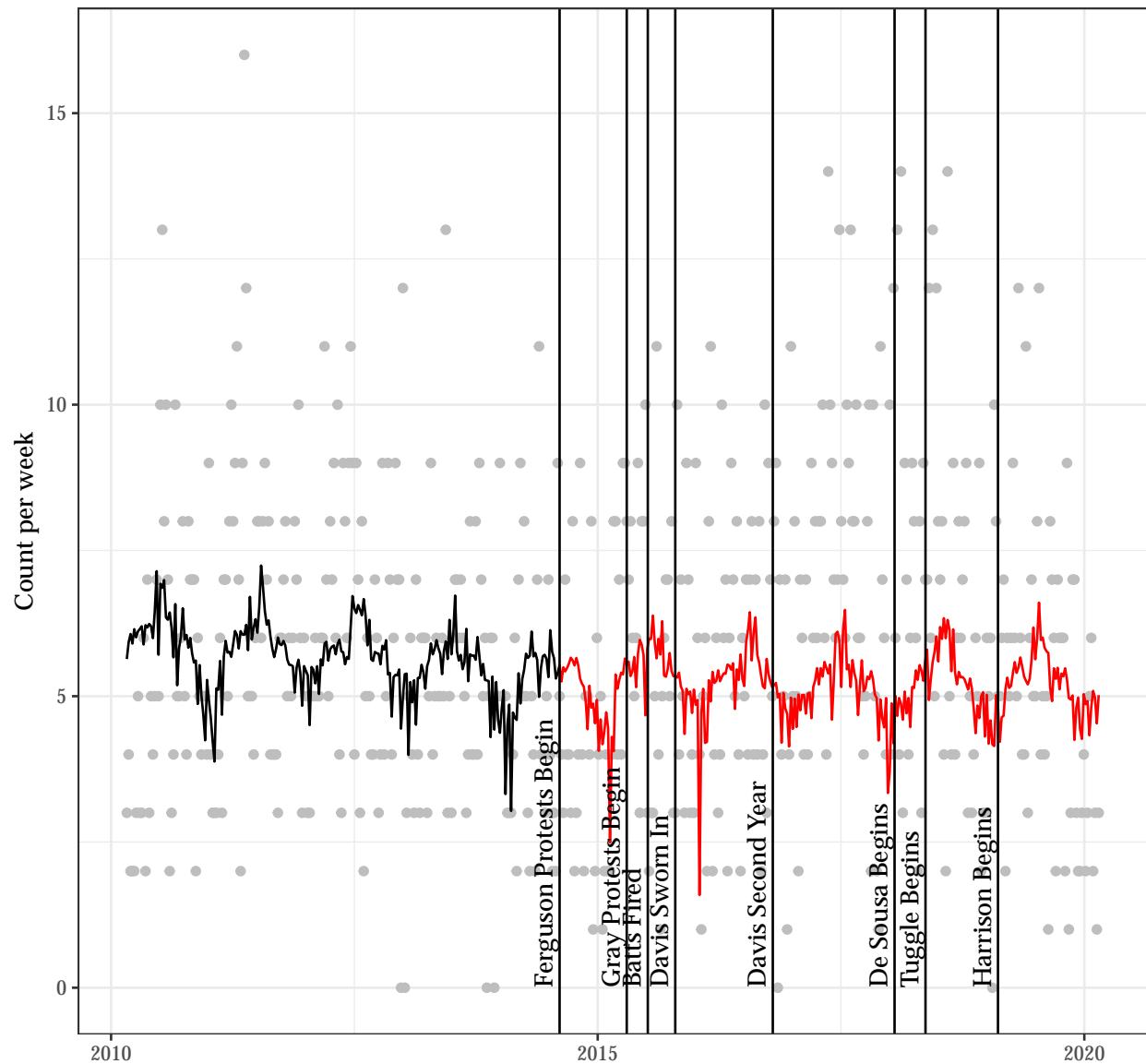
## 6.2 Four Models for rape

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

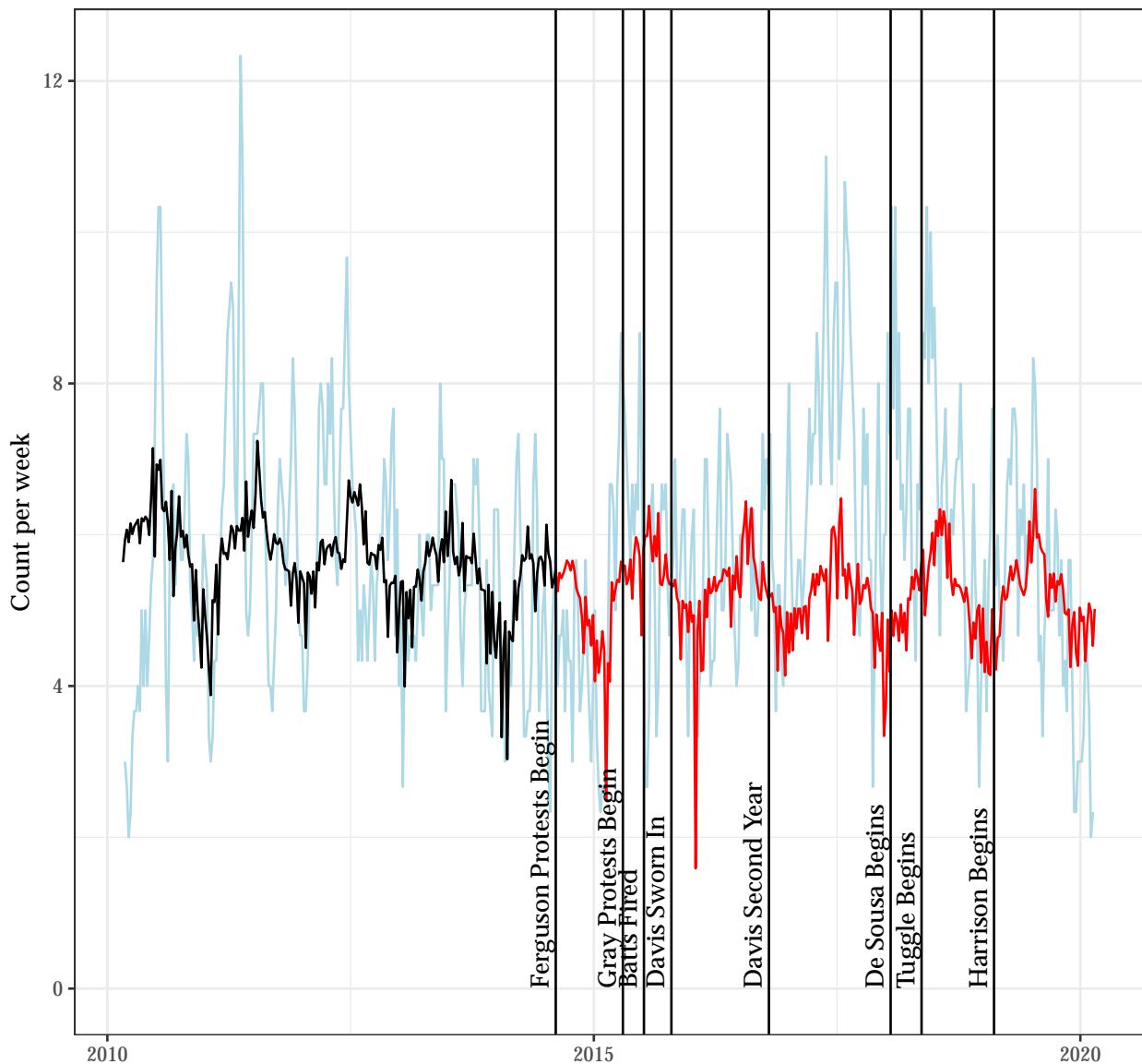
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.004	-0.002		-0.003
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.55		-0.38	-0.30
After Gray Protests Begin (week of 4/20/15 onward)	2.20		1.57	1.30
Unrest and National Guard (4/27/15 - 5/3/2015)	0.26		0.22	0.18
After Batts Fired (week of 7/13/15 onward)	-1.68		-1.95	-1.48
After Davis Confirmed (week of 10/19/15 onward)	0.70		1.11	1.09
After Davis First Year (week of 10/17/16 onward)	1.39		1.33	1.51
After De Sousa Begins (week of 1/19/18 onward)	0.33		0.22	0.21
After Tuggle Begins (week of 5/14/18 onward)	-0.45		-0.80	-0.48
After Harrison Begins (week of 2/11/19 onward)	-1.12		-1.22	-1.17
Average Maximum Temperature to 50 Degrees		0.05		-0.002
Plus Degrees in the 50s		-0.05		-0.01
Plus Degrees in the 60s		0.04		0.05
Plus Degrees in the 70s		-0.07		-0.08
Plus Degrees Greater Than 80		0.14		0.06
Snowfall (inches)		-0.63		-0.13
Precipitation (inches)		0.50		-0.14
Darkness Before Midnight (hours)		-0.07		-0.34
Thanksgiving/Christmas (proportion of week)		-4.95		-7.07
Winter Holiday (proportion of week)		-3.38		-8.29
Other Out-of-School Days (proportion of week)		0.01		0.06
Summer Vacation (proportion of week)		-0.12		0.01
Summer Holiday (proportion of week)		-4.11		0.47
Observations	522	232	522	522
R <sup>2</sup>	0.06	0.06	0.07	0.12

### 6.3 Least Squares Updated Model (2) for rape

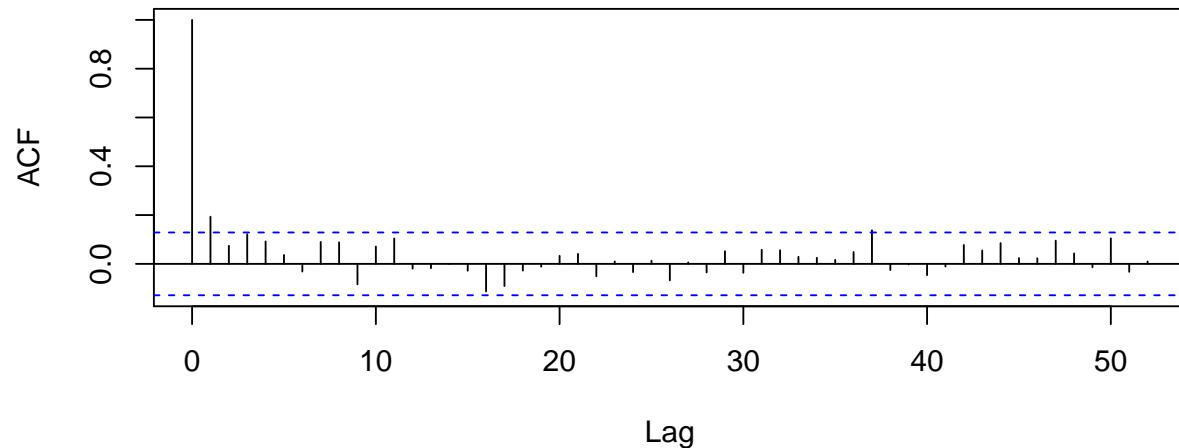
rape



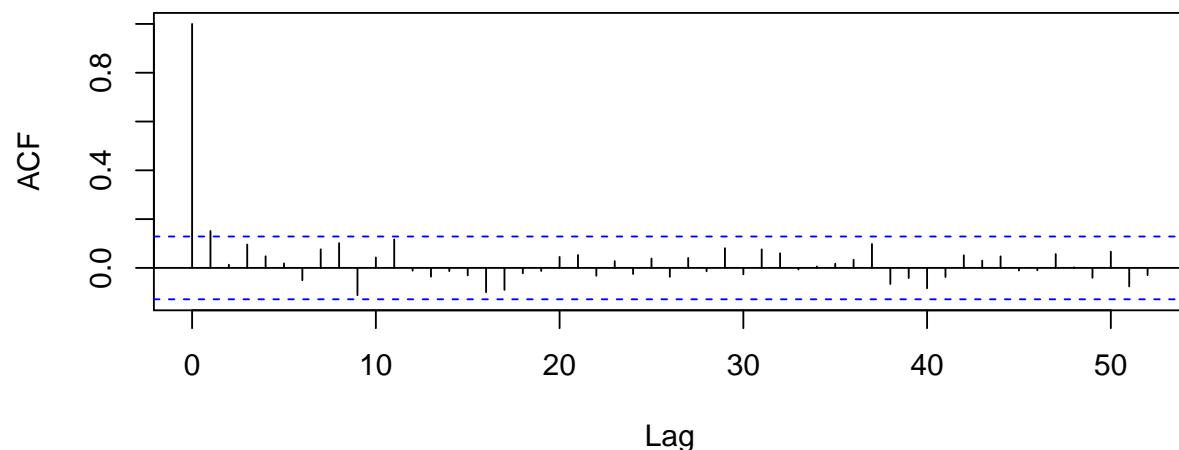
rape



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.2876 -0.7473 -0.0972  0.5571  3.3448  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.3348947  0.6273502  2.128  0.0334 *  
t            -0.0003530  0.0004293 -0.822  0.4109  
tmax.f.spline1 0.0097707  0.0115336  0.847  0.3969  
tmax.f.spline2 -0.0103711  0.0224173 -0.463  0.6436  
tmax.f.spline3  0.0065985  0.0266807  0.247  0.8047  
tmax.f.spline4 -0.0124695  0.0255389 -0.488  0.6254  
tmax.f.spline5  0.0223389  0.0210129  1.063  0.2877  
snow.in        -0.1494618  0.1629606 -0.917  0.3591  
precip.in       0.0843946  0.1532250  0.551  0.5818  
dark.before.12 -0.0122805  0.0420366 -0.292  0.7702  
thanks.xmas     -0.9993578  1.3035845 -0.767  0.4433  
summer.holiday -0.6884105  0.9032956 -0.762  0.4460  
winter.holiday -0.7088740  1.2878209 -0.550  0.5820  
summer.vacation -0.0197795  0.1167440 -0.169  0.8655  
oth.ns          0.0031963  0.1580016  0.020  0.9839  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 273.25 on 231 degrees of freedom  
Residual deviance: 257.21 on 217 degrees of freedom  
AIC: 1092  
  
Number of Fisher Scoring iterations: 4
```

## 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	Pctl(25)	Median	Pctl(75)	Max
robbery.carjacking	232	3.155	2.071	0	2	3	4.2	11

Table 7.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
robbery.carjacking	290	8.638	4.736	0	5	8	11	30

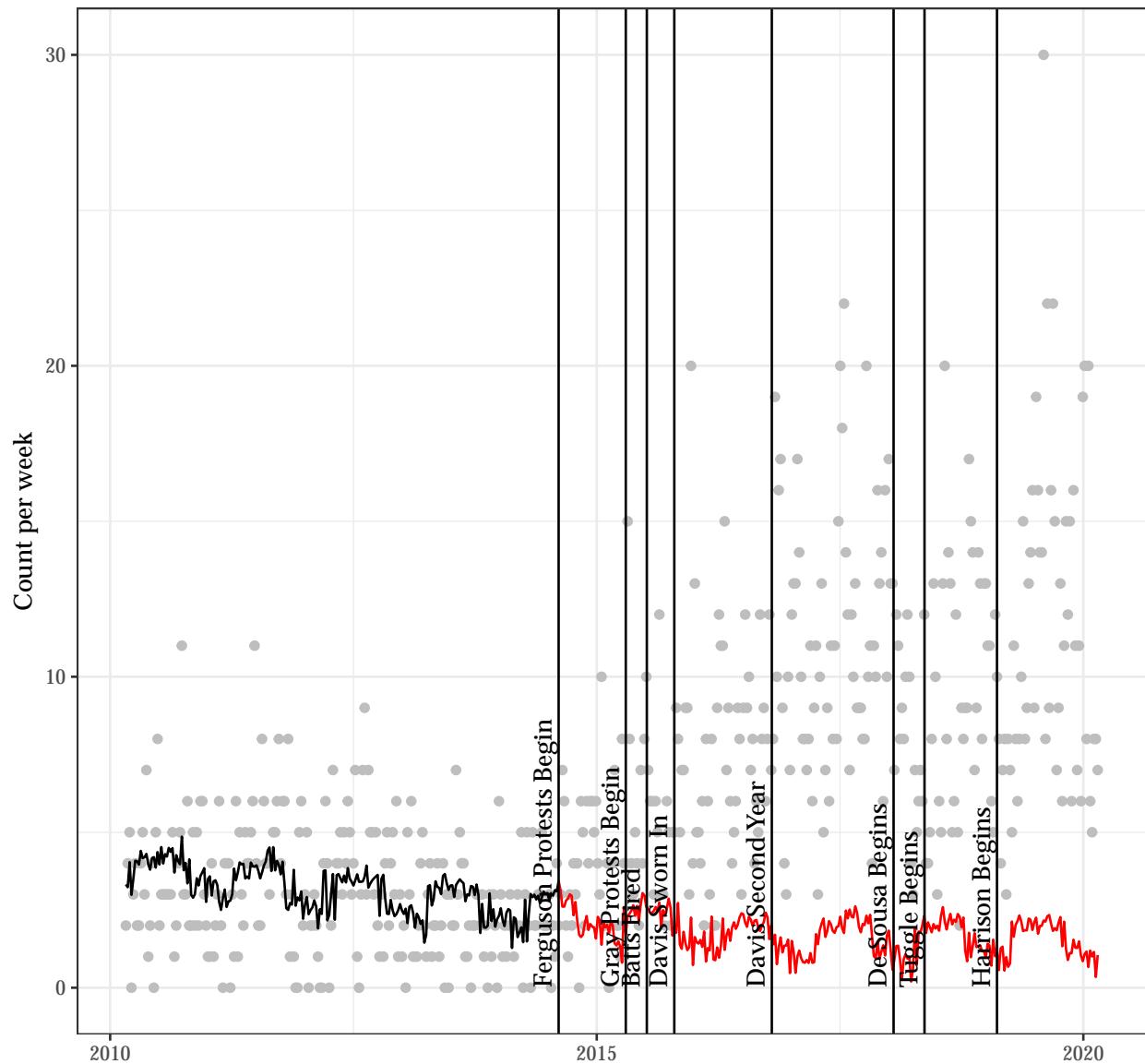
## 7.2 Four Models for robbery.carjacking

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

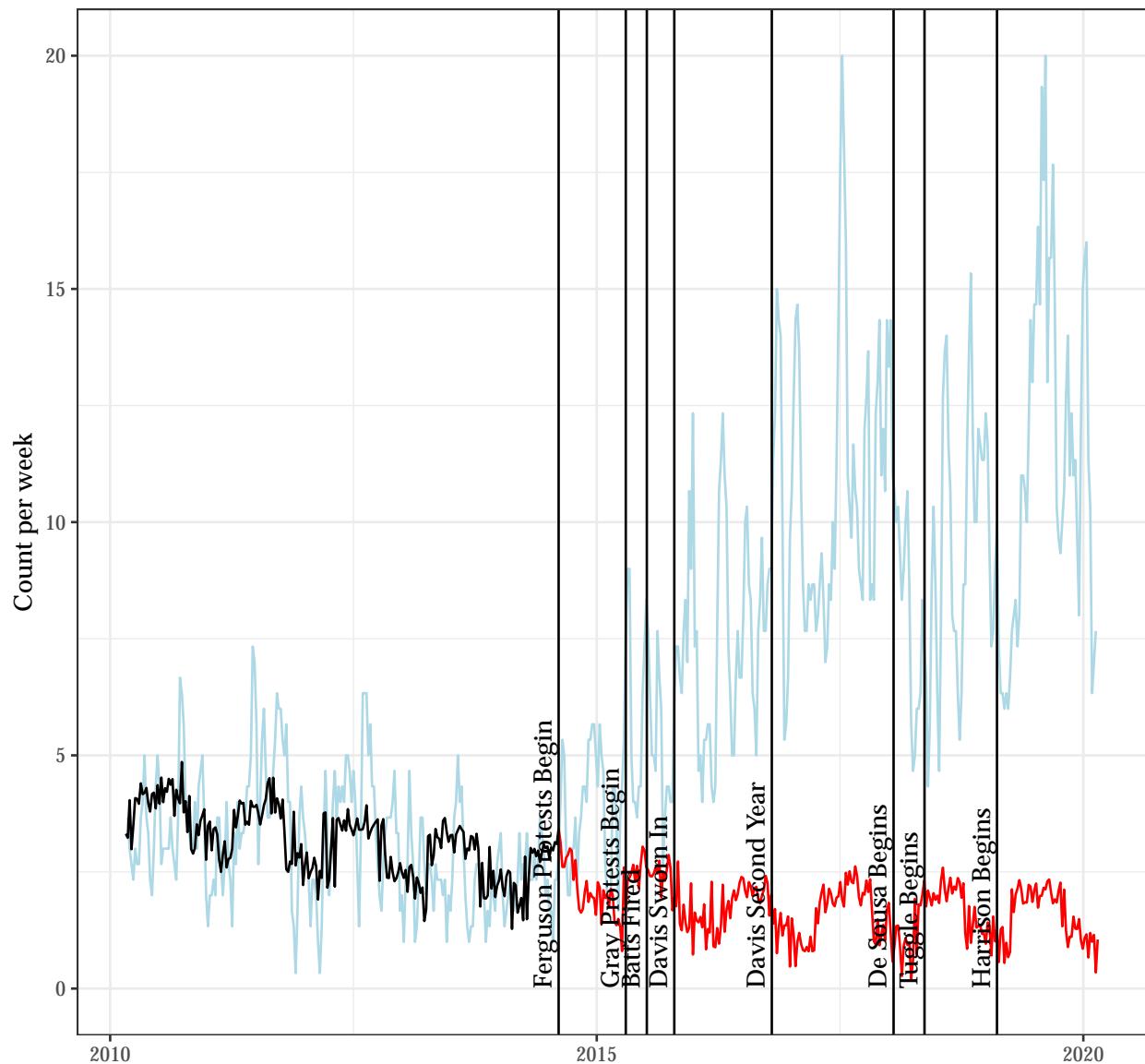
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.004	-0.01		-0.004
After Ferguson Protests Begin (week of 8/11/14 onward)	1.25		1.72	1.46
After Gray Protests Begin (week of 4/20/15 onward)	1.63		1.14	1.49
Unrest and National Guard (4/27/15 - 5/3/2015)	9.62		9.83	10.06
After Batts Fired (week of 7/13/15 onward)	-0.24		-0.22	-1.15
After Davis Confirmed (week of 10/19/15 onward)	2.57		3.12	3.36
After Davis First Year (week of 10/17/16 onward)	3.63		3.55	3.49
After De Sousa Begins (week of 1/19/18 onward)	-2.89		-2.61	-1.98
After Tuggle Begins (week of 5/14/18 onward)	1.82		1.08	0.54
After Harrison Begins (week of 2/11/19 onward)	1.92		1.90	2.24
Average Maximum Temperature to 50 Degrees		-0.03		0.03
Plus Degrees in the 50s		0.01		-0.08
Plus Degrees in the 60s		0.18		0.23
Plus Degrees in the 70s		-0.18		-0.25
Plus Degrees Greater Than 80		-0.02		0.15
Snowfall (inches)		-0.03		-0.19
Precipitation (inches)		0.56		0.76
Darkness Before Midnight (hours)		0.11		0.57
Thanksgiving/Christmas (proportion of week)		3.98		9.94
Winter Holiday (proportion of week)		-4.43		1.29
Other Out-of-School Days (proportion of week)		-0.60		-0.64
Summer Vacation (proportion of week)		0.46		1.66
Summer Holiday (proportion of week)		1.03		-0.25
Observations	522	232	522	522
R <sup>2</sup>	0.52	0.12	0.61	0.55

### 7.3 Least Squares Updated Model (2) for robbery.carjacking

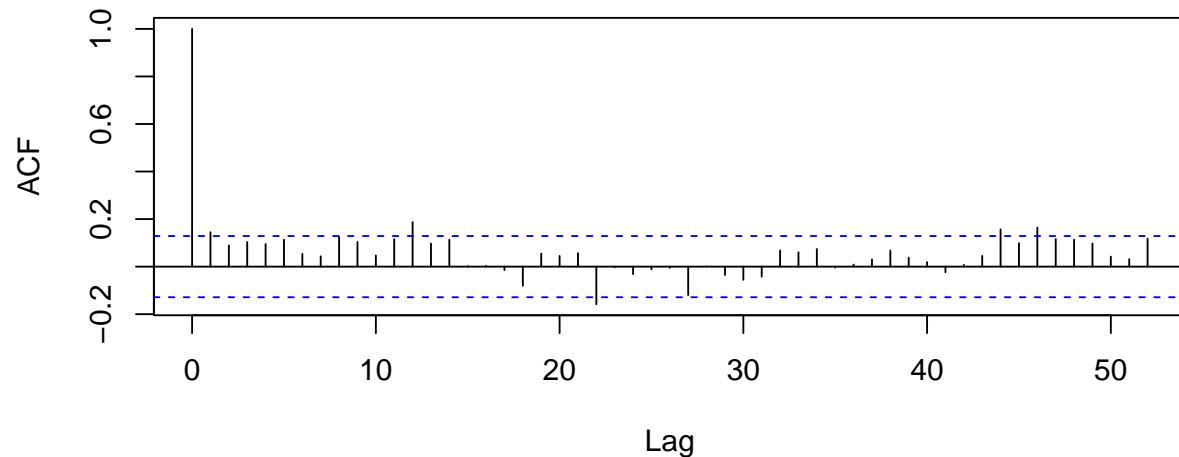
#### robbery.carjacking



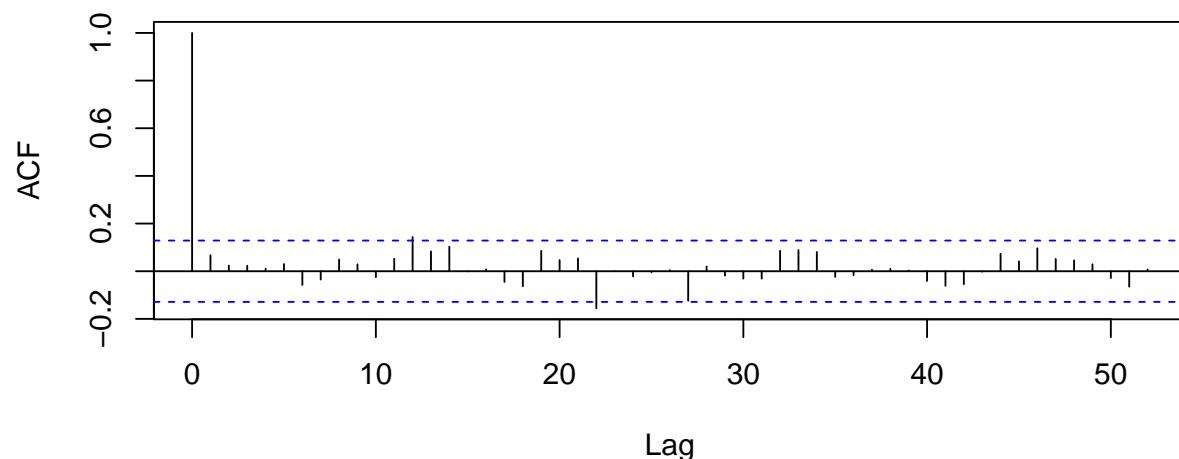
## robbery.carjacking



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-2.9315 -0.8304 -0.1248  0.5684  2.9360  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.5187890  0.8389099  1.810 0.070229 .  
t            -0.0020471  0.0005712 -3.584 0.000338 ***  
tmax.f.spline1 -0.0125280  0.0153753 -0.815 0.415180  
tmax.f.spline2  0.0047008  0.0320326  0.147 0.883330  
tmax.f.spline3  0.0622943  0.0389701  1.599 0.109929  
tmax.f.spline4 -0.0612355  0.0345185 -1.774 0.076064 .  
tmax.f.spline5 -0.0050605  0.0273494 -0.185 0.853203  
snow.in        -0.0234624  0.1967483 -0.119 0.905077  
precip.in       0.1493620  0.1952485  0.765 0.444281  
dark.before.12  0.0414024  0.0596160  0.694 0.487378  
thanks.xmas     1.3974755  1.6286721  0.858 0.390867  
summer.holiday  0.2995971  1.1462780  0.261 0.793811  
winter.holiday -1.8237694  1.8386583 -0.992 0.321245  
summer.vacation 0.1371590  0.1514837  0.905 0.365234  
oth.ns          -0.2182117  0.2288173 -0.954 0.340261  
---  
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: 307.49 on 217 degrees of freedom  
AIC: 970.04  
  
Number of Fisher Scoring iterations: 5
```

## 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	Pctl(25)	Median	Pctl(75)	Max
robbery.street	232	50.642	12.483	24	42	50	58.2	97

Table 8.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
robbery.street	290	67.490	17.742	24	55	68	79.8	128

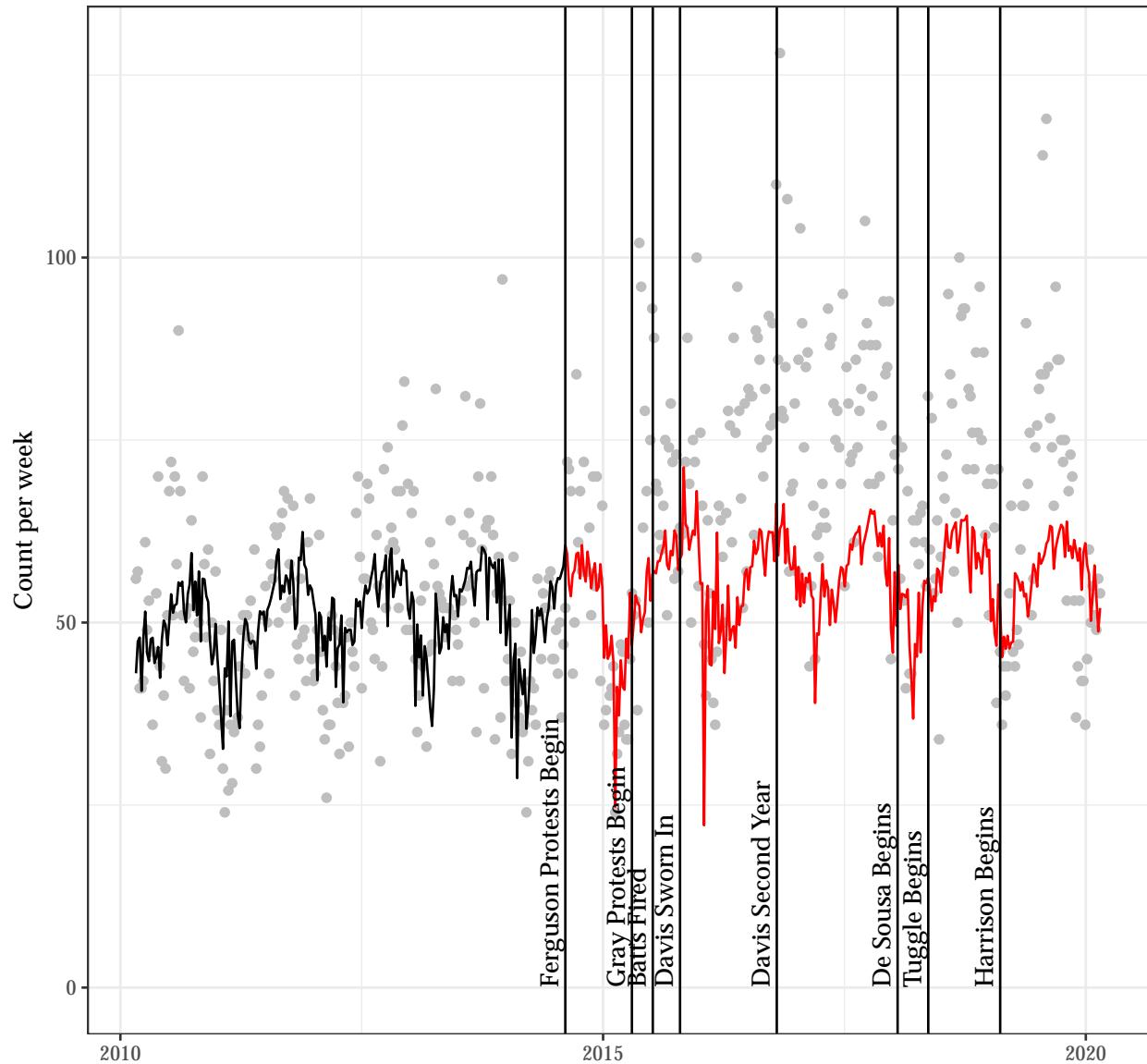
## 8.2 Four Models for robbery.street

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

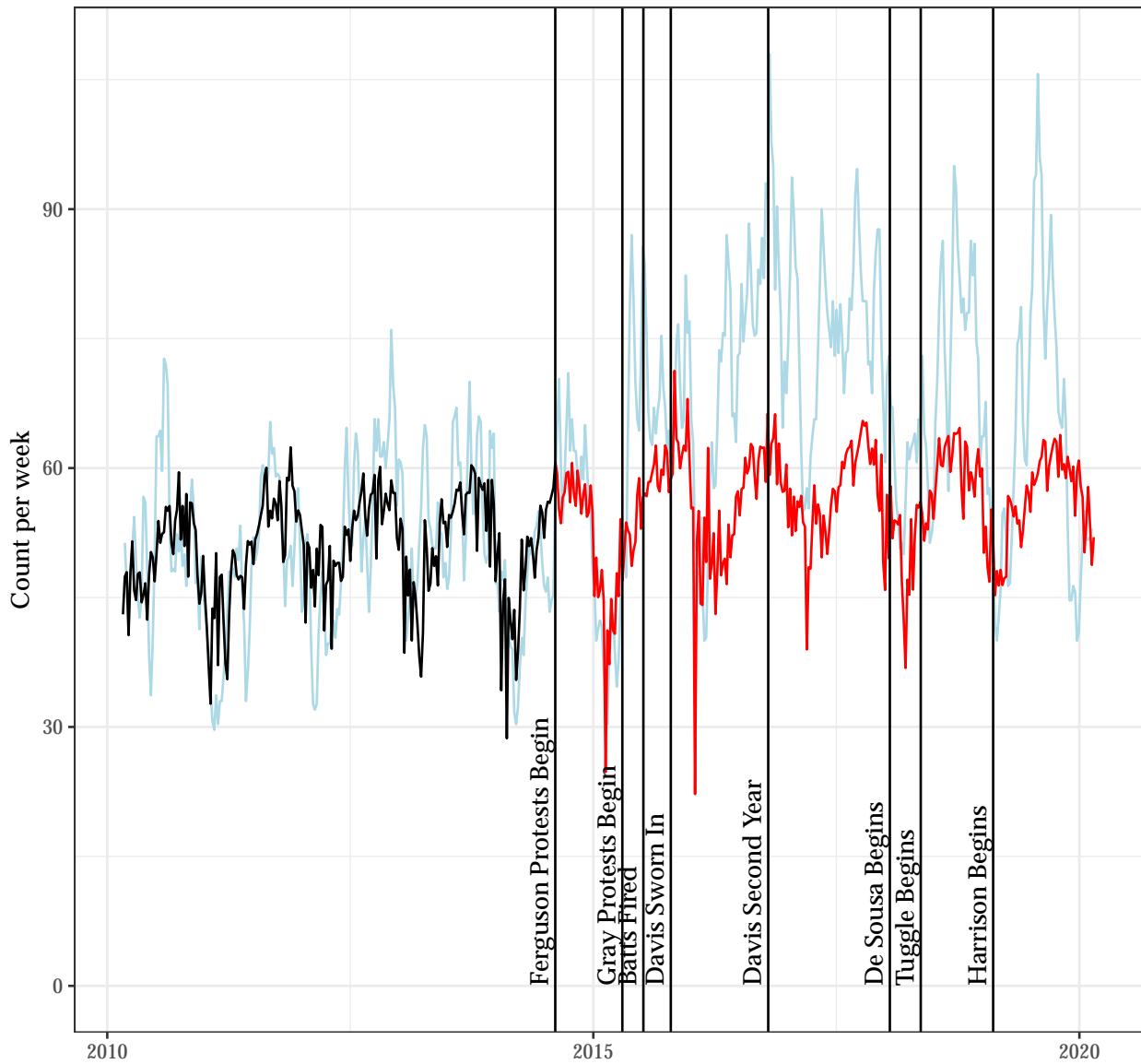
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.01	0.02		0.02
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.28		0.20	1.36
After Gray Protests Begin (week of 4/20/15 onward)	18.09		17.02	13.93
Unrest and National Guard (4/27/15 - 5/3/2015)	-19.04		-16.19	-14.59
After Batts Fired (week of 7/13/15 onward)	-2.22		-8.44	-8.86
After Davis Confirmed (week of 10/19/15 onward)	1.08		5.05	6.59
After Davis First Year (week of 10/17/16 onward)	7.41		6.20	6.19
After De Sousa Begins (week of 1/19/18 onward)	-18.93		-11.56	-12.50
After Tuggle Begins (week of 5/14/18 onward)	12.62		5.14	3.54
After Harrison Begins (week of 2/11/19 onward)	-9.26		-6.81	-7.45
Average Maximum Temperature to 50 Degrees		0.49		0.65
Plus Degrees in the 50s		-0.07		-0.06
Plus Degrees in the 60s		0.63		0.39
Plus Degrees in the 70s		-0.80		-0.37
Plus Degrees Greater Than 80		-0.27		-0.22
Snowfall (inches)		-5.98		-2.66
Precipitation (inches)		4.77		3.51
Darkness Before Midnight (hours)		6.40		6.26
Thanksgiving/Christmas (proportion of week)		-8.54		-6.25
Winter Holiday (proportion of week)		-31.03		-35.92
Other Out-of-School Days (proportion of week)		0.55		-4.67
Summer Vacation (proportion of week)		5.23		0.40
Summer Holiday (proportion of week)		-21.35		-24.11
Observations	522	232	522	522
R <sup>2</sup>	0.34	0.23	0.25	0.49

### 8.3 Least Squares Updated Model (2) for robbery.street

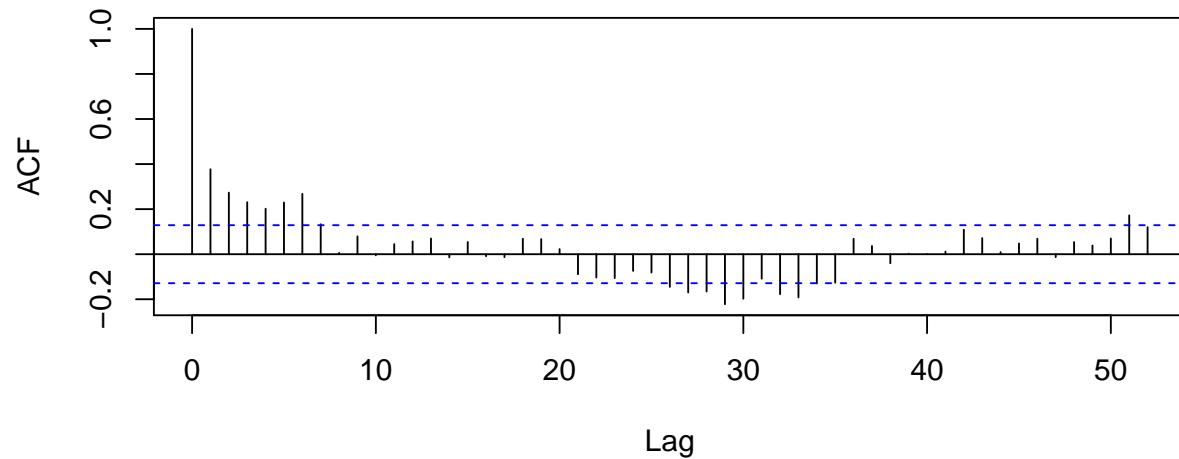
robbery.street



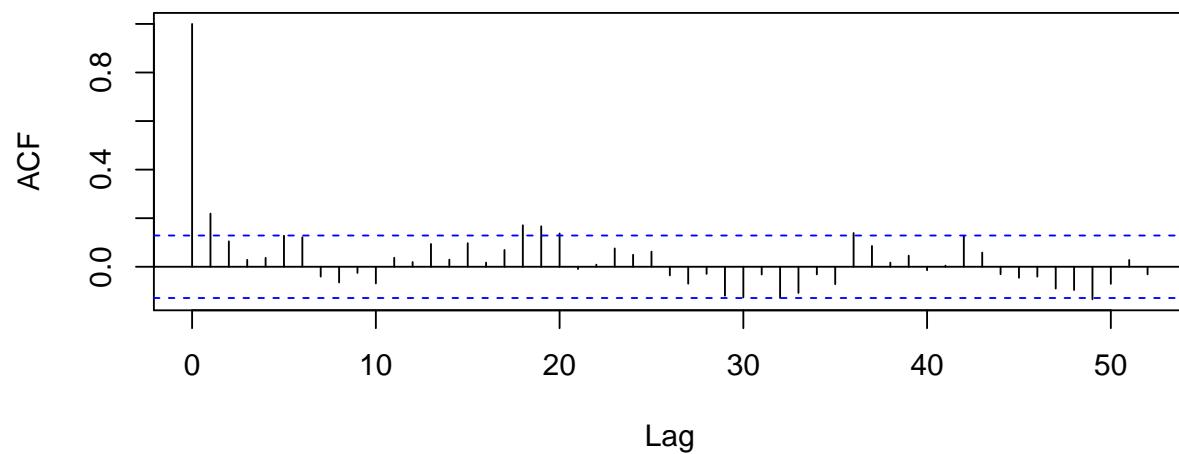
## robbery.street



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.570  -1.106  -0.036   0.952   4.522  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.5385267  0.2051416 12.375 < 2e-16 ***  
t            0.0004340  0.0001444  3.006  0.00264 **  
tmax.f.spline1 0.0096077  0.0037765  2.544  0.01096 *  
tmax.f.spline2 -0.0017489  0.0075000 -0.233  0.81562  
tmax.f.spline3  0.0136003  0.0090287  1.506  0.13198  
tmax.f.spline4 -0.0165405  0.0086444 -1.913  0.05569 .  
tmax.f.spline5 -0.0050603  0.0071265 -0.710  0.47766  
snow.in        -0.1602061  0.0541413 -2.959  0.00309 **  
precip.in       0.0927756  0.0507808  1.827  0.06770 .  
dark.before.12  0.1282986  0.0142056  9.032 < 2e-16 ***  
thanks.xmas     -0.1899076  0.3915296 -0.485  0.62765  
summer.holiday  -0.4188765  0.3067838 -1.365  0.17213  
winter.holiday  -0.7015185  0.4275622 -1.641  0.10085  
summer.vacation 0.1026203  0.0391220  2.623  0.00871 **  
oth.ns          0.0139564  0.0532084  0.262  0.79309  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 703.96 on 231 degrees of freedom  
Residual deviance: 533.06 on 217 degrees of freedom  
AIC: 1893.7  
  
Number of Fisher Scoring iterations: 4
```

## 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	Pctl(25)	Median	Pctl(75)	Max
robbery.commercial	232	10.578	4.377	2	8	10	13	25

Table 9.2: Descriptives for Outcome After Ferguson Protests Begin

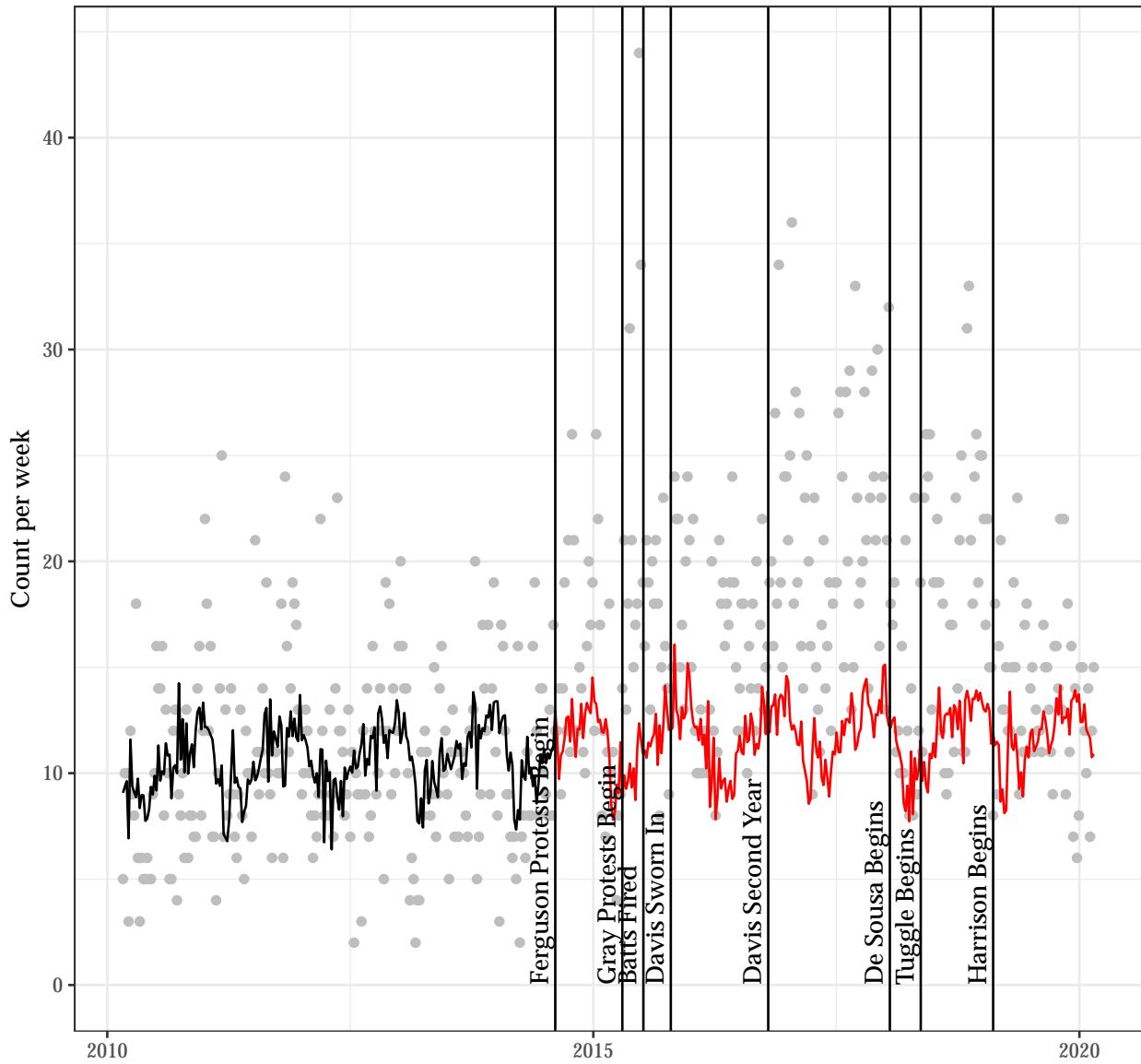
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
robbery.commercial	290	16.938	6.062	4	12	16	21	44

## 9.2 Four Models for robbery.commercial

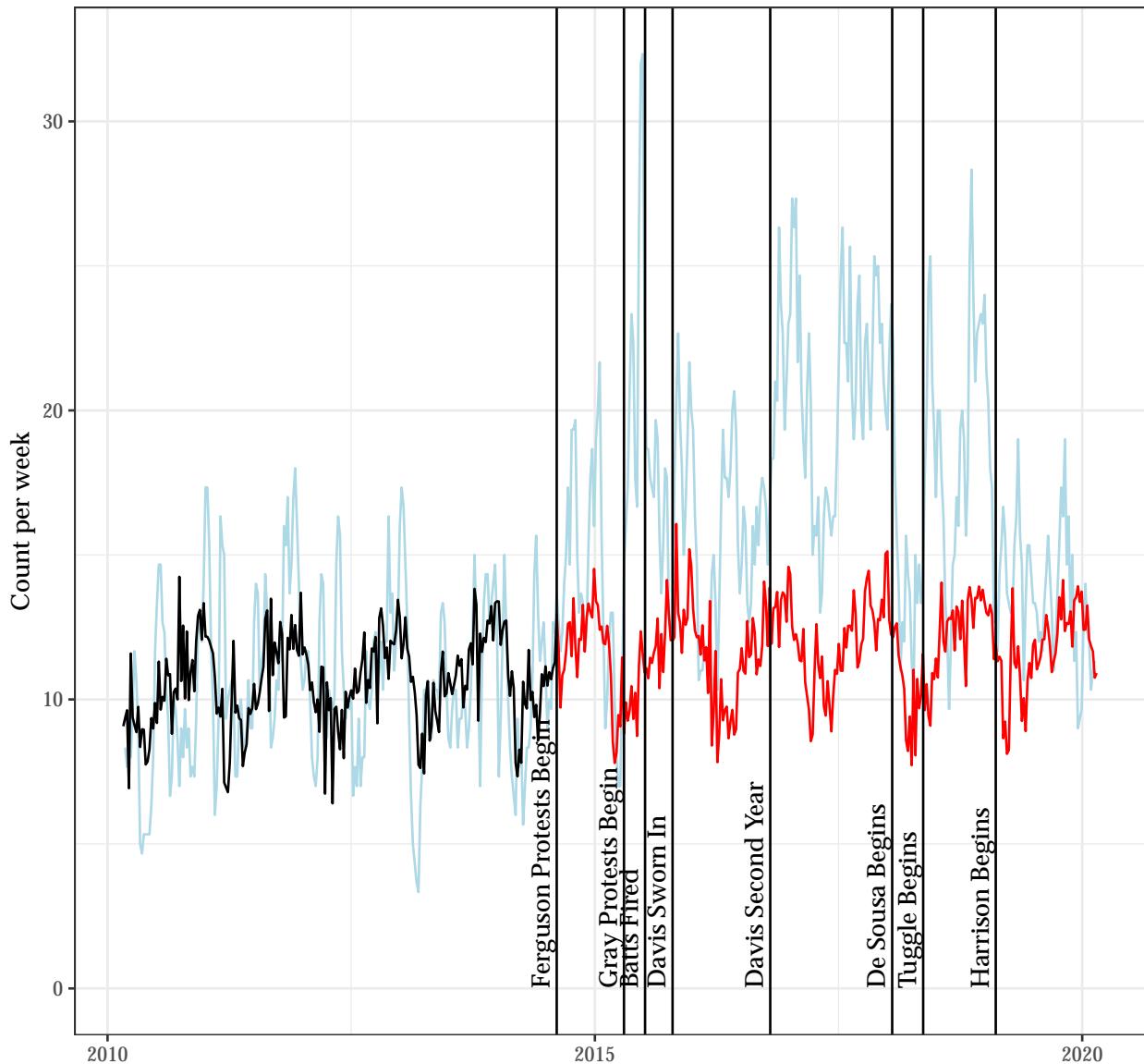
Table 9.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.003	0.005	0.003	
After Ferguson Protests Begin (week of 8/11/14 onward)	2.88		2.20	2.69
After Gray Protests Begin (week of 4/20/15 onward)	8.18		9.75	9.35
Unrest and National Guard (4/27/15 - 5/3/2015)	-1.17		-0.85	-0.44
After Batts Fired (week of 7/13/15 onward)	-5.72		-7.30	-6.80
After Davis Confirmed (week of 10/19/15 onward)	-0.69		-0.24	-0.37
After Davis First Year (week of 10/17/16 onward)	4.74		4.36	4.30
After De Sousa Begins (week of 1/19/18 onward)	-7.25		-5.32	-5.76
After Tuggle Begins (week of 5/14/18 onward)	5.21		3.29	3.57
After Harrison Begins (week of 2/11/19 onward)	-5.63		-4.86	-5.11
Average Maximum Temperature to 50 Degrees		-0.10		0.04
Plus Degrees in the 50s		0.09		-0.13
Plus Degrees in the 60s		0.42		0.42
Plus Degrees in the 70s		-0.54		-0.38
Plus Degrees Greater Than 80		0.10		-0.09
Snowfall (inches)		-0.66		-0.42
Precipitation (inches)		2.77		2.89
Darkness Before Midnight (hours)		1.80		1.59
Thanksgiving/Christmas (proportion of week)		-9.10		-8.01
Winter Holiday (proportion of week)		-0.75		5.91
Other Out-of-School Days (proportion of week)		1.96		1.68
Summer Vacation (proportion of week)		2.20		2.23
Summer Holiday (proportion of week)		4.73		4.31
Observations	522	232	522	522
R <sup>2</sup>	0.39	0.13	0.34	0.44

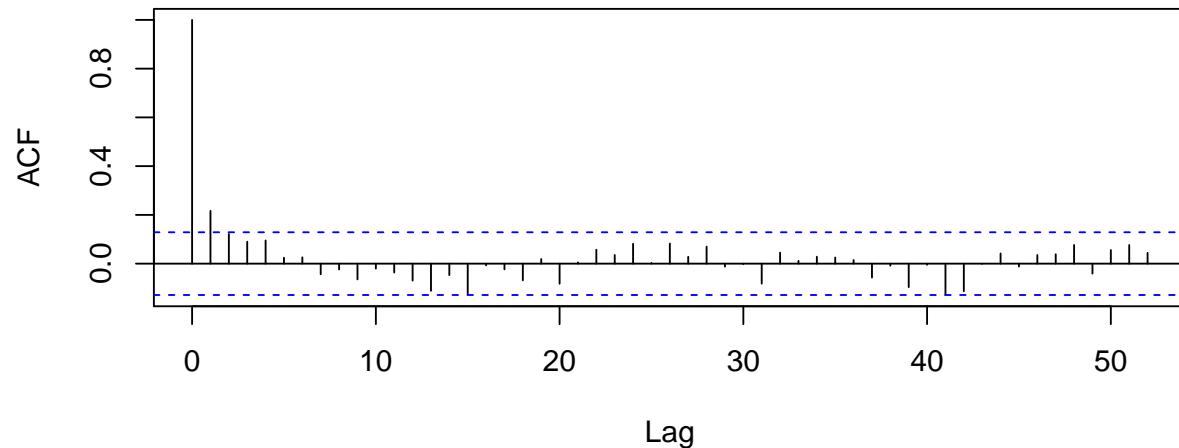
### 9.3 Least Squares Updated Model (2) for robbery.commercial robbery.commercial



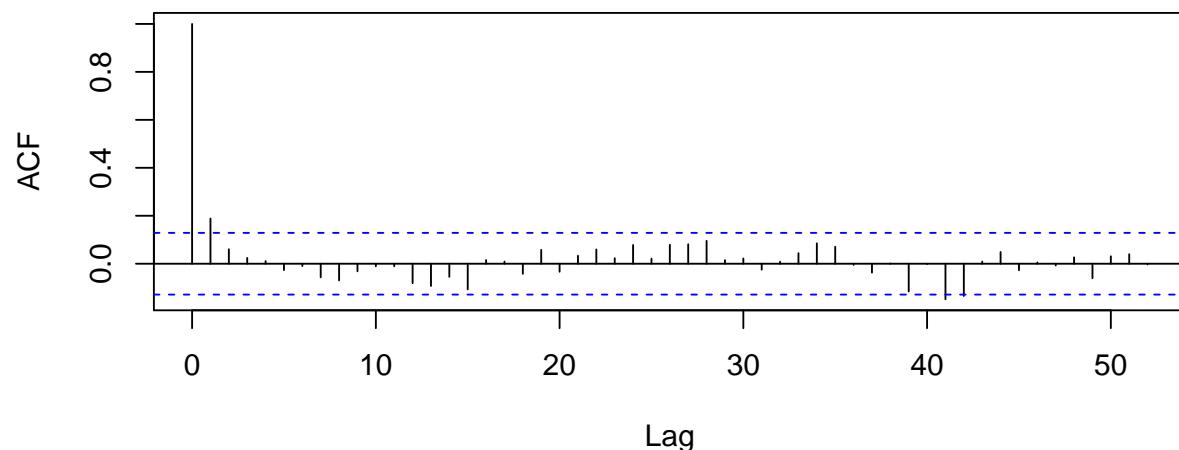
## robbery.commercial



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.3406 -0.9130 -0.1442  0.7414  4.0095  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.5535153  0.4184910  3.712 0.000205 ***  
t            0.0004687  0.0003164  1.481 0.138489  
tmax.f.spline1 -0.0087758  0.0074892 -1.172 0.241283  
tmax.f.spline2  0.0077511  0.0158922  0.488 0.625741  
tmax.f.spline3  0.0429339  0.0202039  2.125 0.033584 *  
tmax.f.spline4 -0.0538785  0.0194122 -2.776 0.005512 **  
tmax.f.spline5  0.0098360  0.0161057  0.611 0.541389  
snow.in       -0.0579571  0.0957926 -0.605 0.545161  
precip.in      0.2464363  0.1080214  2.281 0.022527 *  
dark.before.12 0.1773816  0.0315257  5.627 1.84e-08 ***  
thanks.xmas    -0.8803419  0.8309646 -1.059 0.289408  
summer.holiday 0.4632604  0.6801919  0.681 0.495825  
winter.holiday -0.0172982  0.8223665 -0.021 0.983218  
summer.vacation 0.2223287  0.0898358  2.475 0.013330 *  
oth.ns         0.1795656  0.1095043  1.640 0.101046  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 415.82 on 231 degrees of freedom  
Residual deviance: 361.37 on 217 degrees of freedom  
AIC: 1347.9  
  
Number of Fisher Scoring iterations: 4
```

## 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	Pctl(25)	Median	Pctl(75)	Max
robbery.residence	232	10.280	4.052	1	8	10	13	27

Table 10.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
robbery.residence	290	9.500	3.764	1	7	9	12	27

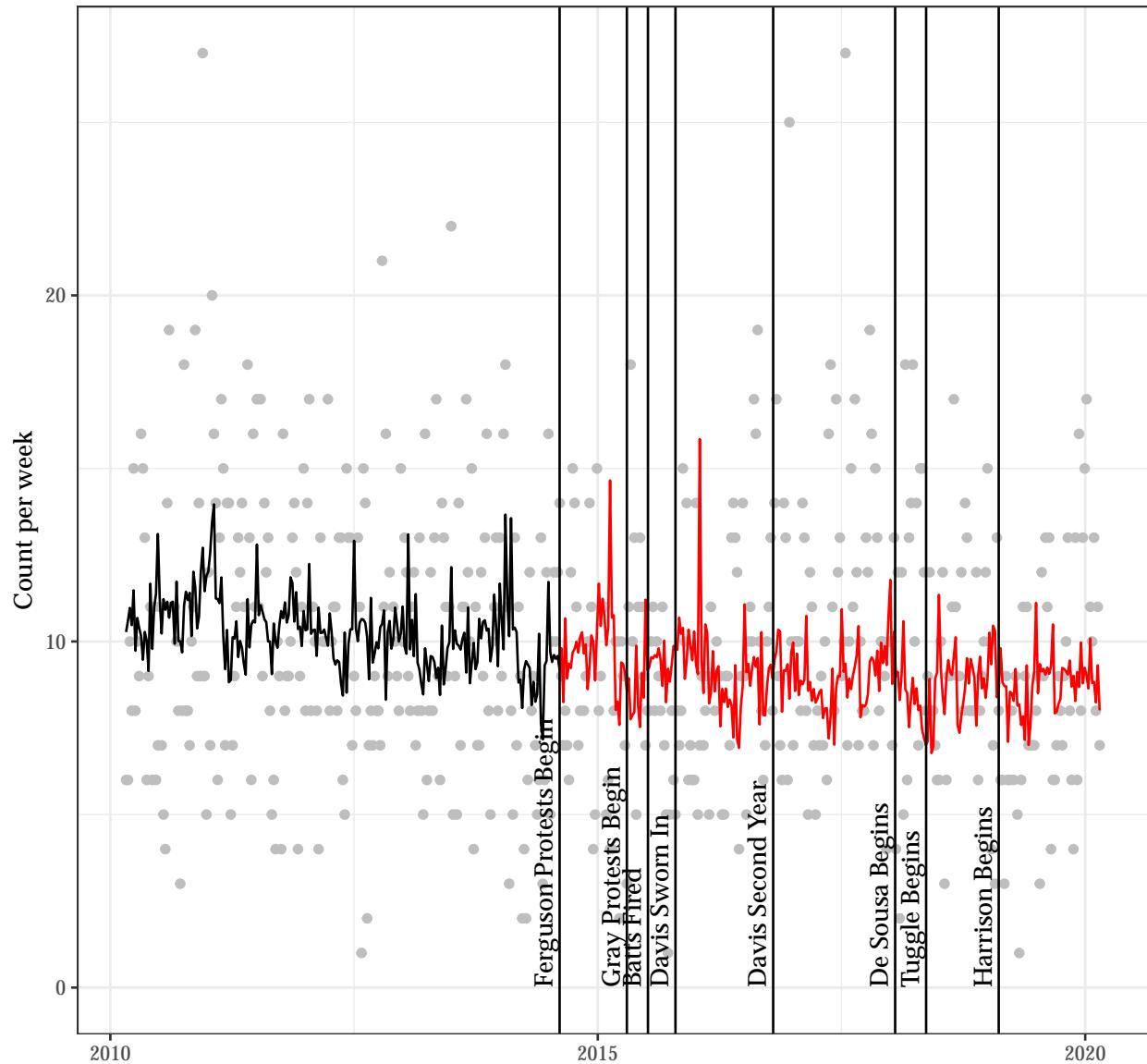
## 10.2 Four Models for robbery.residence

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

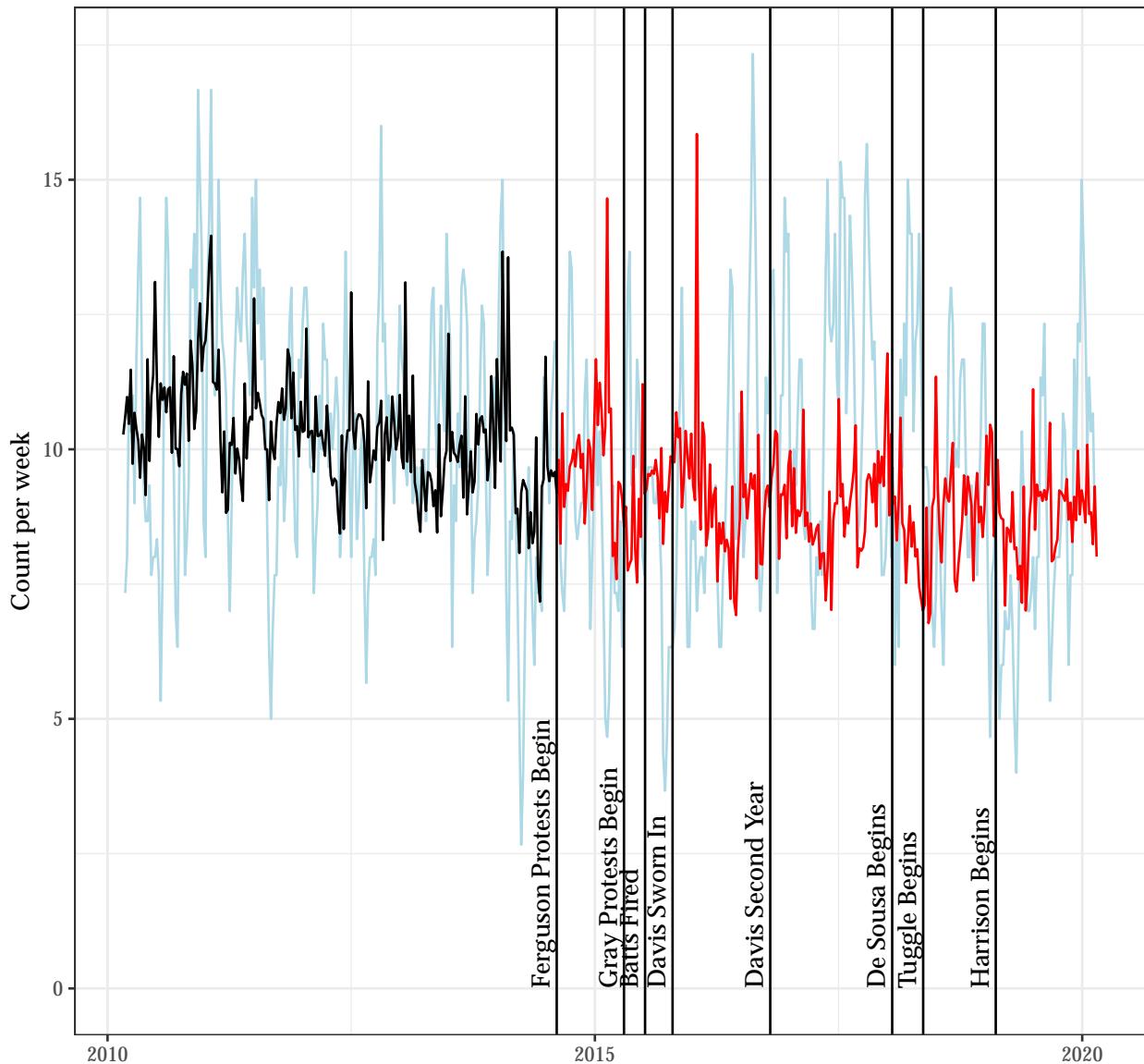
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.004	-0.01		-0.003
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.91		-1.00	-0.91
After Gray Protests Begin (week of 4/20/15 onward)	1.08		2.13	1.42
Unrest and National Guard (4/27/15 - 5/3/2015)	1.16		0.93	1.17
After Batts Fired (week of 7/13/15 onward)	-2.13		-2.85	-3.28
After Davis Confirmed (week of 10/19/15 onward)	1.87		1.92	2.39
After Davis First Year (week of 10/17/16 onward)	1.73		1.64	1.60
After De Sousa Begins (week of 1/19/18 onward)	0.35		0.74	1.04
After Tuggle Begins (week of 5/14/18 onward)	-1.77		-2.21	-2.59
After Harrison Begins (week of 2/11/19 onward)	-0.45		-0.60	-0.35
Average Maximum Temperature to 50 Degrees		-0.12		0.05
Plus Degrees in the 50s		0.27		-0.04
Plus Degrees in the 60s		-0.11		0.11
Plus Degrees in the 70s		-0.15		-0.17
Plus Degrees Greater Than 80		0.17		0.20
Snowfall (inches)		1.16		0.56
Precipitation (inches)		-1.19		-0.97
Darkness Before Midnight (hours)		0.63		0.61
Thanksgiving/Christmas (proportion of week)		-6.85		-0.16
Winter Holiday (proportion of week)		7.90		2.01
Other Out-of-School Days (proportion of week)		0.77		1.16
Summer Vacation (proportion of week)		1.73		0.90
Summer Holiday (proportion of week)		15.11		0.81
Observations	522	232	522	522
R <sup>2</sup>	0.05	0.07	0.05	0.08

### 10.3 Least Squares Updated Model (2) for robbery.residence

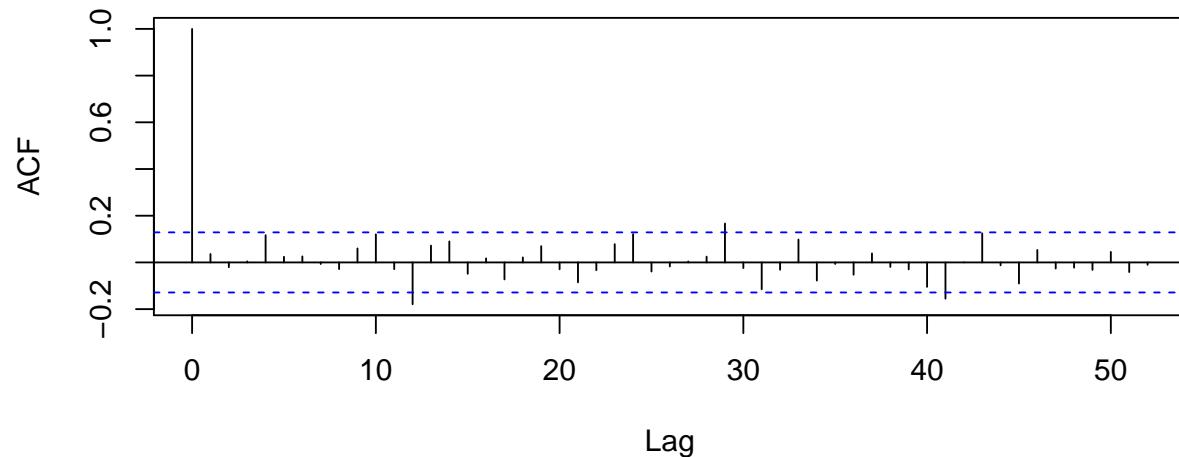
robbery.residence



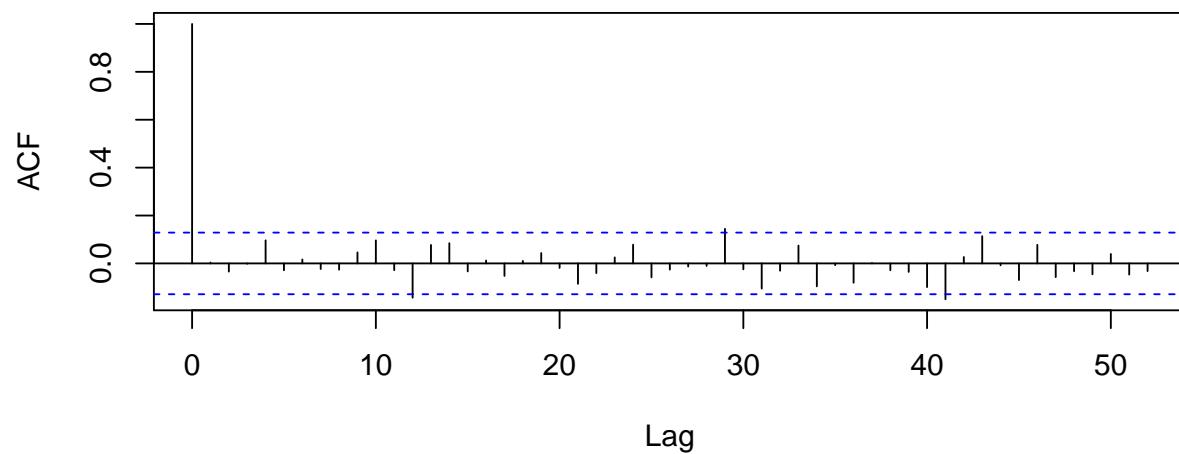
## robbery.residence



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.8114 -0.9165 -0.0670  0.8177  3.4420  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.4569716  0.4264115  5.762 8.31e-09 ***  
t            -0.0005969  0.0003185 -1.874  0.0609 .  
tmax.f.spline1 -0.0105118  0.0076261 -1.378  0.1681  
tmax.f.spline2  0.0245406  0.0158174  1.551  0.1208  
tmax.f.spline3 -0.0102331  0.0196985 -0.519  0.6034  
tmax.f.spline4 -0.0158984  0.0194782 -0.816  0.4144  
tmax.f.spline5  0.0168108  0.0161632  1.040  0.2983  
snow.in        0.1003321  0.0900806  1.114  0.2654  
precip.in       -0.1197486  0.1203469 -0.995  0.3197  
dark.before.12  0.0631909  0.0314540  2.009  0.0445 *  
thanks.xmas     -0.6617689  0.8915517 -0.742  0.4579  
summer.holiday  1.4336645  0.6497807  2.206  0.0274 *  
winter.holiday  0.7095488  0.7962887  0.891  0.3729  
summer.vacation 0.1726922  0.0899723  1.919  0.0549 .  
oth.ns          0.0750569  0.1138792  0.659  0.5098  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 377.10 on 231 degrees of freedom  
Residual deviance: 351.52 on 217 degrees of freedom  
AIC: 1332.2  
  
Number of Fisher Scoring iterations: 4
```

## 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	Pctl(25)	Median	Pctl(75)	Max
aggravated.assault	232	95.405	19.107	47	81	94.5	108	150

Table 11.2: Descriptives for Outcome After Ferguson Protests Begin

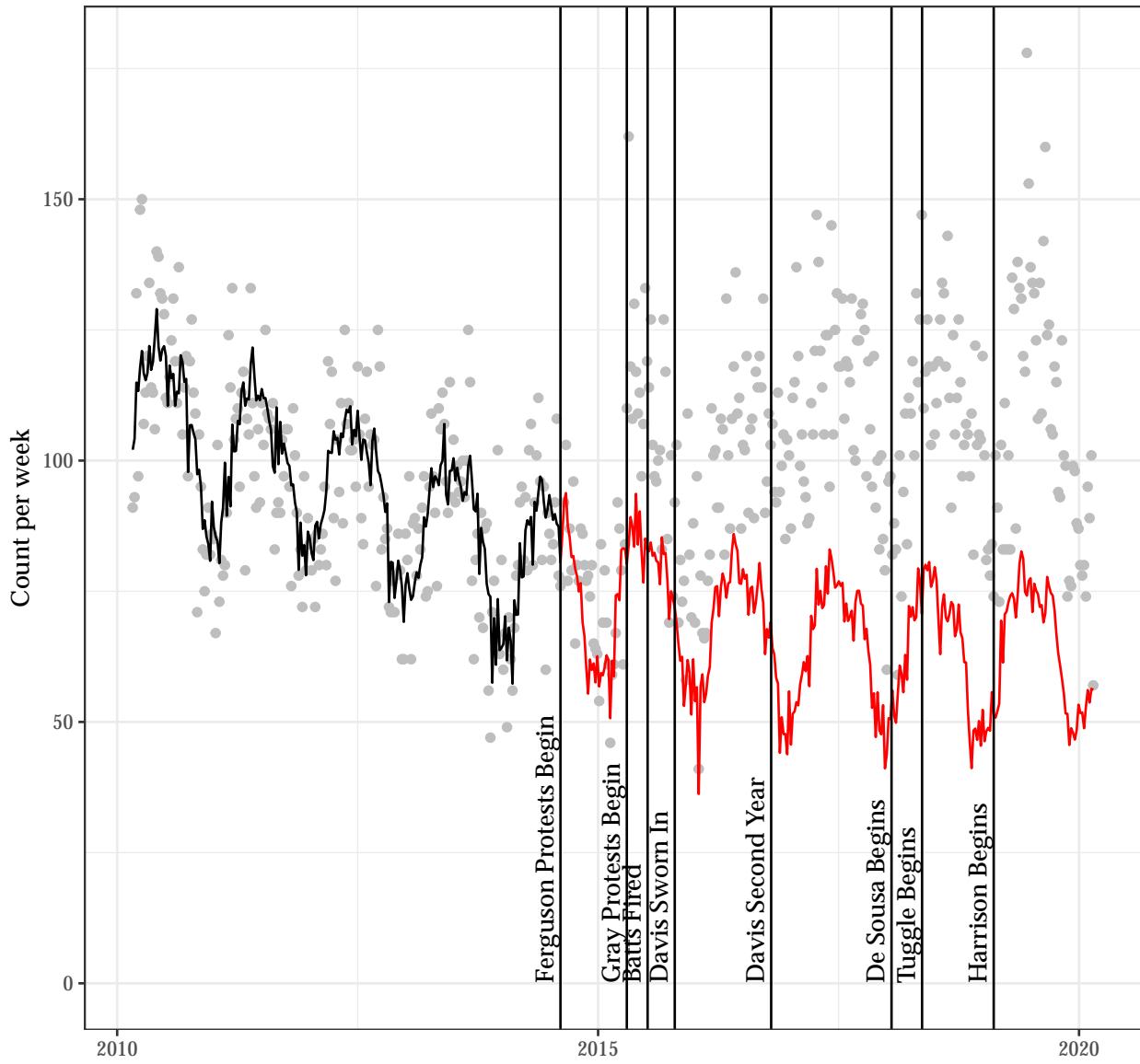
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
aggravated.assault	290	101.314	22.076	41	84.2	102	117.8	178

## 11.2 Four Models for aggravated.assault

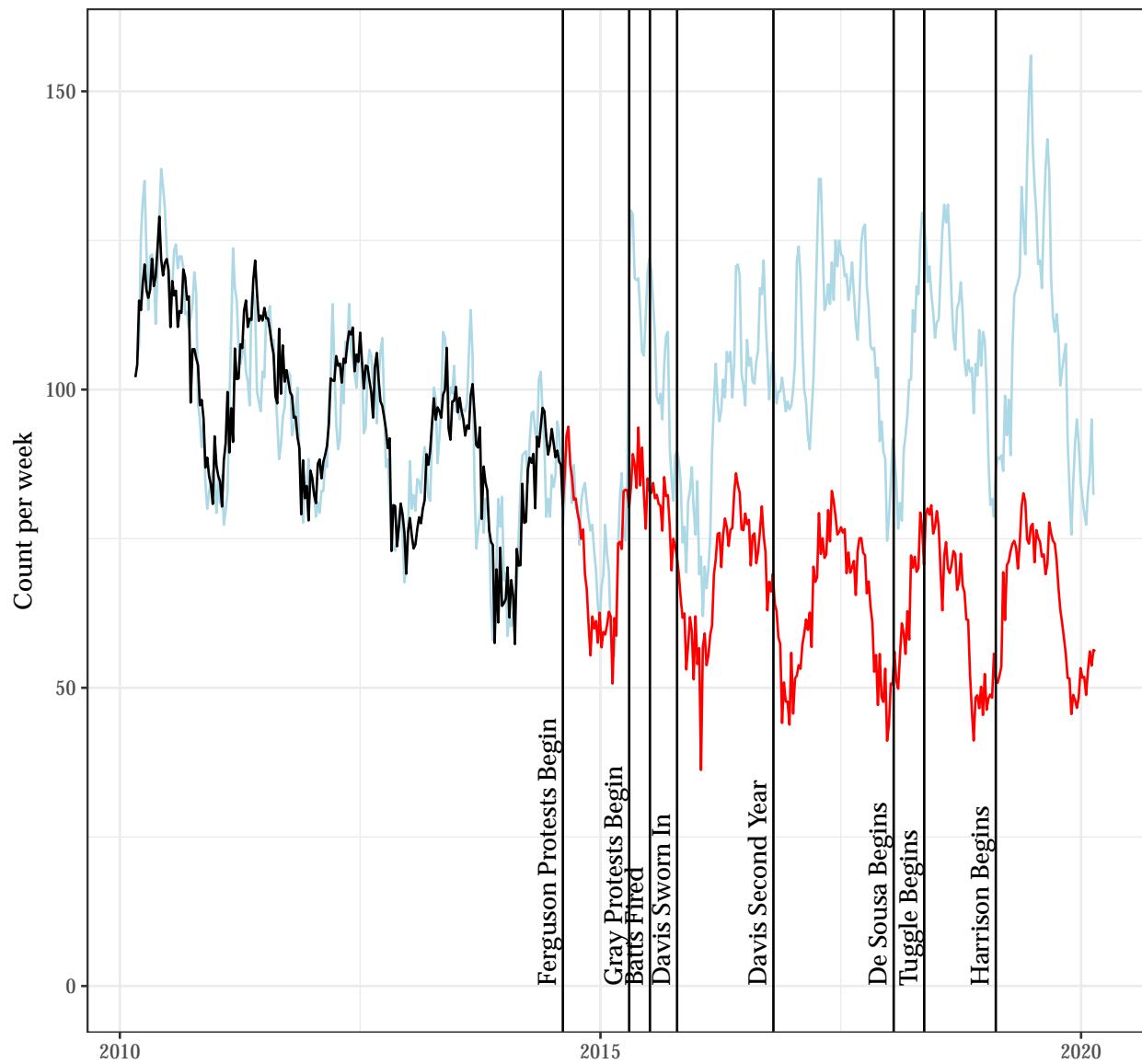
Table 11.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.14	-0.13		-0.12
After Ferguson Protests Begin (week of 8/11/14 onward)	-1.43		4.47	4.60
After Gray Protests Begin (week of 4/20/15 onward)	42.60		25.13	23.22
Unrest and National Guard (4/27/15 - 5/3/2015)	46.68		48.61	51.23
After Batts Fired (week of 7/13/15 onward)	-13.25		-9.54	-10.77
After Davis Confirmed (week of 10/19/15 onward)	-0.17		6.04	8.04
After Davis First Year (week of 10/17/16 onward)	21.87		19.43	22.62
After De Sousa Begins (week of 1/19/18 onward)	-3.62		-9.93	-2.68
After Tuggle Begins (week of 5/14/18 onward)	14.65		11.09	11.59
After Harrison Begins (week of 2/11/19 onward)	2.90		-4.67	1.80
Average Maximum Temperature to 50 Degrees		0.34		0.54
Plus Degrees in the 50s		0.23		-0.31
Plus Degrees in the 60s		-0.53		0.20
Plus Degrees in the 70s		0.44		0.42
Plus Degrees Greater Than 80		-0.28		-0.75
Snowfall (inches)		-3.35		-6.17
Precipitation (inches)		-11.95		-12.13
Darkness Before Midnight (hours)		-5.12		-4.11
Thanksgiving/Christmas (proportion of week)		-51.45		-25.66
Winter Holiday (proportion of week)		-4.89		-1.08
Other Out-of-School Days (proportion of week)		3.31		-0.18
Summer Vacation (proportion of week)		-6.64		-5.12
Summer Holiday (proportion of week)		17.83		-3.90
Observations	522	232	522	522
R <sup>2</sup>	0.29	0.60	0.69	0.61

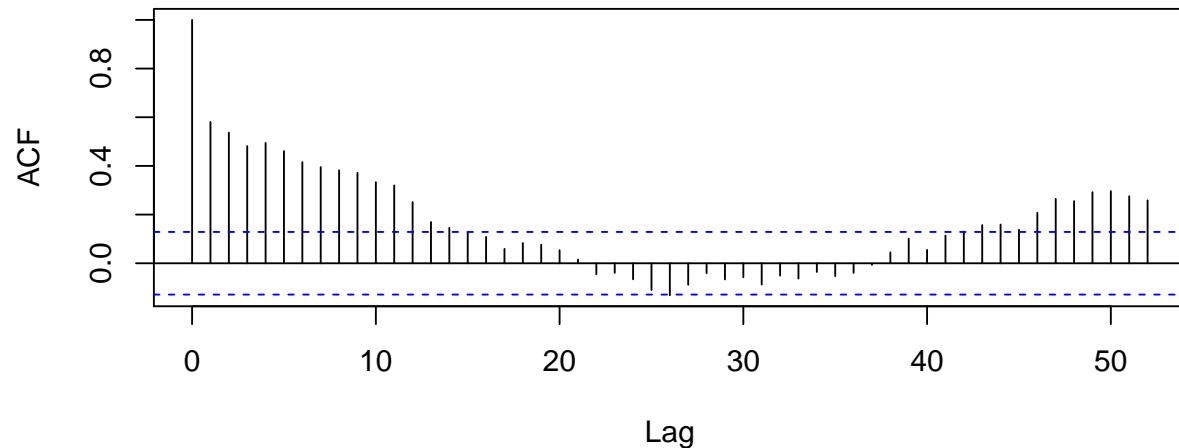
### 11.3 Least Squares Updated Model (2) for aggravated.assault



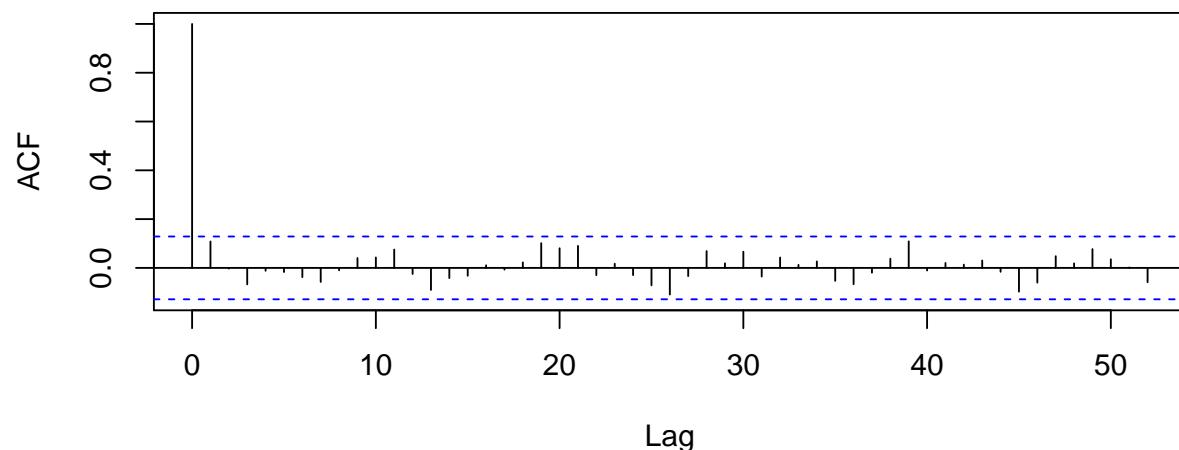
## aggravated.assault



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated 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  
-3.5456 -0.7432  0.0002  0.7370  2.9132  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.7287662  0.1544383 30.619 < 2e-16 ***  
t            -0.0013545  0.0001038 -13.045 < 2e-16 ***  
tmax.f.spline1 0.0043734  0.0028372   1.541  0.12321  
tmax.f.spline2 0.0023680  0.0055216   0.429  0.66802  
tmax.f.spline3 -0.0066341  0.0065095  -1.019  0.30813  
tmax.f.spline4 0.0043720  0.0061451   0.711  0.47680  
tmax.f.spline5 -0.0033819  0.0050491  -0.670  0.50298  
snow.in        -0.0576712  0.0384506  -1.500  0.13365  
precip.in       -0.1251797  0.0389524  -3.214  0.00131 **  
dark.before.12 -0.0538110  0.0103355  -5.206 1.93e-07 ***  
thanks.xmas     -0.6977985  0.3247390  -2.149  0.03165 *  
summer.holiday  0.1758222  0.2083459   0.844  0.39873  
winter.holiday -0.0268461  0.3064561  -0.088  0.93019  
summer.vacation -0.0601273  0.0276406  -2.175  0.02961 *  
oth.ns          0.0349516  0.0380252   0.919  0.35801  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 889.46 on 231 degrees of freedom  
Residual deviance: 349.91 on 217 degrees of freedom  
AIC: 1859.4  
  
Number of Fisher Scoring iterations: 4
```

## 12 Results for common.assault

### 12.1 Summary Values for common.assault

Table 12.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
common.assault	232	170.216	25.481	100	153	170.5	184.2	241

Table 12.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
common.assault	290	151.328	24.091	78	135.2	151	167	215

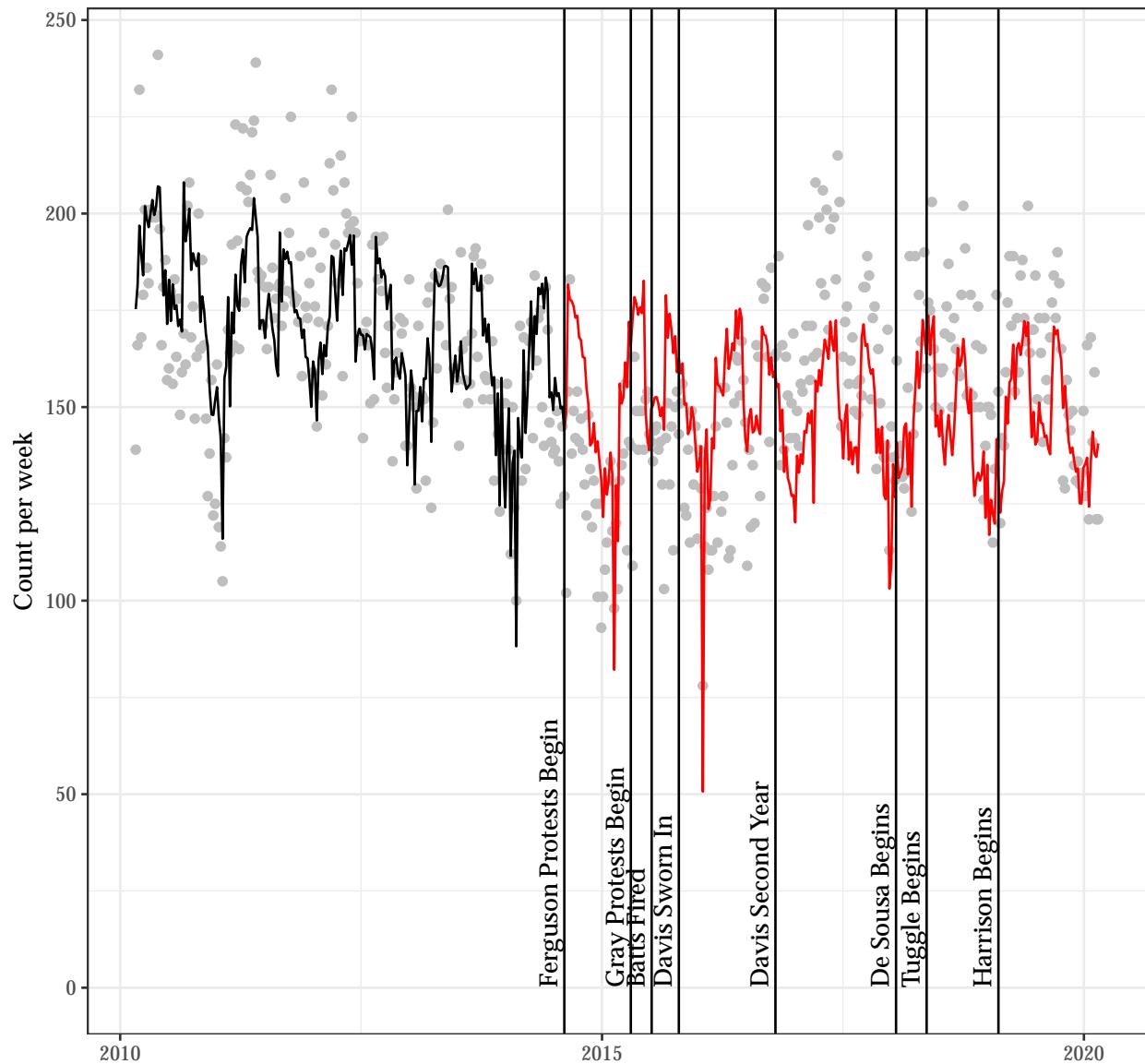
## 12.2 Four Models for common.assault

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

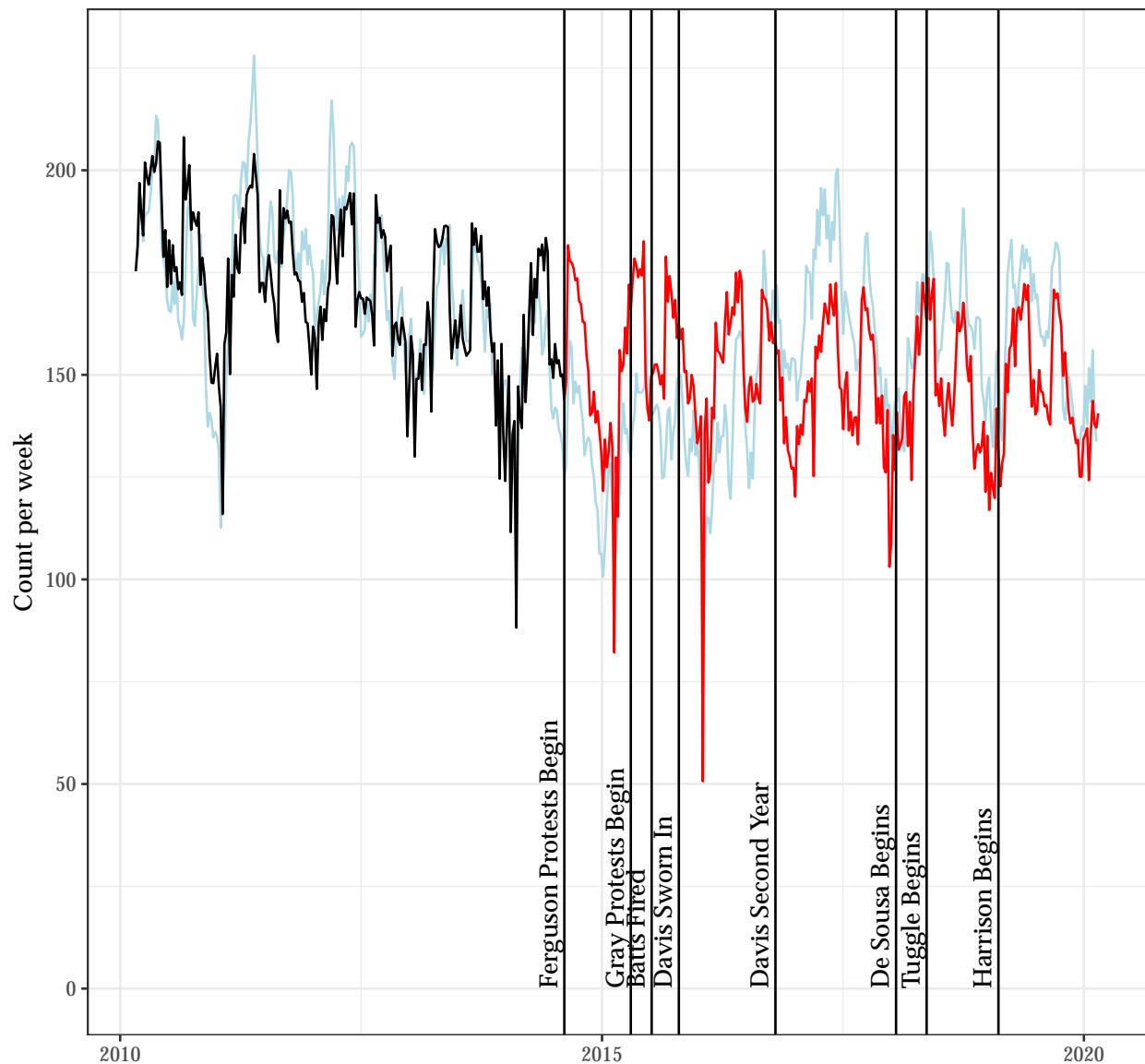
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.13	-0.10		-0.10
After Ferguson Protests Begin (week of 8/11/14 onward)	-23.02		-19.58	-19.76
After Gray Protests Begin (week of 4/20/15 onward)	21.27		2.39	2.55
Unrest and National Guard (4/27/15 - 5/3/2015)	-38.75		-46.82	-44.96
After Batts Fired (week of 7/13/15 onward)	-8.03		-4.74	-5.49
After Davis Confirmed (week of 10/19/15 onward)	6.15		10.17	11.34
After Davis First Year (week of 10/17/16 onward)	33.62		30.55	34.19
After De Sousa Begins (week of 1/19/18 onward)	-3.80		-10.50	-5.66
After Tuggle Begins (week of 5/14/18 onward)	10.46		8.73	9.98
After Harrison Begins (week of 2/11/19 onward)	1.96		-6.47	-0.88
Average Maximum Temperature to 50 Degrees		1.04		0.78
Plus Degrees in the 50s		-0.19		-0.10
Plus Degrees in the 60s		0.07		0.31
Plus Degrees in the 70s		-0.64		-0.73
Plus Degrees Greater Than 80		0.56		0.78
Snowfall (inches)		-18.55		-12.60
Precipitation (inches)		-9.83		-10.88
Darkness Before Midnight (hours)		-3.46		-3.65
Thanksgiving/Christmas (proportion of week)		-16.01		4.39
Winter Holiday (proportion of week)		-37.18		-66.01
Other Out-of-School Days (proportion of week)		-12.54		-14.90
Summer Vacation (proportion of week)		-32.32		-28.74
Summer Holiday (proportion of week)		-45.94		-33.05
Observations	522	232	522	522
R <sup>2</sup>	0.32	0.54	0.36	0.64

### 12.3 Least Squares Updated Model (2) for common.assault

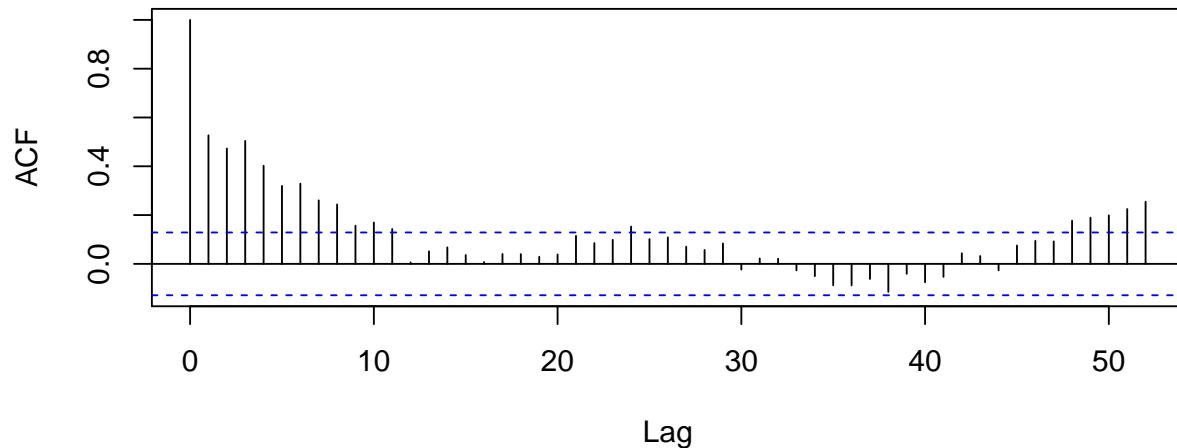
common.assault



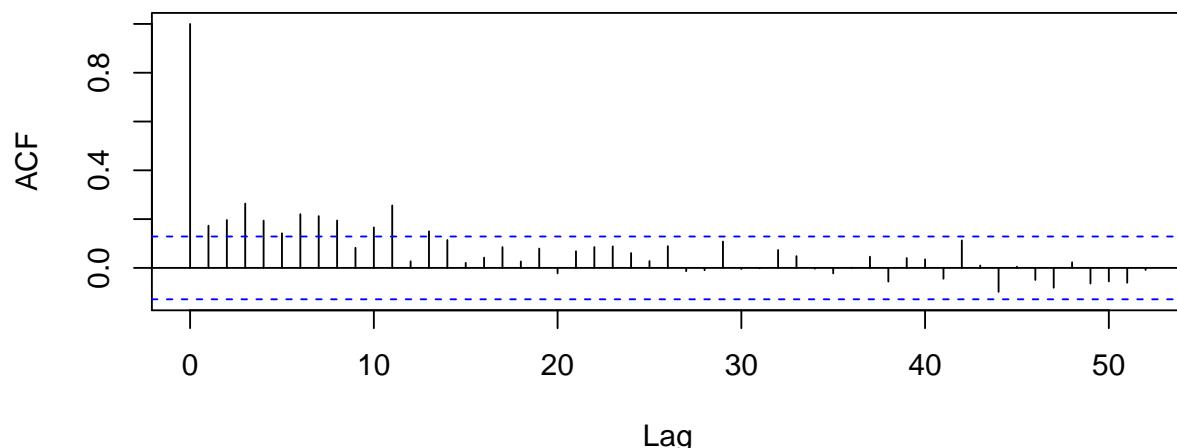
## common.assault



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 12.4 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  
-3.09921 -0.91959 -0.07806  0.83270  3.03425  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.9559003  0.1129029 43.895 < 2e-16 ***  
t            -0.0005903  0.0000780 -7.568 3.79e-14 ***  
tmax.f.spline1 0.0069269  0.0020795  3.331 0.000865 ***  
tmax.f.spline2 -0.0021079  0.0040565 -0.520 0.603325  
tmax.f.spline3 0.0002119  0.0047946  0.044 0.964749  
tmax.f.spline4 -0.0038622  0.0045585 -0.847 0.396858  
tmax.f.spline5 0.0037056  0.0038705  0.957 0.338368  
snow.in       -0.1543451  0.0299398 -5.155 2.53e-07 ***  
precip.in      -0.0556954  0.0287324 -1.938 0.052572 .  
dark.before.12 -0.0202139  0.0075873 -2.664 0.007718 **  
thanks.xmas    -0.1438889  0.2296105 -0.627 0.530879  
summer.holiday -0.2574136  0.1622203 -1.587 0.112554  
winter.holiday -0.2183157  0.2274012 -0.960 0.337032  
summer.vacation -0.1821055  0.0212134 -8.584 < 2e-16 ***  
oth.ns         -0.0744111  0.0290942 -2.558 0.010540 *  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 887.42 on 231 degrees of freedom  
Residual deviance: 395.26 on 217 degrees of freedom  
AIC: 2041  
  
Number of Fisher Scoring iterations: 4
```

## 13 Results for burglary

### 13.1 Summary Values for burglary

Table 13.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
burglary	232	149.763	25.720	85	133	149	164	240

Table 13.2: Descriptives for Outcome After Ferguson Protests Begin

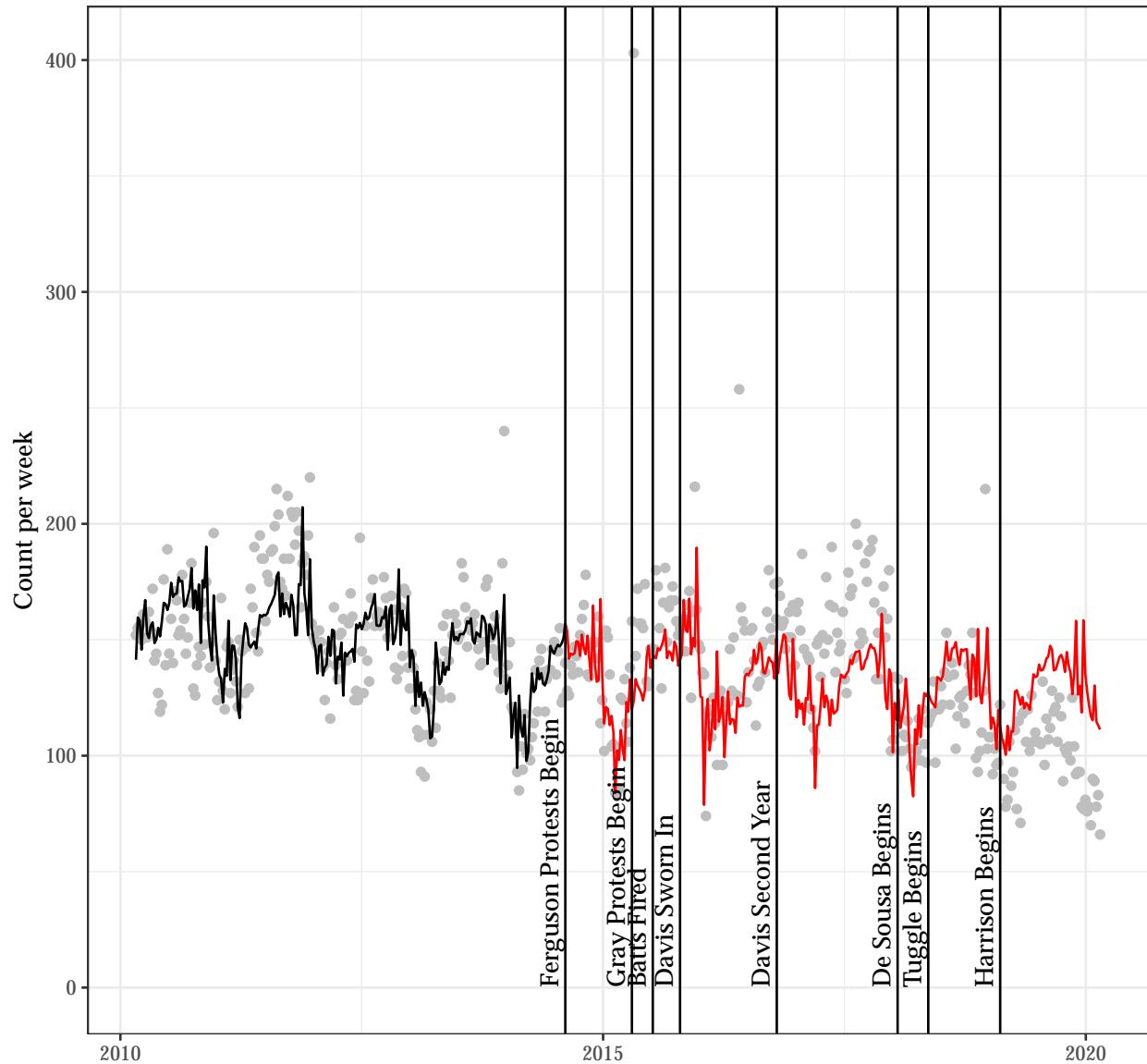
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
burglary	290	133.093	33.876	66	108	132	153	403

## 13.2 Four Models for burglary

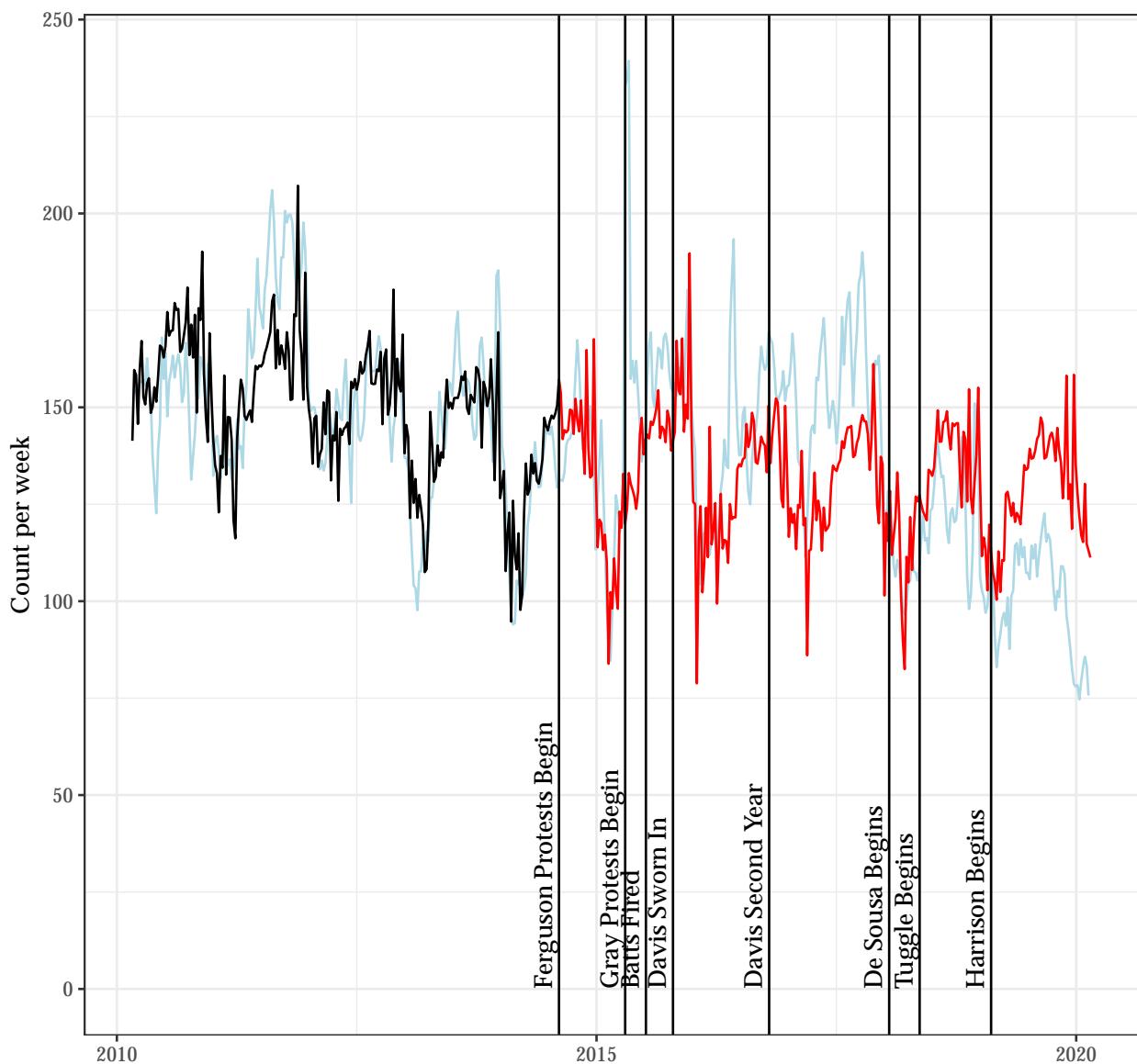
Table 13.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.12	-0.10		-0.10
After Ferguson Protests Begin (week of 8/11/14 onward)	-1.47		0.46	1.49
After Gray Protests Begin (week of 4/20/15 onward)	22.83		18.45	15.44
Unrest and National Guard (4/27/15 - 5/3/2015)	250.67		260.33	260.70
After Batts Fired (week of 7/13/15 onward)	11.24		-2.88	1.48
After Davis Confirmed (week of 10/19/15 onward)	-15.12		-6.04	-6.99
After Davis First Year (week of 10/17/16 onward)	18.98		12.19	17.06
After De Sousa Begins (week of 1/19/18 onward)	-41.82		-29.12	-29.69
After Tuggle Begins (week of 5/14/18 onward)	17.49		-5.69	1.23
After Harrison Begins (week of 2/11/19 onward)	-15.43		-15.82	-11.67
Average Maximum Temperature to 50 Degrees		0.96		1.06
Plus Degrees in the 50s		1.03		0.62
Plus Degrees in the 60s		-0.17		-0.30
Plus Degrees in the 70s		-1.08		-0.22
Plus Degrees Greater Than 80		-0.65		-1.16
Snowfall (inches)		-8.39		-3.02
Precipitation (inches)		12.25		12.50
Darkness Before Midnight (hours)		14.47		11.67
Thanksgiving/Christmas (proportion of week)		161.76		63.96
Winter Holiday (proportion of week)		-10.48		-22.59
Other Out-of-School Days (proportion of week)		3.17		-9.19
Summer Vacation (proportion of week)		14.33		5.03
Summer Holiday (proportion of week)		-11.94		-4.74
Observations	522	232	522	522
R <sup>2</sup>	0.48	0.44	0.45	0.63

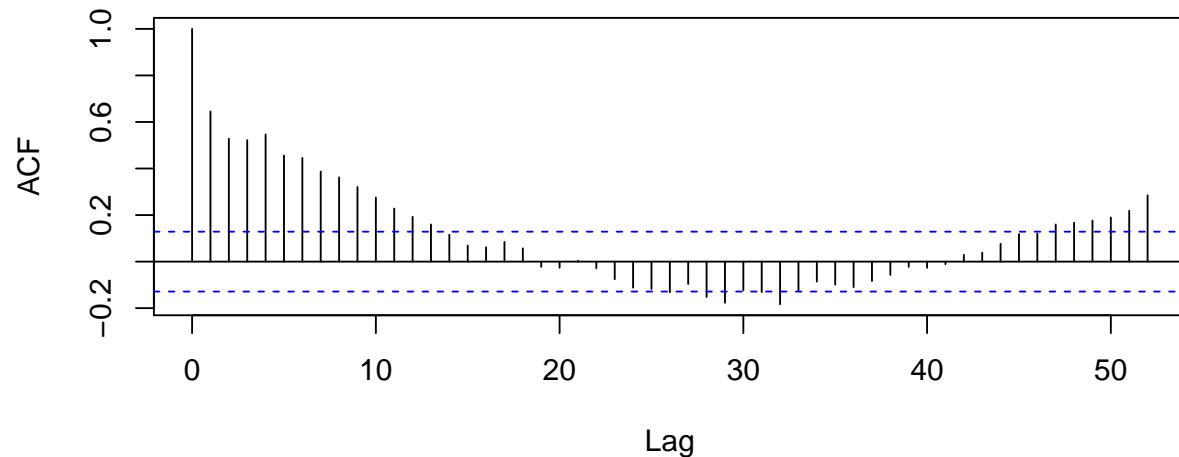
### 13.3 Least Squares Updated Model (2) for burglary burglary



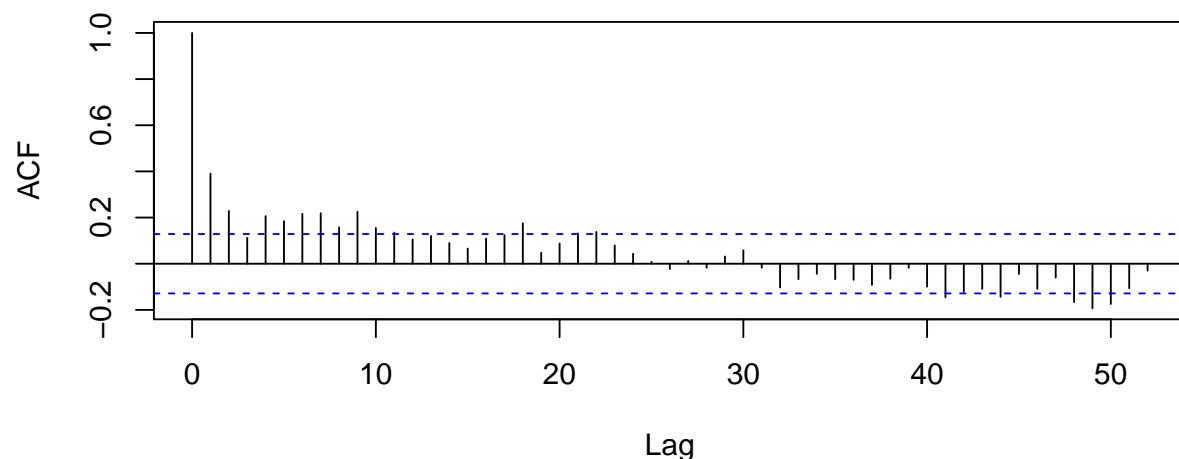
## burglary



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 13.4 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  
-3.8820 -0.9956 -0.0836  0.8731  5.2634  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.041e+00 1.189e-01 33.985 < 2e-16 ***  
t            -6.450e-04 8.371e-05 -7.705 1.31e-14 ***  
tmax.f.spline1 6.409e-03 2.182e-03  2.937  0.00331 **  
tmax.f.spline2 6.919e-03 4.346e-03  1.592  0.11138  
tmax.f.spline3 -2.929e-04 5.223e-03 -0.056  0.95527  
tmax.f.spline4 -7.897e-03 5.024e-03 -1.572  0.11601  
tmax.f.spline5 -4.394e-03 4.131e-03 -1.064  0.28741  
snow.in       -8.310e-02 3.026e-02 -2.746  0.00602 **  
precip.in      7.651e-02 2.966e-02  2.579  0.00990 **  
dark.before.12 9.989e-02 8.303e-03 12.031 < 2e-16 ***  
thanks.xmas    9.413e-01 2.179e-01  4.320 1.56e-05 ***  
summer.holiday -6.896e-02 1.751e-01 -0.394  0.69375  
winter.holiday -7.774e-02 2.408e-01 -0.323  0.74679  
summer.vacation 9.628e-02 2.276e-02  4.230 2.34e-05 ***  
oth.ns         2.640e-02 3.045e-02  0.867  0.38597  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 1019.75 on 231 degrees of freedom  
Residual deviance: 556.75 on 217 degrees of freedom  
AIC: 2172  
  
Number of Fisher Scoring iterations: 4
```

## 14 Results for larceny.from.auto

### 14.1 Summary Values for larceny.from.auto

Table 14.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
larceny.from.auto	232	133.720	26.546	75	115	131	152.2	207

Table 14.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
larceny.from.auto	290	122.066	27.813	52	102.2	122	141	217

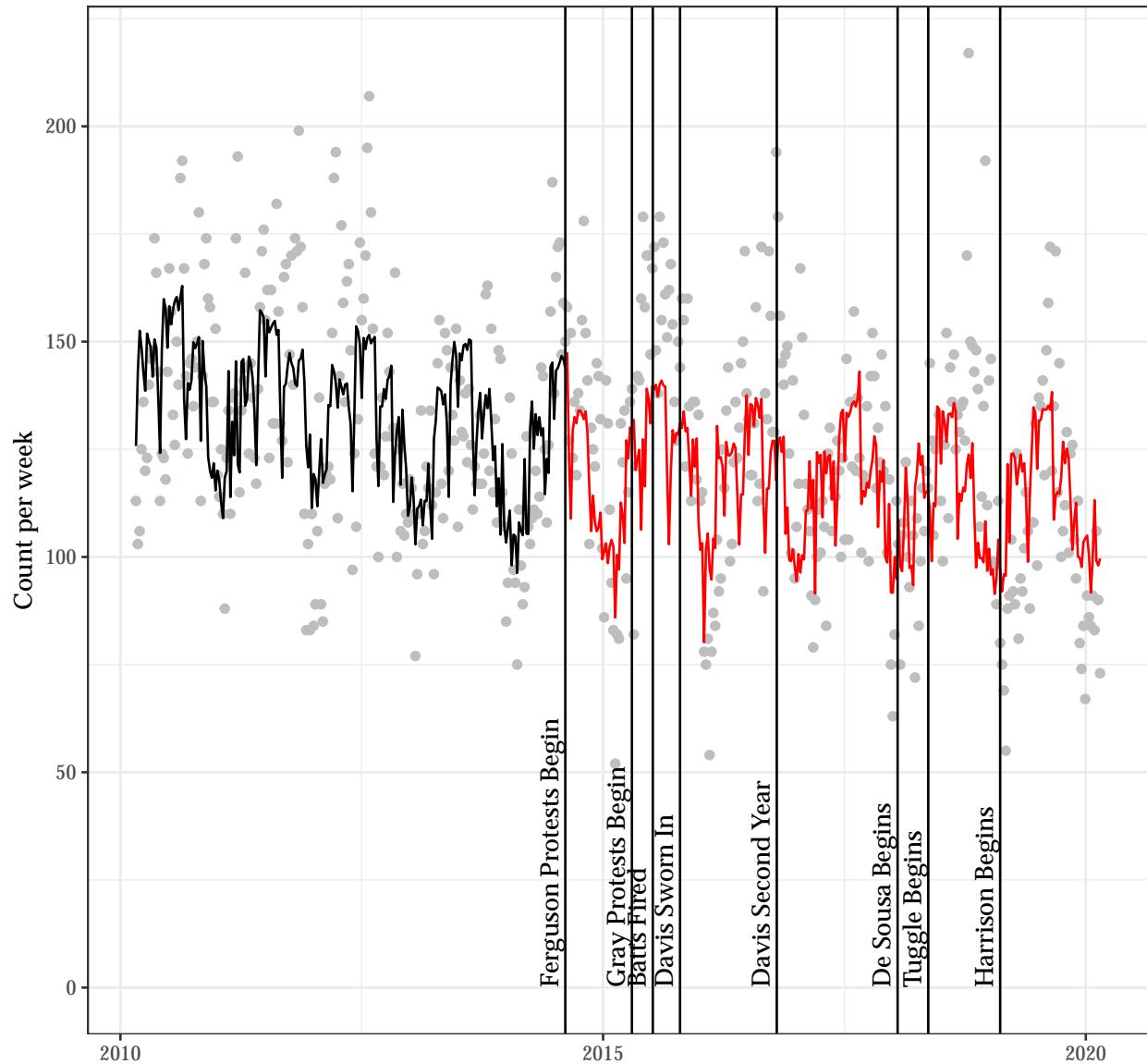
## 14.2 Four Models for larceny.from.auto

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

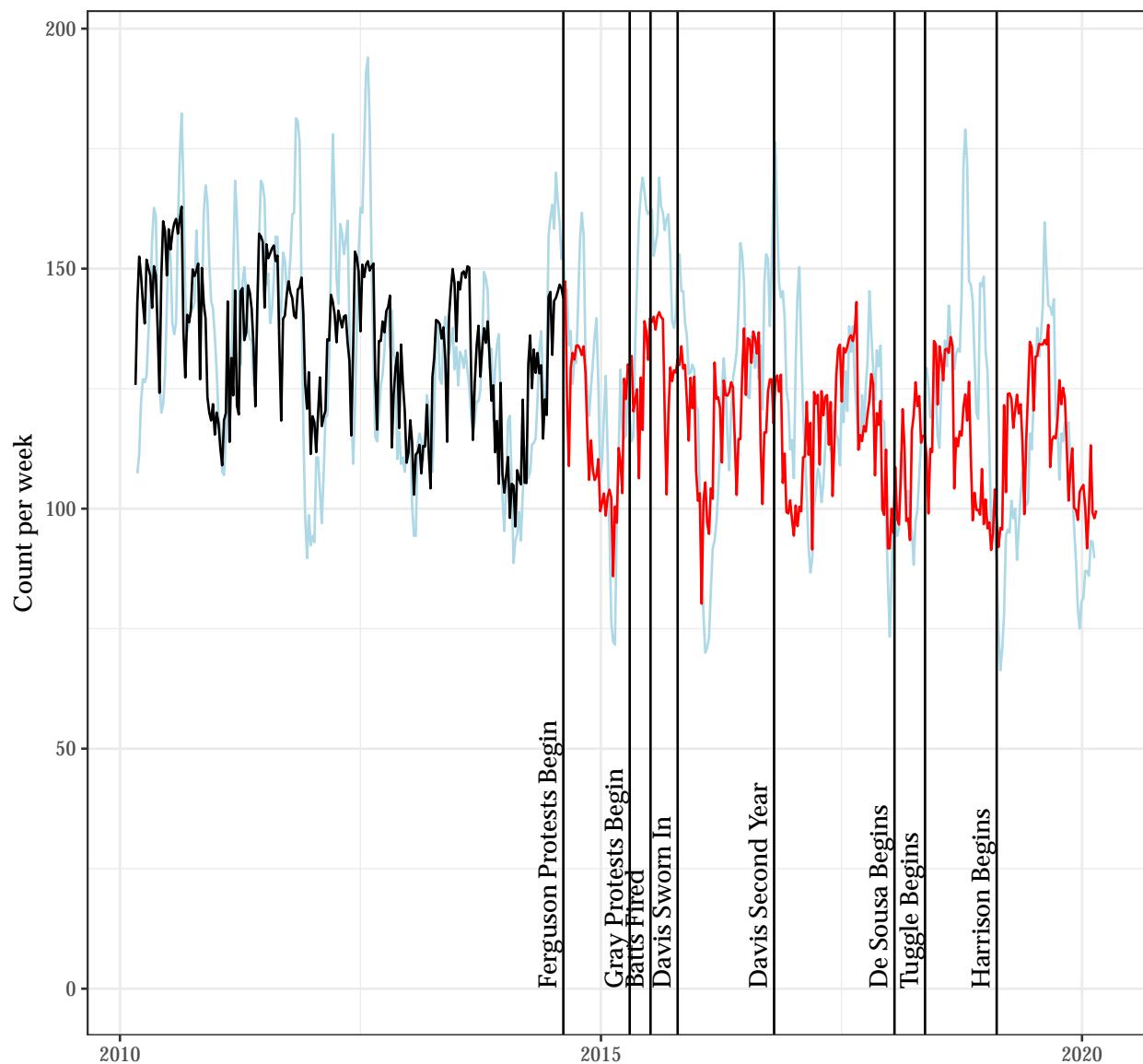
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.09	-0.08		-0.07
After Ferguson Protests Begin (week of 8/11/14 onward)	2.56		7.73	8.38
After Gray Protests Begin (week of 4/20/15 onward)	32.47		19.64	20.02
Unrest and National Guard (4/27/15 - 5/3/2015)	-72.46		-77.19	-71.33
After Batts Fired (week of 7/13/15 onward)	2.46		-2.92	-5.70
After Davis Confirmed (week of 10/19/15 onward)	-28.93		-20.84	-19.79
After Davis First Year (week of 10/17/16 onward)	3.31		1.63	2.50
After De Sousa Begins (week of 1/19/18 onward)	-15.41		-13.84	-6.85
After Tuggle Begins (week of 5/14/18 onward)	32.76		26.49	23.44
After Harrison Begins (week of 2/11/19 onward)	-22.12		-26.98	-22.16
Average Maximum Temperature to 50 Degrees		0.34		1.54
Plus Degrees in the 50s		2.16		0.23
Plus Degrees in the 60s		-2.15		-0.63
Plus Degrees in the 70s		-1.54		-1.25
Plus Degrees Greater Than 80		0.84		-0.37
Snowfall (inches)		-3.02		-1.20
Precipitation (inches)		-8.09		-5.61
Darkness Before Midnight (hours)		1.22		6.60
Thanksgiving/Christmas (proportion of week)		34.05		26.89
Winter Holiday (proportion of week)		-31.38		-11.26
Other Out-of-School Days (proportion of week)		-8.49		-9.81
Summer Vacation (proportion of week)		23.66		18.28
Summer Holiday (proportion of week)		-84.02		-56.43
Observations	522	232	522	522
R <sup>2</sup>	0.20	0.33	0.13	0.43

### 14.3 Least Squares Updated Model (2) for larceny.from.auto

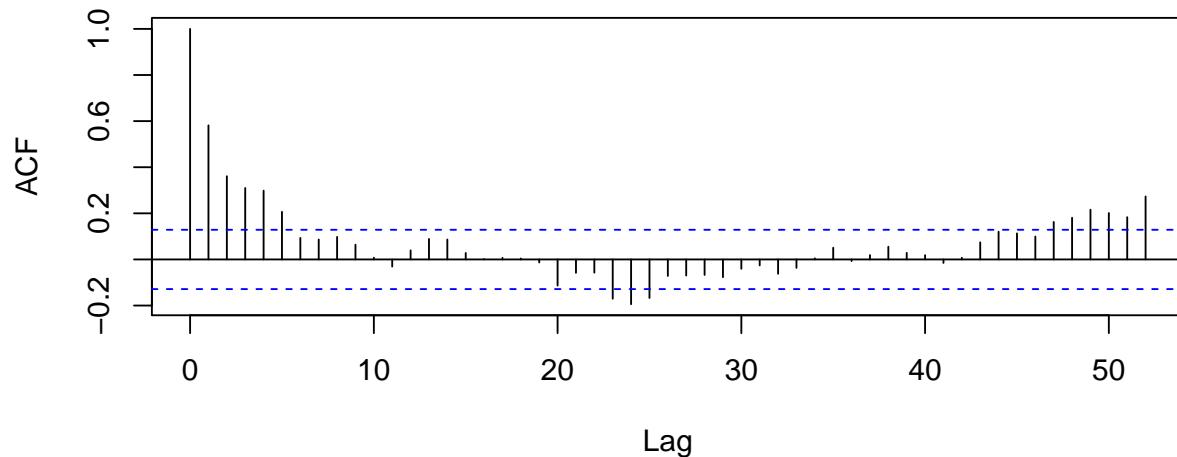
larceny.from.auto



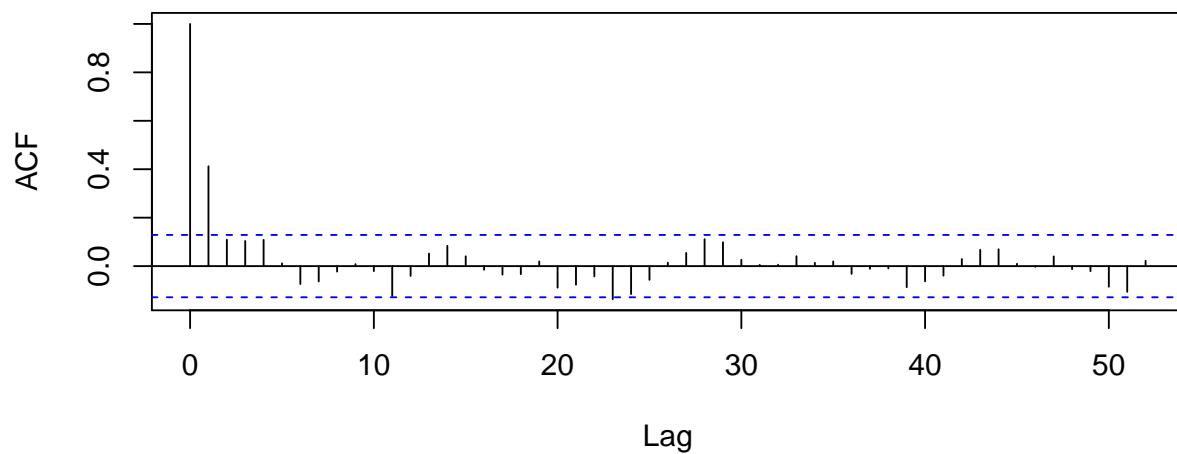
## **larceny.from.auto**



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 14.4 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  
-4.2291 -1.4191 -0.2167  1.3272  6.0227  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.627e+00 1.283e-01 36.063 < 2e-16 ***  
t            -5.622e-04 8.796e-05 -6.392 1.64e-10 ***  
tmax.f.spline1 2.979e-03 2.366e-03  1.259 0.208052  
tmax.f.spline2 1.655e-02 4.633e-03  3.571 0.000355 ***  
tmax.f.spline3 -1.700e-02 5.435e-03 -3.128 0.001760 **  
tmax.f.spline4 -1.124e-02 5.236e-03 -2.146 0.031848 *  
tmax.f.spline5 6.143e-03 4.327e-03  1.420 0.155652  
snow.in       -3.504e-02 3.129e-02 -1.120 0.262810  
precip.in      -6.200e-02 3.241e-02 -1.913 0.055770 .  
dark.before.12 9.767e-03 8.693e-03  1.124 0.261162  
thanks.xmas    2.549e-01 2.541e-01  1.003 0.315763  
summer.holiday -6.327e-01 1.900e-01 -3.330 0.000868 ***  
winter.holiday -2.705e-01 2.595e-01 -1.043 0.297176  
summer.vacation 1.711e-01 2.411e-02  7.093 1.31e-12 ***  
oth.ns         -6.623e-02 3.322e-02 -1.994 0.046169 *  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 1213.43 on 231 degrees of freedom  
Residual deviance: 799.14 on 217 degrees of freedom  
AIC: 2387  
  
Number of Fisher Scoring iterations: 4
```

## 15 Results for larceny

### 15.1 Summary Values for larceny

Table 15.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
larceny	232	206.784	32.840	115	186	205	230.2	302

Table 15.2: Descriptives for Outcome After Ferguson Protests Begin

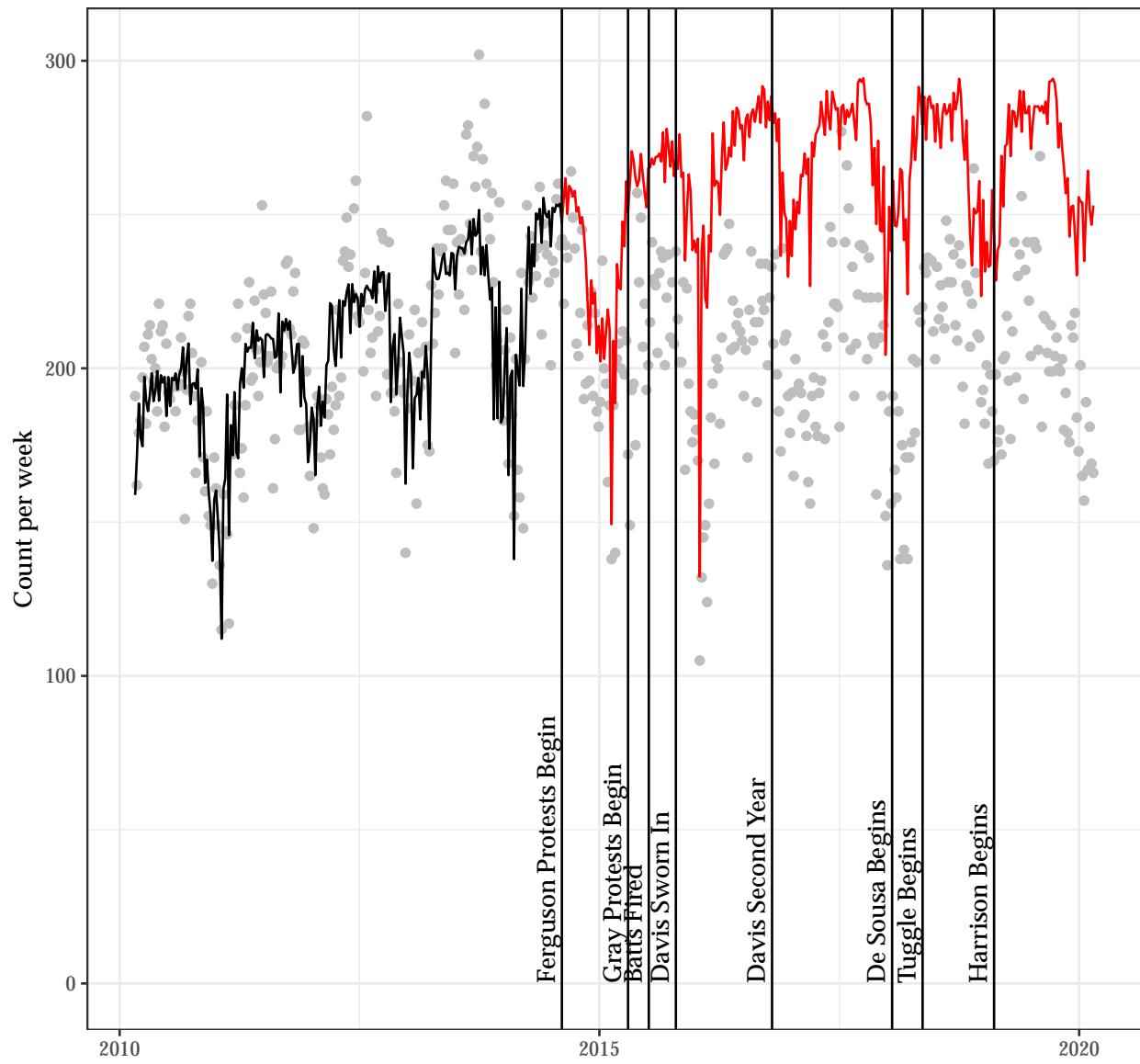
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
larceny	290	204.655	28.312	105	186	206	224.8	277

## 15.2 Four Models for larceny

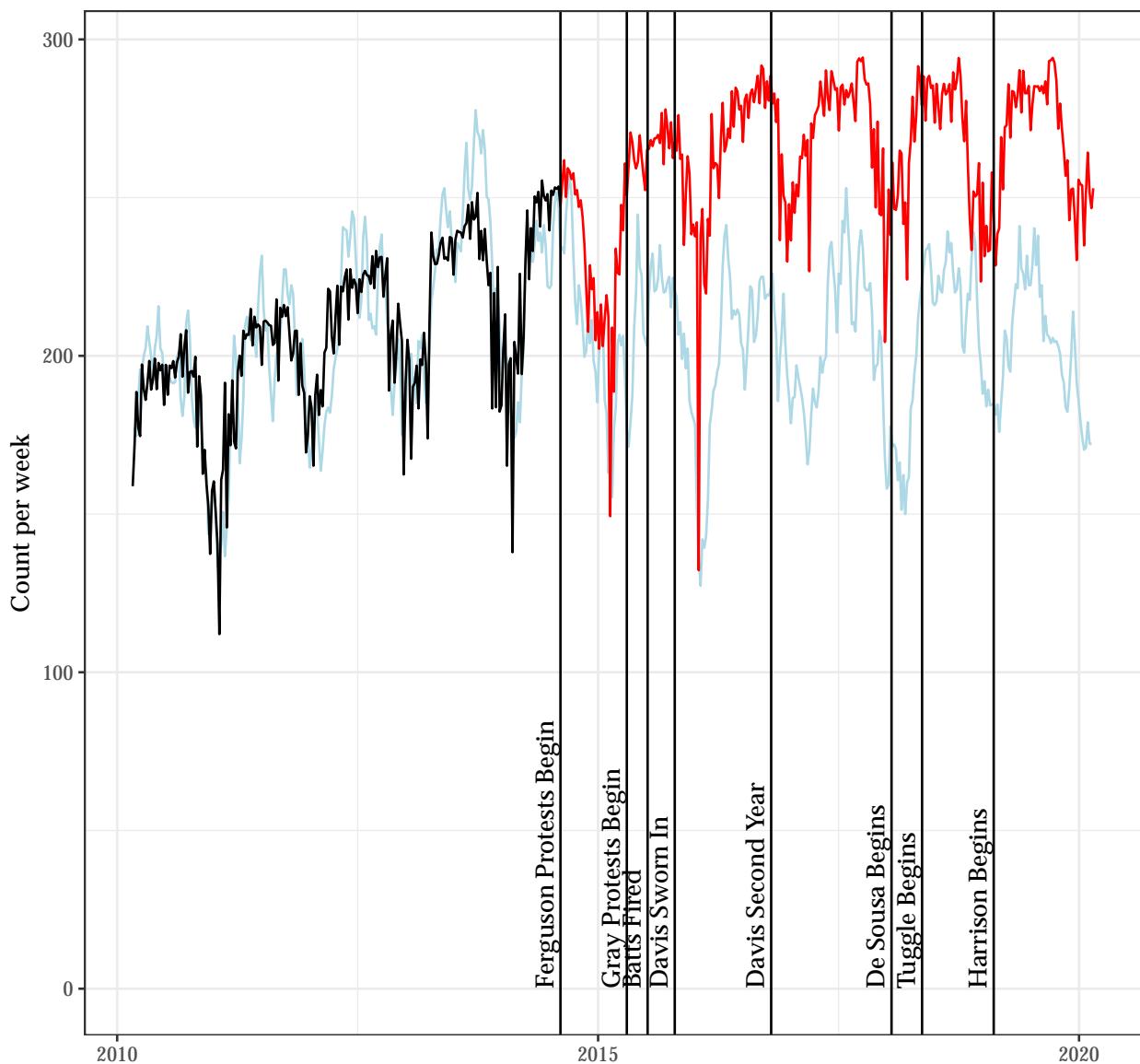
Table 15.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.22	0.27		0.25
After Ferguson Protests Begin (week of 8/11/14 onward)	-27.82		-22.40	-20.35
After Gray Protests Begin (week of 4/20/15 onward)	-4.92		-31.02	-30.45
Unrest and National Guard (4/27/15 - 5/3/2015)	-58.21		-57.76	-55.28
After Batts Fired (week of 7/13/15 onward)	12.51		8.08	8.49
After Davis Confirmed (week of 10/19/15 onward)	-31.40		-18.58	-17.45
After Davis First Year (week of 10/17/16 onward)	-7.40		-0.33	-8.01
After De Sousa Begins (week of 1/19/18 onward)	-36.56		-20.19	-29.97
After Tuggle Begins (week of 5/14/18 onward)	34.75		33.13	23.89
After Harrison Begins (week of 2/11/19 onward)	-25.55		-15.41	-25.97
Average Maximum Temperature to 50 Degrees		1.10		1.14
Plus Degrees in the 50s		0.91		0.23
Plus Degrees in the 60s		-0.70		0.34
Plus Degrees in the 70s		-0.53		-0.95
Plus Degrees Greater Than 80		-0.66		-0.53
Snowfall (inches)		-22.57		-17.72
Precipitation (inches)		-13.47		-7.19
Darkness Before Midnight (hours)		2.28		2.48
Thanksgiving/Christmas (proportion of week)		-128.48		-88.59
Winter Holiday (proportion of week)		-69.79		-100.94
Other Out-of-School Days (proportion of week)		-12.84		-17.36
Summer Vacation (proportion of week)		-5.31		-4.87
Summer Holiday (proportion of week)		-83.30		-63.01
Observations	522	232	522	522
R <sup>2</sup>	0.17	0.63	0.71	0.57

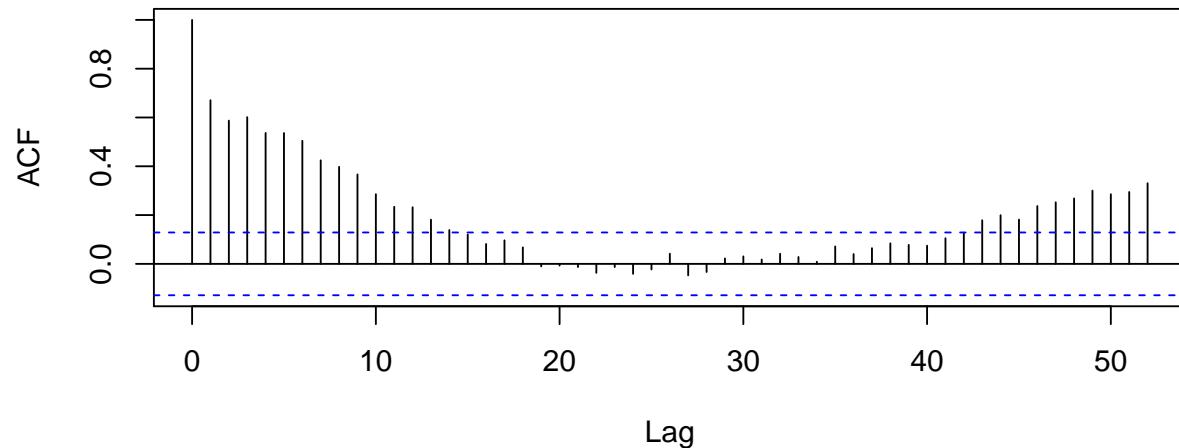
### 15.3 Least Squares Updated Model (2) for larceny larceny



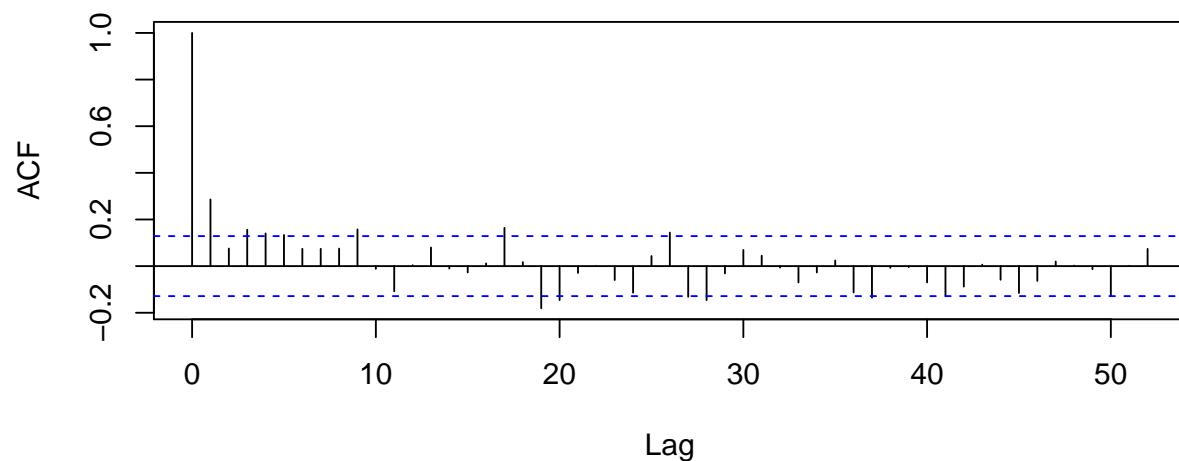
## larceny



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 15.4 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  
-3.4339 -0.9317 -0.0766  0.9001  3.5388  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.716e+00 1.031e-01 45.733 < 2e-16 ***  
t            1.303e-03 7.116e-05 18.317 < 2e-16 ***  
tmax.f.spline1 6.519e-03 1.901e-03  3.429 0.000606 ***  
tmax.f.spline2 3.087e-03 3.727e-03  0.828 0.407450  
tmax.f.spline3 -3.441e-03 4.421e-03 -0.778 0.436354  
tmax.f.spline4 -2.821e-03 4.208e-03 -0.670 0.502639  
tmax.f.spline5 -2.077e-03 3.494e-03 -0.594 0.552217  
snow.in       -1.329e-01 2.606e-02 -5.099 3.42e-07 ***  
precip.in      -6.191e-02 2.615e-02 -2.368 0.017895 *  
dark.before.12 1.123e-02 6.920e-03  1.624 0.104476  
thanks.xmas    -7.040e-01 2.151e-01 -3.273 0.001065 **  
summer.holiday -3.953e-01 1.477e-01 -2.676 0.007443 **  
winter.holiday -3.661e-01 2.081e-01 -1.759 0.078568 .  
summer.vacation -2.765e-02 1.900e-02 -1.456 0.145420  
oth.ns         -6.576e-02 2.718e-02 -2.419 0.015560 *  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 1221.40 on 231 degrees of freedom  
Residual deviance: 451.79 on 217 degrees of freedom  
AIC: 2142.3  
  
Number of Fisher Scoring iterations: 4
```

## 16 Results for auto.theft

### 16.1 Summary Values for auto.theft

Table 16.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
auto.theft	232	81.034	18.144	47	67.8	78	92	146

Table 16.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
auto.theft	290	81.976	16.775	46	70	80	92.8	145

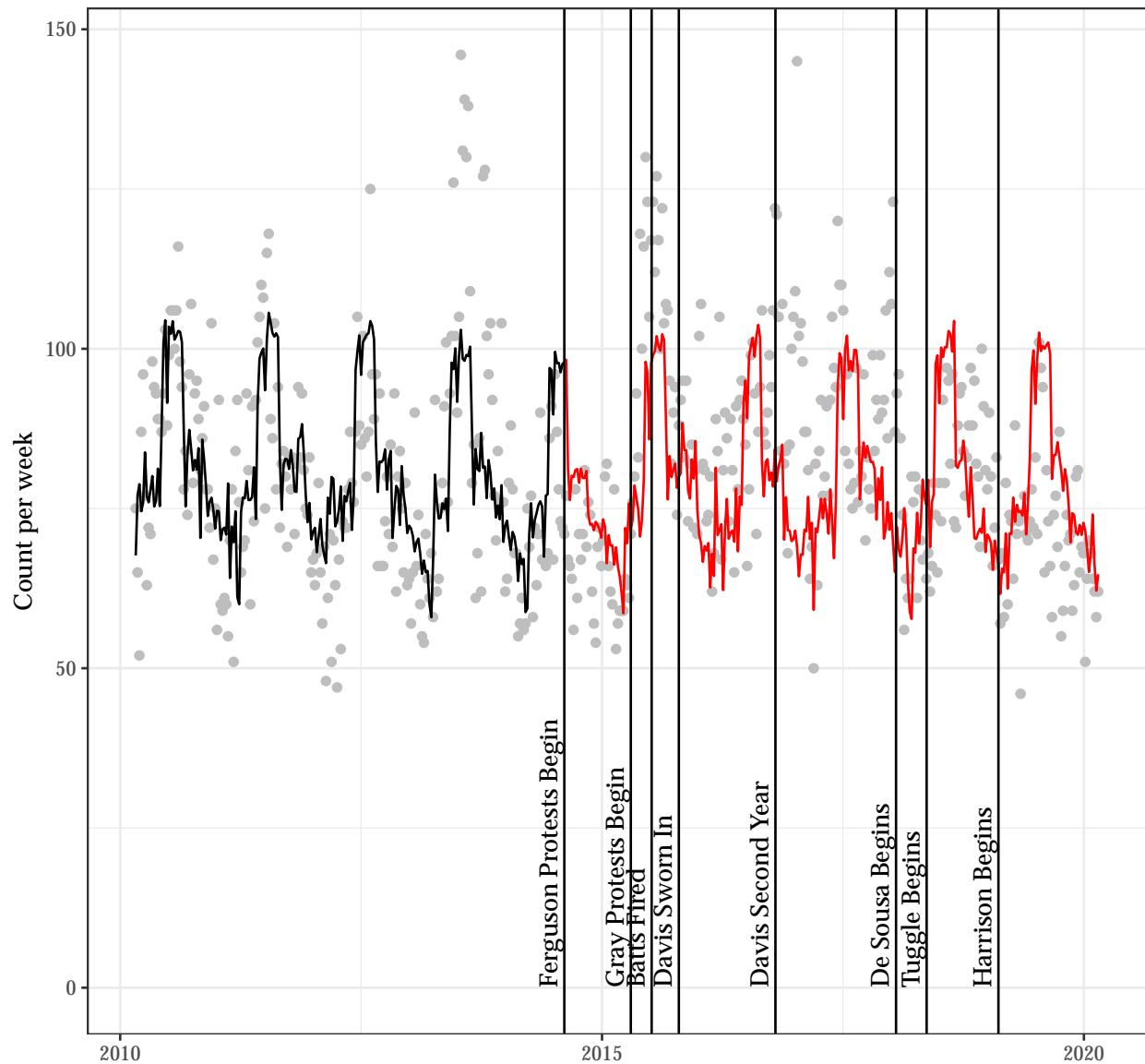
## 16.2 Four Models for auto.theft

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

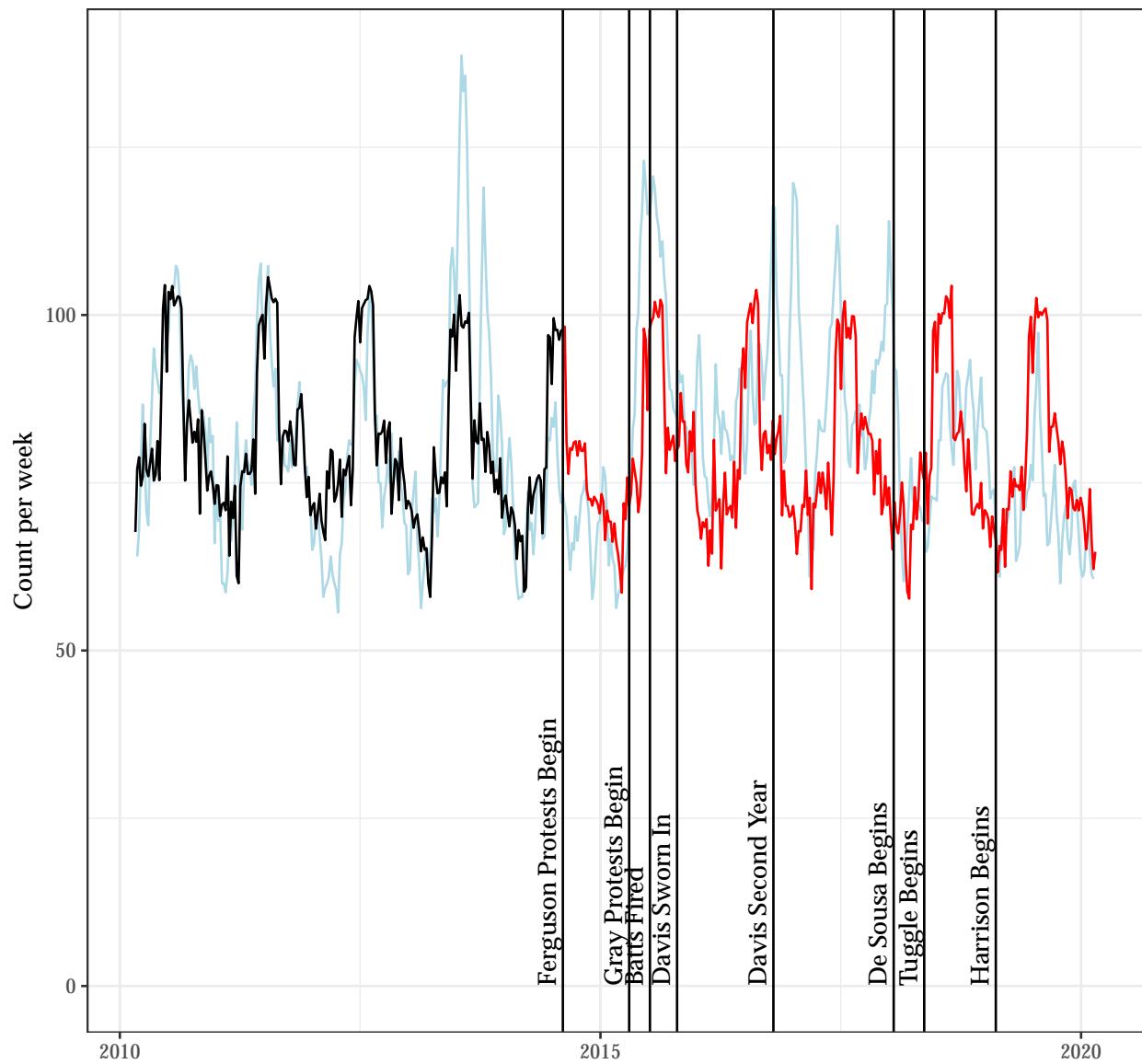
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.02	-0.01		-0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	-11.55		-7.70	-9.69
After Gray Protests Begin (week of 4/20/15 onward)	37.05		28.91	33.83
Unrest and National Guard (4/27/15 - 5/3/2015)	-27.37		-18.56	-20.67
After Batts Fired (week of 7/13/15 onward)	0.77		-8.44	-7.17
After Davis Confirmed (week of 10/19/15 onward)	-17.68		-6.92	-10.14
After Davis First Year (week of 10/17/16 onward)	7.28		6.71	6.56
After De Sousa Begins (week of 1/19/18 onward)	-16.70		-8.31	-9.79
After Tuggle Begins (week of 5/14/18 onward)	8.04		-4.69	-1.71
After Harrison Begins (week of 2/11/19 onward)	-10.11		-7.52	-7.63
Average Maximum Temperature to 50 Degrees		-0.21		-0.23
Plus Degrees in the 50s		1.58		0.90
Plus Degrees in the 60s		-0.81		-0.16
Plus Degrees in the 70s		-0.11		-0.06
Plus Degrees Greater Than 80		0.08		0.18
Snowfall (inches)		-0.70		-1.22
Precipitation (inches)		1.19		-0.27
Darkness Before Midnight (hours)		4.85		4.40
Thanksgiving/Christmas (proportion of week)		0.52		-7.04
Winter Holiday (proportion of week)		-27.37		-26.92
Other Out-of-School Days (proportion of week)		-2.05		0.62
Summer Vacation (proportion of week)		18.86		11.36
Summer Holiday (proportion of week)		-59.20		-43.43
Observations	522	232	522	522
R <sup>2</sup>	0.23	0.42	0.19	0.40

### 16.3 Least Squares Updated Model (2) for auto.theft

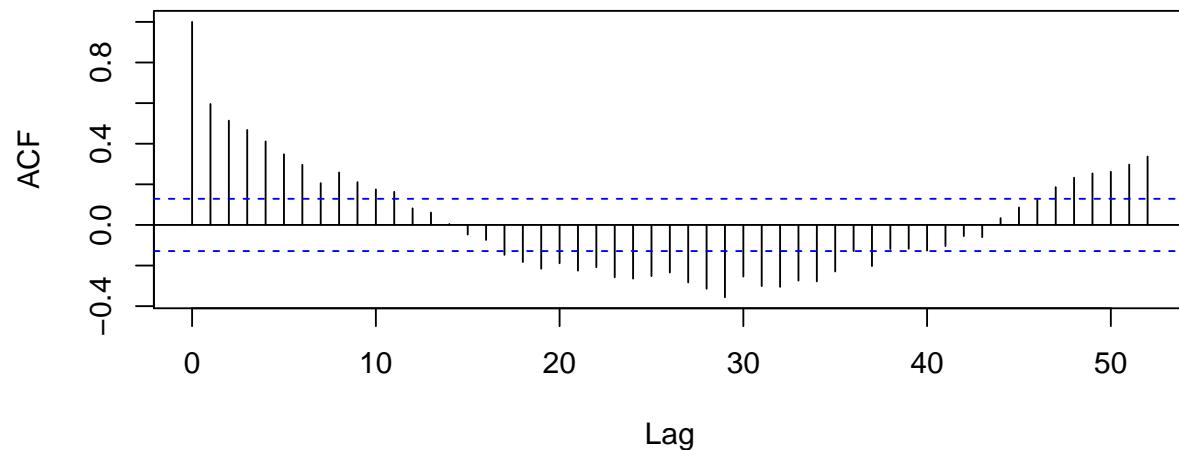
auto.theft



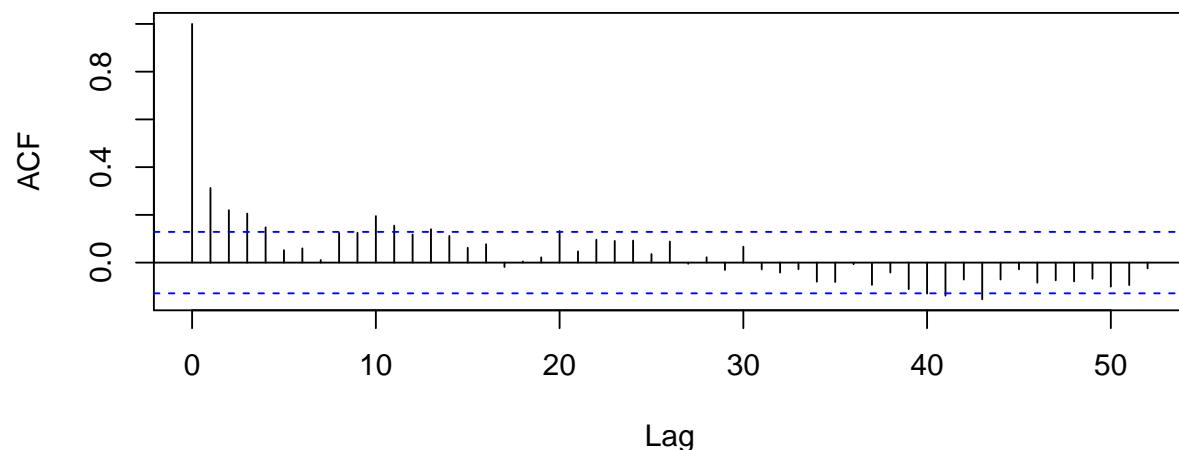
## auto.theft



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 16.4 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  
-3.4728 -1.0943 -0.1527  0.8846  4.7117  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 3.987e+00 1.641e-01 24.306 < 2e-16 ***  
t            -1.095e-04 1.133e-04 -0.966 0.333818  
tmax.f.spline1 -3.340e-03 3.007e-03 -1.111 0.266671  
tmax.f.spline2  2.191e-02 6.052e-03  3.621 0.000294 ***  
tmax.f.spline3 -1.121e-02 7.260e-03 -1.544 0.122607  
tmax.f.spline4 -1.699e-03 6.930e-03 -0.245 0.806308  
tmax.f.spline5  9.845e-07 5.484e-03  0.000 0.999857  
snow.in        -1.344e-02 3.831e-02 -0.351 0.725722  
precip.in       1.108e-02 4.122e-02  0.269 0.788016  
dark.before.12  6.455e-02 1.148e-02  5.624 1.86e-08 ***  
thanks.xmas     1.224e-02 3.270e-01  0.037 0.970139  
summer.holiday -6.781e-01 2.375e-01 -2.856 0.004295 **  
winter.holiday -3.977e-01 3.328e-01 -1.195 0.232139  
summer.vacation 2.168e-01 3.030e-02  7.154 8.42e-13 ***  
oth.ns          -2.746e-02 4.365e-02 -0.629 0.529301  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 904.75 on 231 degrees of freedom  
Residual deviance: 521.84 on 217 degrees of freedom  
AIC: 1992.8  
  
Number of Fisher Scoring iterations: 4
```

## 17 Results for arson

### 17.1 Summary Values for arson

Table 17.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
arson	232	5.289	2.914	0	3	5	7	15

Table 17.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
arson	290	4.003	3.155	0	2	4	5	33

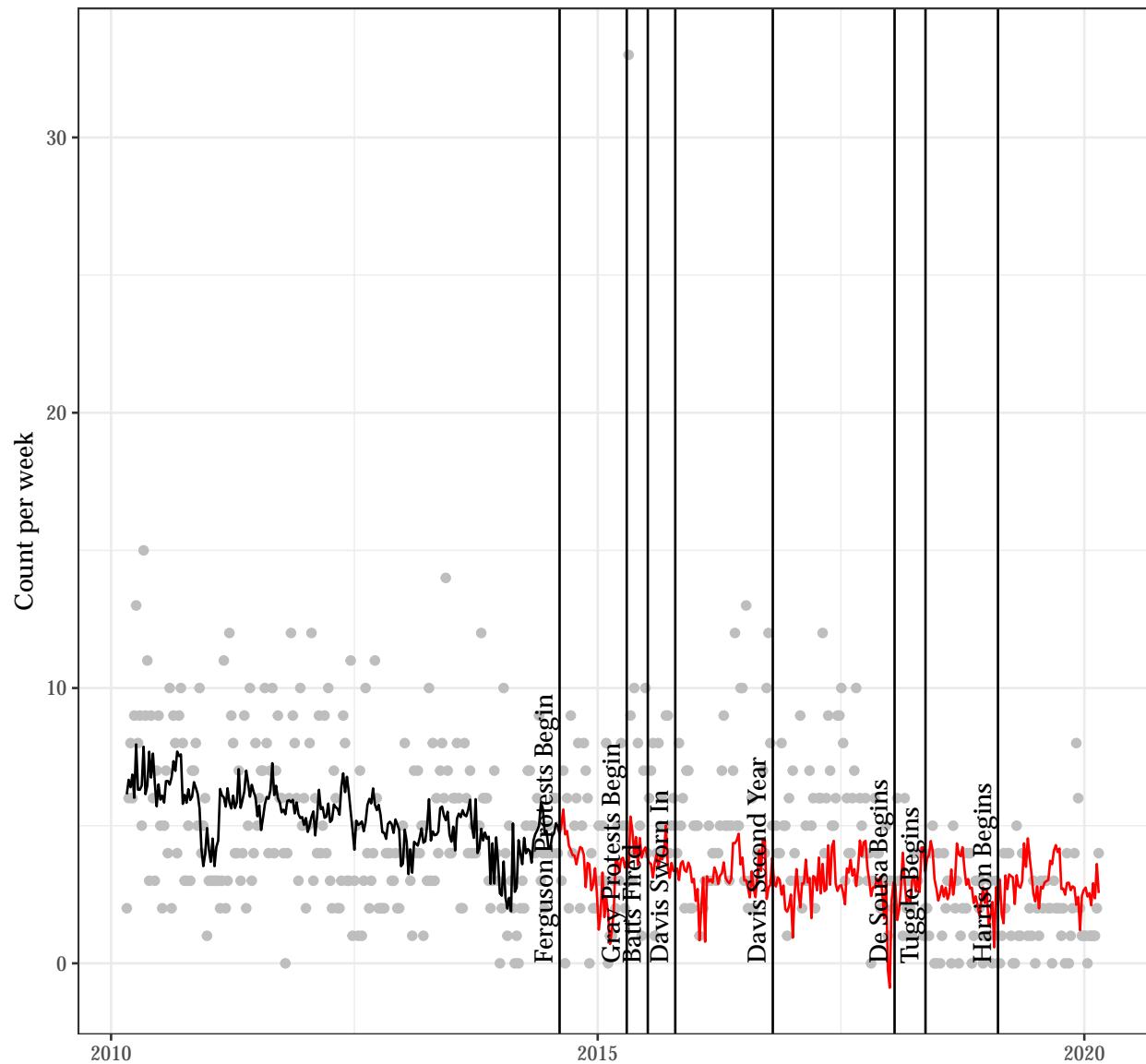
## 17.2 Four Models for arson

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

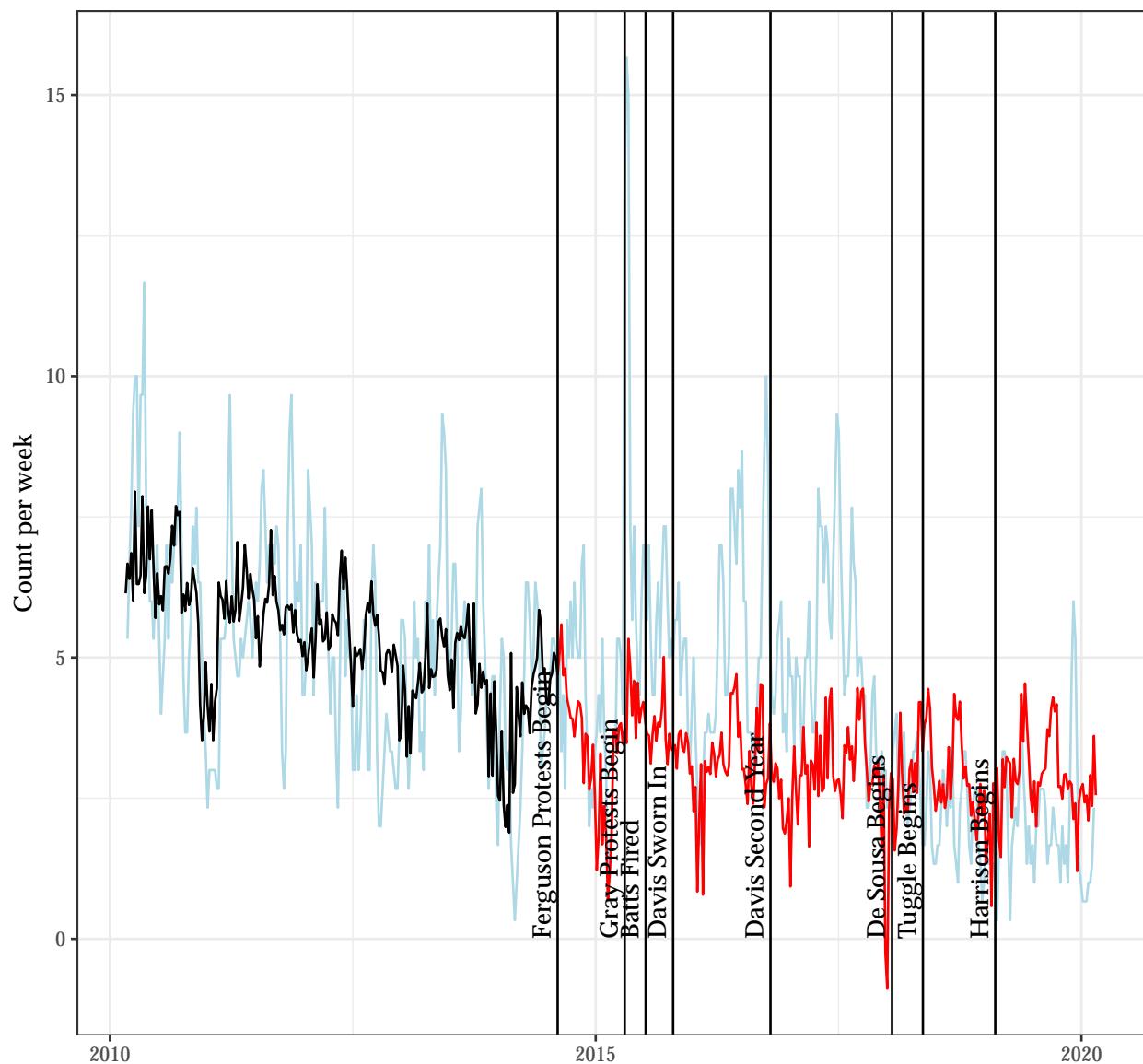
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.01	-0.01	-0.01	-0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	0.21		0.77	0.61
After Gray Protests Begin (week of 4/20/15 onward)	2.14		0.99	1.08
Unrest and National Guard (4/27/15 - 5/3/2015)	26.95		27.76	27.26
After Batts Fired (week of 7/13/15 onward)	-0.01		0.39	0.40
After Davis Confirmed (week of 10/19/15 onward)	-0.32		-0.14	-0.06
After Davis First Year (week of 10/17/16 onward)	0.30		-0.01	0.28
After De Sousa Begins (week of 1/19/18 onward)	-1.46		-1.87	-1.43
After Tuggle Begins (week of 5/14/18 onward)	-0.66		-0.91	-0.65
After Harrison Begins (week of 2/11/19 onward)	0.47		-0.08	0.38
Average Maximum Temperature to 50 Degrees		0.14		0.08
Plus Degrees in the 50s		-0.09		-0.10
Plus Degrees in the 60s		-0.13		0.02
Plus Degrees in the 70s		0.29		0.09
Plus Degrees Greater Than 80		-0.33		-0.21
Snowfall (inches)		-0.03		-0.55
Precipitation (inches)		-0.51		-0.60
Darkness Before Midnight (hours)		-0.01		-0.17
Thanksgiving/Christmas (proportion of week)		-0.37		1.43
Winter Holiday (proportion of week)		5.98		-2.16
Other Out-of-School Days (proportion of week)		-0.29		-0.98
Summer Vacation (proportion of week)		-0.66		-0.09
Summer Holiday (proportion of week)		-1.70		-1.66
Observations	522	232	522	522
R <sup>2</sup>	0.35	0.14	0.31	0.40

### 17.3 Least Squares Updated Model (2) for arson

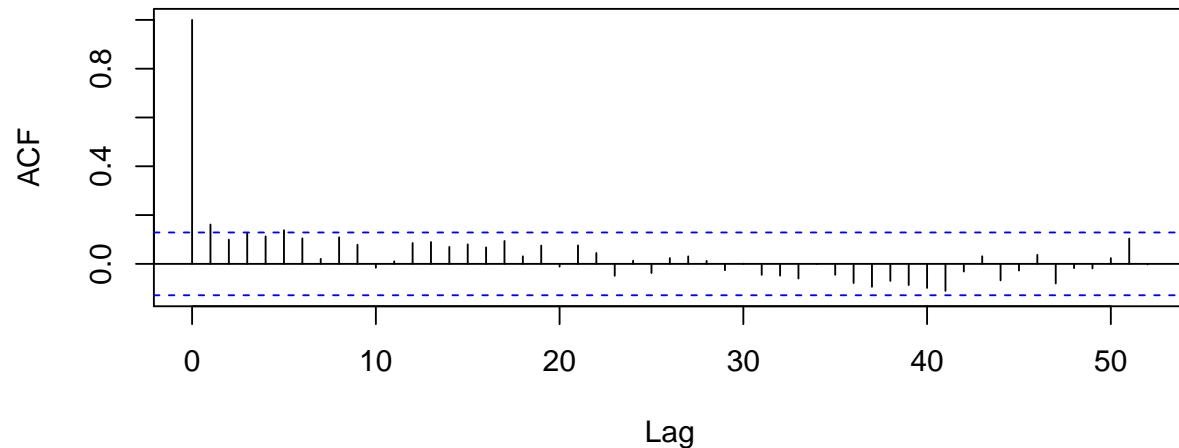
arson



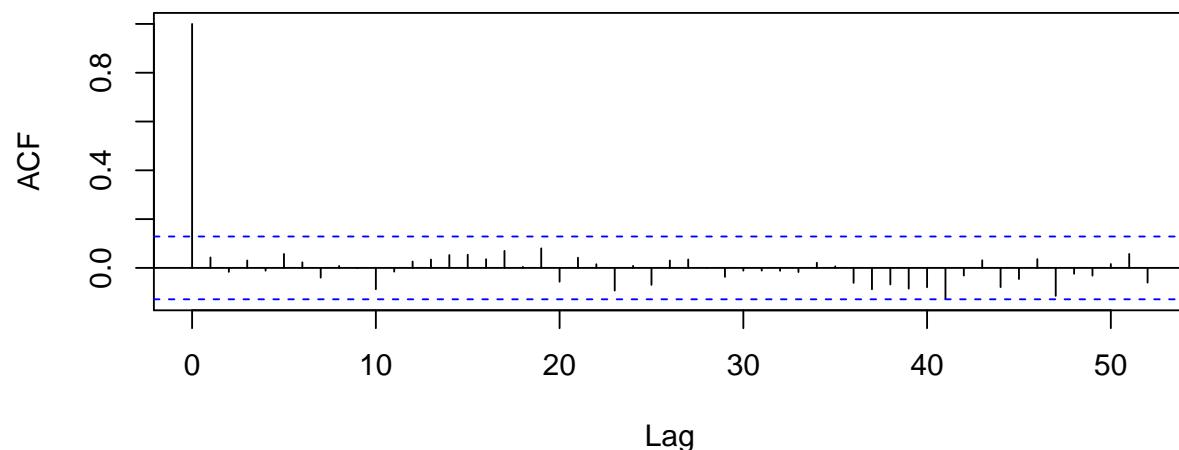
## arson



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 17.4 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  
-3.2816 -0.8973 -0.1311  0.7307  3.2251  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 0.1895036 0.6872716 0.276 0.78275  
t          -0.0020237 0.0004434 -4.564 5.02e-06 ***  
tmax.f.spline1 0.0339058 0.0127801 2.653 0.00798 **  
tmax.f.spline2 -0.0250366 0.0235757 -1.062 0.28825  
tmax.f.spline3 -0.0221325 0.0271130 -0.816 0.41432  
tmax.f.spline4 0.0489929 0.0260237 1.883 0.05975 .  
tmax.f.spline5 -0.0579500 0.0216386 -2.678 0.00740 **  
snow.in       -0.0667078 0.1882739 -0.354 0.72310  
precip.in      -0.0971110 0.1624323 -0.598 0.54994  
dark.before.12 -0.0002337 0.0434155 -0.005 0.99570  
thanks.xmas    -0.1448295 1.3198450 -0.110 0.91262  
summer.holiday -0.2732261 0.9038656 -0.302 0.76243  
winter.holiday 1.3741704 1.2706204 1.081 0.27948  
summer.vacation -0.1009813 0.1155001 -0.874 0.38196  
oth.ns        -0.0528826 0.1663959 -0.318 0.75063  
---  
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 380.64 on 231 degrees of freedom  
Residual deviance: 324.99 on 217 degrees of freedom  
AIC: 1132.6  
  
Number of Fisher Scoring iterations: 5
```

## 18 Results for northwestern

### 18.1 Summary Values for northwestern

Table 18.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northwestern	232	95.052	15.257	56	85	94	105	151

Table 18.2: Descriptives for Outcome After Ferguson Protests Begin

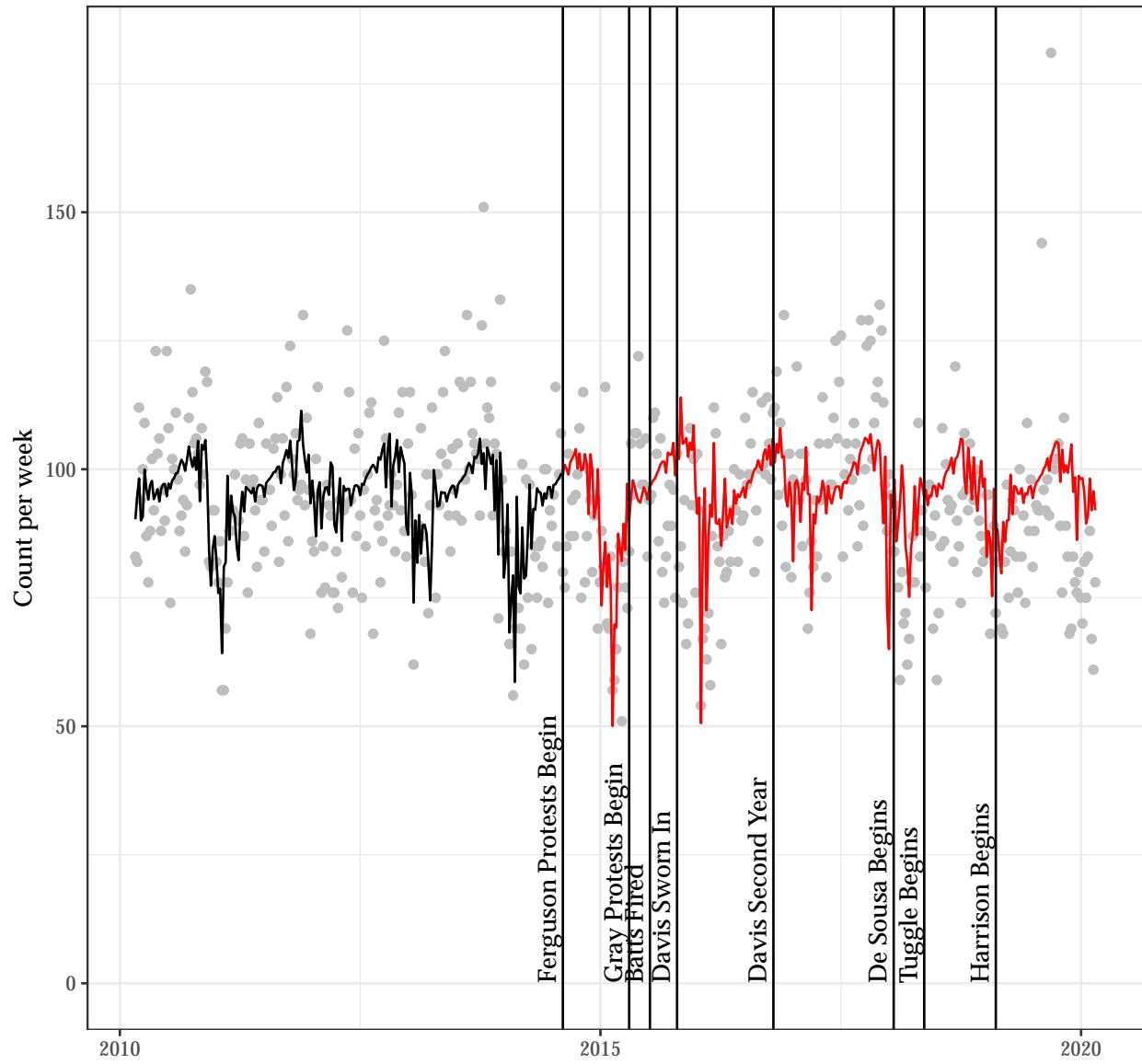
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northwestern	290	91.317	16.424	51	81	91	100	181

## 18.2 Four Models for northwestern

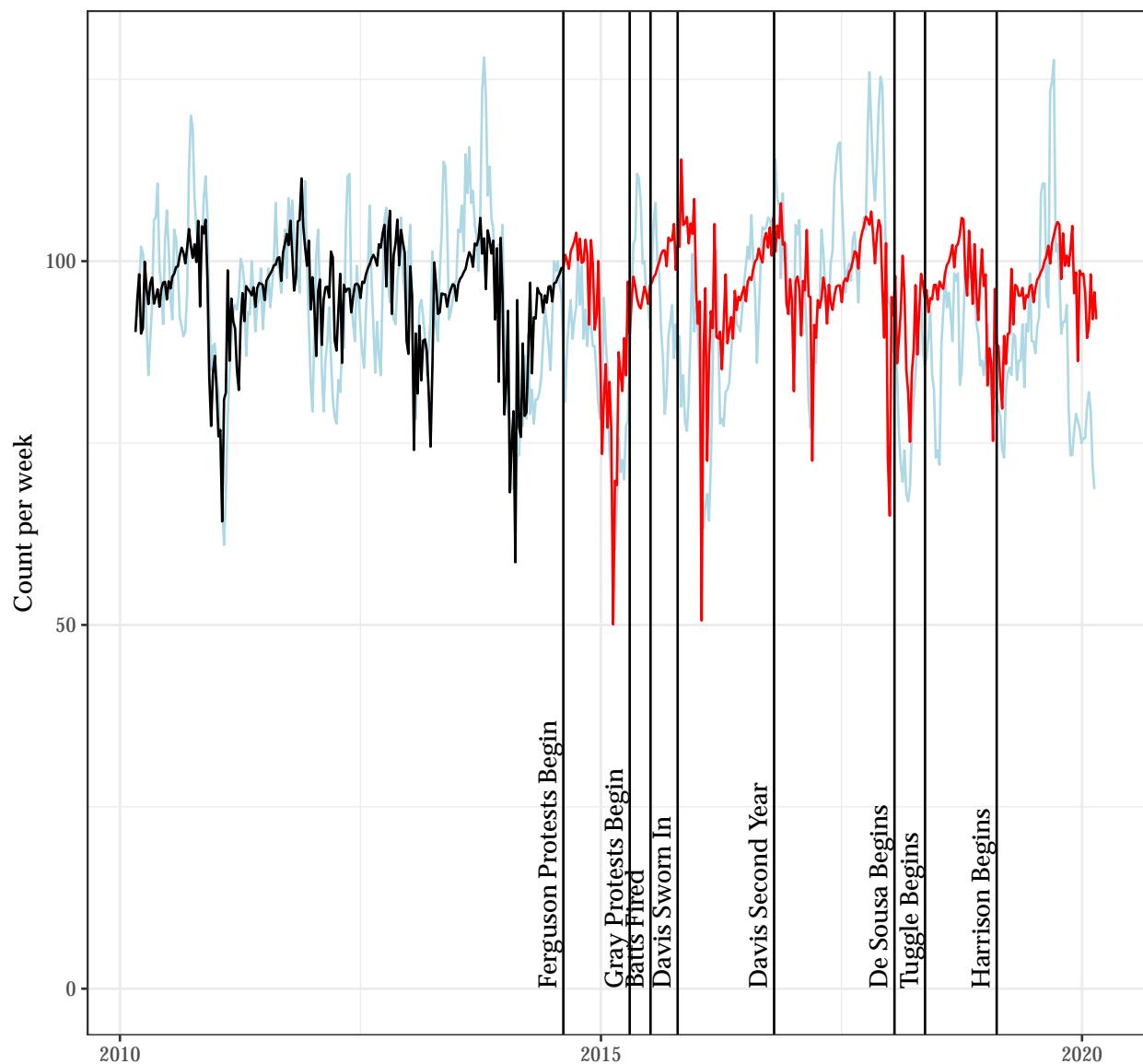
Table 18.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.01	-0.001		0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	-10.32		-7.29	-8.91
After Gray Protests Begin (week of 4/20/15 onward)	16.35		12.07	11.62
Unrest and National Guard (4/27/15 - 5/3/2015)	5.23		5.65	6.80
After Batts Fired (week of 7/13/15 onward)	-7.19		-12.92	-13.20
After Davis Confirmed (week of 10/19/15 onward)	-2.82		1.39	2.16
After Davis First Year (week of 10/17/16 onward)	13.09		11.69	11.85
After De Sousa Begins (week of 1/19/18 onward)	-21.62		-15.61	-15.63
After Tuggle Begins (week of 5/14/18 onward)	9.73		3.33	1.95
After Harrison Begins (week of 2/11/19 onward)	-1.05		-0.78	-0.19
Average Maximum Temperature to 50 Degrees		1.32		0.58
Plus Degrees in the 50s		-0.80		0.28
Plus Degrees in the 60s		0.52		0.20
Plus Degrees in the 70s		-0.83		-0.74
Plus Degrees Greater Than 80		-0.17		0.001
Snowfall (inches)		-6.08		-5.32
Precipitation (inches)		-1.74		0.71
Darkness Before Midnight (hours)		6.01		5.74
Thanksgiving/Christmas (proportion of week)		26.44		1.08
Winter Holiday (proportion of week)		8.96		-8.68
Other Out-of-School Days (proportion of week)		-6.18		-6.38
Summer Vacation (proportion of week)		1.98		-0.57
Summer Holiday (proportion of week)		-15.53		-21.17
Observations	522	232	522	522
R <sup>2</sup>	0.12	0.27	0.11	0.31

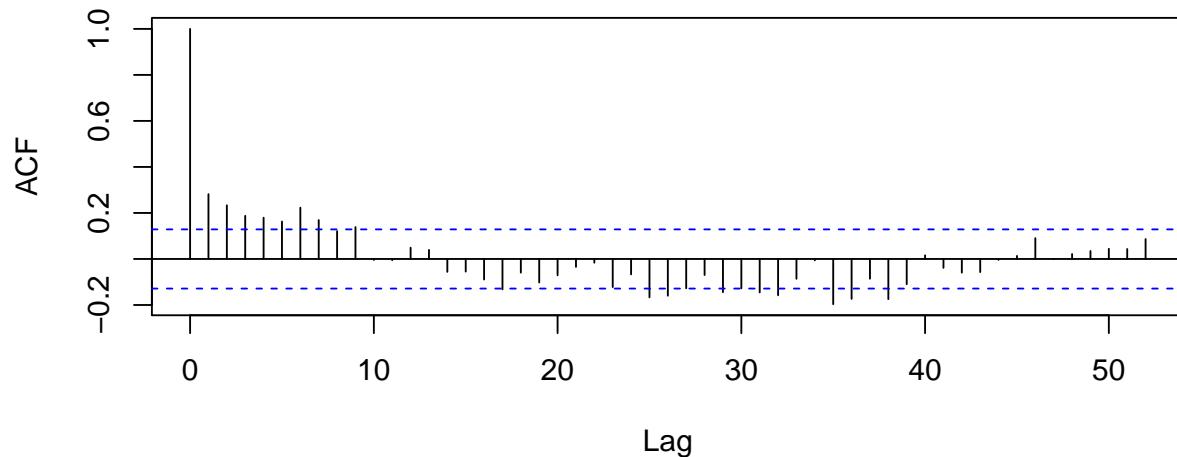
### 18.3 Least Squares Updated Model (2) for northwestern northwestern



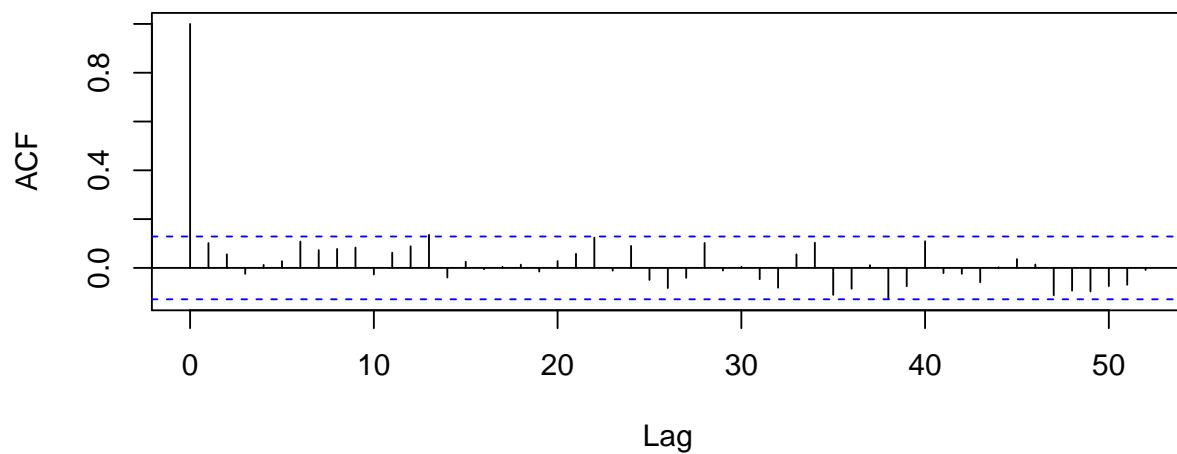
## northwestern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 18.4 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  
-3.4902 -0.9710 -0.0699  0.8588  4.3961  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 3.419e+00 1.504e-01 22.724 < 2e-16 ***  
t            -9.197e-06 1.050e-04 -0.088  0.9302  
tmax.f.spline1 1.481e-02 2.765e-03  5.358 8.40e-08 ***  
tmax.f.spline2 -9.936e-03 5.409e-03 -1.837  0.0662 .  
tmax.f.spline3 6.149e-03 6.482e-03  0.949  0.3428  
tmax.f.spline4 -8.969e-03 6.246e-03 -1.436  0.1510  
tmax.f.spline5 -1.801e-03 5.214e-03 -0.345  0.7297  
snow.in        -9.196e-02 3.861e-02 -2.382  0.0172 *  
precip.in       -1.732e-02 3.804e-02 -0.455  0.6488  
dark.before.12  6.272e-02 1.023e-02  6.131 8.76e-10 ***  
thanks.xmas     2.725e-01 2.892e-01  0.942  0.3460  
summer.holiday -1.584e-01 2.209e-01 -0.717  0.4735  
winter.holiday 1.097e-01 2.972e-01  0.369  0.7121  
summer.vacation 2.128e-02 2.861e-02  0.744  0.4570  
oth.ns          -6.546e-02 3.917e-02 -1.671  0.0947 .  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 567.36 on 231 degrees of freedom  
Residual deviance: 409.45 on 217 degrees of freedom  
AIC: 1919.8  
  
Number of Fisher Scoring iterations: 4
```

## 19 Results for northern

### 19.1 Summary Values for northern

Table 19.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northern	232	104.272	17.723	56	93	104.5	116	149

Table 19.2: Descriptives for Outcome After Ferguson Protests Begin

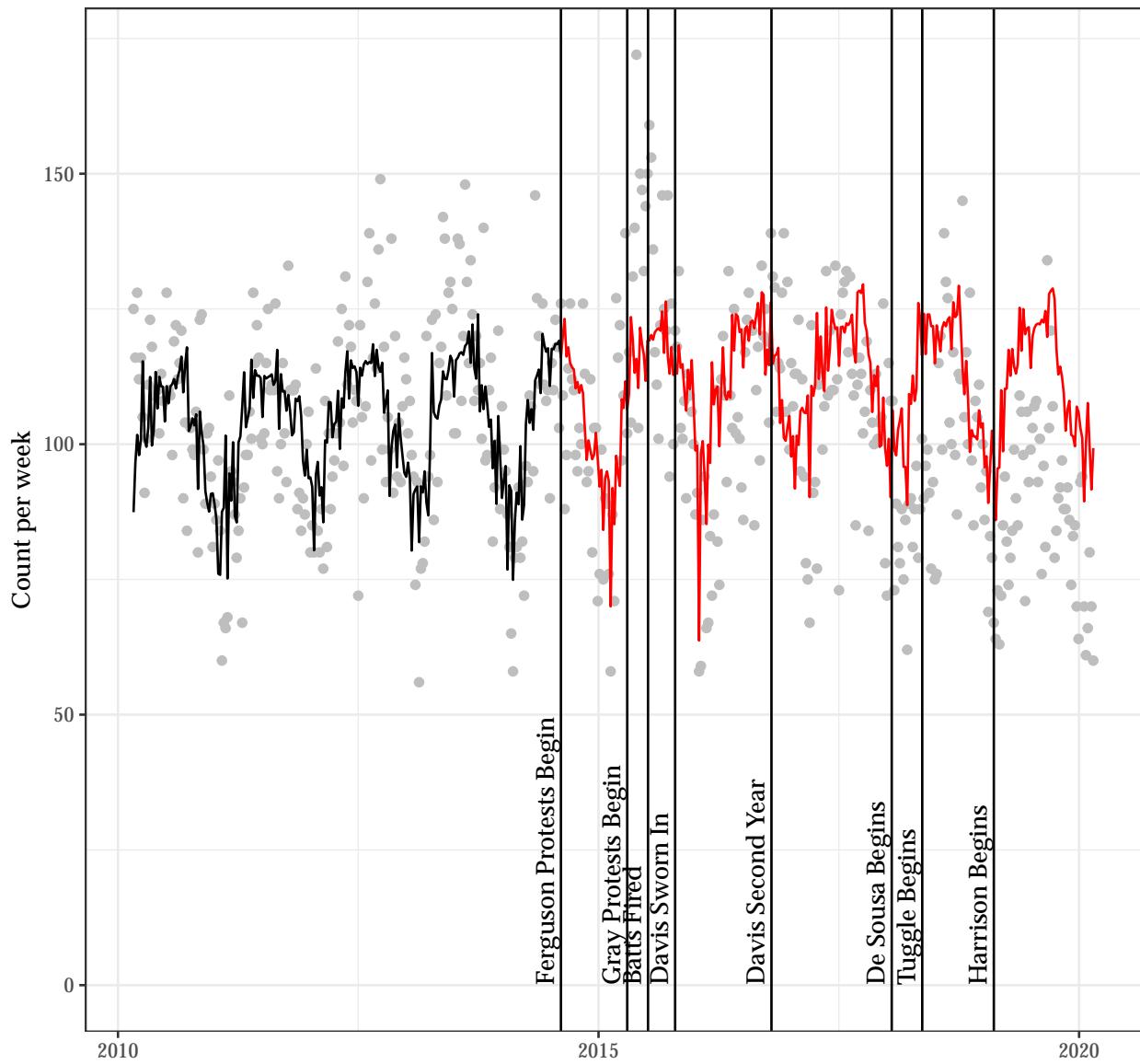
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northern	290	102.014	21.026	58	87	102	115	172

## 19.2 Four Models for northern

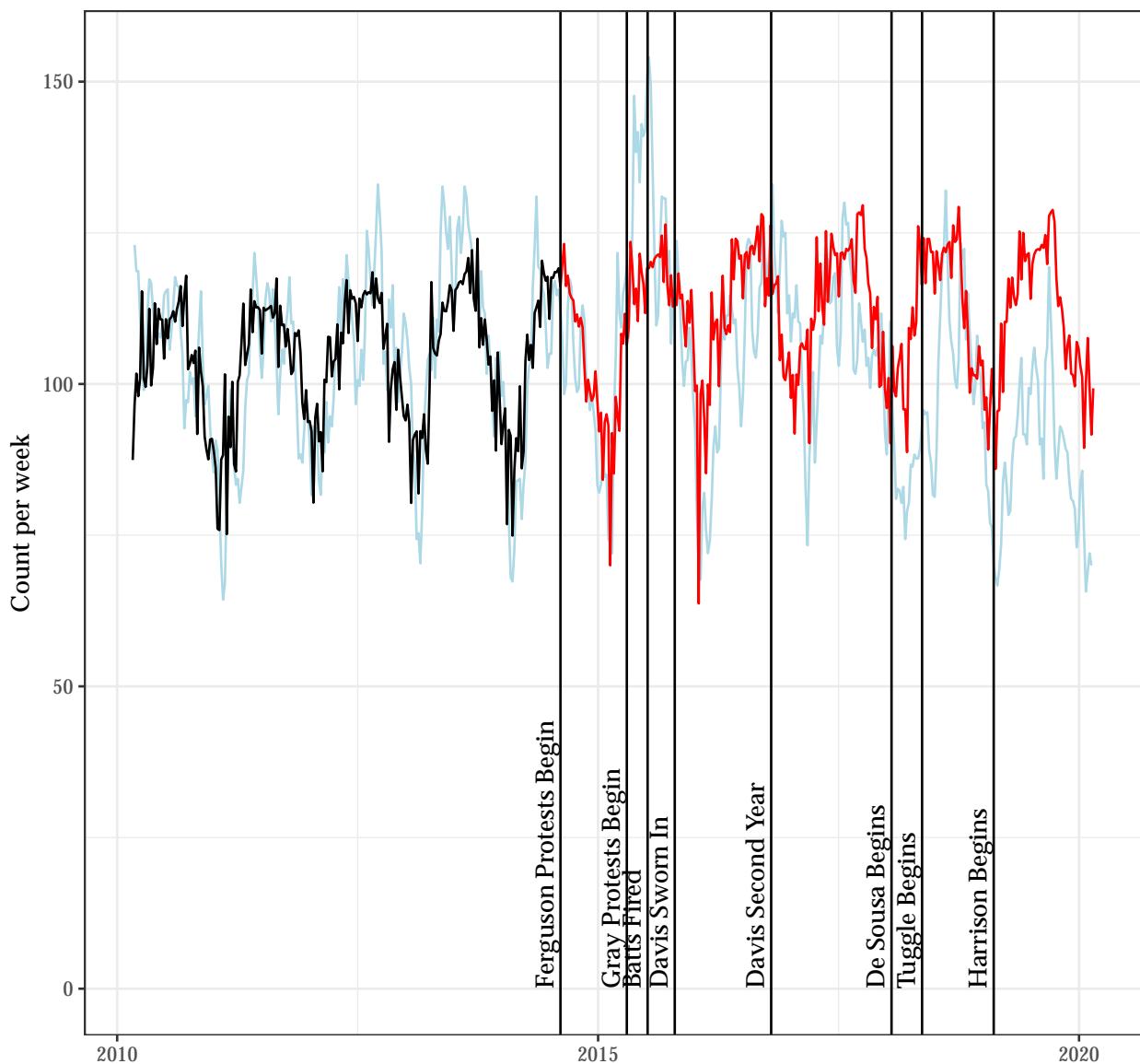
Table 19.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.01	0.03		0.03
After Ferguson Protests Begin (week of 8/11/14 onward)	-5.83		-2.44	-2.02
After Gray Protests Begin (week of 4/20/15 onward)	33.61		20.50	22.29
Unrest and National Guard (4/27/15 - 5/3/2015)	-17.03		-10.33	-12.58
After Batts Fired (week of 7/13/15 onward)	-8.75		-11.90	-13.29
After Davis Confirmed (week of 10/19/15 onward)	-23.48		-15.74	-16.03
After Davis First Year (week of 10/17/16 onward)	5.86		6.29	5.24
After De Sousa Begins (week of 1/19/18 onward)	-25.15		-18.15	-19.87
After Tuggle Begins (week of 5/14/18 onward)	16.85		9.63	8.93
After Harrison Begins (week of 2/11/19 onward)	-15.17		-12.73	-14.39
Average Maximum Temperature to 50 Degrees		0.23		0.75
Plus Degrees in the 50s		1.17		0.18
Plus Degrees in the 60s		-1.02		-0.34
Plus Degrees in the 70s		0.99		0.20
Plus Degrees Greater Than 80		-1.42		-0.47
Snowfall (inches)		-6.07		-5.30
Precipitation (inches)		-5.08		-3.79
Darkness Before Midnight (hours)		2.55		3.14
Thanksgiving/Christmas (proportion of week)		8.41		20.15
Winter Holiday (proportion of week)		-67.06		-67.50
Other Out-of-School Days (proportion of week)		0.13		-6.63
Summer Vacation (proportion of week)		-2.35		-0.22
Summer Holiday (proportion of week)		-47.83		-37.86
Observations	522	232	522	522
R <sup>2</sup>	0.20	0.36	0.27	0.44

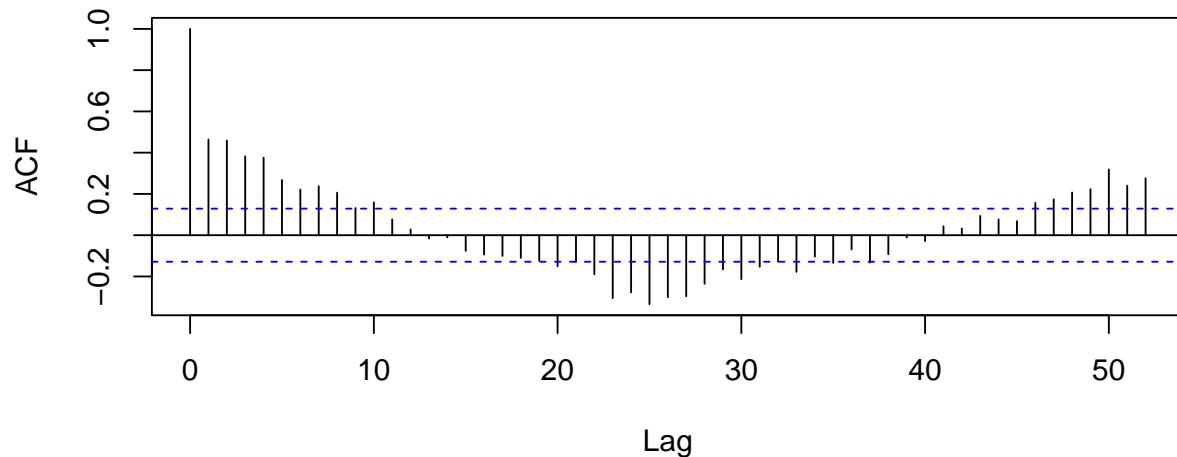
### 19.3 Least Squares Updated Model (2) for northern northern



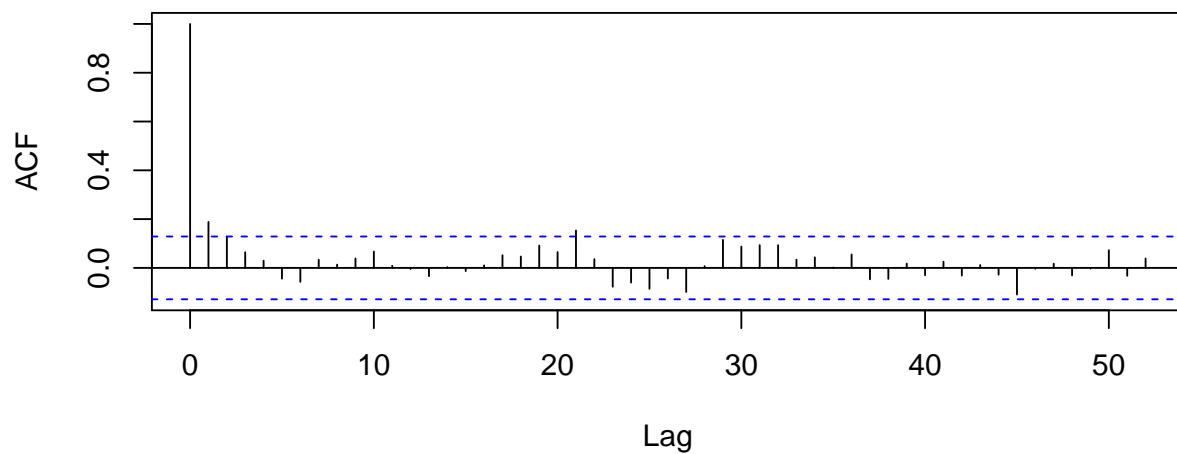
## northern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 19.4 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  
-4.1303 -0.9654 -0.0654  0.8819  3.7038  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.206e+00 1.452e-01 28.962 < 2e-16 ***  
t            3.219e-04 9.979e-05  3.226 0.00126 **  
tmax.f.spline1 2.566e-03 2.678e-03  0.958 0.33787  
tmax.f.spline2 1.157e-02 5.287e-03  2.189 0.02863 *  
tmax.f.spline3 -1.035e-02 6.267e-03 -1.652 0.09848 .  
tmax.f.spline4 8.671e-03 5.955e-03  1.456 0.14537  
tmax.f.spline5 -1.271e-02 4.885e-03 -2.602 0.00926 **  
snow.in       -7.286e-02 3.558e-02 -2.047 0.04062 *  
precip.in      -4.782e-02 3.674e-02 -1.302 0.19303  
dark.before.12 2.511e-02 9.864e-03  2.546 0.01090 *  
thanks.xmas    9.081e-02 2.874e-01  0.316 0.75200  
summer.holiday -4.274e-01 2.066e-01 -2.069 0.03857 *  
winter.holiday -7.793e-01 3.015e-01 -2.585 0.00974 **  
summer.vacation -2.019e-02 2.651e-02 -0.762 0.44617  
oth.ns         2.198e-03 3.735e-02  0.059 0.95306  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 709.28 on 231 degrees of freedom  
Residual deviance: 454.75 on 217 degrees of freedom  
AIC: 1986.1  
  
Number of Fisher Scoring iterations: 4
```

## 20 Results for northeastern

### 20.1 Summary Values for northeastern

Table 20.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northeastern	232	149.030	20.718	84	134.8	148	162.2	207

Table 20.2: Descriptives for Outcome After Ferguson Protests Begin

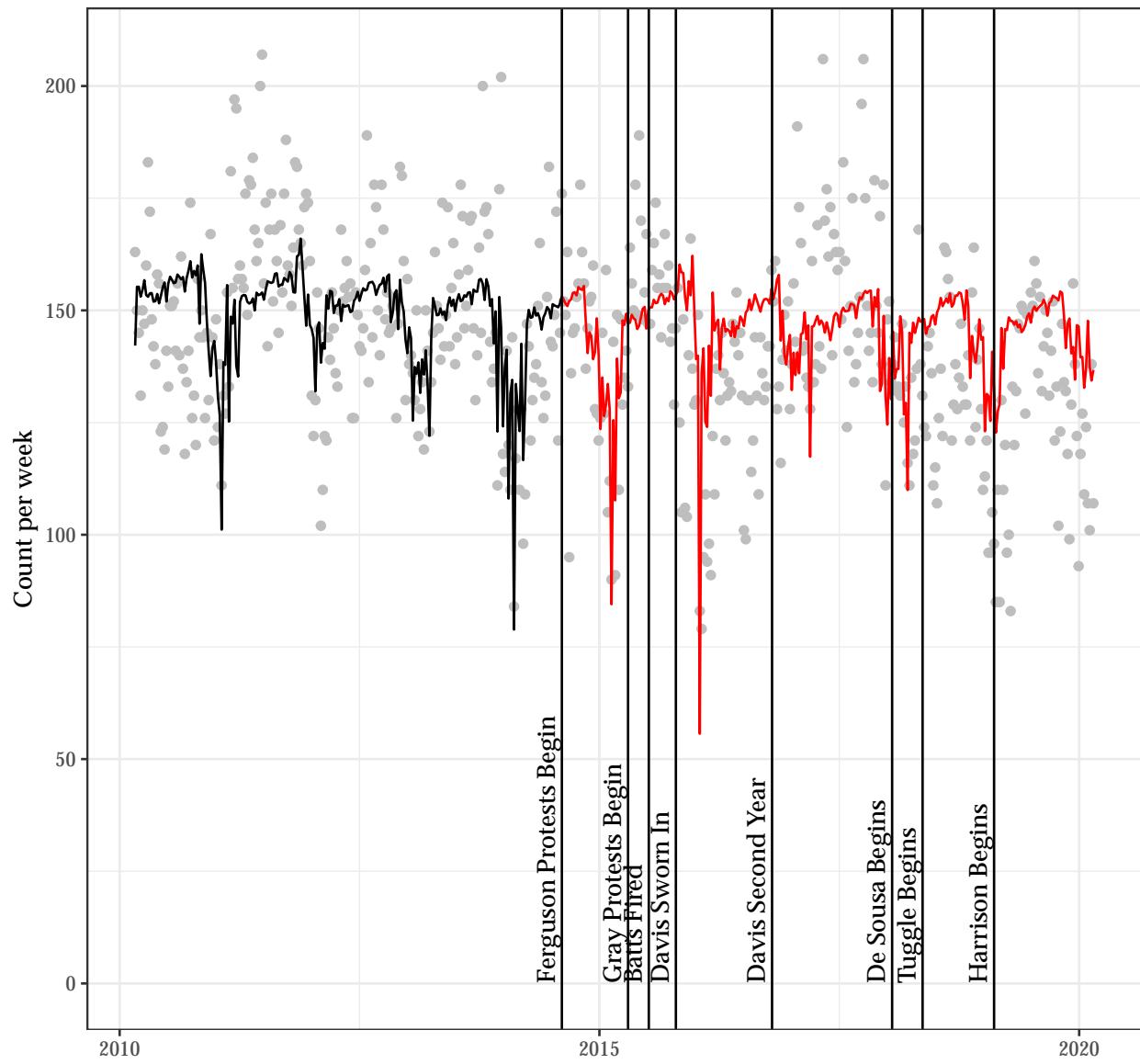
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
northeastern	290	137.790	22.366	79	126	138	152	206

## 20.2 Four Models for northeastern

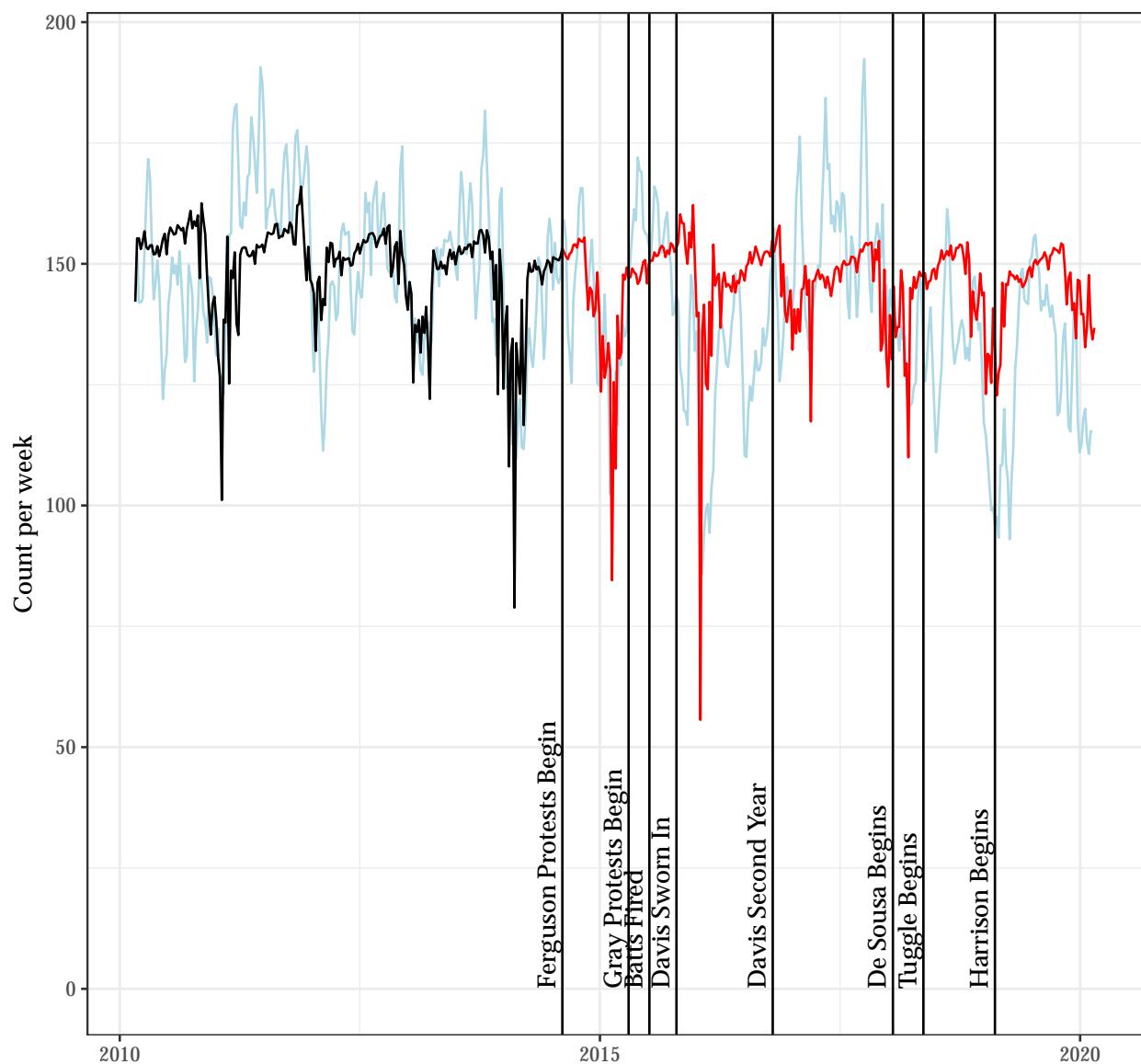
Table 20.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.04	-0.02		-0.02
After Ferguson Protests Begin (week of 8/11/14 onward)	-4.88		-2.10	-2.26
After Gray Protests Begin (week of 4/20/15 onward)	20.28		12.17	10.59
Unrest and National Guard (4/27/15 - 5/3/2015)	5.54		6.69	9.89
After Batts Fired (week of 7/13/15 onward)	-3.71		-8.42	-8.36
After Davis Confirmed (week of 10/19/15 onward)	-26.02		-21.01	-19.49
After Davis First Year (week of 10/17/16 onward)	28.13		25.89	26.75
After De Sousa Begins (week of 1/19/18 onward)	-18.08		-13.37	-12.83
After Tuggle Begins (week of 5/14/18 onward)	-1.07		-8.53	-9.72
After Harrison Begins (week of 2/11/19 onward)	-1.64		-2.39	-0.60
Average Maximum Temperature to 50 Degrees		0.60		0.55
Plus Degrees in the 50s		0.91		0.42
Plus Degrees in the 60s		-1.20		-0.43
Plus Degrees in the 70s		-0.15		0.12
Plus Degrees Greater Than 80		0.04		-0.16
Snowfall (inches)		-20.25		-15.55
Precipitation (inches)		3.10		3.90
Darkness Before Midnight (hours)		4.37		4.07
Thanksgiving/Christmas (proportion of week)		10.60		-4.25
Winter Holiday (proportion of week)		-30.52		-51.56
Other Out-of-School Days (proportion of week)		-0.13		-8.31
Summer Vacation (proportion of week)		1.87		-2.80
Summer Holiday (proportion of week)		-17.98		-24.15
Observations	522	232	522	522
R <sup>2</sup>	0.22	0.25	0.21	0.40

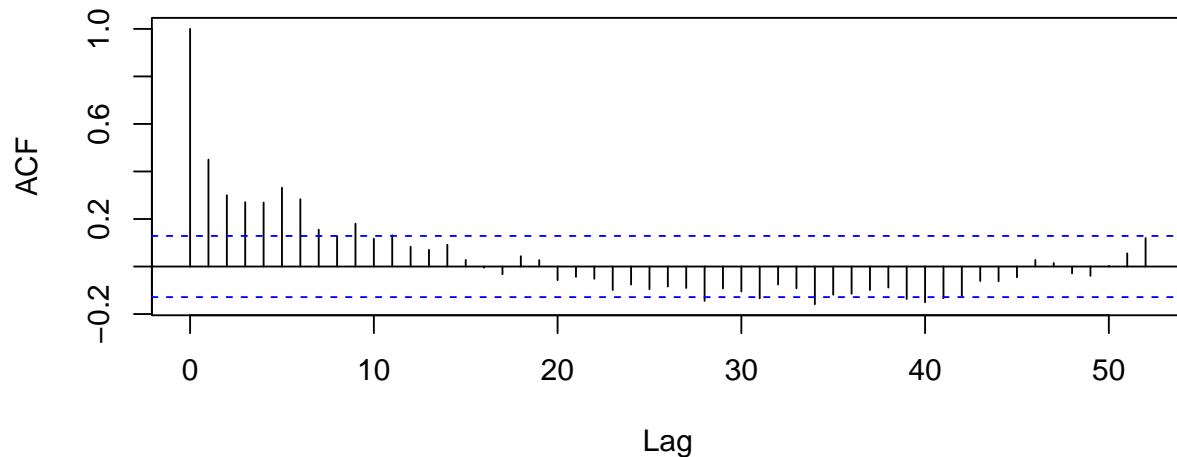
### 20.3 Least Squares Updated Model (2) for northeastern northeastern



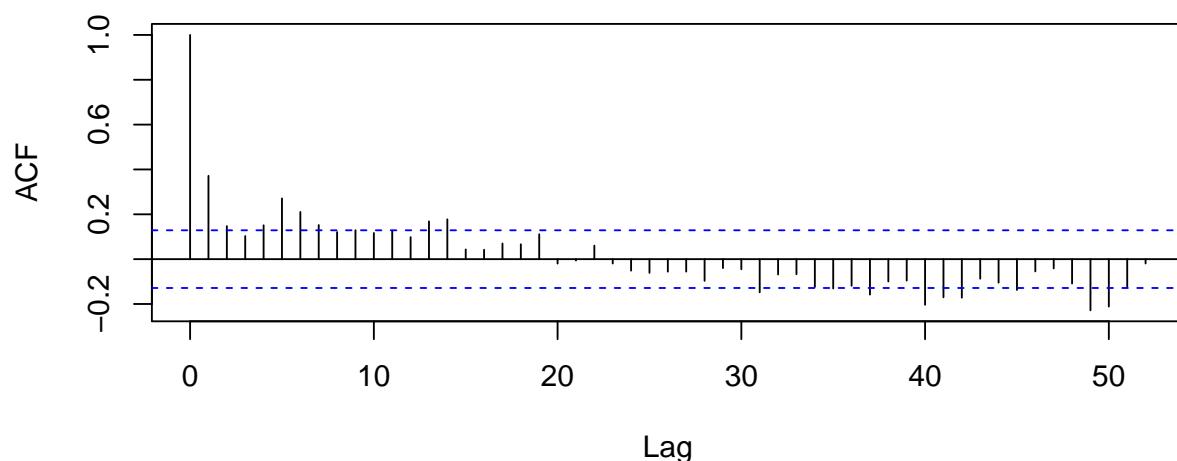
## northeastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 20.4 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  
-3.2228 -0.9757 -0.1569  0.9071  4.5399  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.585e+00 1.185e-01 38.680 < 2e-16 ***  
t          -1.268e-04 8.363e-05 -1.516 0.12957  
tmax.f.spline1 4.167e-03 2.176e-03  1.915 0.05548 .  
tmax.f.spline2 5.713e-03 4.300e-03  1.329 0.18396  
tmax.f.spline3 -7.803e-03 5.140e-03 -1.518 0.12902  
tmax.f.spline4 -9.893e-04 4.983e-03 -0.199 0.84262  
tmax.f.spline5 2.117e-04 4.164e-03  0.051 0.95946  
snow.in       -1.813e-01 3.162e-02 -5.733 9.85e-09 ***  
precip.in      2.067e-02 3.022e-02  0.684 0.49406  
dark.before.12 2.900e-02 8.160e-03  3.554 0.00038 ***  
thanks.xmas    5.862e-02 2.333e-01  0.251 0.80159  
summer.holiday -1.174e-01 1.758e-01 -0.668 0.50443  
winter.holiday -2.037e-01 2.399e-01 -0.849 0.39597  
summer.vacation 1.244e-02 2.289e-02  0.543 0.58694  
oth.ns         1.264e-03 3.066e-02  0.041 0.96712  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 669.22 on 231 degrees of freedom  
Residual deviance: 487.40 on 217 degrees of freedom  
AIC: 2102.7  
  
Number of Fisher Scoring iterations: 4
```

## 21 Results for western

### 21.1 Summary Values for western

Table 21.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
western	232	77.522	13.491	43	67.8	77	87	113

Table 21.2: Descriptives for Outcome After Ferguson Protests Begin

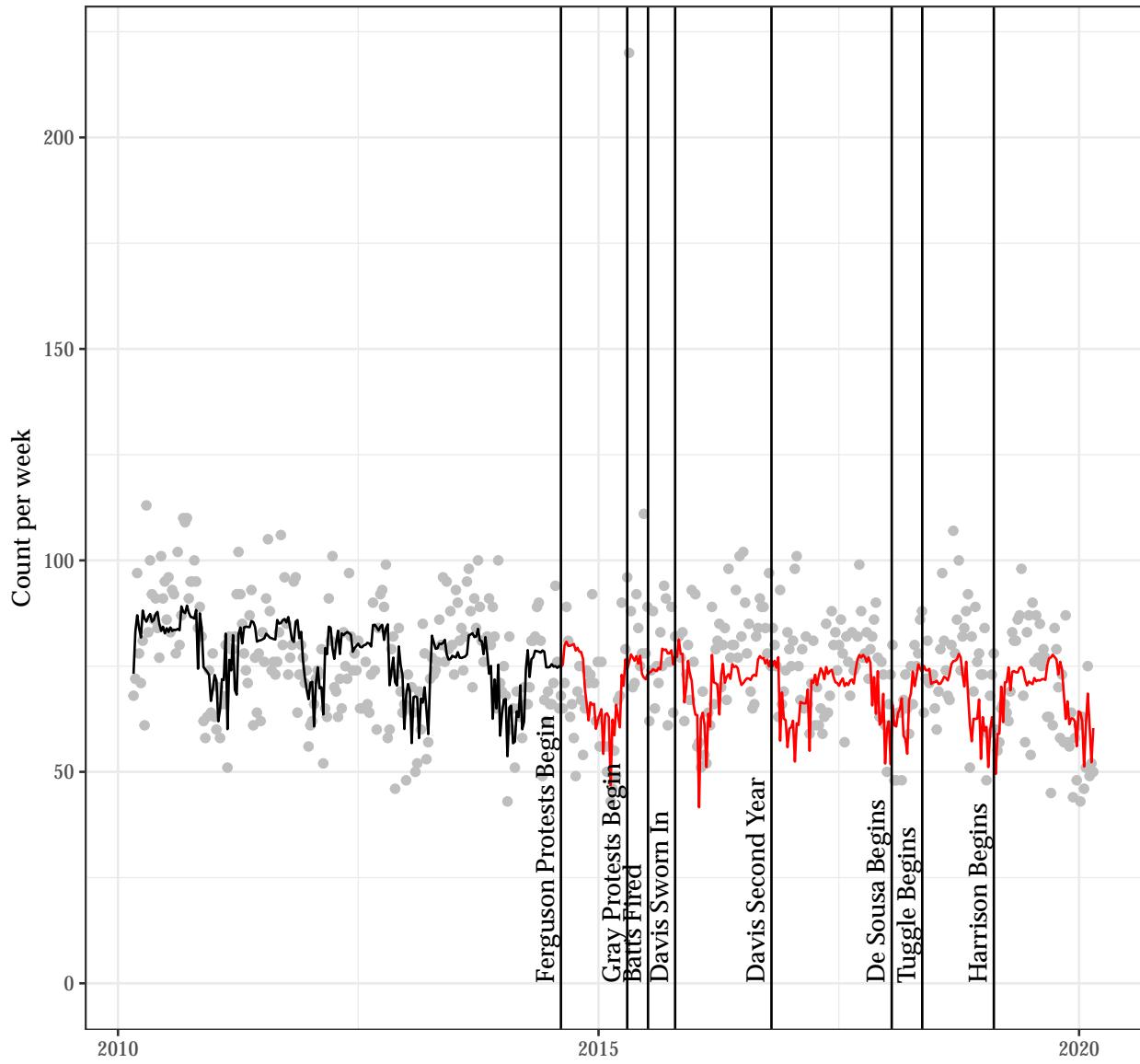
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
western	290	73.652	15.766	43	64	74.5	82	220

## 21.2 Four Models for western

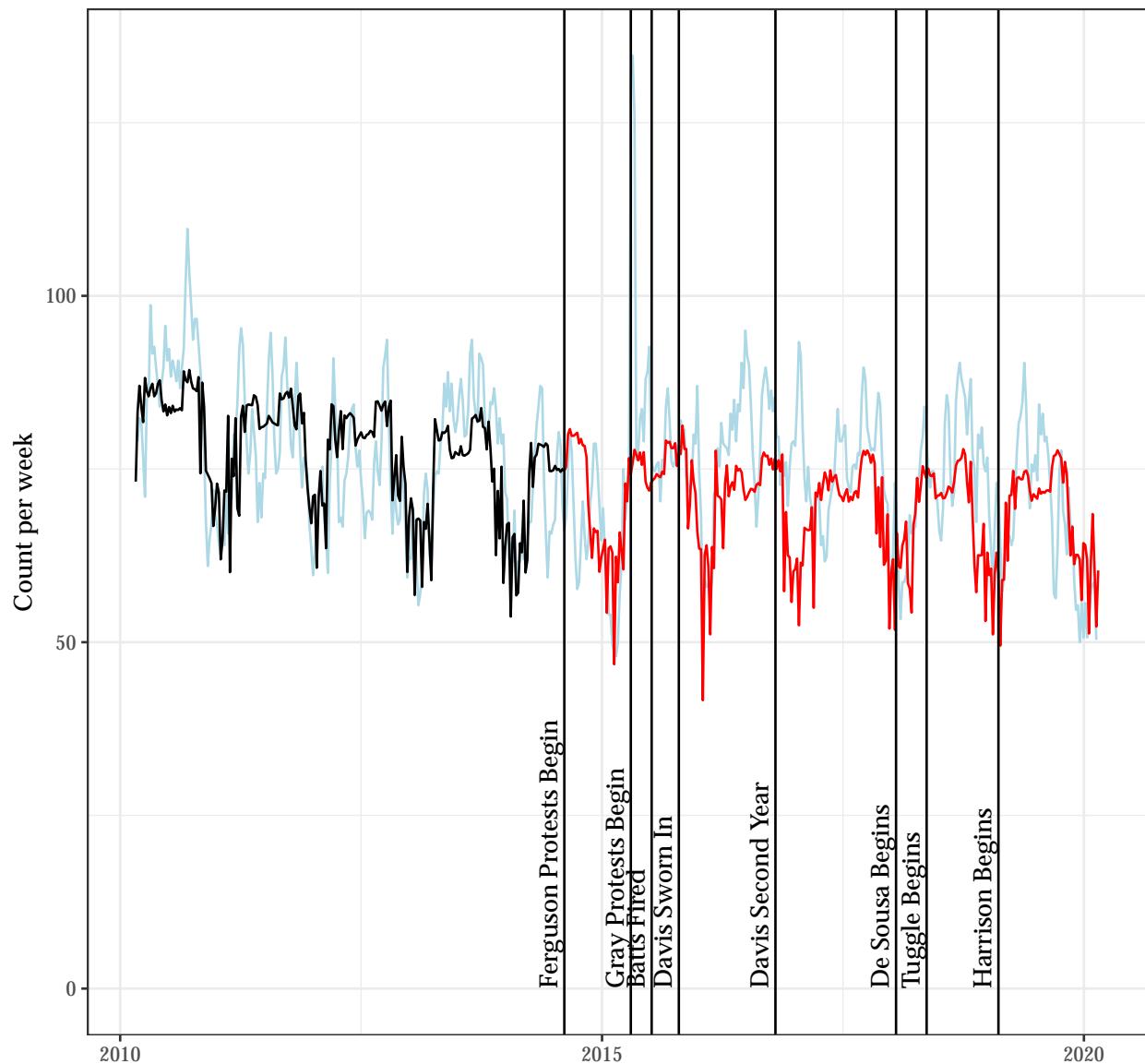
Table 21.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.05	-0.04		-0.04
After Ferguson Protests Begin (week of 8/11/14 onward)	-5.26		-3.89	-3.48
After Gray Protests Begin (week of 4/20/15 onward)	20.69		13.51	13.58
Unrest and National Guard (4/27/15 - 5/3/2015)	135.02		134.50	136.94
After Batts Fired (week of 7/13/15 onward)	-7.79		-9.41	-9.08
After Davis Confirmed (week of 10/19/15 onward)	3.33		6.71	6.72
After Davis First Year (week of 10/17/16 onward)	0.55		-0.39	0.52
After De Sousa Begins (week of 1/19/18 onward)	-6.02		-5.29	-3.66
After Tuggle Begins (week of 5/14/18 onward)	10.46		6.09	6.43
After Harrison Begins (week of 2/11/19 onward)	-6.39		-8.10	-5.95
Average Maximum Temperature to 50 Degrees		0.05		0.38
Plus Degrees in the 50s		1.30		0.36
Plus Degrees in the 60s		-0.96		-0.33
Plus Degrees in the 70s		-0.25		-0.03
Plus Degrees Greater Than 80		0.02		-0.24
Snowfall (inches)		-3.24		-2.35
Precipitation (inches)		-0.45		1.33
Darkness Before Midnight (hours)		1.96		1.69
Thanksgiving/Christmas (proportion of week)		-32.69		1.72
Winter Holiday (proportion of week)		-65.85		-44.32
Other Out-of-School Days (proportion of week)		-4.80		-3.67
Summer Vacation (proportion of week)		-4.07		-3.87
Summer Holiday (proportion of week)		-1.77		0.29
Observations	522	232	522	522
R <sup>2</sup>	0.30	0.33	0.29	0.44

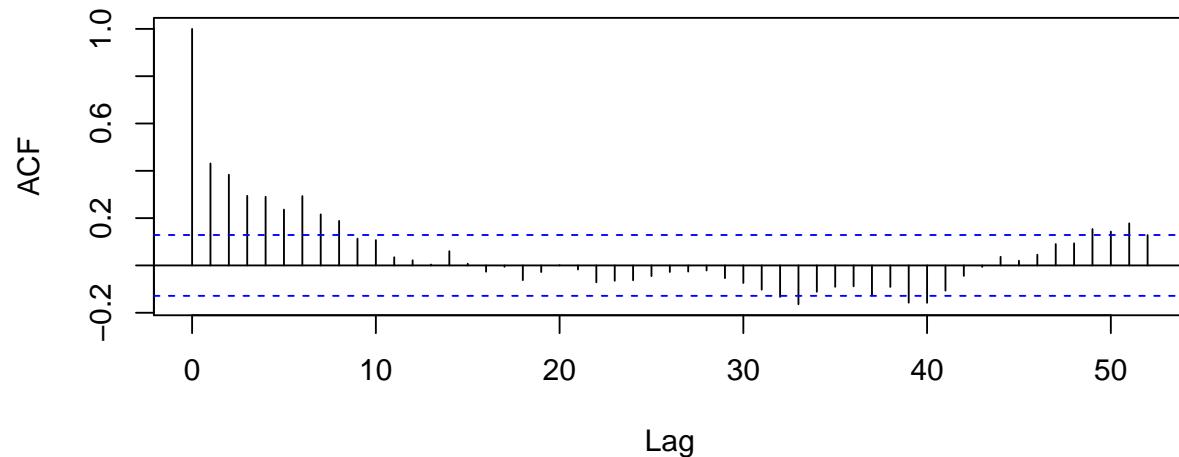
### 21.3 Least Squares Updated Model (2) for western western



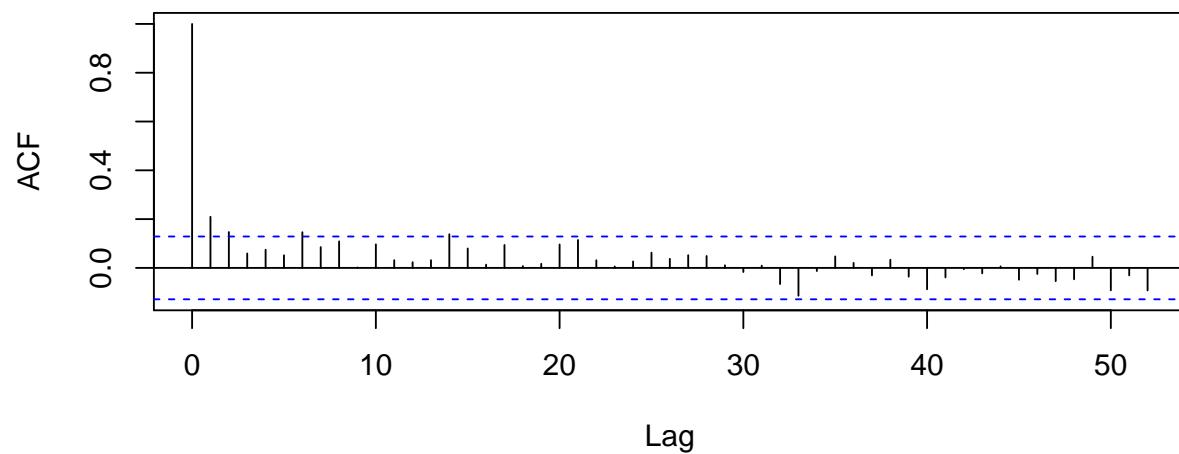
## western



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 21.4 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  
-3.5664 -0.8653 -0.0172  0.8421  3.0711  
  
Coefficients:  
            Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.1003795  0.1670171 24.551 < 2e-16 ***  
t          -0.0004844  0.0001156 -4.191 2.78e-05 ***  
tmax.f.spline1 0.0006900  0.0030848  0.224  0.82301  
tmax.f.spline2 0.0173176  0.0060709  2.853  0.00434 **  
tmax.f.spline3 -0.0133143  0.0071297 -1.867  0.06184 .  
tmax.f.spline4 -0.0030510  0.0068014 -0.449  0.65373  
tmax.f.spline5 0.0001544  0.0057066  0.027  0.97842  
snow.in       -0.0553299  0.0407542 -1.358  0.17458  
precip.in      -0.0059520  0.0419649 -0.142  0.88721  
dark.before.12 0.0259565  0.0113364  2.290  0.02204 *  
thanks.xmas    -0.4699716  0.3410826 -1.378  0.16824  
summer.holiday -0.0183024  0.2391161 -0.077  0.93899  
winter.holiday -1.0226796  0.3507815 -2.915  0.00355 **  
summer.vacation -0.0484338  0.0313375 -1.546  0.12221  
oth.ns        -0.0665394  0.0436405 -1.525  0.12733  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 546.86 on 231 degrees of freedom  
Residual deviance: 364.18 on 217 degrees of freedom  
AIC: 1826.8  
  
Number of Fisher Scoring iterations: 4
```

## 22 Results for central

### 22.1 Summary Values for central

Table 22.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
central	232	116.155	23.837	56	98	115	133	193

Table 22.2: Descriptives for Outcome After Ferguson Protests Begin

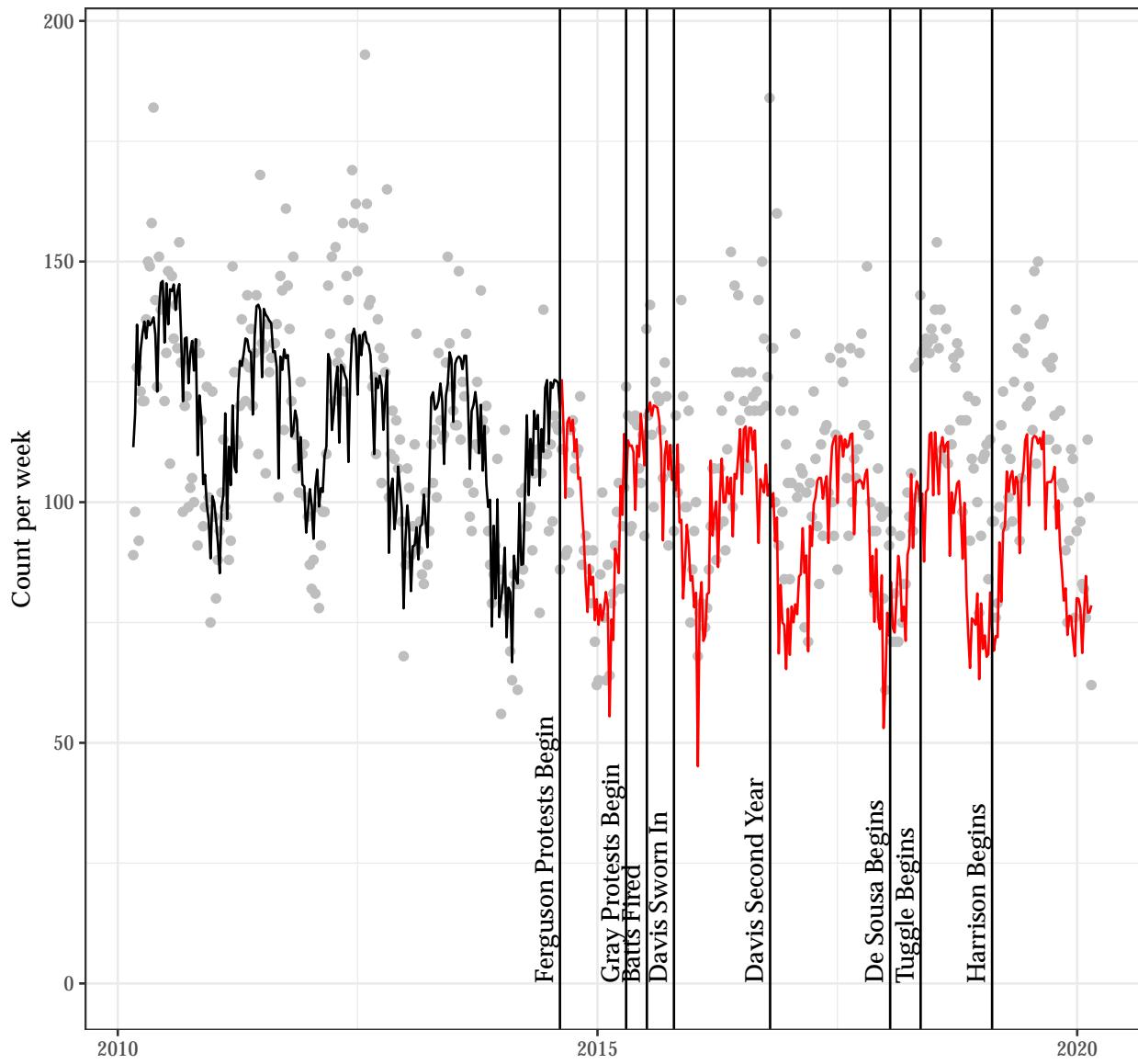
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
central	290	107.403	20.527	61	94	107	121	184

## 22.2 Four Models for central

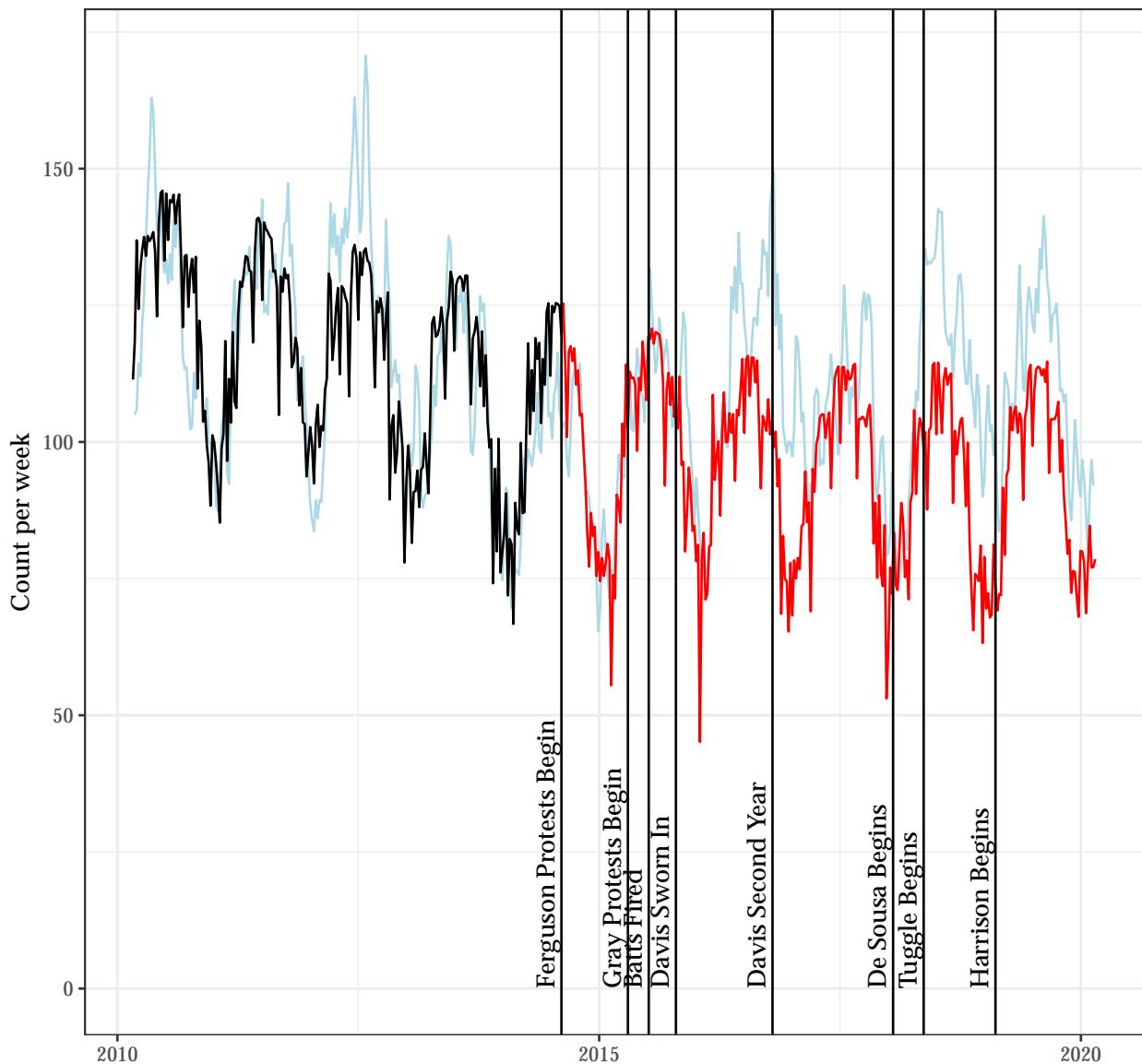
Table 22.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.12	-0.10		-0.10
After Ferguson Protests Begin (week of 8/11/14 onward)	-9.17		-2.16	-2.80
After Gray Protests Begin (week of 4/20/15 onward)	22.11		2.45	3.80
Unrest and National Guard (4/27/15 - 5/3/2015)	6.70		4.86	8.11
After Batts Fired (week of 7/13/15 onward)	6.38		2.28	2.62
After Davis Confirmed (week of 10/19/15 onward)	-2.60		9.41	8.38
After Davis First Year (week of 10/17/16 onward)	5.36		2.89	5.68
After De Sousa Begins (week of 1/19/18 onward)	-10.53		-9.56	-5.59
After Tuggle Begins (week of 5/14/18 onward)	30.01		21.13	23.04
After Harrison Begins (week of 2/11/19 onward)	-5.06		-10.86	-5.67
Average Maximum Temperature to 50 Degrees		0.66		0.85
Plus Degrees in the 50s		0.63		0.21
Plus Degrees in the 60s		0.24		0.33
Plus Degrees in the 70s		-1.92		-1.05
Plus Degrees Greater Than 80		0.37		-0.44
Snowfall (inches)		-5.15		-3.08
Precipitation (inches)		-12.29		-9.34
Darkness Before Midnight (hours)		-0.16		1.16
Thanksgiving/Christmas (proportion of week)		-71.39		-63.80
Winter Holiday (proportion of week)		-26.90		-8.87
Other Out-of-School Days (proportion of week)		-4.09		-8.36
Summer Vacation (proportion of week)		10.40		4.49
Summer Holiday (proportion of week)		-90.31		-85.40
Observations	522	232	522	522
R <sup>2</sup>	0.17	0.55	0.24	0.54

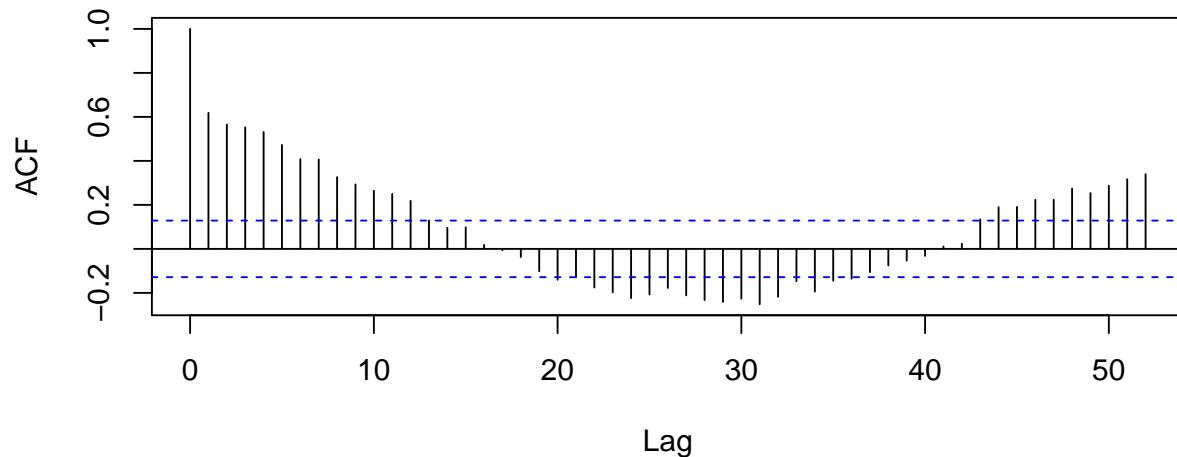
### 22.3 Least Squares Updated Model (2) for central central



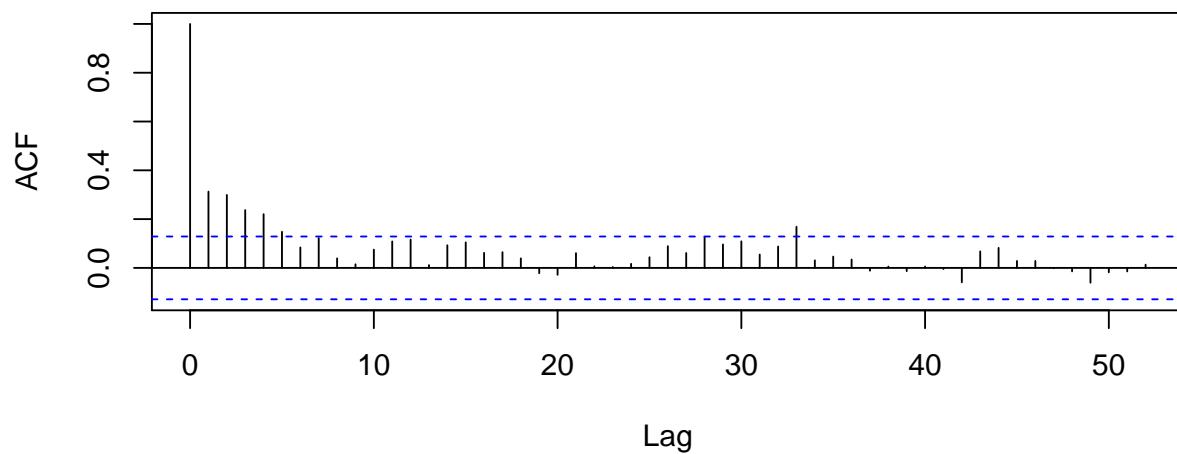
central



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 22.4 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  
-3.2624 -1.1174 -0.1217  0.8103  4.6628  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.372e+00 1.419e-01 30.804 < 2e-16 ***  
t            -8.144e-04 9.423e-05 -8.642 < 2e-16 ***  
tmax.f.spline1 6.932e-03 2.628e-03  2.638 0.008349 **  
tmax.f.spline2 5.476e-03 5.099e-03  1.074 0.282845  
tmax.f.spline3 5.435e-05 5.945e-03  0.009 0.992707  
tmax.f.spline4 -1.569e-02 5.570e-03 -2.817 0.004844 **  
tmax.f.spline5 2.439e-03 4.552e-03  0.536 0.592001  
snow.in       -7.371e-02 3.601e-02 -2.047 0.040691 *  
precip.in      -1.075e-01 3.499e-02 -3.073 0.002117 **  
dark.before.12 -4.470e-04 9.412e-03 -0.047 0.962119  
thanks.xmas    -7.804e-01 2.948e-01 -2.647 0.008112 **  
summer.holiday -7.289e-01 1.987e-01 -3.668 0.000244 ***  
winter.holiday -2.661e-01 2.871e-01 -0.927 0.354032  
summer.vacation 8.564e-02 2.519e-02  3.400 0.000674 ***  
oth.ns         -3.911e-02 3.572e-02 -1.095 0.273566  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 1136.7 on 231 degrees of freedom  
Residual deviance: 496.5 on 217 degrees of freedom  
AIC: 2051.4  
  
Number of Fisher Scoring iterations: 4
```

## 23 Results for eastern

### 23.1 Summary Values for eastern

Table 23.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
eastern	232	78.927	14.044	41	69	78	90	117

Table 23.2: Descriptives for Outcome After Ferguson Protests Begin

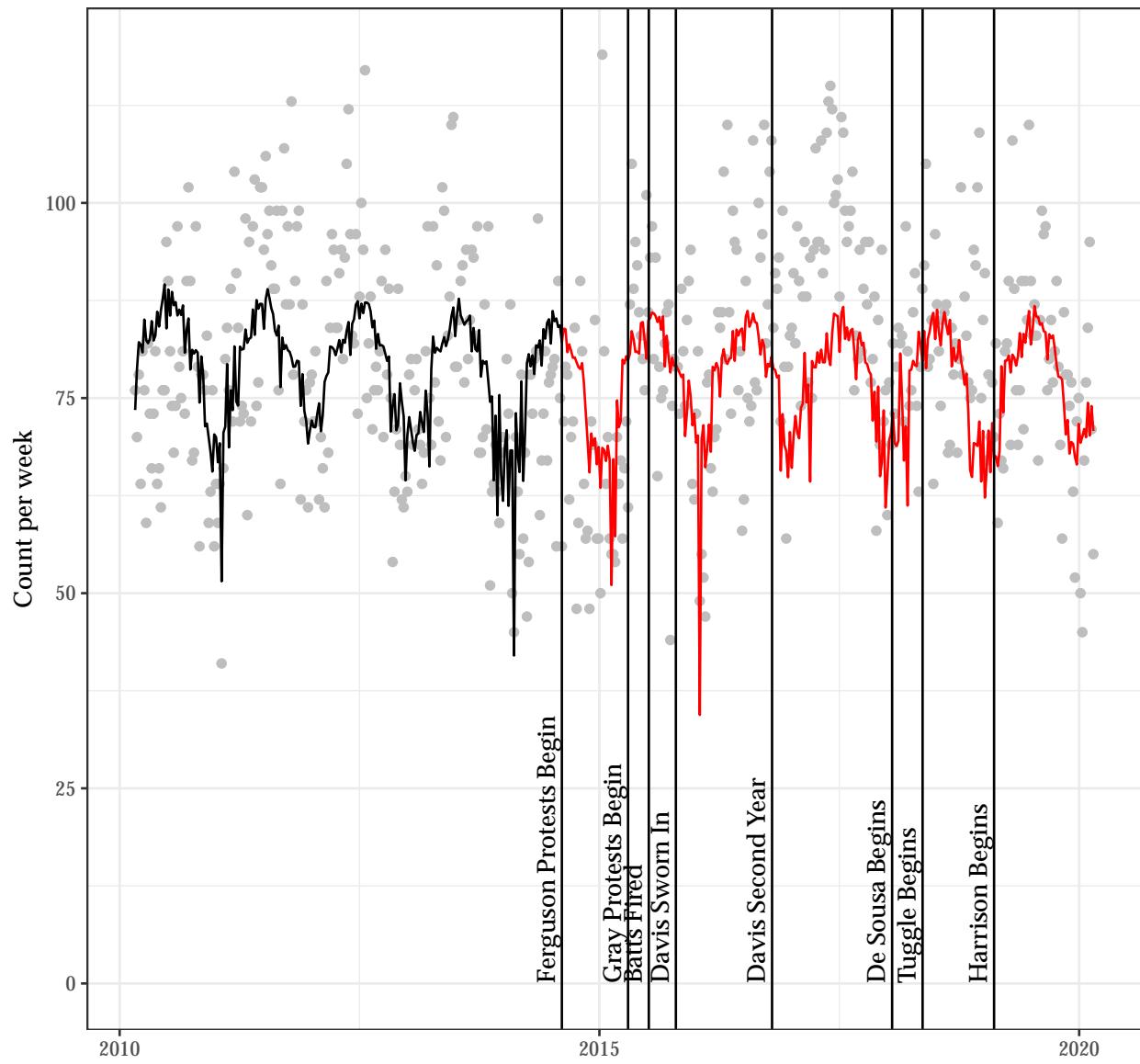
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
eastern	290	80.793	14.629	44	72	81	90	119

## 23.2 Four Models for eastern

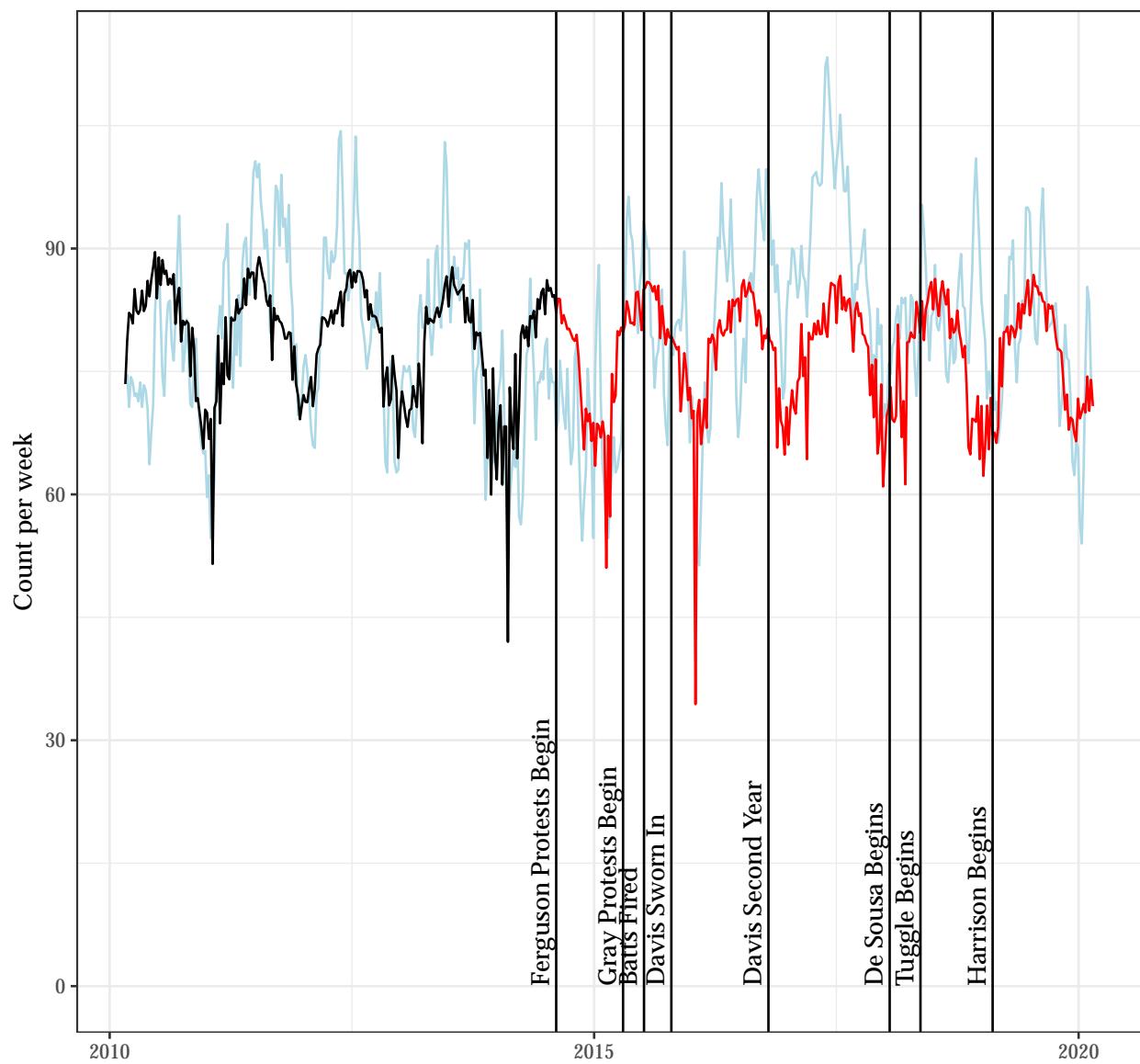
Table 23.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.02	-0.01		-0.01
After Ferguson Protests Begin (week of 8/11/14 onward)	-8.86		-6.05	-6.14
After Gray Protests Begin (week of 4/20/15 onward)	20.06		10.48	10.97
Unrest and National Guard (4/27/15 - 5/3/2015)	0.17		1.92	1.51
After Batts Fired (week of 7/13/15 onward)	-7.10		-8.06	-7.33
After Davis Confirmed (week of 10/19/15 onward)	1.54		6.29	5.85
After Davis First Year (week of 10/17/16 onward)	10.34		9.97	10.32
After De Sousa Begins (week of 1/19/18 onward)	-8.65		-7.67	-7.79
After Tuggle Begins (week of 5/14/18 onward)	3.86		0.95	1.85
After Harrison Begins (week of 2/11/19 onward)	-4.15		-5.12	-4.93
Average Maximum Temperature to 50 Degrees		0.18		0.29
Plus Degrees in the 50s		0.58		0.04
Plus Degrees in the 60s		-0.77		-0.15
Plus Degrees in the 70s		0.29		0.09
Plus Degrees Greater Than 80		-0.05		-0.04
Snowfall (inches)		-10.00		-7.61
Precipitation (inches)		-3.40		-5.77
Darkness Before Midnight (hours)		-0.72		-0.96
Thanksgiving/Christmas (proportion of week)		-30.43		-38.85
Winter Holiday (proportion of week)		16.44		16.45
Other Out-of-School Days (proportion of week)		-1.09		-3.00
Summer Vacation (proportion of week)		0.51		-1.93
Summer Holiday (proportion of week)		-25.74		-4.51
Observations	522	232	522	522
R <sup>2</sup>	0.13	0.26	0.14	0.31

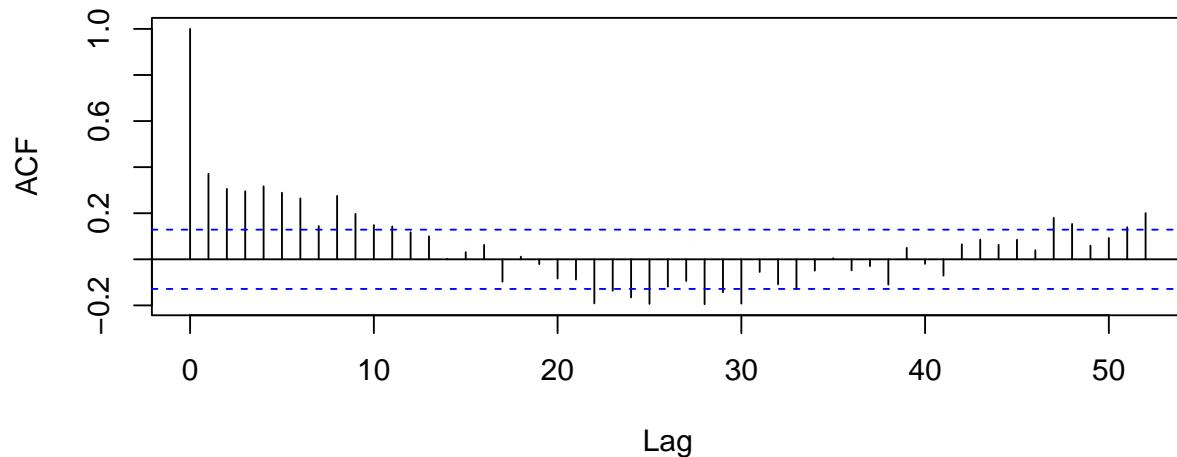
### 23.3 Least Squares Updated Model (2) for eastern eastern



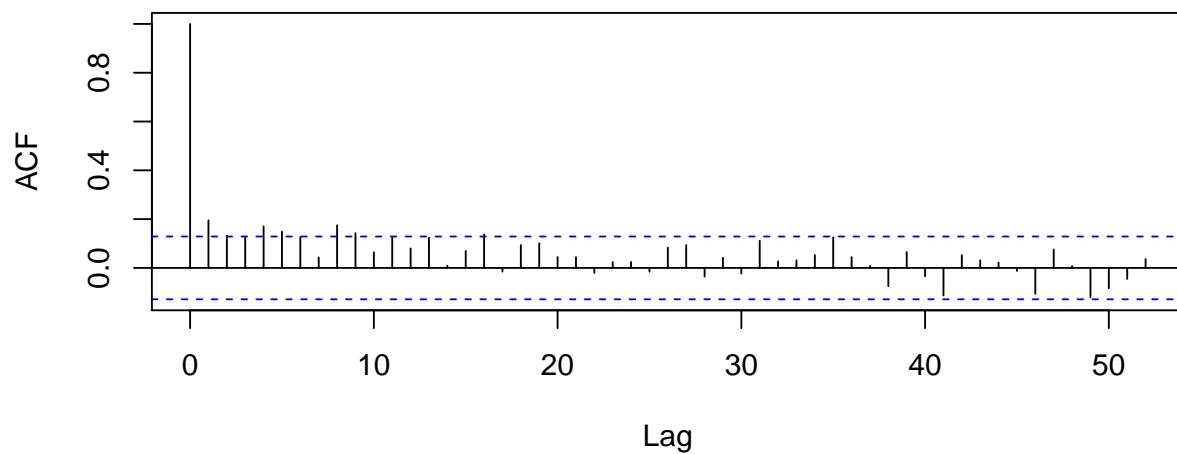
eastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 23.4 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  
-3.9379 -1.0102 -0.0806  1.0114  3.4500  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.234e+00 1.656e-01 25.573 < 2e-16 ***  
t            -9.463e-05 1.146e-04 -0.826   0.409  
tmax.f.spline1 2.521e-03 3.037e-03  0.830   0.406  
tmax.f.spline2 7.265e-03 5.987e-03  1.214   0.225  
tmax.f.spline3 -1.015e-02 7.130e-03 -1.424   0.154  
tmax.f.spline4 3.675e-03 6.837e-03  0.538   0.591  
tmax.f.spline5 -7.394e-04 5.631e-03 -0.131   0.896  
snow.in       -1.708e-01 4.369e-02 -3.908  9.3e-05 ***  
precip.in      -4.299e-02 4.221e-02 -1.018   0.308  
dark.before.12 -9.485e-03 1.129e-02 -0.840   0.401  
thanks.xmas     -4.462e-01 3.421e-01 -1.304   0.192  
summer.holiday -3.081e-01 2.382e-01 -1.293   0.196  
winter.holiday 2.700e-01 3.257e-01  0.829   0.407  
summer.vacation 6.025e-03 3.086e-02  0.195   0.845  
oth.ns          -1.352e-02 4.290e-02 -0.315   0.753  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 580.41 on 231 degrees of freedom  
Residual deviance: 424.70 on 217 degrees of freedom  
AIC: 1891.3  
  
Number of Fisher Scoring iterations: 4
```

## 24 Results for southwestern

### 24.1 Summary Values for southwestern

Table 24.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
southwestern	232	83.599	13.437	52	75	83	92	122

Table 24.2: Descriptives for Outcome After Ferguson Protests Begin

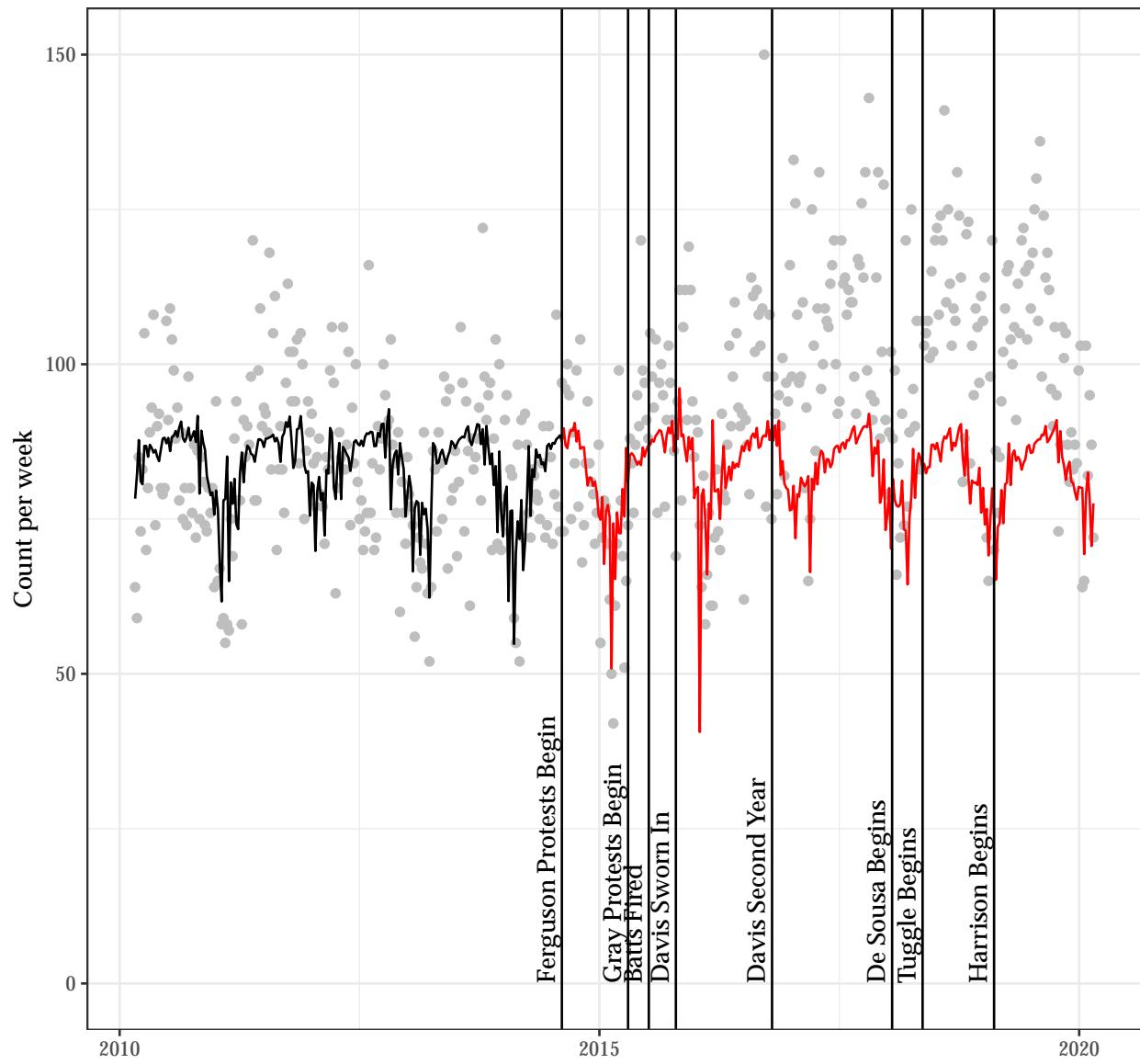
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
southwestern	290	96.131	18.369	42	84	97	109	150

## 24.2 Four Models for southwestern

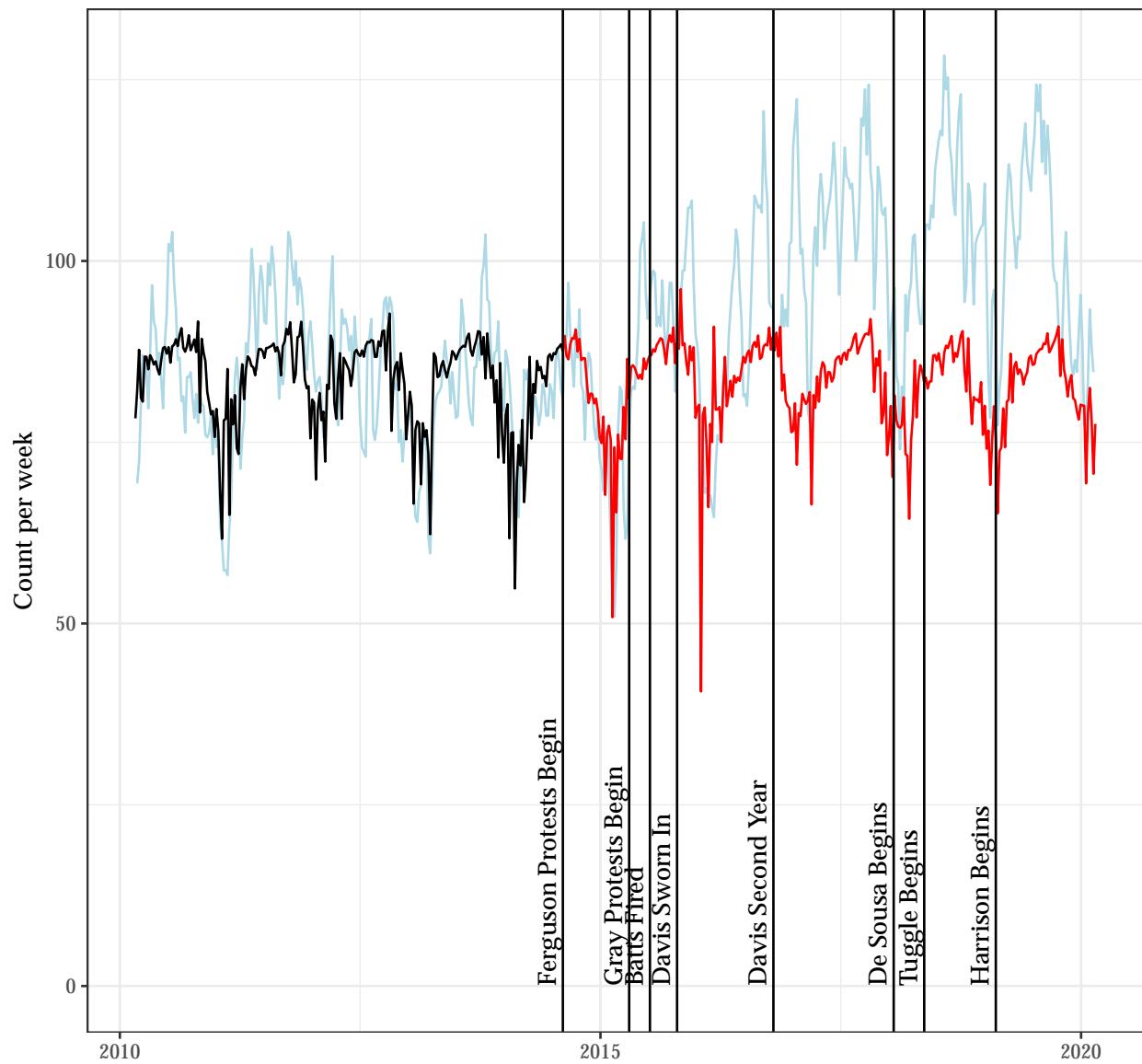
Table 24.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.01	-0.003		-0.002
After Ferguson Protests Begin (week of 8/11/14 onward)	-4.17		-2.88	-1.52
After Gray Protests Begin (week of 4/20/15 onward)	13.92		9.07	6.20
Unrest and National Guard (4/27/15 - 5/3/2015)	-3.07		-3.50	-0.50
After Batts Fired (week of 7/13/15 onward)	2.97		-0.65	-1.00
After Davis Confirmed (week of 10/19/15 onward)	-2.53		1.78	3.25
After Davis First Year (week of 10/17/16 onward)	13.70		12.58	13.12
After De Sousa Begins (week of 1/19/18 onward)	-12.61		-8.01	-8.11
After Tuggle Begins (week of 5/14/18 onward)	17.85		12.38	11.55
After Harrison Begins (week of 2/11/19 onward)	-7.49		-7.41	-6.90
Average Maximum Temperature to 50 Degrees		0.15		0.54
Plus Degrees in the 50s		0.56		0.02
Plus Degrees in the 60s		0.11		0.13
Plus Degrees in the 70s		-0.91		-0.22
Plus Degrees Greater Than 80		0.10		-0.18
Snowfall (inches)		-8.01		-3.19
Precipitation (inches)		-3.29		-4.44
Darkness Before Midnight (hours)		3.25		2.75
Thanksgiving/Christmas (proportion of week)		9.67		21.22
Winter Holiday (proportion of week)		-57.34		-49.21
Other Out-of-School Days (proportion of week)		-6.27		-6.63
Summer Vacation (proportion of week)		3.38		0.27
Summer Holiday (proportion of week)		-5.89		-25.03
Observations	522	232	522	522
R <sup>2</sup>	0.28	0.22	0.32	0.44

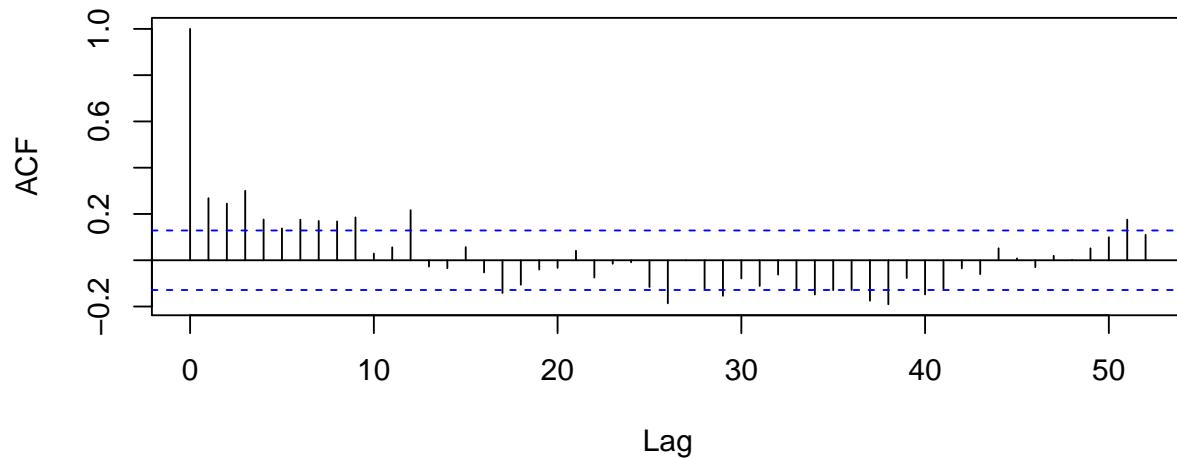
### 24.3 Least Squares Updated Model (2) for southwestern southwestern



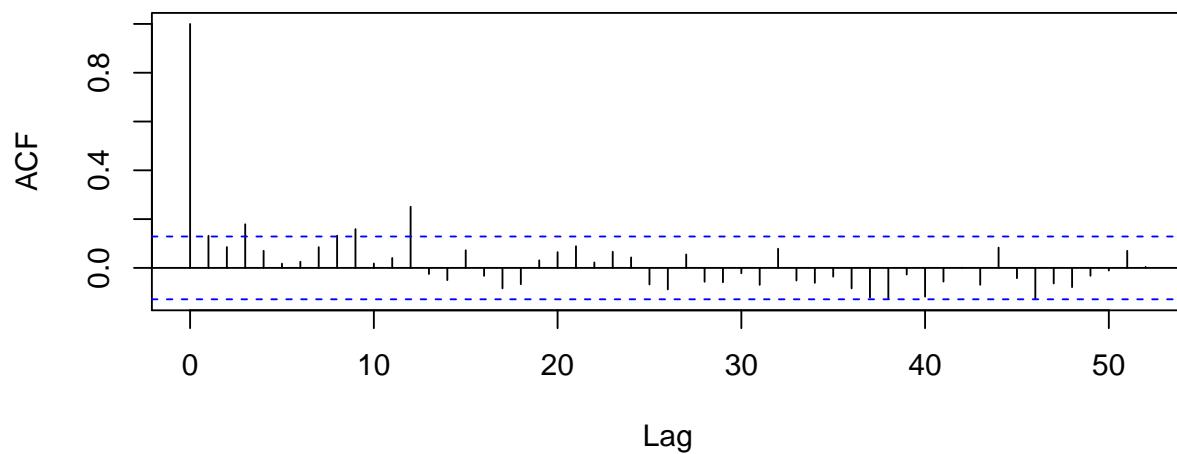
## southwestern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 24.4 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  
-3.1762 -0.9636 -0.1275  0.8589  3.5408  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.0448289  0.1584090 25.534 < 2e-16 ***  
t            -0.0000363  0.0001116 -0.325 0.744901  
tmax.f.spline1 0.0017105  0.0029090  0.588 0.556533  
tmax.f.spline2 0.0069552  0.0057951  1.200 0.230068  
tmax.f.spline3 0.0011623  0.0069404  0.167 0.867006  
tmax.f.spline4 -0.0108268 0.0066531 -1.627 0.103666  
tmax.f.spline5 0.0010769  0.0055286  0.195 0.845566  
snow.in       -0.1218242 0.0402785 -3.025 0.002490 **  
precip.in      -0.0387967 0.0407861 -0.951 0.341490  
dark.before.12 0.0392765 0.0109548  3.585 0.000337 ***  
thanks.xmas    0.1145952 0.3149713  0.364 0.715987  
summer.holiday -0.0662264 0.2335249 -0.284 0.776721  
winter.holiday -0.7771616 0.3282060 -2.368 0.017889 *  
summer.vacation 0.0399248 0.0303956  1.314 0.189013  
oth.ns         -0.0781884 0.0421587 -1.855 0.063650 .  
---  
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 501.18 on 231 degrees of freedom  
Residual deviance: 388.41 on 217 degrees of freedom  
AIC: 1869.1  
  
Number of Fisher Scoring iterations: 4
```

## 25 Results for southern

### 25.1 Summary Values for southern

Table 25.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
southern	232	113.078	20.885	57	98.8	112	127	185

Table 25.2: Descriptives for Outcome After Ferguson Protests Begin

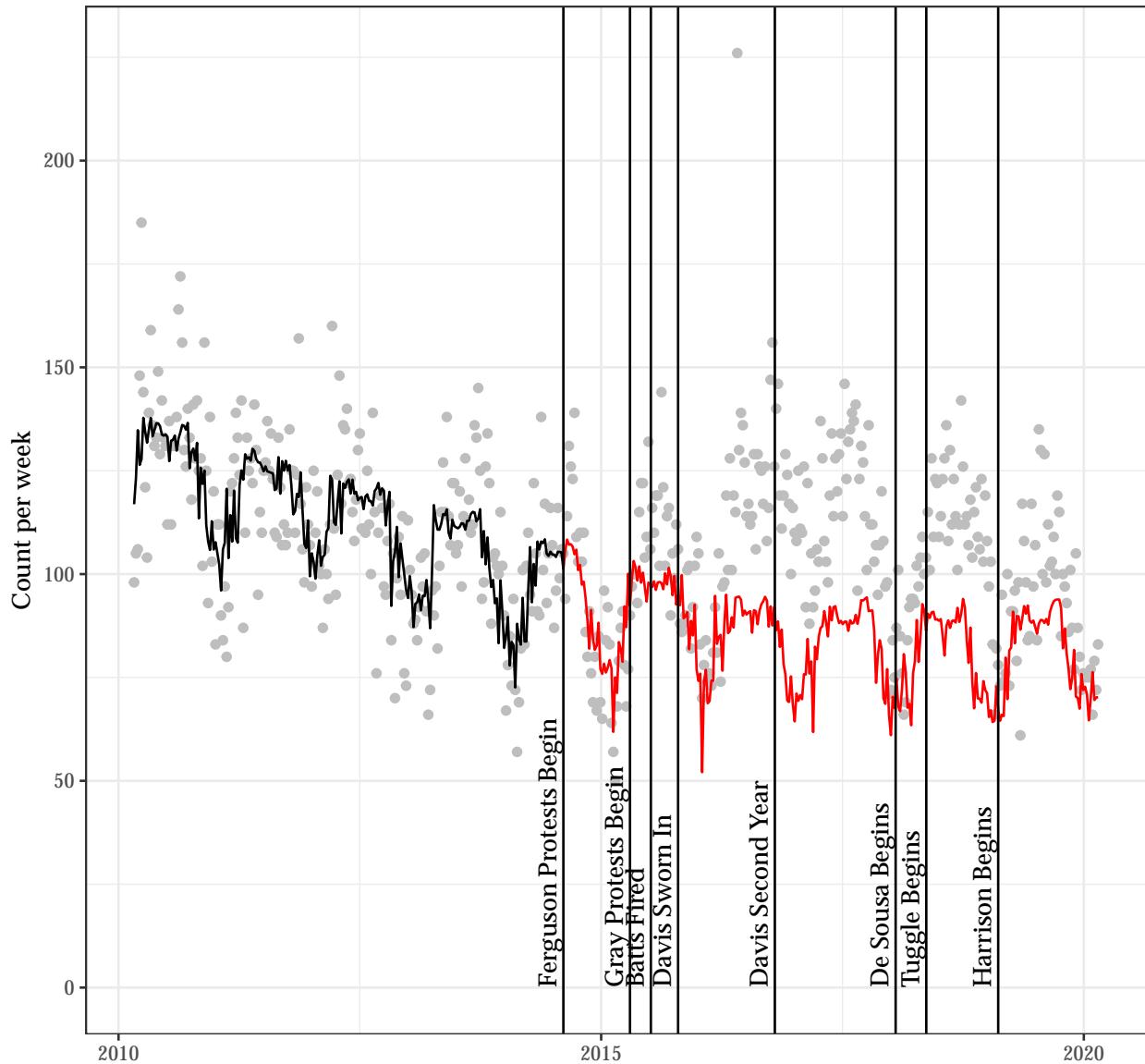
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
southern	290	103.872	21.332	50	88	104	118.8	226

## 25.2 Four Models for southern

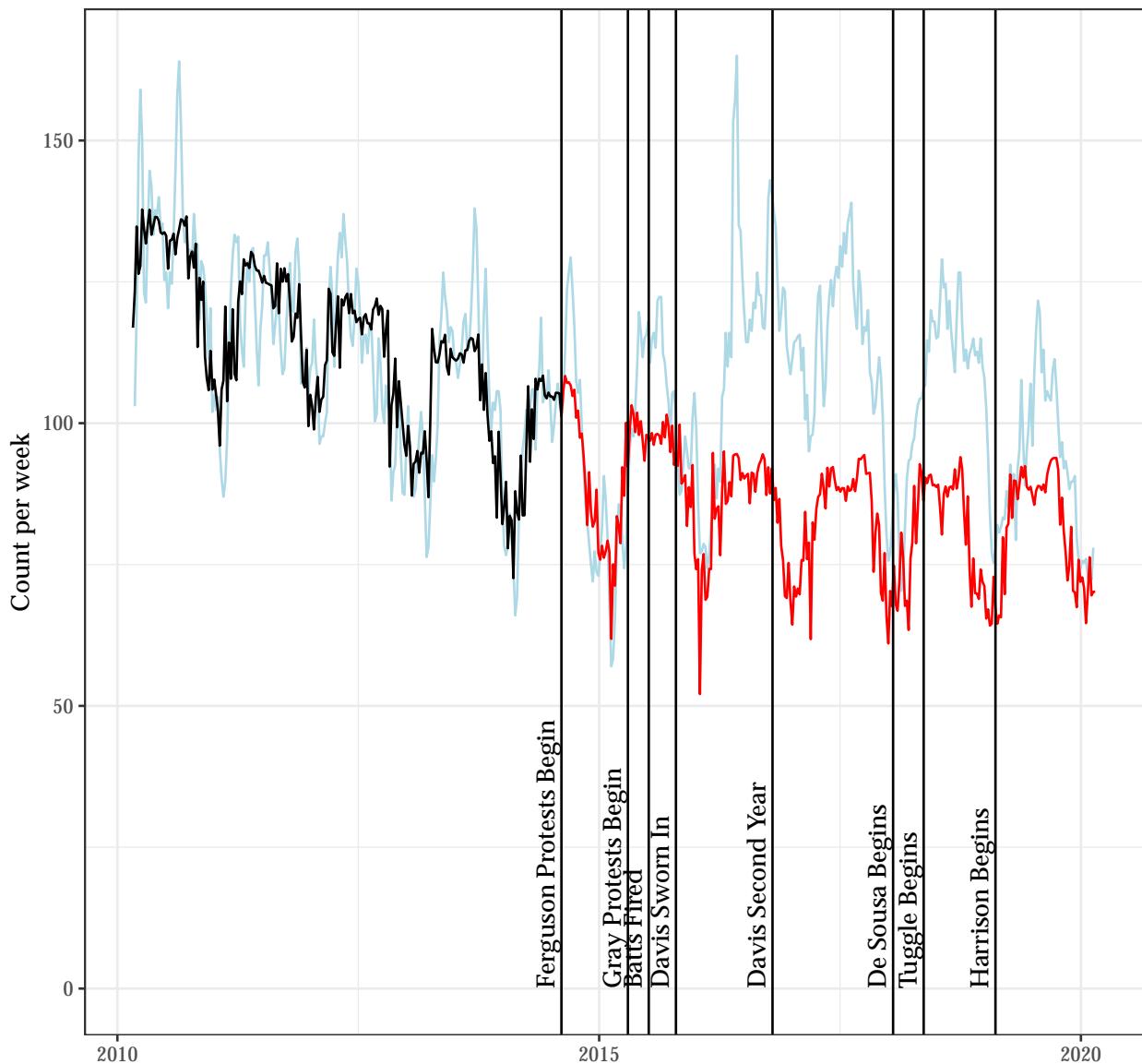
Table 25.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.15	-0.14		-0.13
After Ferguson Protests Begin (week of 8/11/14 onward)	-4.28		-0.09	0.80
After Gray Protests Begin (week of 4/20/15 onward)	22.90		10.26	7.56
Unrest and National Guard (4/27/15 - 5/3/2015)	-12.17		-11.94	-7.67
After Batts Fired (week of 7/13/15 onward)	5.46		4.24	3.55
After Davis Confirmed (week of 10/19/15 onward)	0.46		6.81	9.31
After Davis First Year (week of 10/17/16 onward)	15.34		11.22	15.15
After De Sousa Begins (week of 1/19/18 onward)	-17.55		-18.50	-11.92
After Tuggle Begins (week of 5/14/18 onward)	25.27		16.52	17.00
After Harrison Begins (week of 2/11/19 onward)	-12.74		-19.42	-12.21
Average Maximum Temperature to 50 Degrees		0.40		0.80
Plus Degrees in the 50s		0.75		-0.49
Plus Degrees in the 60s		-0.18		1.16
Plus Degrees in the 70s		-0.69		-0.94
Plus Degrees Greater Than 80		-0.37		-0.45
Snowfall (inches)		-3.61		-2.77
Precipitation (inches)		-8.79		-5.67
Darkness Before Midnight (hours)		1.10		1.40
Thanksgiving/Christmas (proportion of week)		48.35		21.61
Winter Holiday (proportion of week)		-14.12		-30.37
Other Out-of-School Days (proportion of week)		-5.76		-5.25
Summer Vacation (proportion of week)		-2.33		-0.58
Summer Holiday (proportion of week)		-1.55		12.75
Observations	522	232	522	522
R <sup>2</sup>	0.26	0.45	0.40	0.50

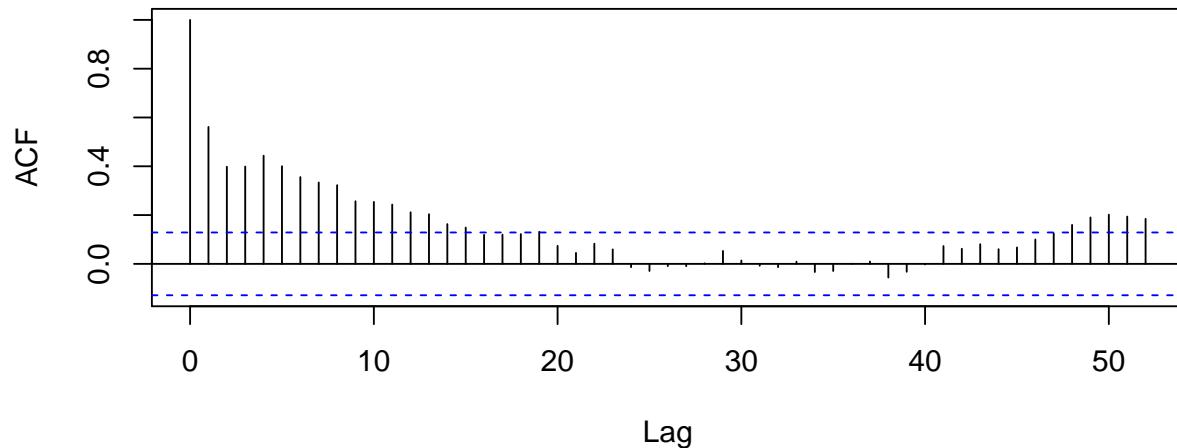
### 25.3 Least Squares Updated Model (2) for southern southern



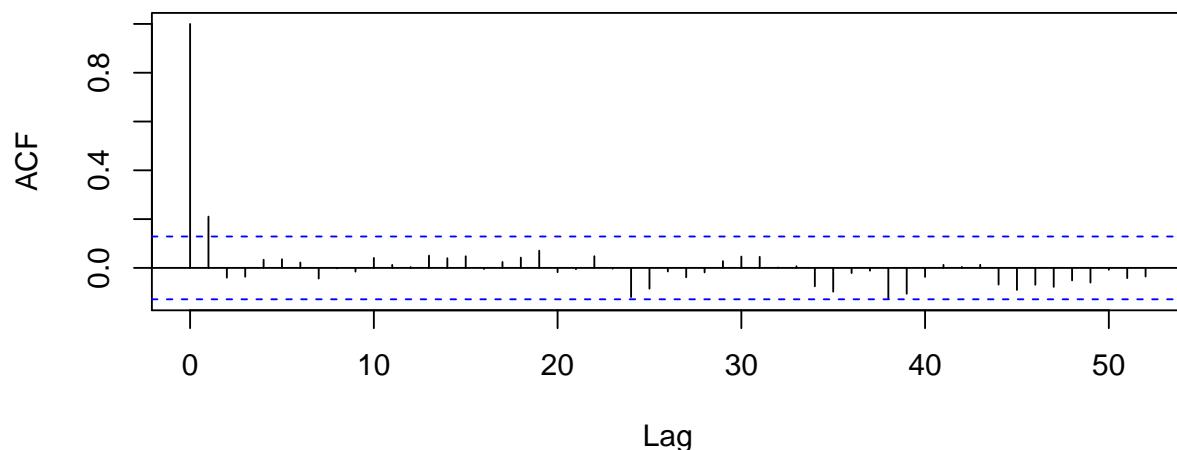
## southern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 25.4 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  
-4.3248 -0.9865 -0.0218  0.9276  4.7265  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 4.4943681  0.1391521 32.298 <2e-16 ***  
t            -0.0011898  0.0000957 -12.432 <2e-16 ***  
tmax.f.spline1 0.0039987  0.0025598  1.562  0.1183  
tmax.f.spline2 0.0068715  0.0050450  1.362  0.1732  
tmax.f.spline3 -0.0023230  0.0059746 -0.389  0.6974  
tmax.f.spline4 -0.0061871  0.0056582 -1.093  0.2742  
tmax.f.spline5 -0.0032929  0.0046910 -0.702  0.4827  
snow.in        -0.0537494  0.0348085 -1.544  0.1226  
precip.in       -0.0779670  0.0352883 -2.209  0.0271 *  
dark.before.12  0.0113237  0.0094886  1.193  0.2327  
thanks.xmas     0.4274480  0.2732162  1.565  0.1177  
summer.holiday -0.0022020  0.1969402 -0.011  0.9911  
winter.holiday -0.1294838  0.2797819 -0.463  0.6435  
summer.vacation -0.0157765  0.0257793 -0.612  0.5405  
oth.ns          -0.0519293  0.0357392 -1.453  0.1462  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 898.84 on 231 degrees of freedom  
Residual deviance: 490.02 on 217 degrees of freedom  
AIC: 2039.6  
  
Number of Fisher Scoring iterations: 4
```

## 26 Results for southeastern

### 26.1 Summary Values for southeastern

Table 26.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
southeastern	232	126.487	20.270	79	113	126.5	142	181

Table 26.2: Descriptives for Outcome After Ferguson Protests Begin

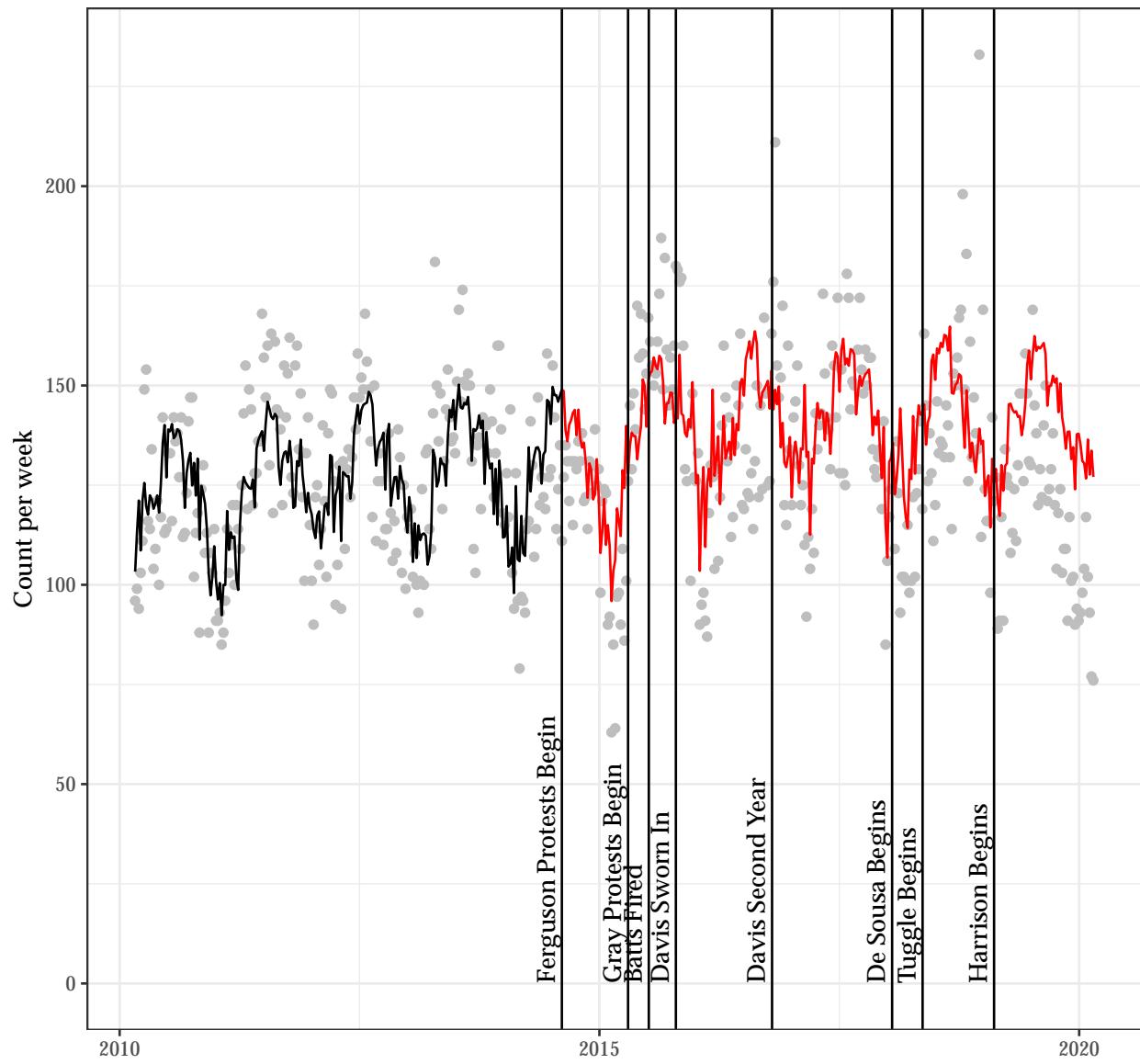
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
southeastern	290	131.390	25.125	63	117	129.5	148	233

## 26.2 Four Models for southeastern

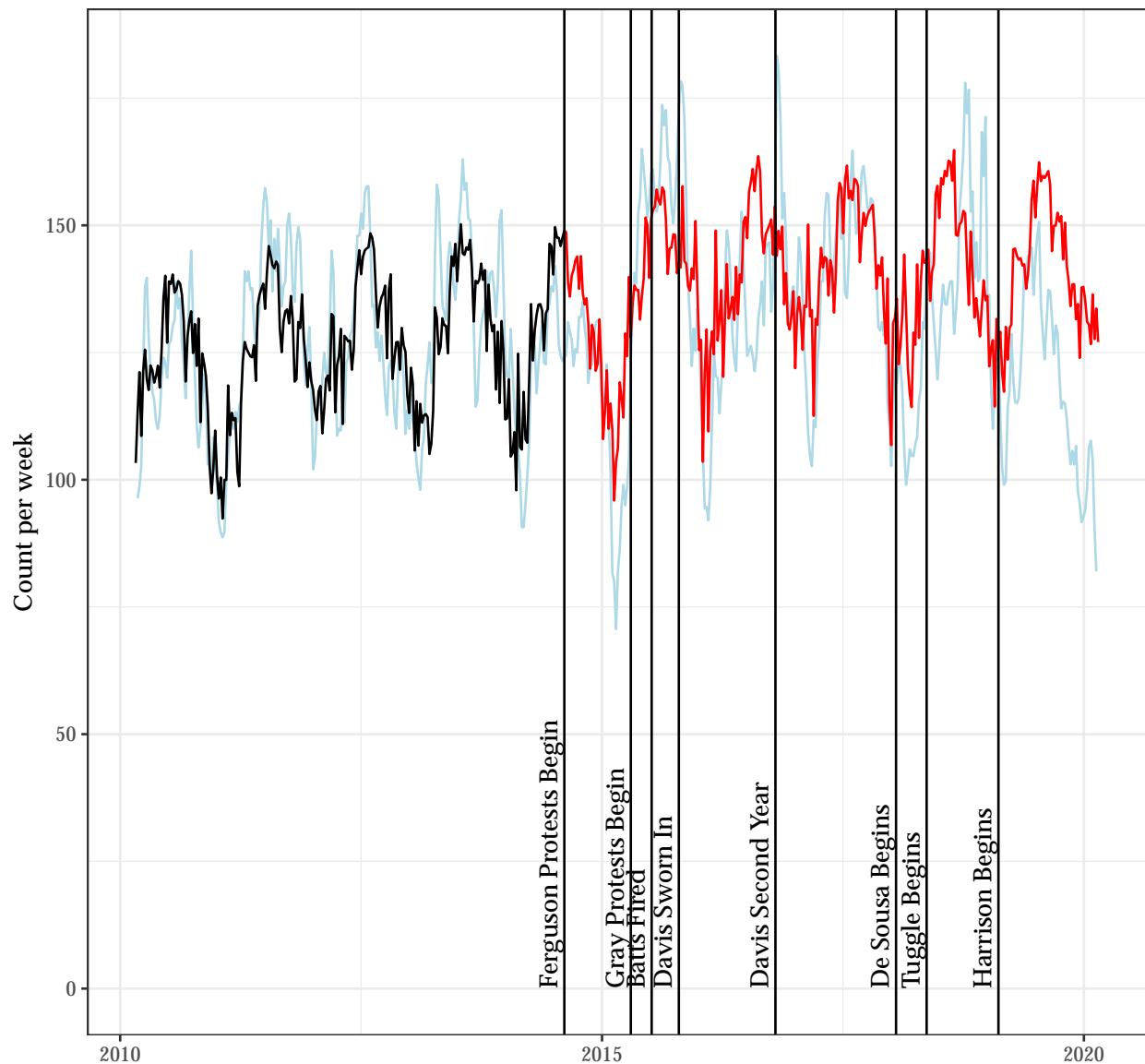
Table 26.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.02	0.06		0.04
After Ferguson Protests Begin (week of 8/11/14 onward)	-15.56		-12.55	-10.90
After Gray Protests Begin (week of 4/20/15 onward)	36.03		23.32	24.23
Unrest and National Guard (4/27/15 - 5/3/2015)	-5.70		-0.63	-1.68
After Batts Fired (week of 7/13/15 onward)	8.95		-1.15	0.68
After Davis Confirmed (week of 10/19/15 onward)	-29.36		-18.41	-19.46
After Davis First Year (week of 10/17/16 onward)	7.88		8.05	6.72
After De Sousa Begins (week of 1/19/18 onward)	-28.02		-16.71	-18.48
After Tuggle Begins (week of 5/14/18 onward)	27.49		15.33	15.14
After Harrison Begins (week of 2/11/19 onward)	-25.76		-21.91	-24.38
Average Maximum Temperature to 50 Degrees		1.08		1.24
Plus Degrees in the 50s		-0.06		-0.15
Plus Degrees in the 60s		0.73		0.78
Plus Degrees in the 70s		-1.75		-1.50
Plus Degrees Greater Than 80		0.65		-0.33
Snowfall (inches)		-2.66		-1.80
Precipitation (inches)		2.75		-0.15
Darkness Before Midnight (hours)		6.17		7.44
Thanksgiving/Christmas (proportion of week)		0.94		-1.71
Winter Holiday (proportion of week)		30.03		-24.14
Other Out-of-School Days (proportion of week)		0.59		-6.36
Summer Vacation (proportion of week)		11.95		6.84
Summer Holiday (proportion of week)		-52.84		-36.22
Observations	522	232	522	522
R <sup>2</sup>	0.20	0.41	0.20	0.46

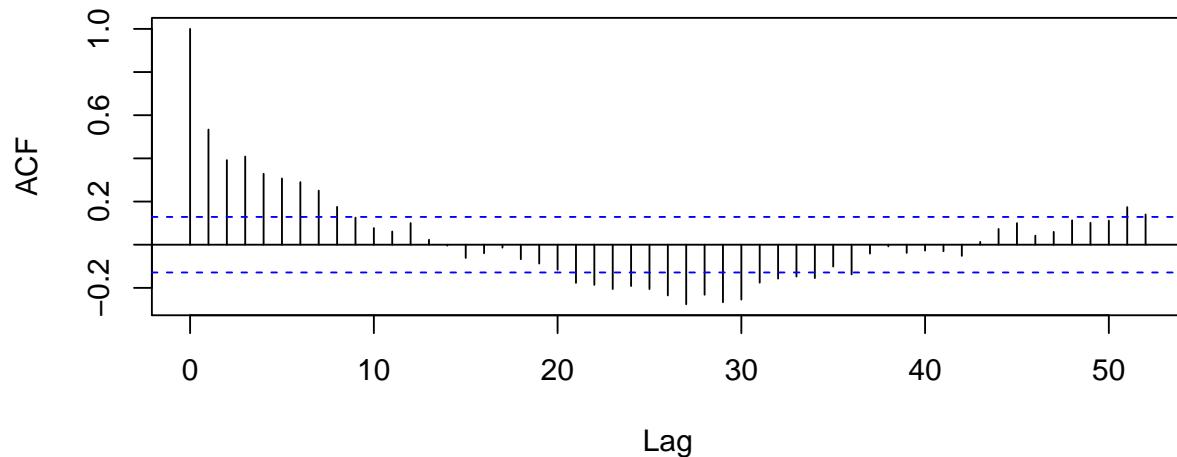
### 26.3 Least Squares Updated Model (2) for southeastern southeastern



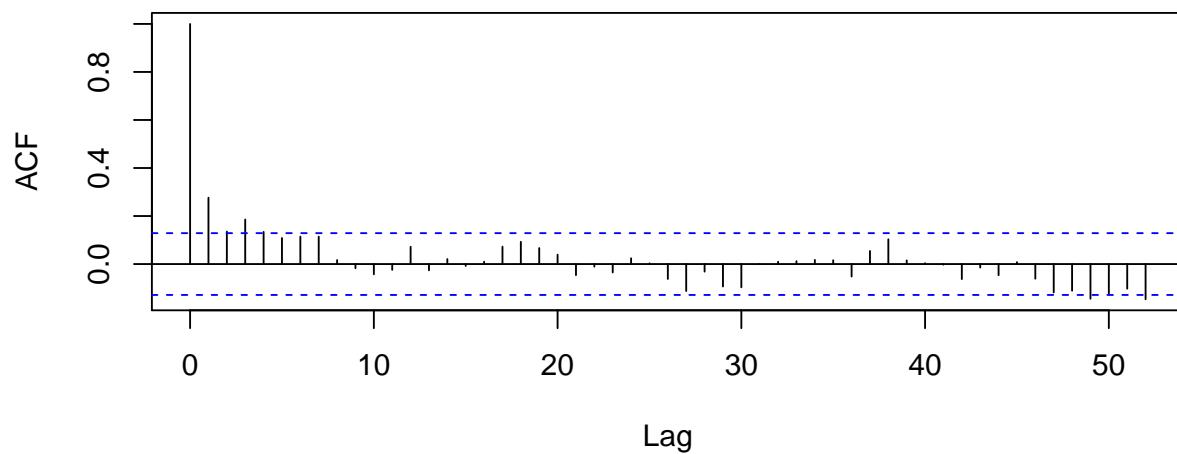
## southeastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 26.4 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  
-3.2087 -0.9756 -0.0418  0.9077  4.0860  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 3.883e+00 1.323e-01 29.348 < 2e-16 ***  
t            5.005e-04 9.096e-05  5.503 3.74e-08 ***  
tmax.f.spline1 9.676e-03 2.428e-03  3.985 6.75e-05 ***  
tmax.f.spline2 -1.243e-03 4.786e-03 -0.260 0.795036  
tmax.f.spline3 5.737e-03 5.741e-03  0.999 0.317689  
tmax.f.spline4 -1.402e-02 5.459e-03 -2.568 0.010227 *  
tmax.f.spline5 5.053e-03 4.440e-03  1.138 0.255124  
snow.in       -2.559e-02 3.166e-02 -0.808 0.418996  
precip.in      2.248e-02 3.280e-02  0.685 0.493181  
dark.before.12 5.038e-02 9.005e-03  5.594 2.22e-08 ***  
thanks.xmas    1.639e-02 2.599e-01  0.063 0.949710  
summer.holiday -3.983e-01 1.896e-01 -2.101 0.035674 *  
winter.holiday  2.711e-01 2.588e-01  1.047 0.294995  
summer.vacation 8.925e-02 2.444e-02  3.652 0.000261 ***  
oth.ns         6.637e-03 3.388e-02  0.196 0.844716  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 755.96 on 231 degrees of freedom  
Residual deviance: 442.01 on 217 degrees of freedom  
AIC: 2018.6  
  
Number of Fisher Scoring iterations: 4
```

## 27 Results for homicide.northwestern

### 27.1 Summary Values for homicide.northwestern

Table 27.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.northwestern	232	0.539	0.749	0	0	0	1	4

Table 27.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.northwestern	290	0.790	0.889	0	0	1	1	4

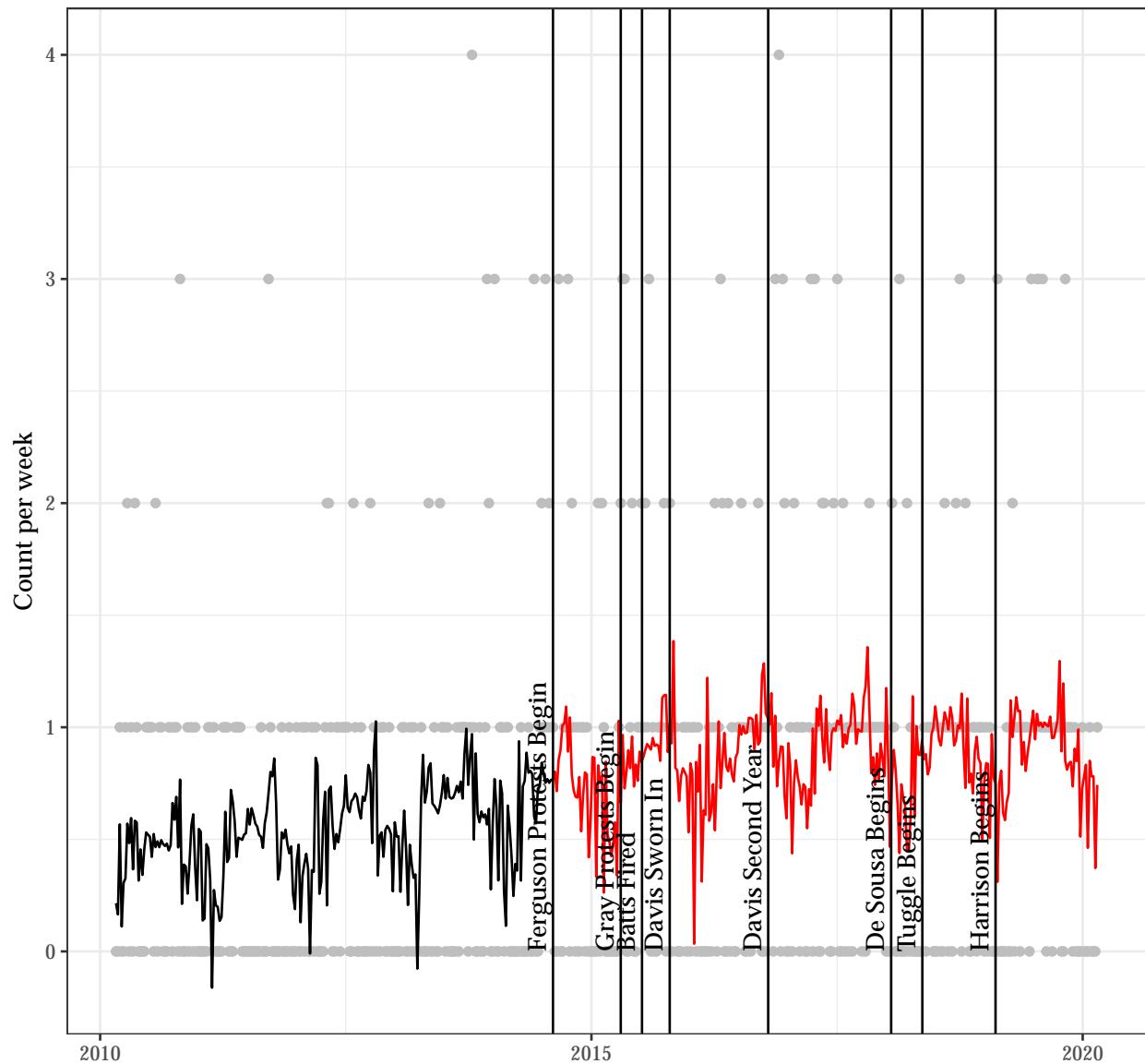
## 27.2 Four Models for homicide.northwestern

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

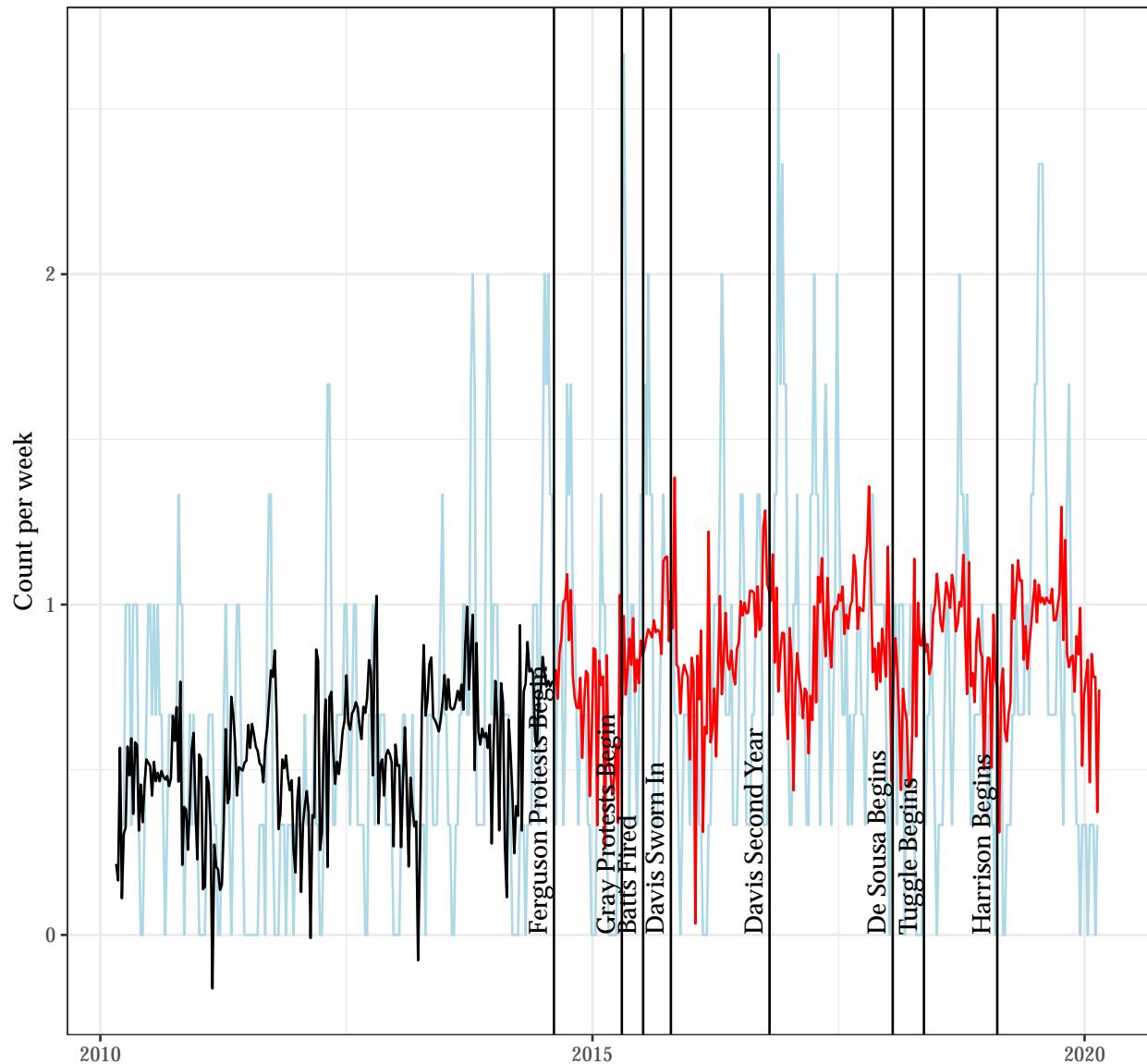
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.002		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.04		-0.11	-0.02
After Gray Protests Begin (week of 4/20/15 onward)	0.46		0.39	0.36
Unrest and National Guard (4/27/15 - 5/3/2015)	1.91		1.76	1.88
After Batts Fired (week of 7/13/15 onward)	-0.10		-0.23	-0.22
After Davis Confirmed (week of 10/19/15 onward)	-0.34		-0.21	-0.25
After Davis First Year (week of 10/17/16 onward)	0.20		0.20	0.21
After De Sousa Begins (week of 1/19/18 onward)	-0.41		-0.20	-0.33
After Tuggle Begins (week of 5/14/18 onward)	0.11		-0.04	0.001
After Harrison Begins (week of 2/11/19 onward)	0.07		0.14	0.07
Average Maximum Temperature to 50 Degrees		-0.02		0.001
Plus Degrees in the 50s		0.02		0.04
Plus Degrees in the 60s		0.06		-0.03
Plus Degrees in the 70s		-0.10		-0.02
Plus Degrees Greater Than 80		0.05		0.03
Snowfall (inches)		-0.18		0.09
Precipitation (inches)		-0.08		-0.09
Darkness Before Midnight (hours)		0.09		0.08
Thanksgiving/Christmas (proportion of week)		-0.61		-0.12
Winter Holiday (proportion of week)		-2.65		0.03
Other Out-of-School Days (proportion of week)		-0.25		-0.12
Summer Vacation (proportion of week)		0.11		0.01
Summer Holiday (proportion of week)		0.53		0.47
Observations	522	232	522	522
R <sup>2</sup>	0.05	0.07	0.02	0.08

### 27.3 Least Squares Updated Model (2) for homicide.northwestern

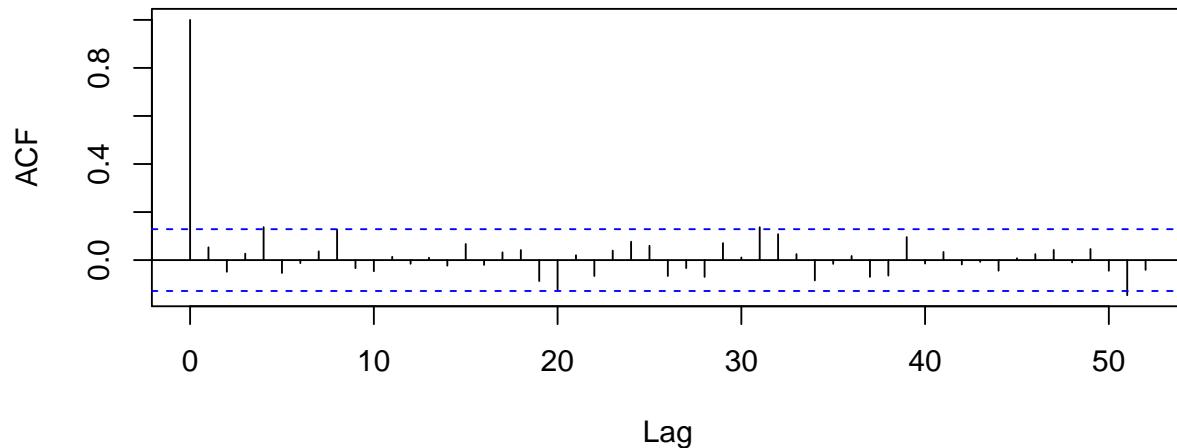
homicide.northwestern



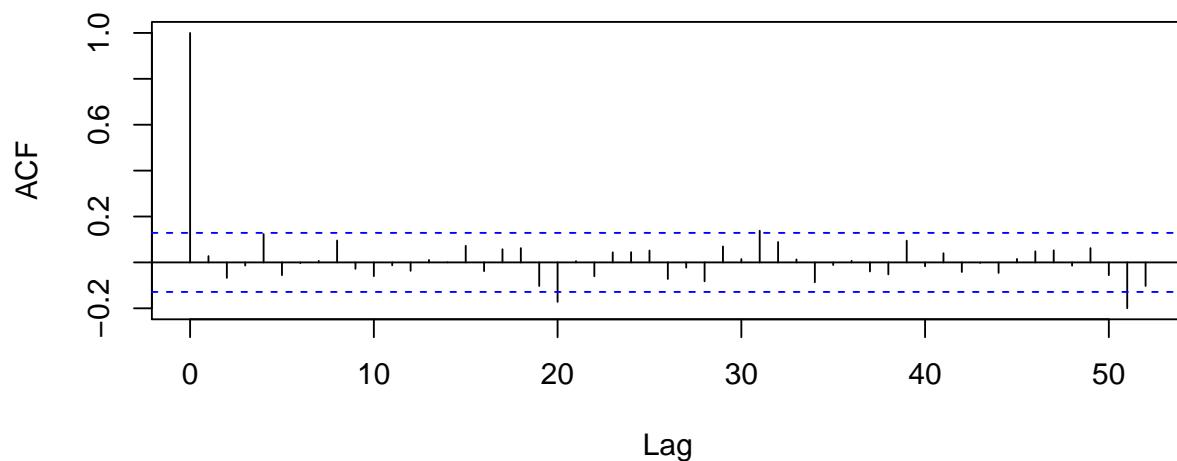
## homicide.northwestern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 27.4 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  
-1.5722 -1.0208 -0.7189  0.5896  2.3903  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -0.481787  2.021176 -0.238  0.8116  
t             0.002879  0.001403  2.052  0.0402 *  
tmax.f.spline1 -0.042494  0.038597 -1.101  0.2709  
tmax.f.spline2  0.058747  0.083915  0.700  0.4839  
tmax.f.spline3  0.097294  0.098381  0.989  0.3227  
tmax.f.spline4 -0.169969  0.081900 -2.075  0.0380 *  
tmax.f.spline5  0.075716  0.065598  1.154  0.2484  
snow.in        -0.488513  0.600785 -0.813  0.4161  
precip.in       -0.1244481 0.501195 -0.248  0.8038  
dark.before.12   0.199746  0.144035  1.387  0.1655  
thanks.xmas      -1.155785  4.565228 -0.253  0.8001  
summer.holiday   0.870744  2.723723  0.320  0.7492  
winter.holiday  -9.734295  7.249947 -1.343  0.1794  
summer.vacation  0.202654  0.372352  0.544  0.5863  
oth.ns          -0.617919  0.680749 -0.908  0.3640  
---  
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: 218.79 on 217 degrees of freedom  
AIC: 459.37  
  
Number of Fisher Scoring iterations: 6
```

## 28 Results for homicide.northern

### 28.1 Summary Values for homicide.northern

Table 28.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.northern	232	0.345	0.612	0	0	0	1	3

Table 28.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.northern	290	0.421	0.683	0	0	0	1	3

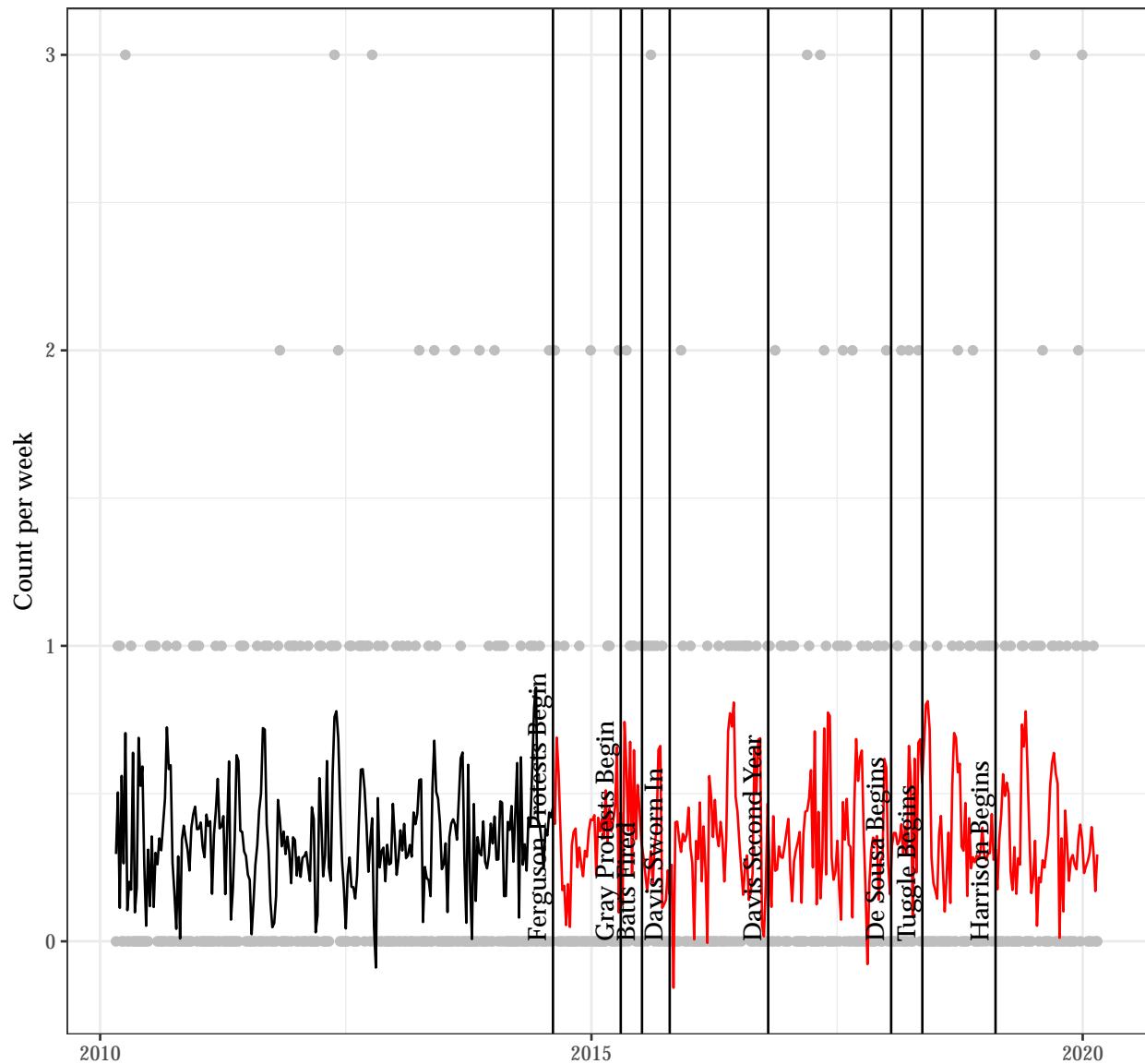
## 28.2 Four Models for homicide.northern

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

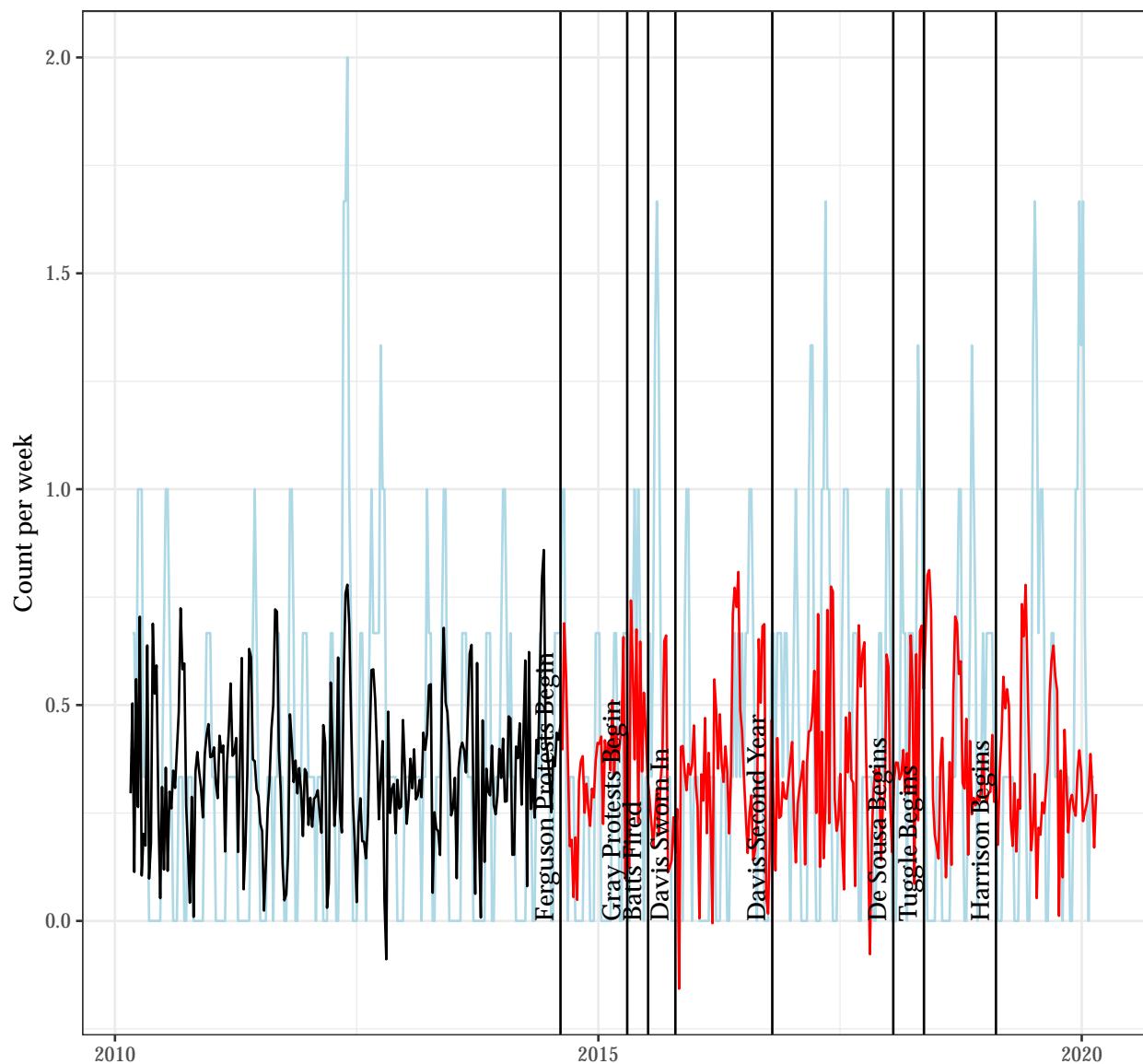
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0003	0.0000		0.0002
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.08		-0.04	-0.06
After Gray Protests Begin (week of 4/20/15 onward)	0.23		0.10	0.16
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.54		-0.18	-0.30
After Batts Fired (week of 7/13/15 onward)	0.02		0.22	0.08
After Davis Confirmed (week of 10/19/15 onward)	-0.29		-0.34	-0.26
After Davis First Year (week of 10/17/16 onward)	0.19		0.21	0.19
After De Sousa Begins (week of 1/19/18 onward)	0.05		-0.004	0.06
After Tuggle Begins (week of 5/14/18 onward)	-0.19		-0.15	-0.25
After Harrison Begins (week of 2/11/19 onward)	0.06		0.11	0.11
Average Maximum Temperature to 50 Degrees		-0.02		-0.01
Plus Degrees in the 50s		0.04		0.004
Plus Degrees in the 60s		-0.08		-0.01
Plus Degrees in the 70s		0.13		0.05
Plus Degrees Greater Than 80		-0.10		-0.05
Snowfall (inches)		-0.14		-0.09
Precipitation (inches)		0.18		0.23
Darkness Before Midnight (hours)		-0.06		-0.01
Thanksgiving/Christmas (proportion of week)		0.15		-0.99
Winter Holiday (proportion of week)		-0.73		-1.43
Other Out-of-School Days (proportion of week)		0.13		0.13
Summer Vacation (proportion of week)		-0.33		-0.11
Summer Holiday (proportion of week)		0.13		-0.11
Observations	522	232	522	522
R <sup>2</sup>	0.02	0.08	0.01	0.04

### 28.3 Least Squares Updated Model (2) for homicide.northern

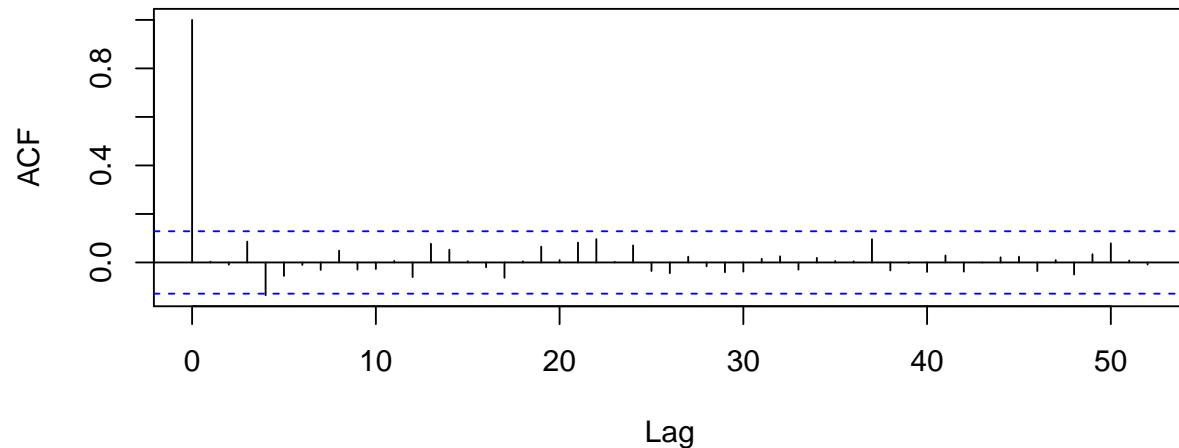
homicide.northern



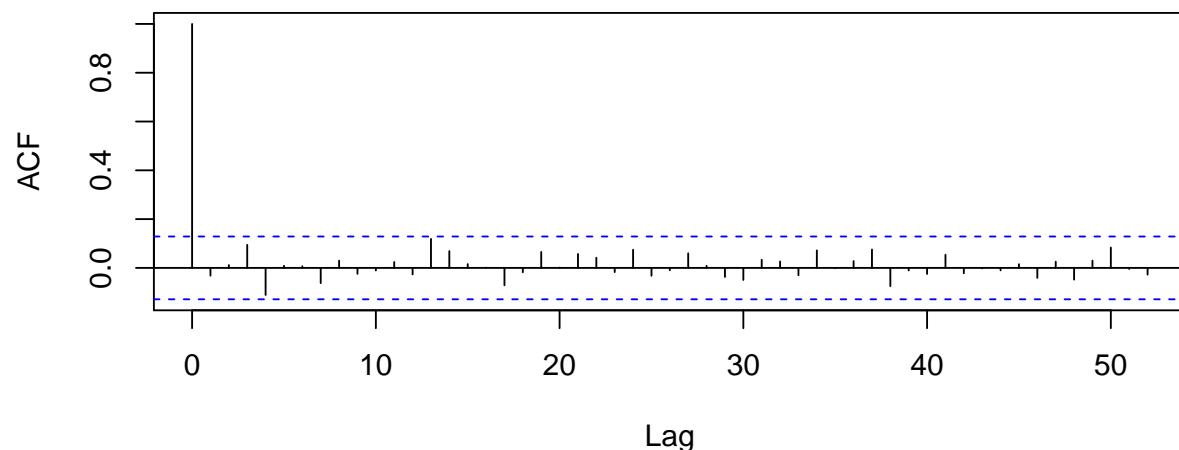
## homicide.northern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 28.4 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  
-1.5435 -0.8441 -0.6768  0.5995  2.6666  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.953e+00 2.346e+00  0.832 0.405281  
t            4.679e-05 1.696e-03  0.028 0.977989  
tmax.f.spline1 -4.468e-02 4.265e-02 -1.048 0.294813  
tmax.f.spline2  9.942e-02 8.666e-02  1.147 0.251251  
tmax.f.spline3 -2.438e-01 1.064e-01 -2.291 0.021975 *  
tmax.f.spline4  4.099e-01 1.199e-01  3.419 0.000628 ***  
tmax.f.spline5 -3.112e-01 9.586e-02 -3.247 0.001167 **  
snow.in       -4.351e-01 6.430e-01 -0.677 0.498624  
precip.in      4.773e-01 5.888e-01  0.811 0.417565  
dark.before.12 -1.751e-01 1.679e-01 -1.043 0.296968  
thanks.xmas    3.412e-01 4.813e+00  0.071 0.943494  
summer.holiday 3.122e-01 3.171e+00  0.098 0.921562  
winter.holiday -2.407e+00 5.386e+00 -0.447 0.654979  
summer.vacation -7.315e-01 4.199e-01 -1.742 0.081461 .  
oth.ns         4.276e-01 6.176e-01  0.692 0.488676  
---  
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: 193.42 on 217 degrees of freedom  
AIC: 363.31  
  
Number of Fisher Scoring iterations: 6
```

## 29 Results for homicide.northeastern

### 29.1 Summary Values for homicide.northeastern

Table 29.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.northeastern	232	0.625	0.849	0	0	0	1	5

Table 29.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.northeastern	290	0.817	0.972	0	0	1	1	5

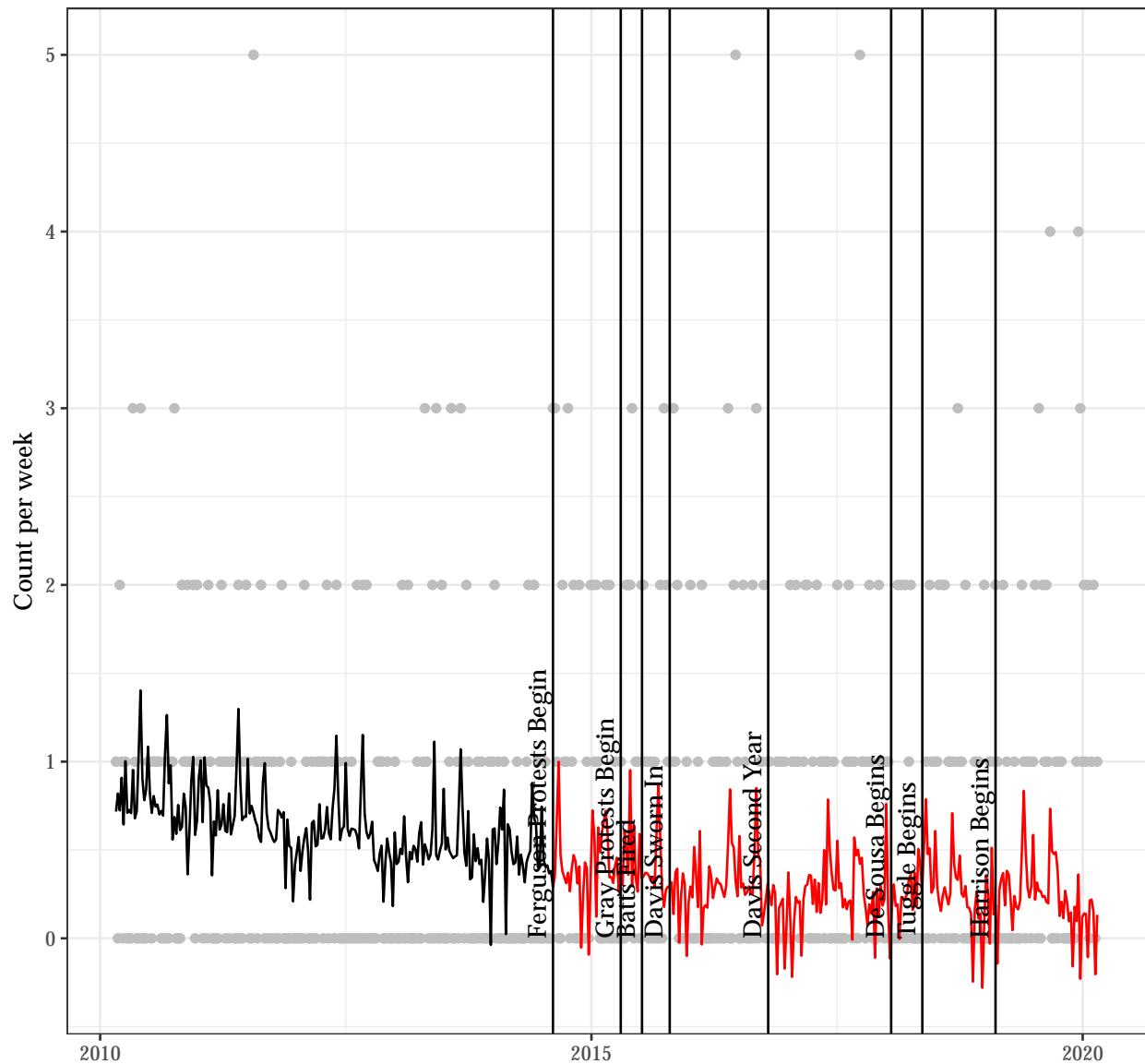
## 29.2 Four Models for homicide.northeastern

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

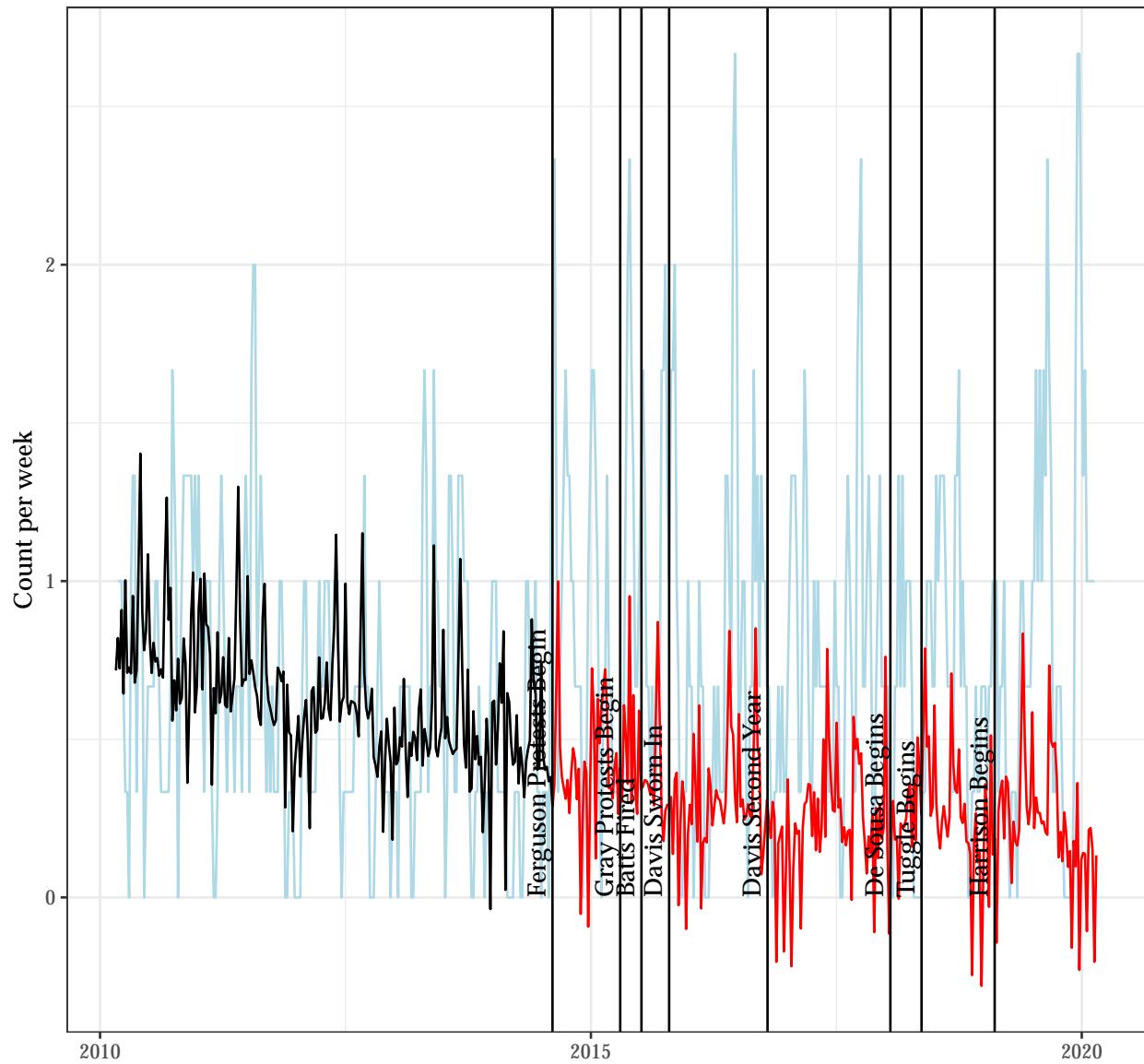
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.002		-0.002
After Ferguson Protests Begin (week of 8/11/14 onward)	0.49		0.50	0.52
After Gray Protests Begin (week of 4/20/15 onward)	0.39		0.29	0.28
Unrest and National Guard (4/27/15 - 5/3/2015)	-1.28		-1.09	-1.11
After Batts Fired (week of 7/13/15 onward)	-0.25		-0.18	-0.21
After Davis Confirmed (week of 10/19/15 onward)	-0.16		-0.14	-0.09
After Davis First Year (week of 10/17/16 onward)	0.04		0.03	0.03
After De Sousa Begins (week of 1/19/18 onward)	-0.12		-0.20	-0.04
After Tuggle Begins (week of 5/14/18 onward)	0.20		0.14	0.10
After Harrison Begins (week of 2/11/19 onward)	0.24		0.21	0.28
Average Maximum Temperature to 50 Degrees		-0.03		-0.01
Plus Degrees in the 50s		0.05		0.01
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		-0.04
Snowfall (inches)		0.05		-0.14
Precipitation (inches)		-0.10		-0.02
Darkness Before Midnight (hours)		-0.03		0.03
Thanksgiving/Christmas (proportion of week)		-2.11		-1.96
Winter Holiday (proportion of week)		-2.34		-0.76
Other Out-of-School Days (proportion of week)		-0.06		-0.10
Summer Vacation (proportion of week)		-0.29		0.09
Summer Holiday (proportion of week)		2.18		1.96
Observations	522	232	522	522
R <sup>2</sup>	0.03	0.06	0.08	0.05

### 29.3 Least Squares Updated Model (2) for homicide.northeastern

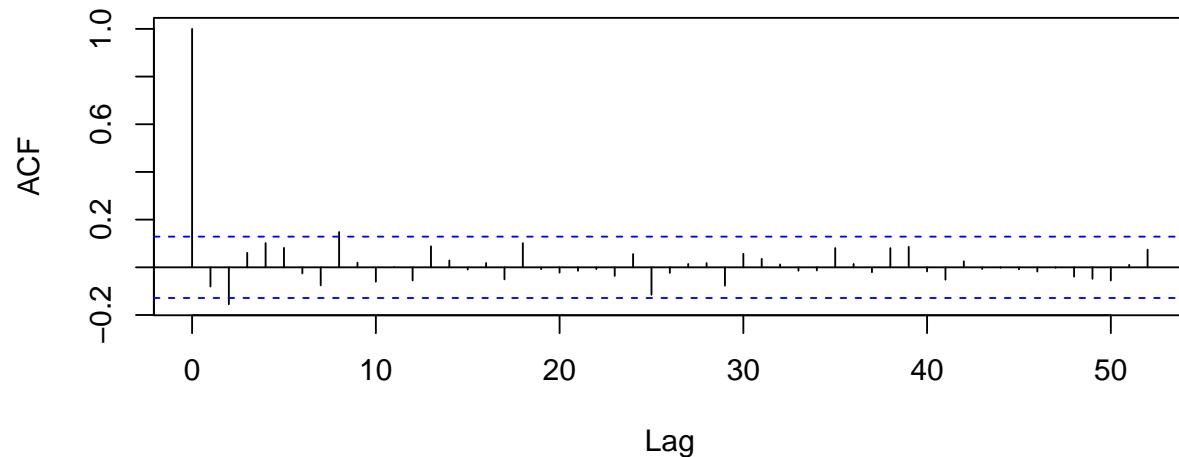
homicide.northeastern



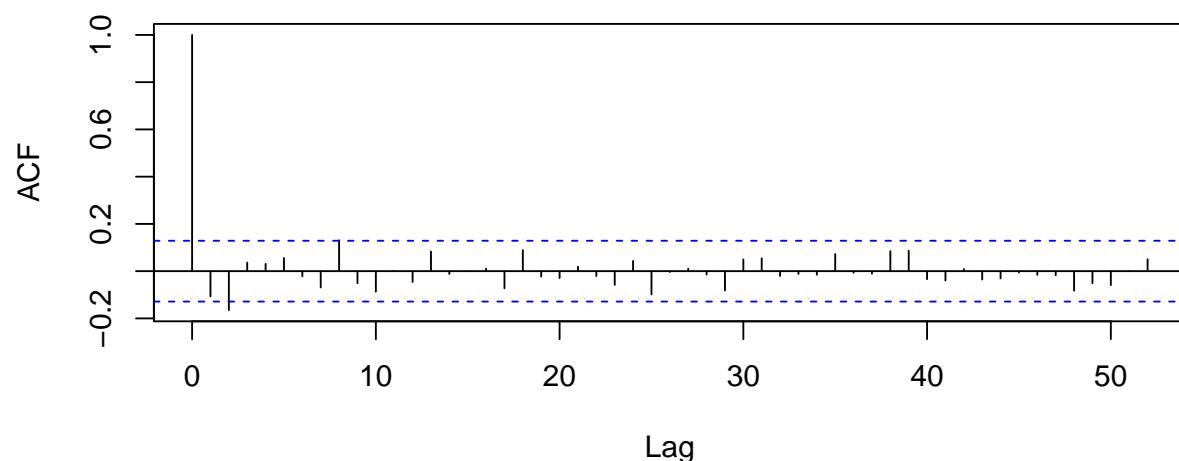
## homicide.northeastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 29.4 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  
-1.6614 -1.0775 -0.8975  0.5000  3.3346  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.091176  1.784085  1.172  0.2411  
t            -0.002439  0.001278 -1.908  0.0564 .  
tmax.f.spline1 -0.046278  0.032620 -1.419  0.1560  
tmax.f.spline2  0.088983  0.068197  1.305  0.1920  
tmax.f.spline3 -0.087248  0.080130 -1.089  0.2762  
tmax.f.spline4  0.093885  0.077512  1.211  0.2258  
tmax.f.spline5 -0.039503  0.062595 -0.631  0.5280  
snow.in        0.050935  0.363694  0.140  0.8886  
precip.in      -0.162390  0.491339 -0.331  0.7410  
dark.before.12 -0.041482  0.129242 -0.321  0.7482  
thanks.xmas     -5.560308  5.279860 -1.053  0.2923  
summer.holiday   2.461935  2.233844  1.102  0.2704  
winter.holiday  -4.593444  4.323259 -1.062  0.2880  
summer.vacation -0.377485  0.328527 -1.149  0.2505  
oth.ns          -0.126794  0.525271 -0.241  0.8093  
---  
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: 251.53 on 217 degrees of freedom  
AIC: 509.29  
  
Number of Fisher Scoring iterations: 6
```

## 30 Results for homicide.western

### 30.1 Summary Values for homicide.western

Table 30.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.western	232	0.616	0.808	0	0	0	1	3

Table 30.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.western	290	1.021	1.097	0	0	1	1	5

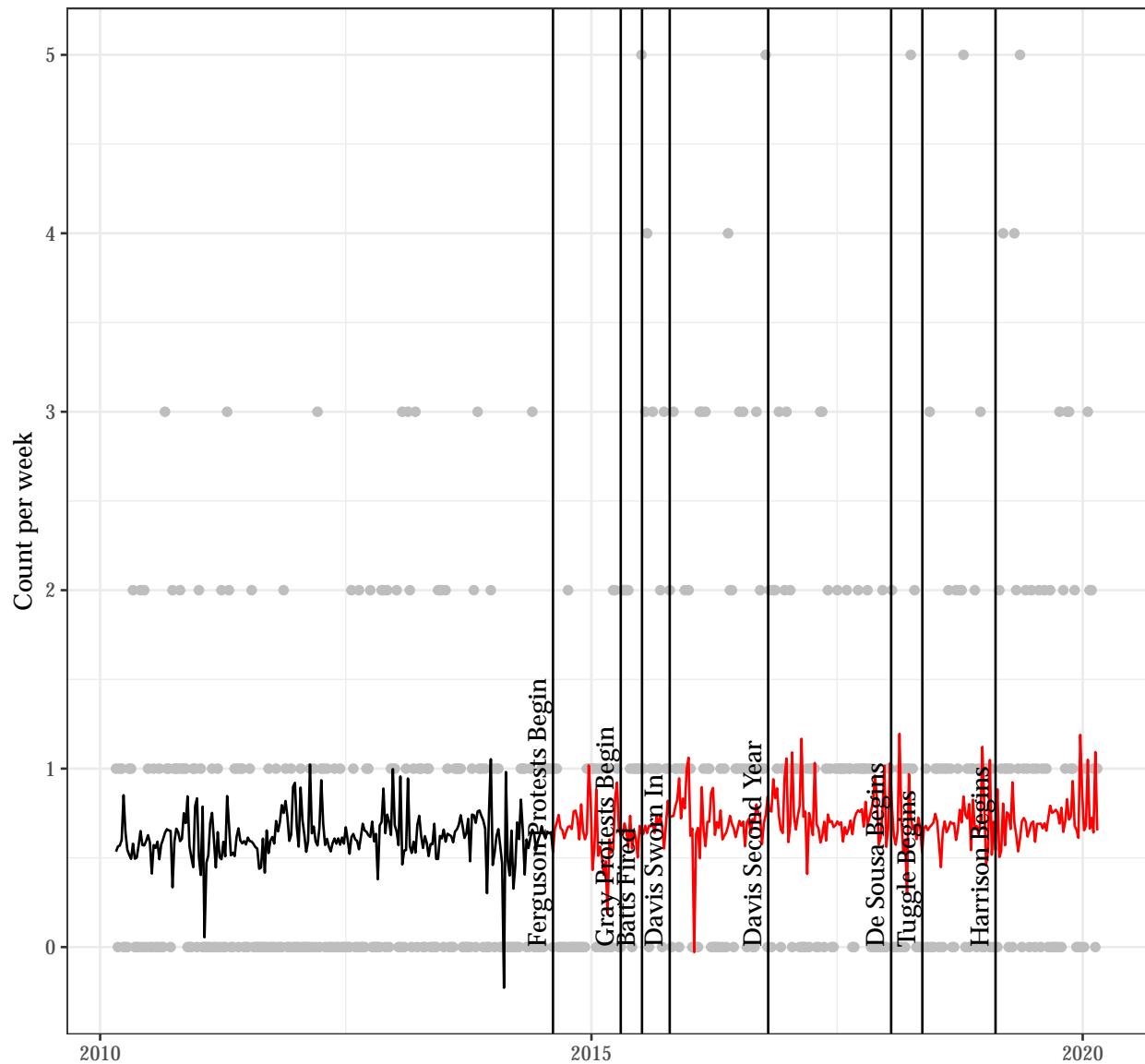
## 30.2 Four Models for homicide.western

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

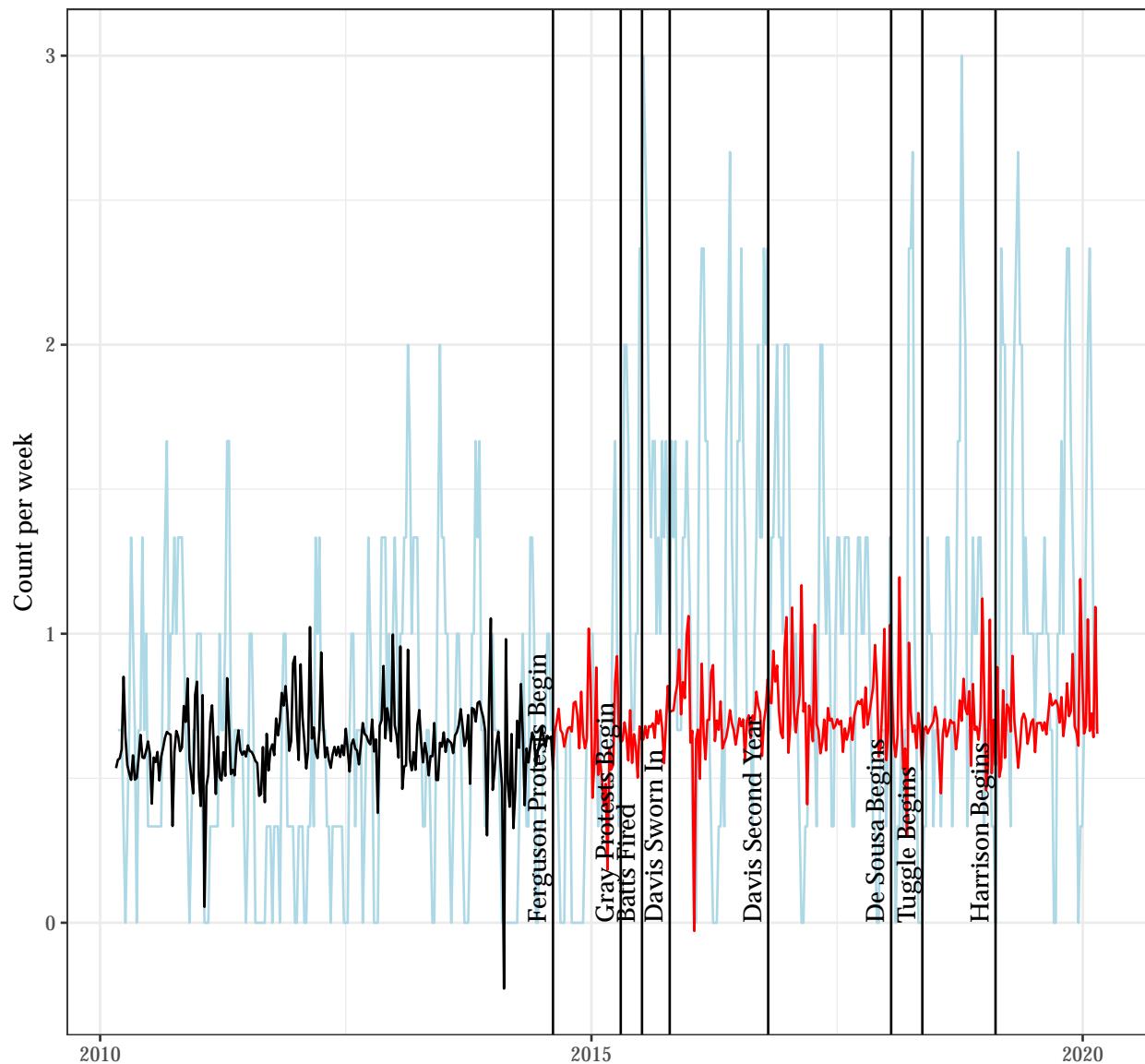
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0001	0.0003	0.0003	
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.16		-0.17	-0.18
After Gray Protests Begin (week of 4/20/15 onward)	0.98		1.00	0.99
Unrest and National Guard (4/27/15 - 5/3/2015)	0.55		0.54	0.43
After Batts Fired (week of 7/13/15 onward)	0.12		0.06	0.06
After Davis Confirmed (week of 10/19/15 onward)	-0.38		-0.40	-0.39
After Davis First Year (week of 10/17/16 onward)	-0.26		-0.29	-0.29
After De Sousa Begins (week of 1/19/18 onward)	-0.07		-0.01	-0.04
After Tuggle Begins (week of 5/14/18 onward)	0.05		0.05	0.07
After Harrison Begins (week of 2/11/19 onward)	0.25		0.23	0.20
Average Maximum Temperature to 50 Degrees		0.01		0.002
Plus Degrees in the 50s		0.01		0.01
Plus Degrees in the 60s		-0.02		-0.01
Plus Degrees in the 70s		0.02		-0.01
Plus Degrees Greater Than 80		-0.01		0.02
Snowfall (inches)		-0.26		-0.21
Precipitation (inches)		-0.24		-0.31
Darkness Before Midnight (hours)		0.04		0.03
Thanksgiving/Christmas (proportion of week)		0.89		-1.52
Winter Holiday (proportion of week)		2.80		0.23
Other Out-of-School Days (proportion of week)		0.32		0.19
Summer Vacation (proportion of week)		-0.01		0.03
Summer Holiday (proportion of week)		0.33		1.23
Observations	522	232	522	522
R <sup>2</sup>	0.08	0.03	0.07	0.10

### 30.3 Least Squares Updated Model (2) for homicide.western

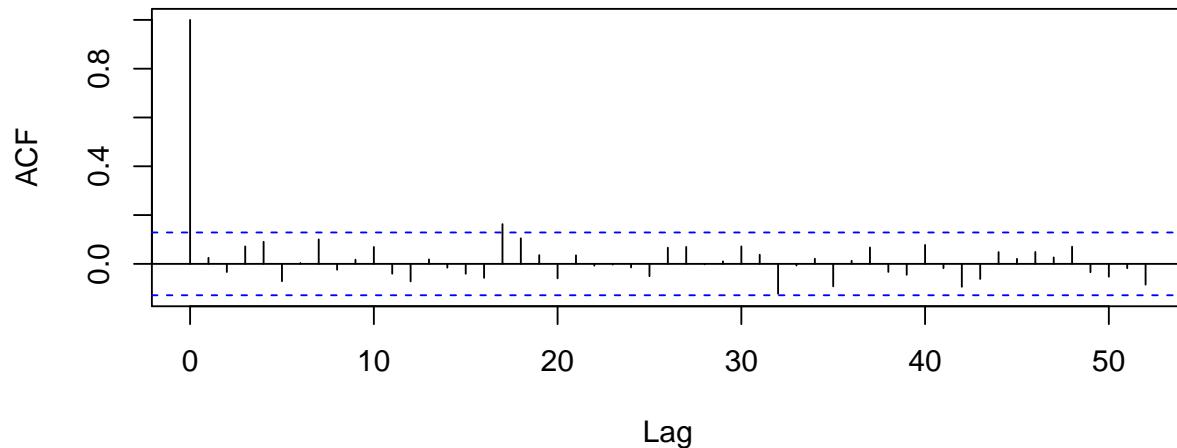
homicide.western



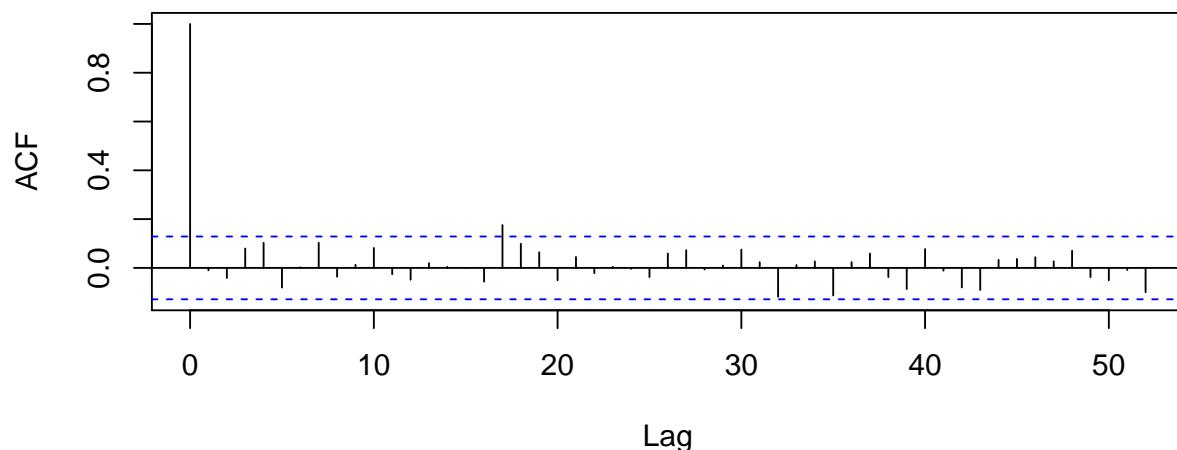
## homicide.western



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 30.4 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  
-1.4312 -1.0946 -0.9558  0.4598  2.5704  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -1.3088967  1.7900652 -0.731   0.465  
t             0.0006019  0.0013164  0.457   0.647  
tmax.f.spline1 0.0082552  0.0326501  0.253   0.800  
tmax.f.spline2  0.0125291  0.0646919  0.194   0.846  
tmax.f.spline3 -0.0382319  0.0781582 -0.489   0.625  
tmax.f.spline4  0.0314903  0.0787732  0.400   0.689  
tmax.f.spline5 -0.0113207  0.0665658 -0.170   0.865  
snow.in        -0.9985887  0.8011405 -1.246   0.213  
precip.in       -0.4491048  0.5380149 -0.835   0.404  
dark.before.12  0.0535456  0.1271632  0.421   0.674  
thanks.xmas     0.9998769  3.1930966  0.313   0.754  
summer.holiday  0.5069445  2.7237166  0.186   0.852  
winter.holiday  4.6565652  3.1072860  1.499   0.134  
summer.vacation -0.0259468  0.3605845 -0.072   0.943  
oth.ns          0.4786333  0.4139306  1.156   0.248  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 257.67 on 231 degrees of freedom  
Residual deviance: 249.76 on 217 degrees of freedom  
AIC: 508.42  
  
Number of Fisher Scoring iterations: 6
```

## 31 Results for homicide.central

### 31.1 Summary Values for homicide.central

Table 31.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.central	232	0.289	0.595	0	0	0	0	3

Table 31.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.central	290	0.372	0.616	0	0	0	1	3

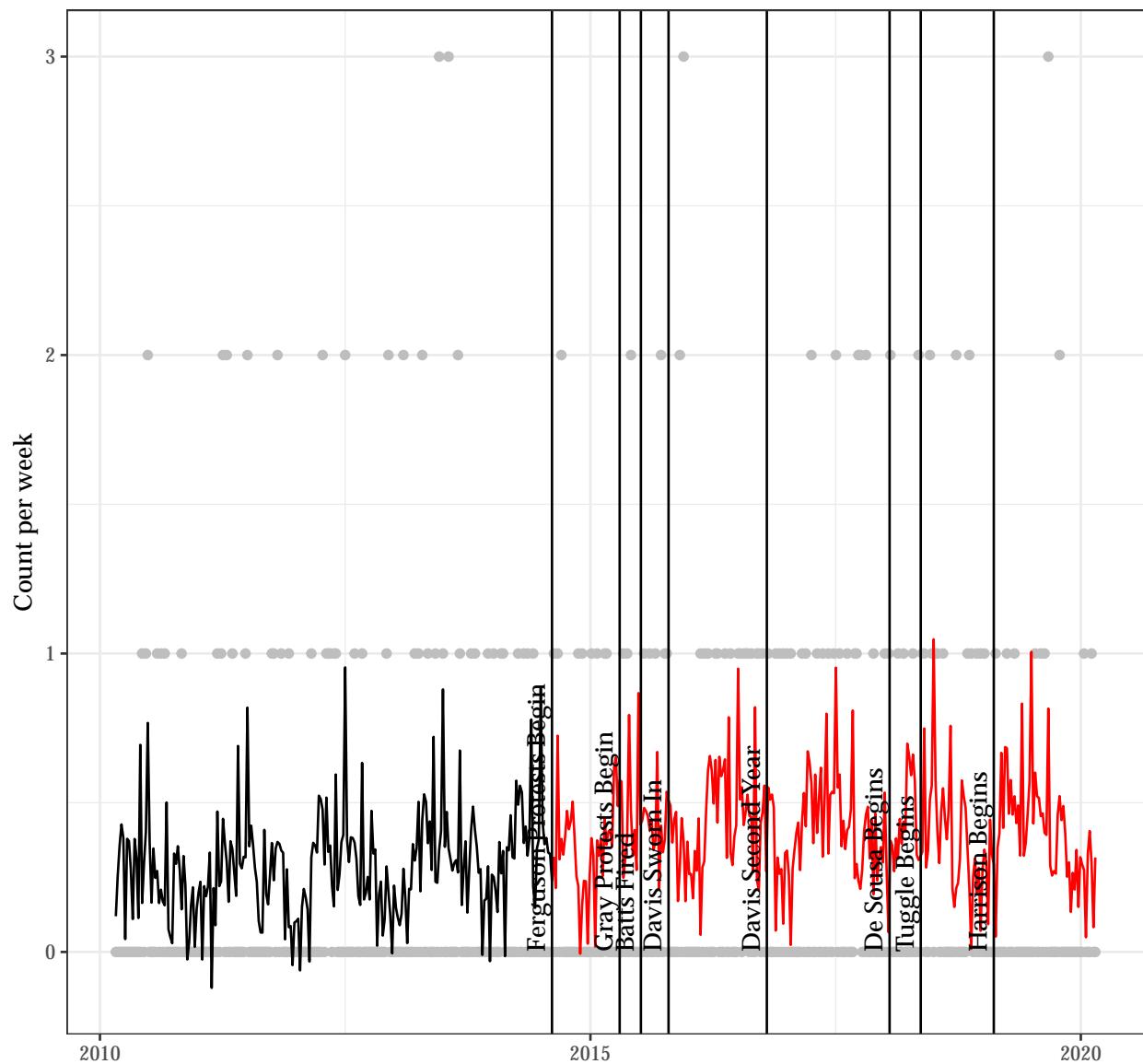
## 31.2 Four Models for homicide.central

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

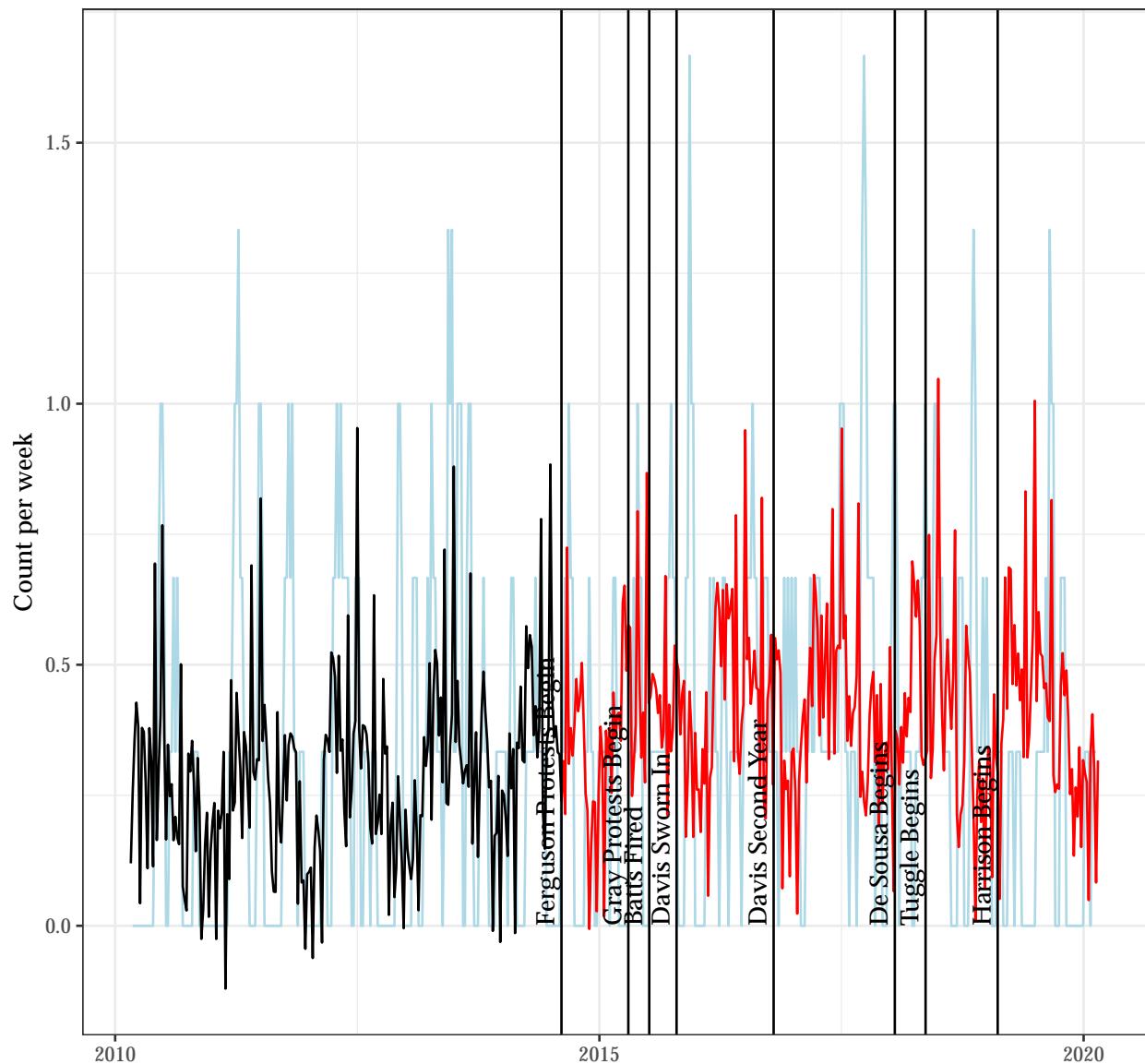
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001	0.001	0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.08		-0.06	-0.06
After Gray Protests Begin (week of 4/20/15 onward)	0.07		-0.04	-0.01
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.36		-0.47	-0.43
After Batts Fired (week of 7/13/15 onward)	0.13		0.17	0.13
After Davis Confirmed (week of 10/19/15 onward)	-0.11		-0.11	-0.07
After Davis First Year (week of 10/17/16 onward)	0.005		0.07	0.02
After De Sousa Begins (week of 1/19/18 onward)	-0.02		-0.04	-0.01
After Tuggle Begins (week of 5/14/18 onward)	-0.02		0.07	-0.02
After Harrison Begins (week of 2/11/19 onward)	-0.22		-0.23	-0.25
Average Maximum Temperature to 50 Degrees		-0.01		-0.001
Plus Degrees in the 50s		0.04		0.002
Plus Degrees in the 60s		-0.04		0.01
Plus Degrees in the 70s		-0.02		-0.02
Plus Degrees Greater Than 80		0.04		0.02
Snowfall (inches)		0.005		0.03
Precipitation (inches)		-0.21		-0.28
Darkness Before Midnight (hours)		-0.07		-0.03
Thanksgiving/Christmas (proportion of week)		-1.30		0.46
Winter Holiday (proportion of week)		-1.75		-0.34
Other Out-of-School Days (proportion of week)		0.04		-0.19
Summer Vacation (proportion of week)		0.11		-0.02
Summer Holiday (proportion of week)		3.32		1.66
Observations	522	232	522	522
R <sup>2</sup>	0.02	0.09	0.01	0.05

### 31.3 Least Squares Updated Model (2) for homicide.central

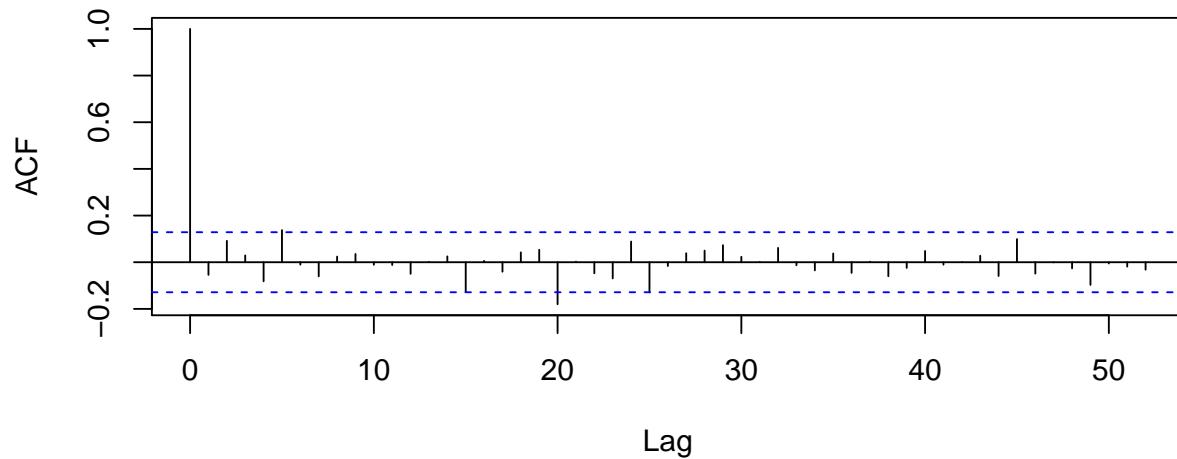
homicide.central



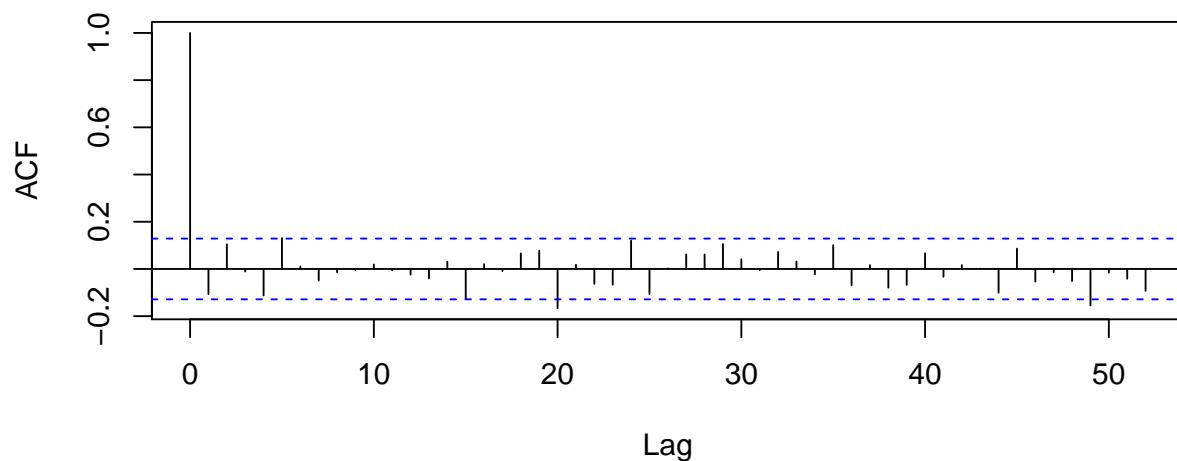
## homicide.central



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 31.4 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  
-1.48047 -0.79426 -0.63271 -0.00024  2.81593  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.927e+00 3.105e+00 0.621 0.5348  
t            2.111e-03 1.865e-03 1.132 0.2577  
tmax.f.spline1 -5.448e-02 6.021e-02 -0.905 0.3656  
tmax.f.spline2  1.613e-01 1.147e-01 1.406 0.1596  
tmax.f.spline3 -1.499e-01 1.123e-01 -1.336 0.1817  
tmax.f.spline4 -5.111e-02 1.058e-01 -0.483 0.6290  
tmax.f.spline5  1.286e-01 8.926e-02 1.441 0.1495  
snow.in       3.993e-02 5.983e-01 0.067 0.9468  
precip.in     -7.601e-01 8.166e-01 -0.931 0.3519  
dark.before.12 -2.140e-01 1.856e-01 -1.153 0.2489  
thanks.xmas   -1.090e+02 8.498e+03 -0.013 0.9898  
summer.holiday 7.152e+00 2.973e+00 2.406 0.0161 *  
winter.holiday -1.111e+02 8.226e+03 -0.014 0.9892  
summer.vacation 2.916e-01 5.079e-01 0.574 0.5659  
oth.ns        4.451e-02 7.205e-01 0.062 0.9507  
---  
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 210.12 on 231 degrees of freedom  
Residual deviance: 184.45 on 217 degrees of freedom  
AIC: 327.18  
  
Number of Fisher Scoring iterations: 15
```

## 32 Results for homicide.eastern

### 32.1 Summary Values for homicide.eastern

Table 32.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.eastern	232	0.634	0.805	0	0	0	1	3

Table 32.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.eastern	290	0.903	1.038	0	0	1	1	5

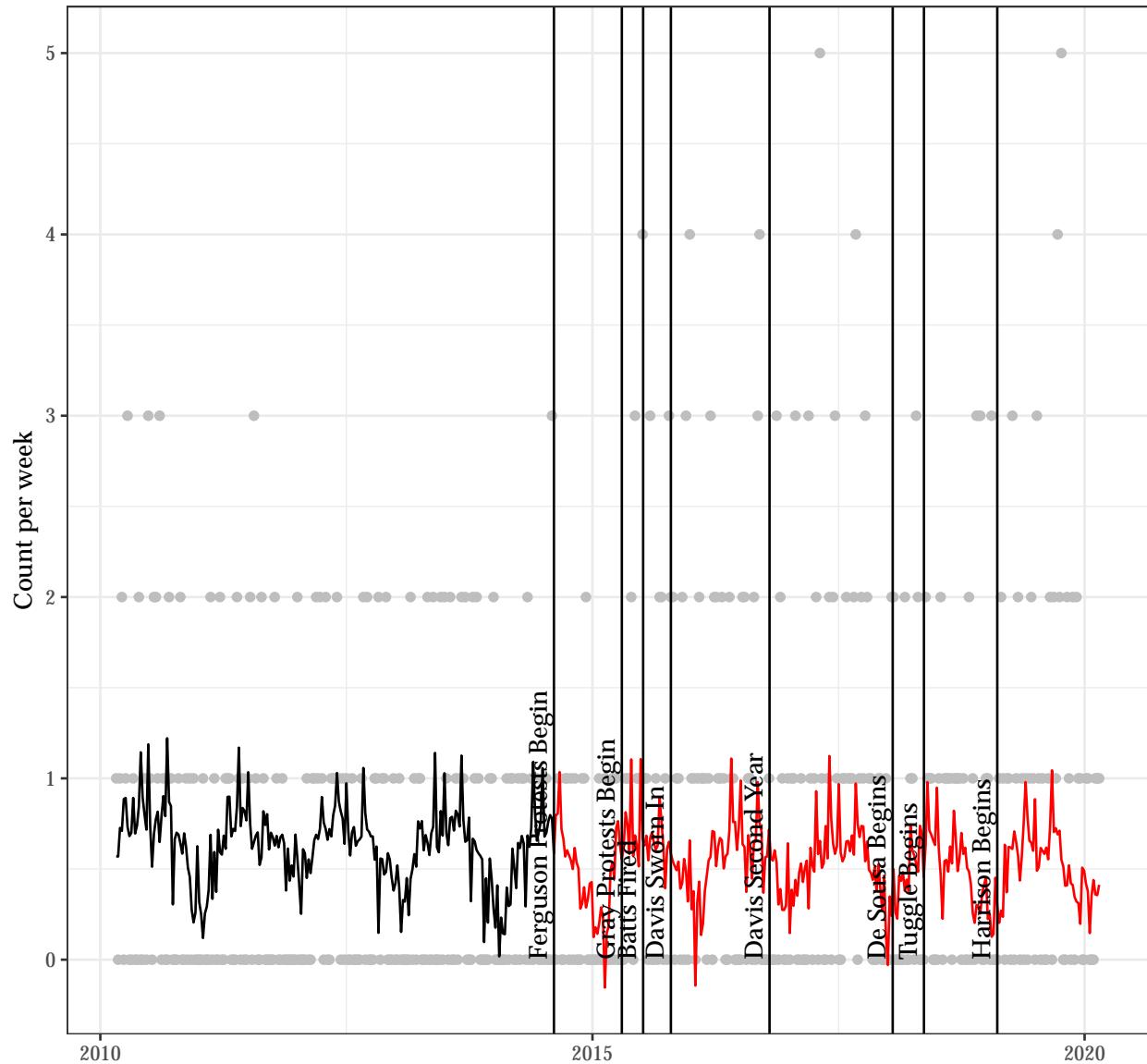
## 32.2 Four Models for homicide.eastern

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

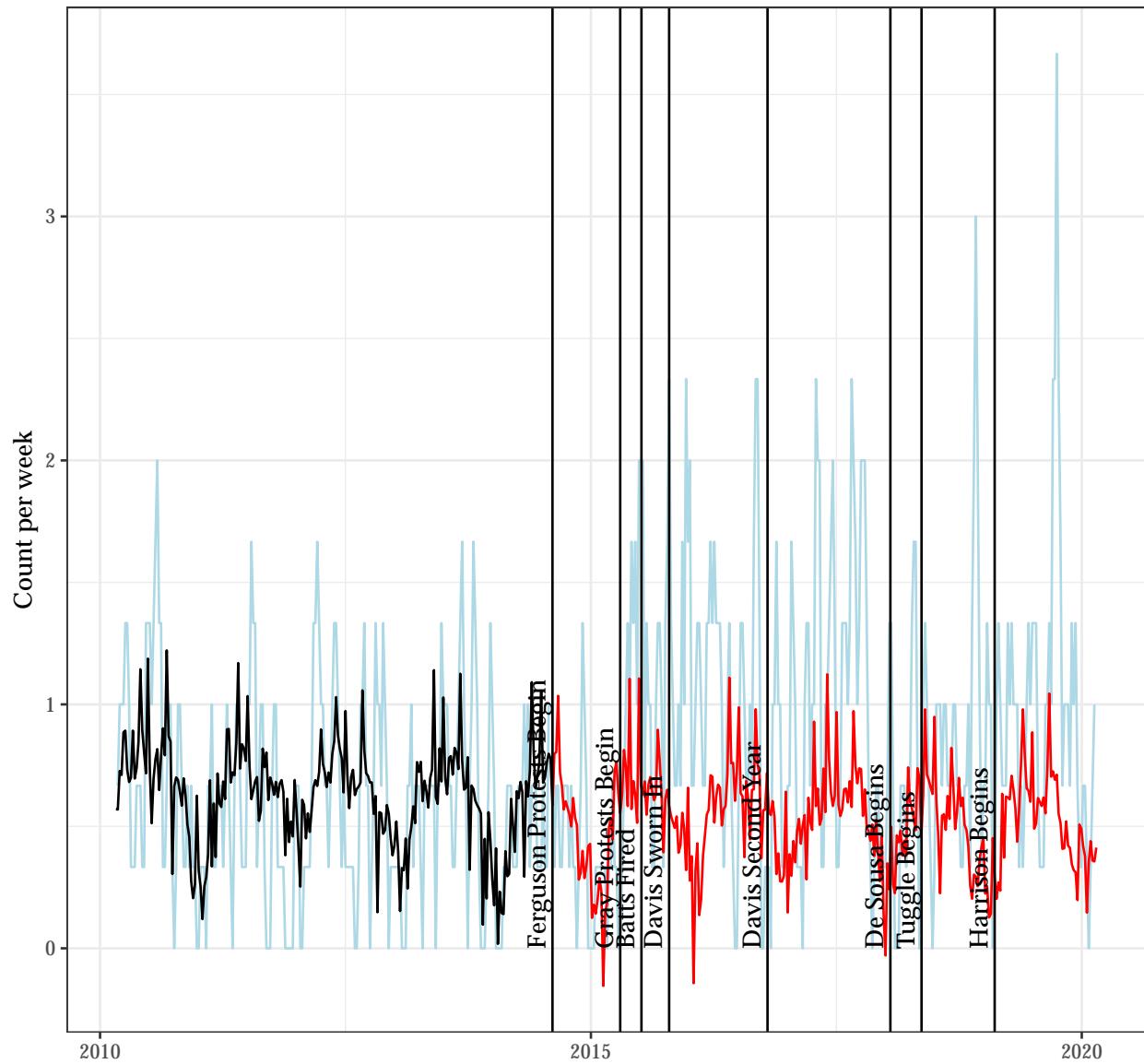
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.0005		-0.0004
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.17		-0.07	-0.11
After Gray Protests Begin (week of 4/20/15 onward)	0.99		0.71	0.80
Unrest and National Guard (4/27/15 - 5/3/2015)	-1.37		-1.27	-1.23
After Batts Fired (week of 7/13/15 onward)	-0.36		-0.29	-0.36
After Davis Confirmed (week of 10/19/15 onward)	0.08		0.15	0.17
After Davis First Year (week of 10/17/16 onward)	-0.04		-0.05	-0.06
After De Sousa Begins (week of 1/19/18 onward)	-0.28		-0.26	-0.21
After Tuggle Begins (week of 5/14/18 onward)	0.20		0.18	0.14
After Harrison Begins (week of 2/11/19 onward)	0.13		0.08	0.12
Average Maximum Temperature to 50 Degrees		0.02		0.02
Plus Degrees in the 50s		-0.01		-0.02
Plus Degrees in the 60s		-0.02		0.02
Plus Degrees in the 70s		0.03		0.02
Plus Degrees Greater Than 80		-0.04		-0.04
Snowfall (inches)		0.01		-0.04
Precipitation (inches)		-0.41		-0.30
Darkness Before Midnight (hours)		-0.03		0.05
Thanksgiving/Christmas (proportion of week)		-0.95		-4.37
Winter Holiday (proportion of week)		-0.77		-0.08
Other Out-of-School Days (proportion of week)		0.20		0.30
Summer Vacation (proportion of week)		-0.02		-0.10
Summer Holiday (proportion of week)		2.41		1.41
Observations	522	232	522	522
R <sup>2</sup>	0.05	0.07	0.06	0.09

### 32.3 Least Squares Updated Model (2) for homicide.eastern

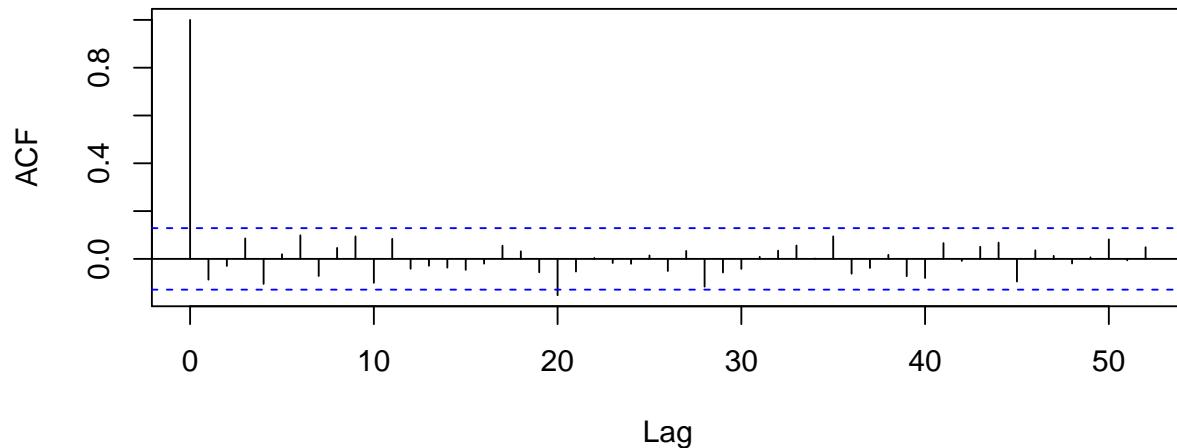
homicide.eastern



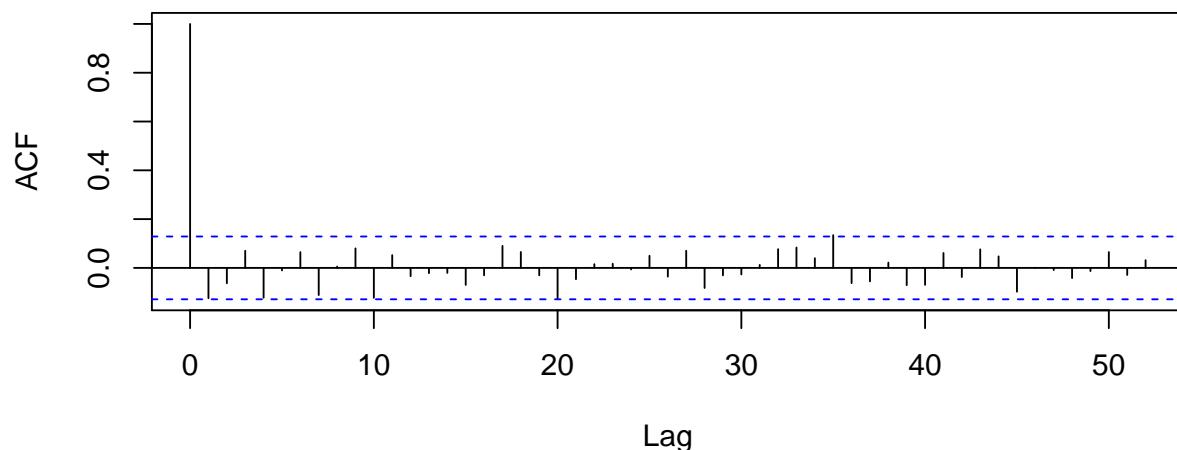
## homicide.eastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 32.4 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  
-1.6198 -1.1240 -0.6908  0.4463  2.1623  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -3.0683387  2.3767740 -1.291   0.197  
t             -0.0006898  0.0012672 -0.544   0.586  
tmax.f.spline1  0.0575161  0.0455575  1.262   0.207  
tmax.f.spline2 -0.0405850  0.0769590 -0.527   0.598  
tmax.f.spline3 -0.0258588  0.0805028 -0.321   0.748  
tmax.f.spline4  0.0371586  0.0744313  0.499   0.618  
tmax.f.spline5 -0.0499658  0.0596642 -0.837   0.402  
snow.in        -0.0646210  0.6577568 -0.098   0.922  
precip.in       -0.7021405  0.5298535 -1.325   0.185  
dark.before.12 -0.0451674  0.1270998 -0.355   0.722  
thanks.xmas     -1.9548310  4.4530604 -0.439   0.661  
summer.holiday  2.7245009  2.1989983  1.239   0.215  
winter.holiday -2.3392533  5.2382802 -0.447   0.655  
summer.vacation -0.0068747  0.3139168 -0.022   0.983  
oth.ns          0.3153427  0.4432398  0.711   0.477  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 258.61 on 231 degrees of freedom  
Residual deviance: 240.45 on 217 degrees of freedom  
AIC: 503.66  
  
Number of Fisher Scoring iterations: 6
```

## 33 Results for homicide.southwestern

### 33.1 Summary Values for homicide.southwestern

Table 33.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.southwestern	232	0.526	0.720	0	0	0	1	4

Table 33.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.southwestern	290	0.855	0.934	0	0	1	1	4

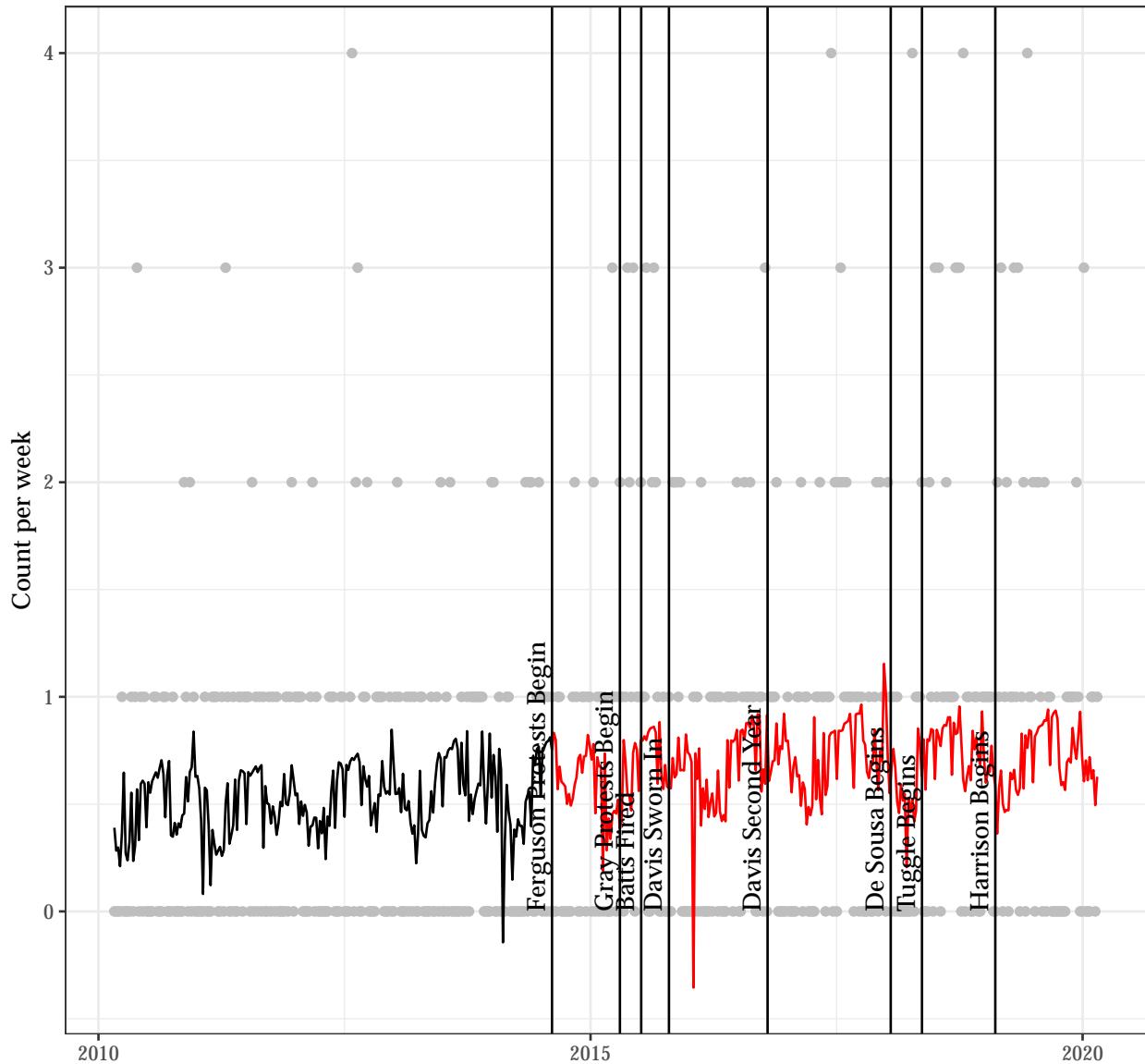
### 33.2 Four Models for homicide.southwestern

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

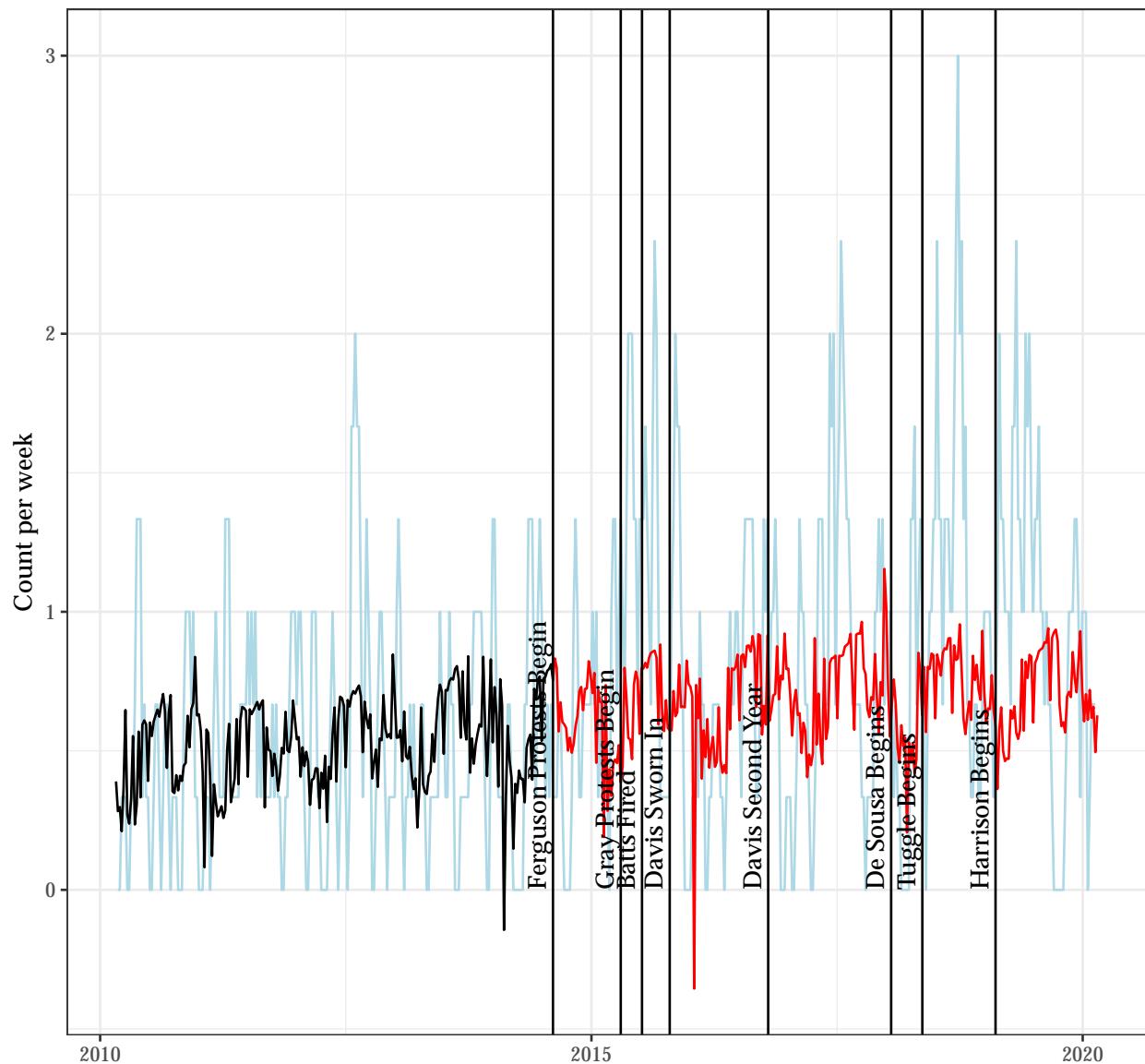
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.01		-0.02	0.02
After Gray Protests Begin (week of 4/20/15 onward)	0.86		0.83	0.75
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.45		-0.25	-0.35
After Batts Fired (week of 7/13/15 onward)	-0.46		-0.57	-0.59
After Davis Confirmed (week of 10/19/15 onward)	-0.29		-0.17	-0.13
After Davis First Year (week of 10/17/16 onward)	0.06		0.01	0.05
After De Sousa Begins (week of 1/19/18 onward)	-0.28		-0.09	-0.19
After Tuggle Begins (week of 5/14/18 onward)	0.53		0.34	0.34
After Harrison Begins (week of 2/11/19 onward)	-0.18		-0.10	-0.13
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		0.002
Plus Degrees in the 70s		0.03		-0.01
Plus Degrees Greater Than 80		-0.04		0.03
Snowfall (inches)		-0.32		-0.17
Precipitation (inches)		-0.09		0.10
Darkness Before Midnight (hours)		0.08		0.02
Thanksgiving/Christmas (proportion of week)		0.94		1.05
Winter Holiday (proportion of week)		-0.95		0.11
Other Out-of-School Days (proportion of week)		0.09		-0.18
Summer Vacation (proportion of week)		0.06		0.04
Summer Holiday (proportion of week)		-1.58		-1.39
Observations	522	232	522	522
R <sup>2</sup>	0.07	0.05	0.03	0.10

### 33.3 Least Squares Updated Model (2) for homicide.southwestern

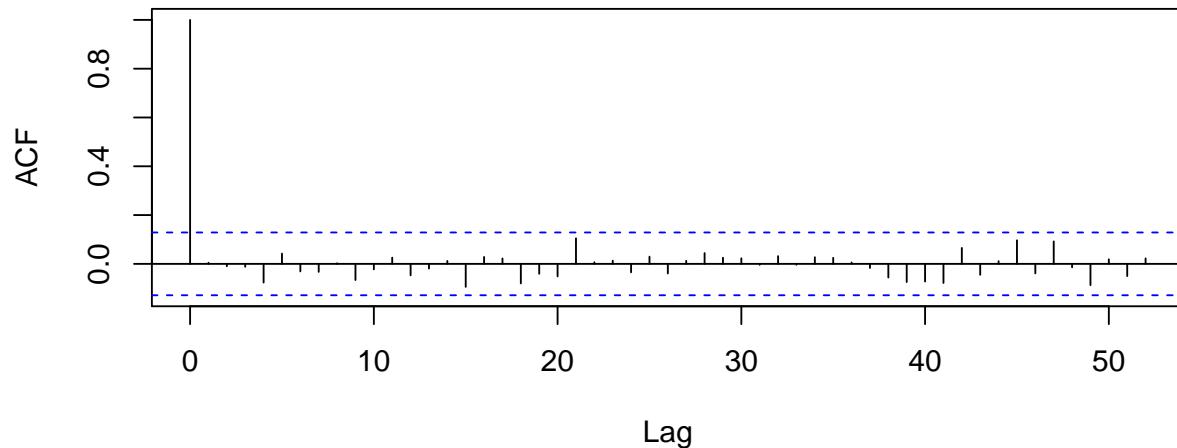
homicide.southwestern



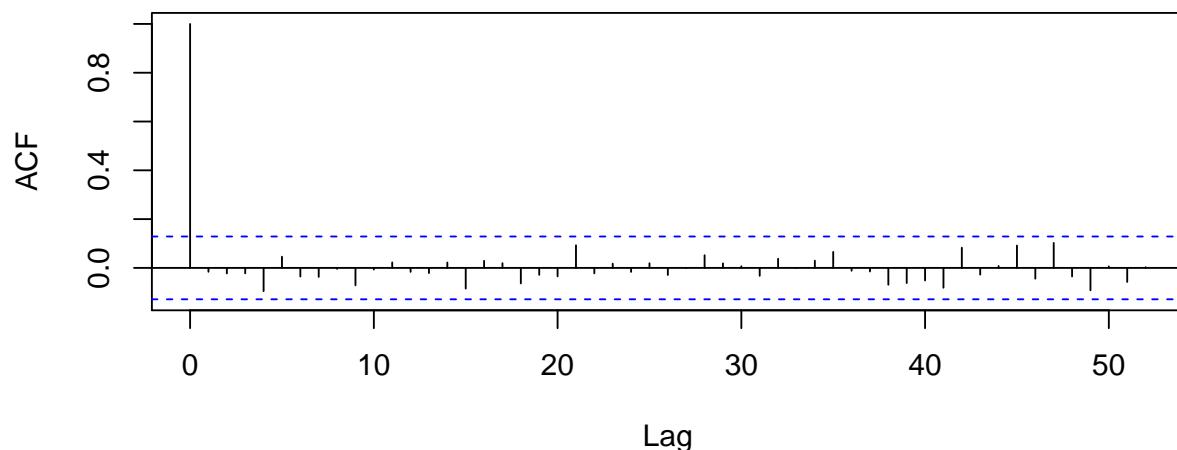
## homicide.southwestern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 33.4 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  
-1.3359 -1.0169 -0.8141  0.5457  2.6608  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -0.653409  1.926467 -0.339  0.734  
t             0.001450  0.001419  1.022  0.307  
tmax.f.spline1 -0.028134  0.034949 -0.805  0.421  
tmax.f.spline2  0.018494  0.077098  0.240  0.810  
tmax.f.spline3  0.033187  0.098706  0.336  0.737  
tmax.f.spline4  0.042721  0.092191  0.463  0.643  
tmax.f.spline5 -0.067692  0.068597 -0.987  0.324  
snow.in       -1.208338  0.908257 -1.330  0.183  
precip.in      -0.180484  0.547640 -0.330  0.742  
dark.before.12  0.180088  0.150626  1.196  0.232  
thanks.xmas     1.032631  3.539608  0.292  0.770  
summer.holiday -2.935410  3.164448 -0.928  0.354  
winter.holiday -1.436224  4.440399 -0.323  0.746  
summer.vacation  0.101216  0.355837  0.284  0.776  
oth.ns         0.188886  0.529789  0.357  0.721  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 232.05 on 231 degrees of freedom  
Residual deviance: 219.33 on 217 degrees of freedom  
AIC: 457.39  
  
Number of Fisher Scoring iterations: 6
```

## 34 Results for homicide.southern

### 34.1 Summary Values for homicide.southern

Table 34.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.southern	232	0.379	0.598	0	0	0	1	3

Table 34.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.southern	290	0.586	0.777	0	0	0	1	4

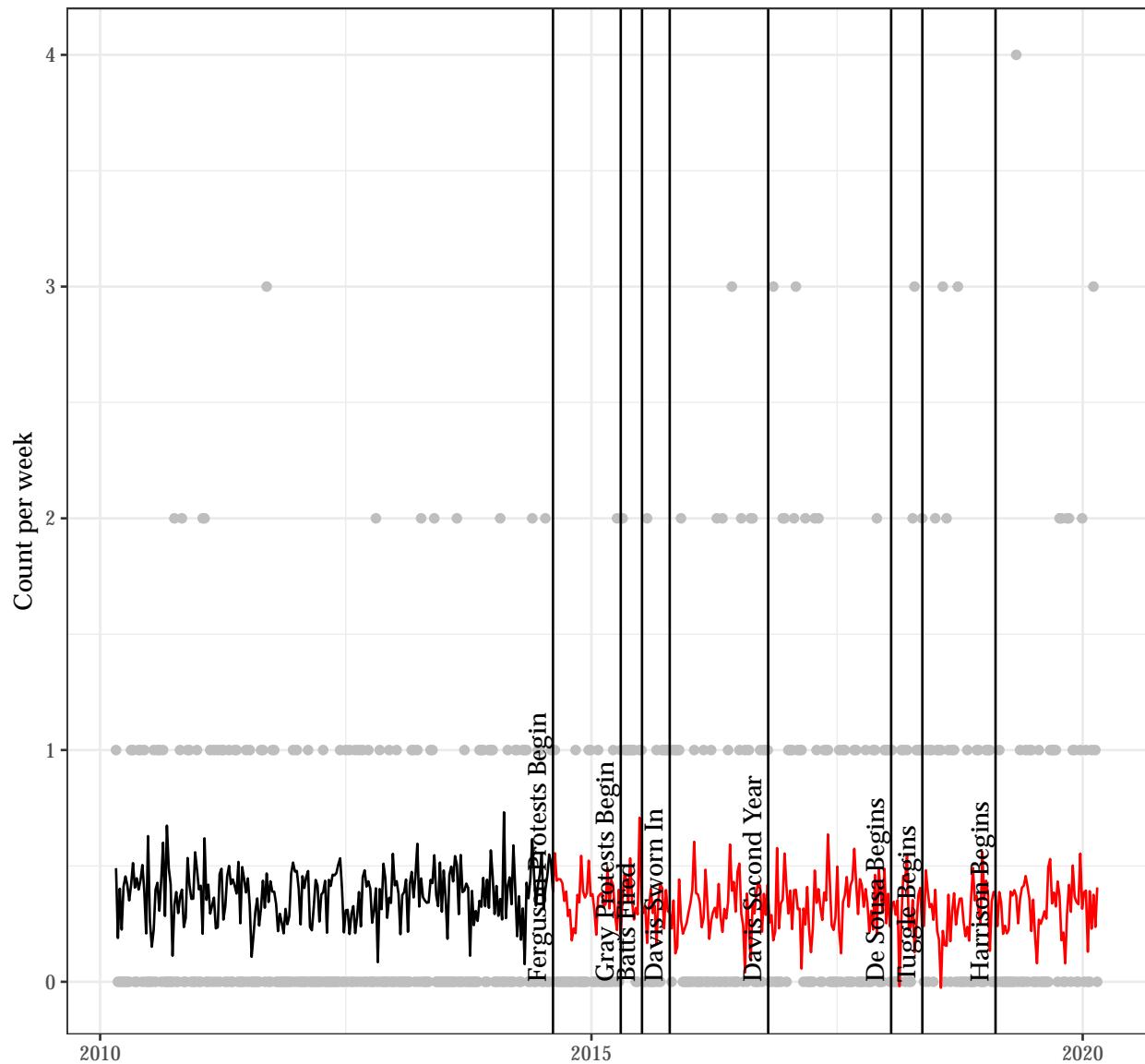
## 34.2 Four Models for homicide.southern

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

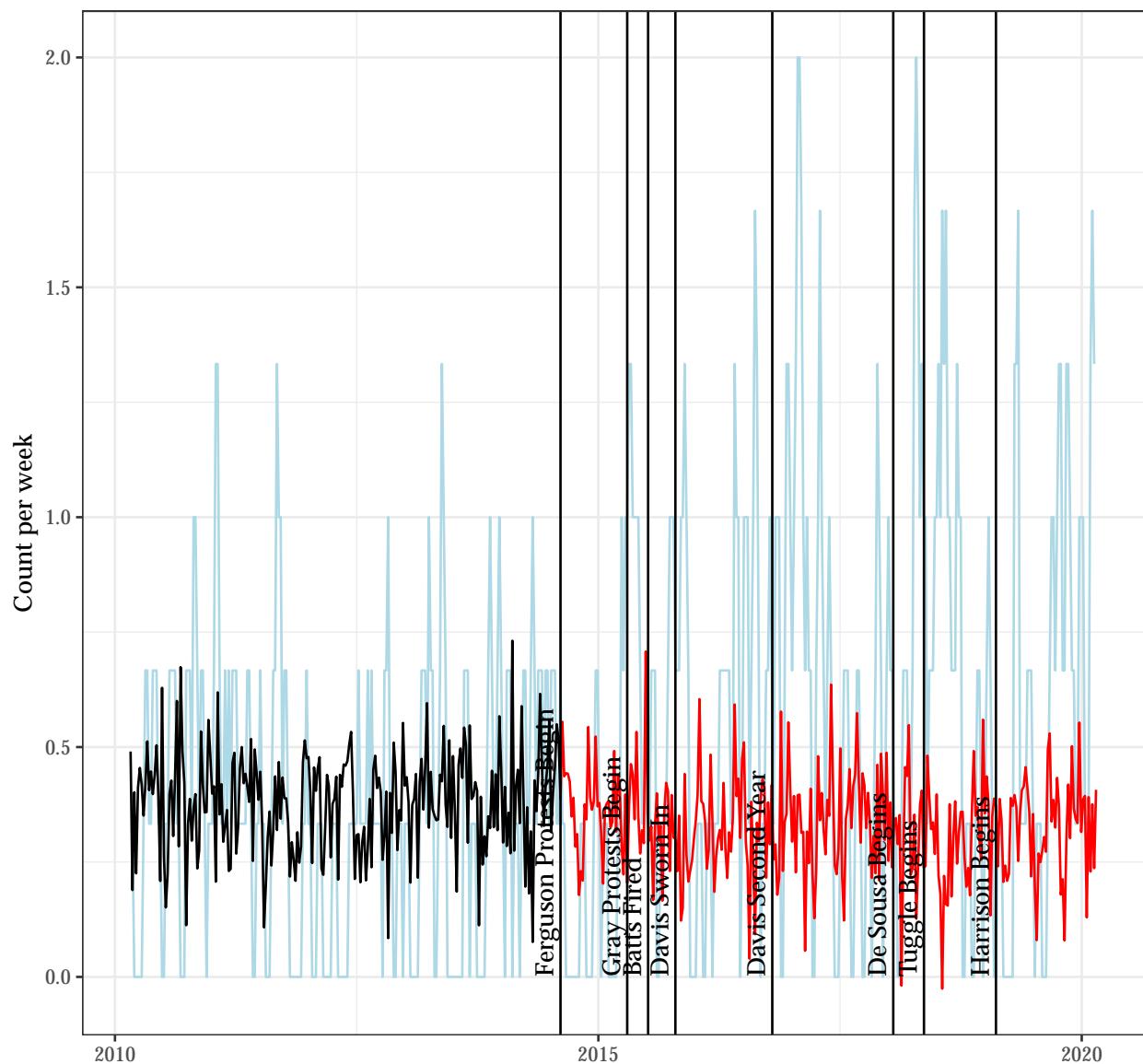
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0001	-0.0002		0.0000
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.17		-0.14	-0.17
After Gray Protests Begin (week of 4/20/15 onward)	0.59		0.57	0.59
Unrest and National Guard (4/27/15 - 5/3/2015)	1.18		1.20	1.14
After Batts Fired (week of 7/13/15 onward)	-0.32		-0.25	-0.31
After Davis Confirmed (week of 10/19/15 onward)	0.07		0.07	0.07
After Davis First Year (week of 10/17/16 onward)	0.06		0.04	0.05
After De Sousa Begins (week of 1/19/18 onward)	0.11		0.14	0.14
After Tuggle Begins (week of 5/14/18 onward)	-0.06		-0.05	-0.05
After Harrison Begins (week of 2/11/19 onward)	-0.10		-0.12	-0.11
Average Maximum Temperature to 50 Degrees		0.01		0.003
Plus Degrees in the 50s		-0.03		-0.01
Plus Degrees in the 60s		0.04		0.01
Plus Degrees in the 70s		-0.01		-0.01
Plus Degrees Greater Than 80		-0.04		-0.01
Snowfall (inches)		0.18		0.09
Precipitation (inches)		-0.33		-0.23
Darkness Before Midnight (hours)		-0.01		0.001
Thanksgiving/Christmas (proportion of week)		1.09		0.52
Winter Holiday (proportion of week)		-1.27		-1.00
Other Out-of-School Days (proportion of week)		0.04		0.17
Summer Vacation (proportion of week)		0.08		-0.01
Summer Holiday (proportion of week)		1.24		0.50
Observations	522	232	522	522
R <sup>2</sup>	0.05	0.03	0.07	0.06

### 34.3 Least Squares Updated Model (2) for homicide.southern

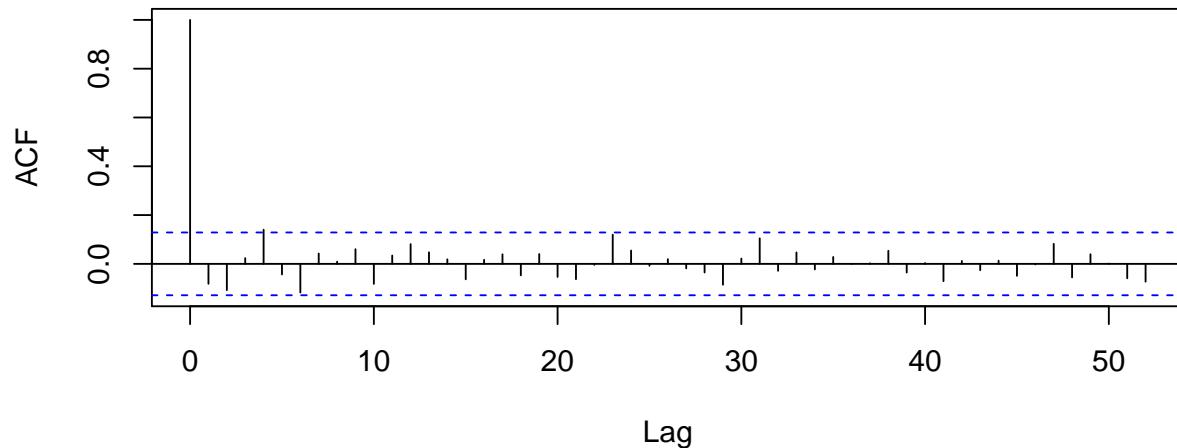
homicide.southern



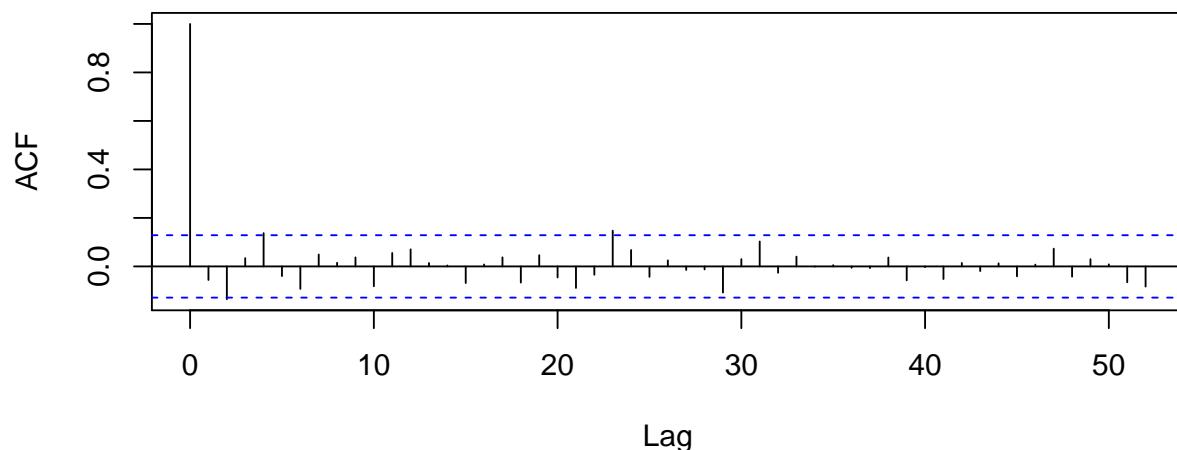
## homicide.southern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 34.4 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  
-1.2479 -0.9029 -0.7553  0.7142  2.4524  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -1.4489962  2.3311962 -0.622   0.534  
t            -0.0005257  0.0016367 -0.321   0.748  
tmax.f.spline1  0.0201795  0.0414233  0.487   0.626  
tmax.f.spline2 -0.0947501  0.0866636 -1.093   0.274  
tmax.f.spline3  0.1314847  0.1150843  1.143   0.253  
tmax.f.spline4 -0.0397961  0.1044487 -0.381   0.703  
tmax.f.spline5 -0.0945277  0.0845867 -1.118   0.264  
snow.in        0.3881935  0.4208399  0.922   0.356  
precip.in       -1.0188552  0.7391133 -1.378   0.168  
dark.before.12 -0.0300763  0.1643754 -0.183   0.855  
thanks.xmas     2.6903814  4.2093743  0.639   0.523  
summer.holiday  3.0172778  3.1856558  0.947   0.344  
winter.holiday -3.6940967  5.2562116 -0.703   0.482  
summer.vacation  0.2129532  0.4375365  0.487   0.626  
oth.ns          0.0825301  0.5595134  0.148   0.883  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 207.70 on 231 degrees of freedom  
Residual deviance: 200.01 on 217 degrees of freedom  
AIC: 387.75  
  
Number of Fisher Scoring iterations: 6
```

## 35 Results for homicide.southeastern

### 35.1 Summary Values for homicide.southeastern

Table 35.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.southeastern	232	0.246	0.505	0	0	0	0	2

Table 35.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
homicide.southeastern	290	0.417	0.601	0	0	0	1	3

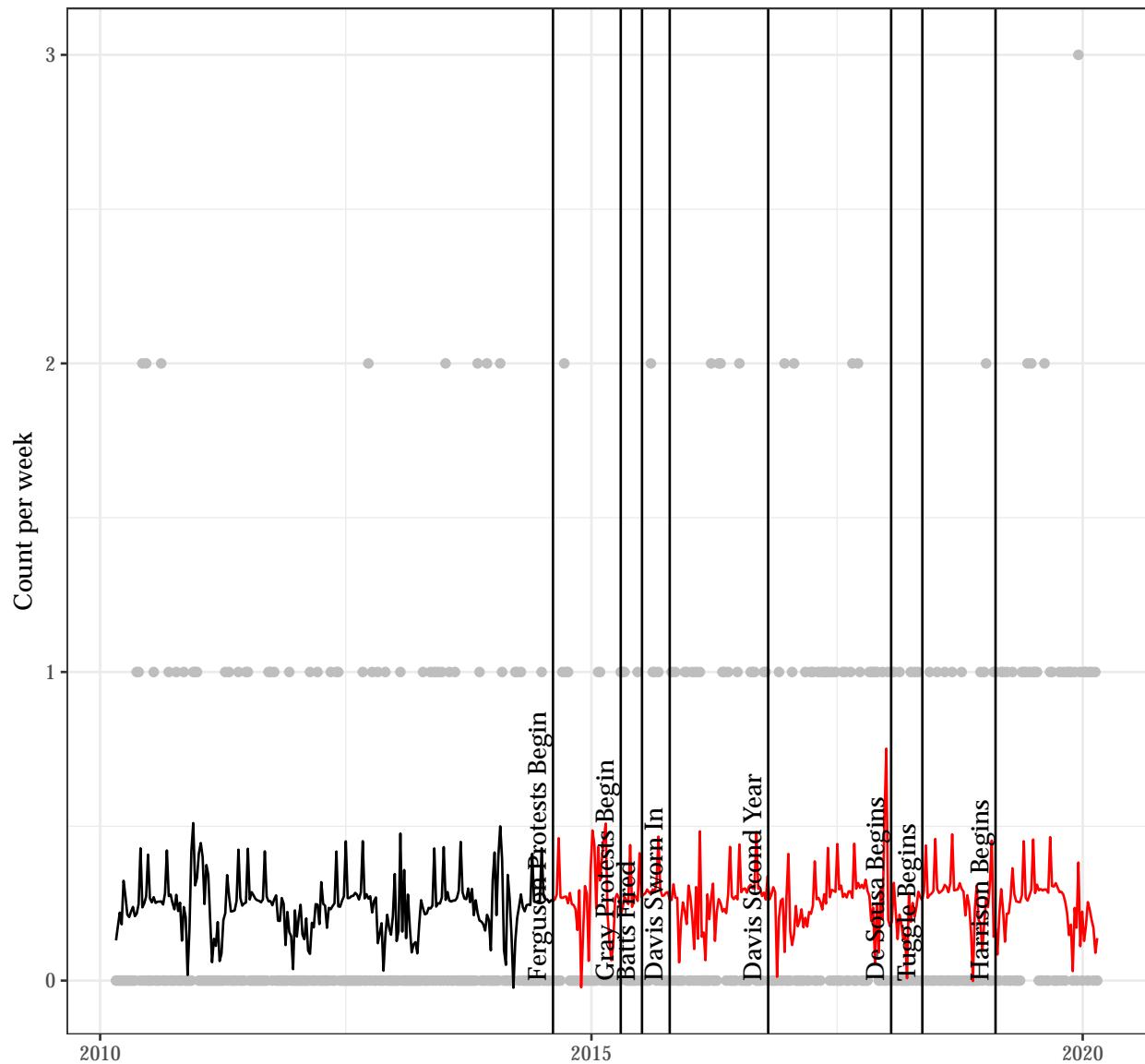
## 35.2 Four Models for homicide.southeastern

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

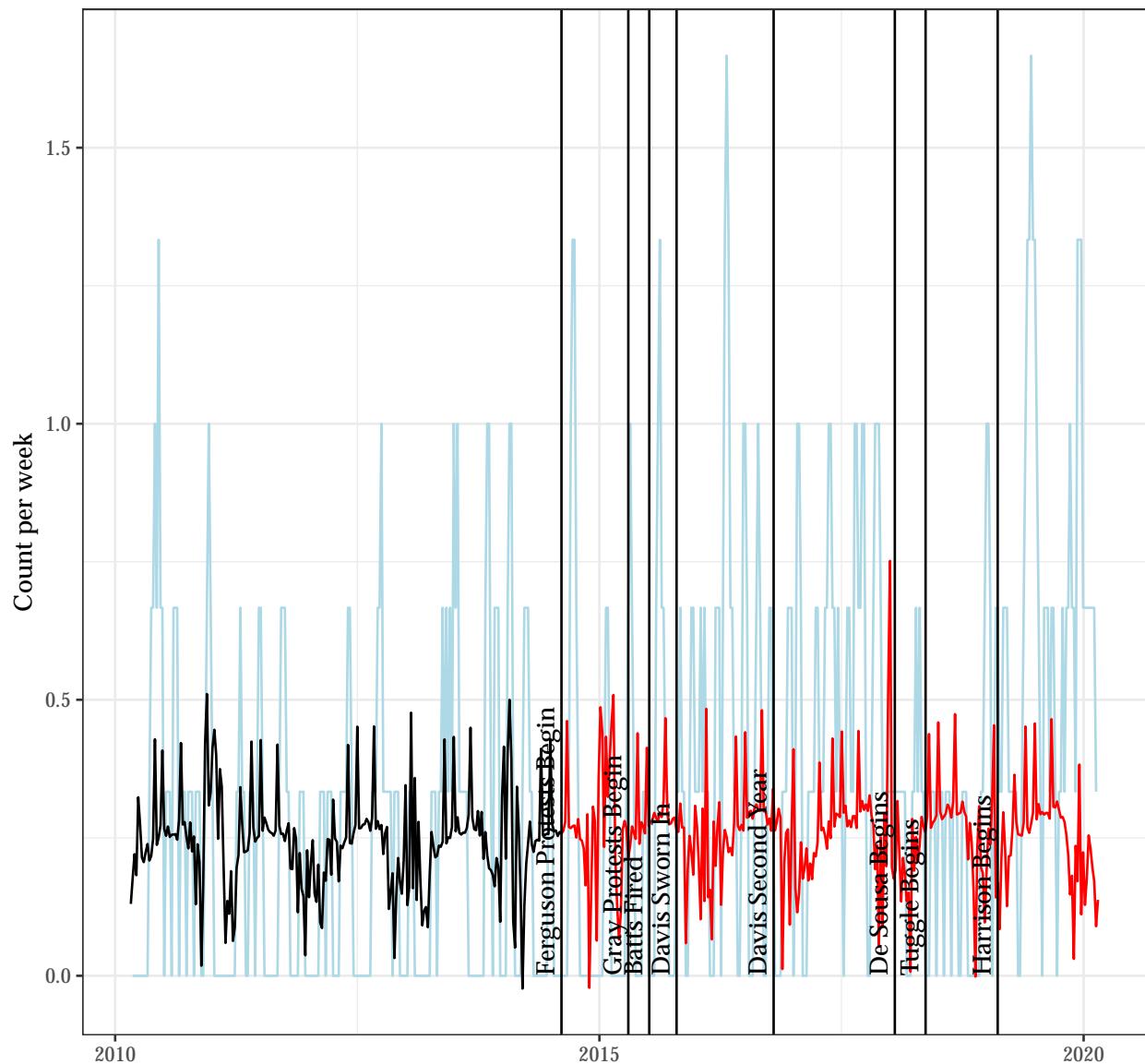
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.0001	0.0001		0.0002
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.07		-0.08	-0.08
After Gray Protests Begin (week of 4/20/15 onward)	0.07		0.06	0.05
Unrest and National Guard (4/27/15 - 5/3/2015)	0.73		0.78	0.73
After Batts Fired (week of 7/13/15 onward)	0.08		0.07	0.08
After Davis Confirmed (week of 10/19/15 onward)	0.10		0.14	0.13
After Davis First Year (week of 10/17/16 onward)	0.0001		0.003	-0.01
After De Sousa Begins (week of 1/19/18 onward)	-0.16		-0.10	-0.13
After Tuggle Begins (week of 5/14/18 onward)	-0.06		-0.13	-0.09
After Harrison Begins (week of 2/11/19 onward)	0.37		0.40	0.37
Average Maximum Temperature to 50 Degrees		-0.02		-0.02
Plus Degrees in the 50s		0.04		0.03
Plus Degrees in the 60s		-0.01		-0.01
Plus Degrees in the 70s		-0.002		-0.001
Plus Degrees Greater Than 80		0.001		0.001
Snowfall (inches)		-0.14		-0.15
Precipitation (inches)		-0.001		-0.11
Darkness Before Midnight (hours)		0.02		0.004
Thanksgiving/Christmas (proportion of week)		-1.15		0.04
Winter Holiday (proportion of week)		-0.27		-0.63
Other Out-of-School Days (proportion of week)		0.11		-0.08
Summer Vacation (proportion of week)		-0.01		0.07
Summer Holiday (proportion of week)		1.14		0.96
Observations	522	232	522	522
R <sup>2</sup>	0.06	0.03	0.06	0.08

### 35.3 Least Squares Updated Model (2) for homicide.southeastern

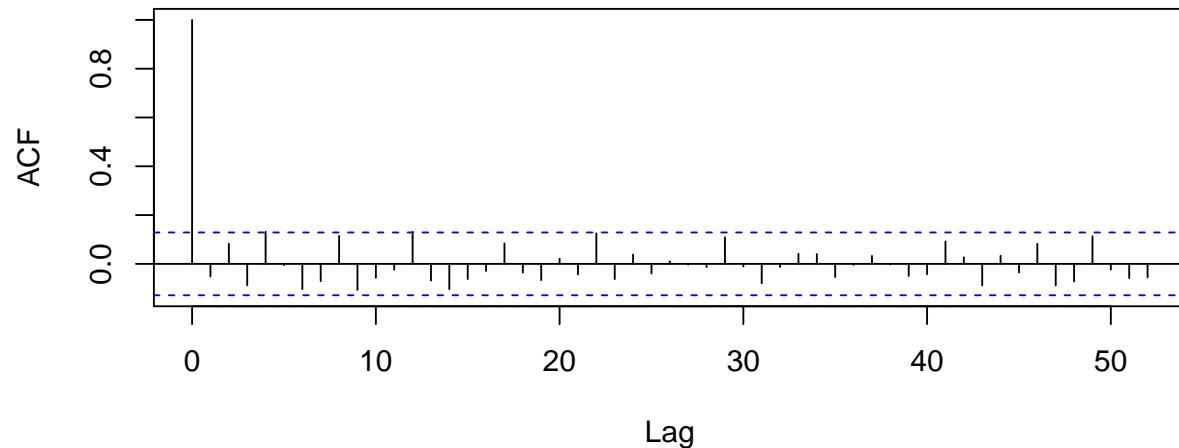
homicide.southeastern



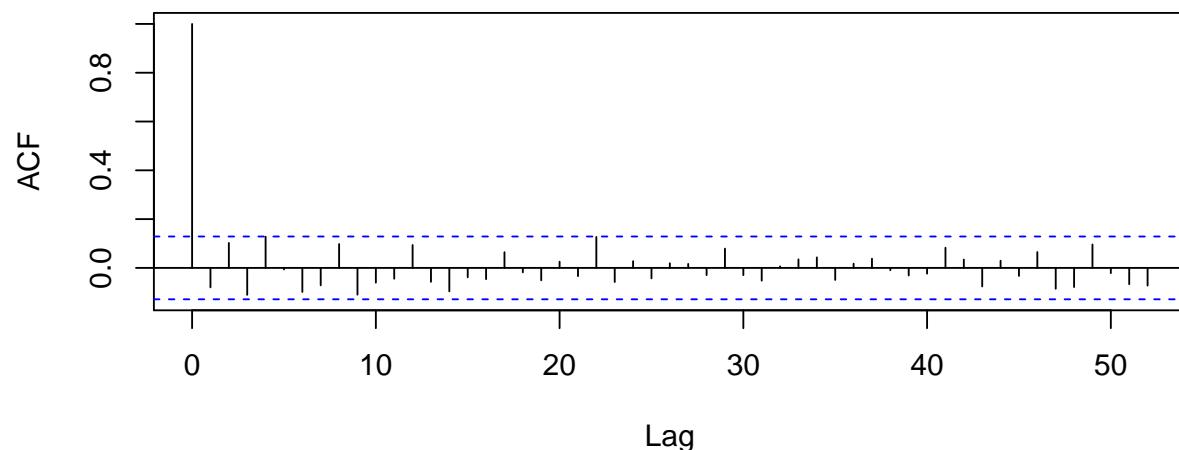
## homicide.southeastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 35.4 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  
-0.9842 -0.7253 -0.6587 -0.4637  2.4266  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.1532202 2.7591352  0.780  0.4352  
t            0.0004661 0.0020285  0.230  0.8183  
tmax.f.spline1 -0.1018862 0.0506969 -2.010  0.0445 *  
tmax.f.spline2  0.1708277 0.1185154  1.441  0.1495  
tmax.f.spline3 -0.0440542 0.1414470 -0.311  0.7555  
tmax.f.spline4 -0.0128679 0.1261258 -0.102  0.9187  
tmax.f.spline5  0.0005267 0.0984605  0.005  0.9957  
snow.in       -0.6136057 0.7766862 -0.790  0.4295  
precip.in      0.0119052 0.7510452  0.016  0.9874  
dark.before.12 0.1130591 0.2214388  0.511  0.6097  
thanks.xmas    -5.9667694 7.6190795 -0.783  0.4335  
summer.holiday 3.3869695 3.5409893  0.957  0.3388  
winter.holiday -1.5065339 5.6426046 -0.267  0.7895  
summer.vacation -0.0060170 0.5307207 -0.011  0.9910  
oth.ns         0.4727145 0.7416905  0.637  0.5239  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 182.2 on 231 degrees of freedom  
Residual deviance: 174.6 on 217 degrees of freedom  
AIC: 307.51  
  
Number of Fisher Scoring iterations: 6
```

## 36 Results for shooting.northwestern

### 36.1 Summary Values for shooting.northwestern

Table 36.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.northwestern	232	0.806	1.101	0	0	0	1	6

Table 36.2: Descriptives for Outcome After Ferguson Protests Begin

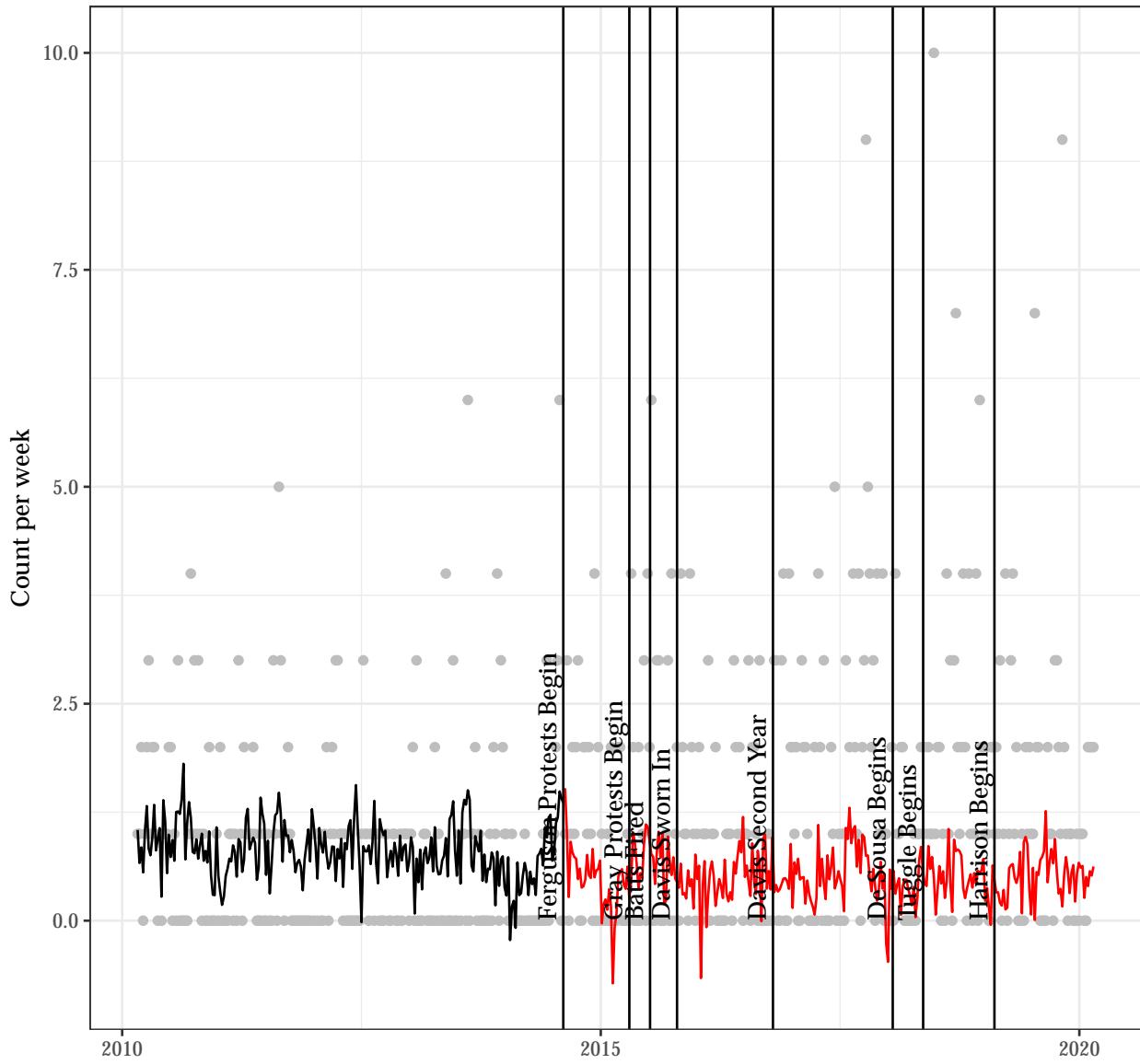
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.northwestern	290	1.438	1.615	0	0	1	2	10

## 36.2 Four Models for shooting.northwestern

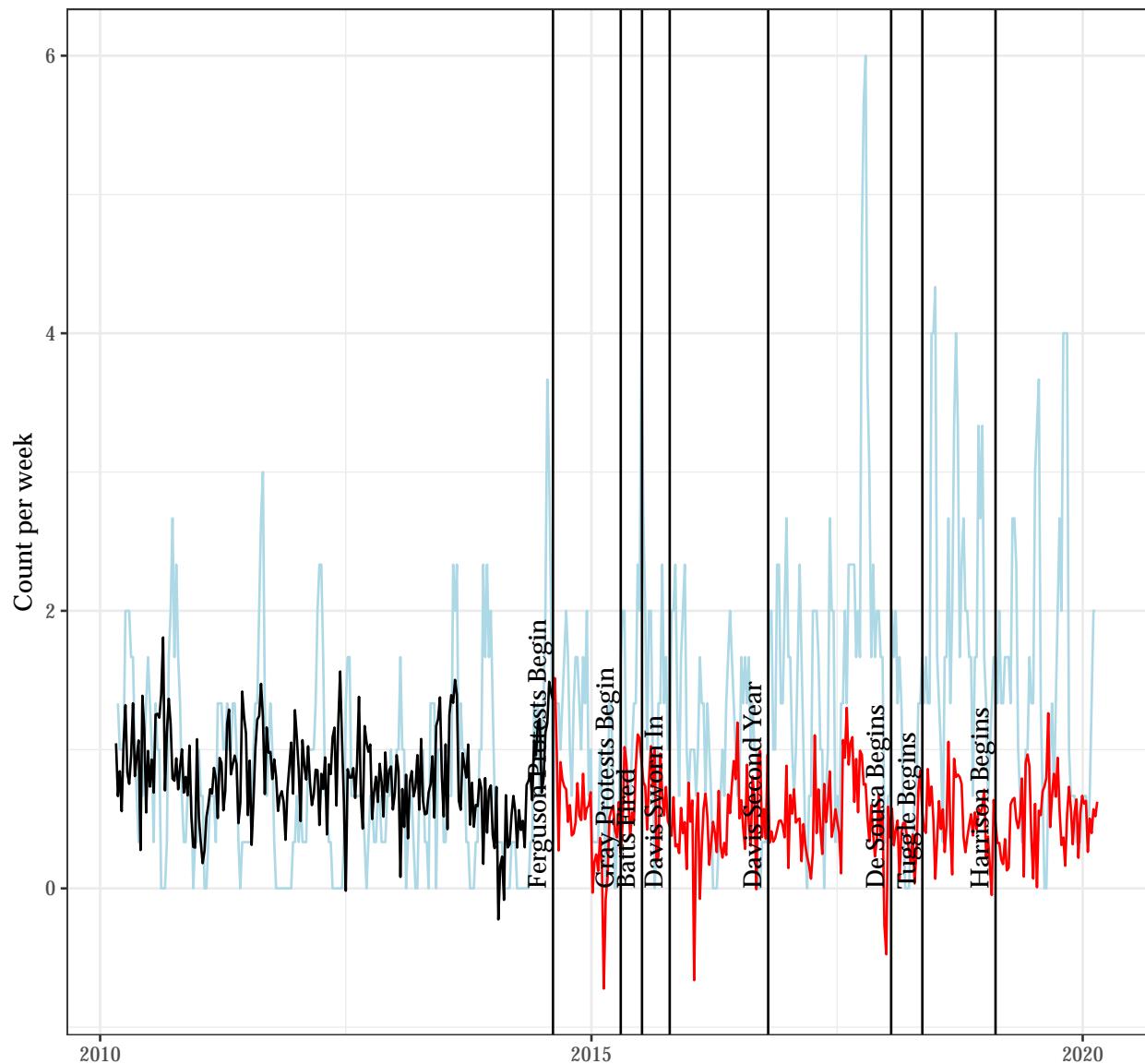
Table 36.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.001	-0.001	-0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.33		0.50	0.43
After Gray Protests Begin (week of 4/20/15 onward)	0.30		0.02	0.14
Unrest and National Guard (4/27/15 - 5/3/2015)	2.72		3.01	2.82
After Batts Fired (week of 7/13/15 onward)	0.24		0.31	0.08
After Davis Confirmed (week of 10/19/15 onward)	-0.39		-0.24	-0.21
After Davis First Year (week of 10/17/16 onward)	0.68		0.57	0.61
After De Sousa Begins (week of 1/19/18 onward)	-0.72		-0.62	-0.45
After Tuggle Begins (week of 5/14/18 onward)	1.12		0.98	0.90
After Harrison Begins (week of 2/11/19 onward)	-0.52		-0.59	-0.52
Average Maximum Temperature to 50 Degrees		0.05		0.03
Plus Degrees in the 50s		-0.10		-0.03
Plus Degrees in the 60s		0.08		0.04
Plus Degrees in the 70s		0.02		-0.02
Plus Degrees Greater Than 80		-0.14		-0.07
Snowfall (inches)		-0.06		-0.08
Precipitation (inches)		-0.24		-0.31
Darkness Before Midnight (hours)		0.06		0.20
Thanksgiving/Christmas (proportion of week)		-2.30		-0.12
Winter Holiday (proportion of week)		-0.98		0.57
Other Out-of-School Days (proportion of week)		0.23		0.06
Summer Vacation (proportion of week)		0.41		0.33
Summer Holiday (proportion of week)		-2.03		-2.54
Observations	522	232	522	522
R <sup>2</sup>	0.09	0.09	0.13	0.12

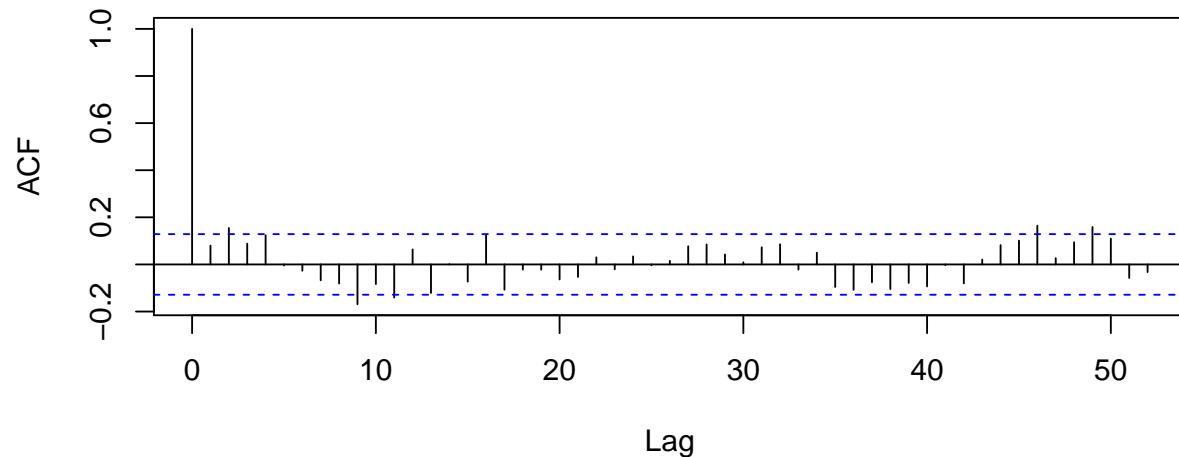
### 36.3 Least Squares Updated Model (2) for shooting.northwestern shooting.northwestern



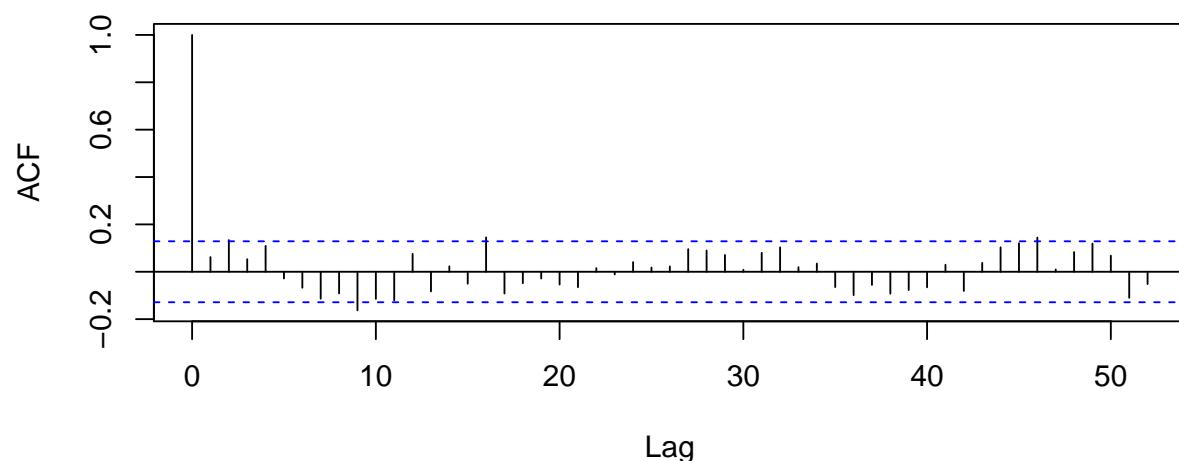
## shooting.northwestern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 36.4 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  
-2.1384 -1.1612 -0.4403  0.4217  2.6992  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -4.659207  2.058122 -2.264  0.02359 *  
t            -0.001643  0.001135 -1.449  0.14745  
tmax.f.spline1  0.090361  0.038901  2.323  0.02019 *  
tmax.f.spline2 -0.166750  0.067484 -2.471  0.01347 *  
tmax.f.spline3  0.129199  0.078577  1.644  0.10013  
tmax.f.spline4  0.003727  0.070727  0.053  0.95798  
tmax.f.spline5 -0.149870  0.055085 -2.721  0.00651 **  
snow.in        -0.411342  0.700045 -0.588  0.55681  
precip.in       -0.274589  0.416696 -0.659  0.50992  
dark.before.12   0.070356  0.115320  0.610  0.54180  
thanks.xmas     -3.312679  3.858942 -0.858  0.39065  
summer.holiday  -2.827734  2.708638 -1.044  0.29650  
winter.holiday  -2.013725  4.280325 -0.470  0.63803  
summer.vacation  0.411867  0.283138  1.455  0.14577  
oth.ns          0.266397  0.391762  0.680  0.49651  
---  
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: 292.33 on 217 degrees of freedom  
AIC: 587.46  
  
Number of Fisher Scoring iterations: 6
```

## 37 Results for shooting.northern

### 37.1 Summary Values for shooting.northern

Table 37.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.northern	232	0.517	0.800	0	0	0	1	4

Table 37.2: Descriptives for Outcome After Ferguson Protests Begin

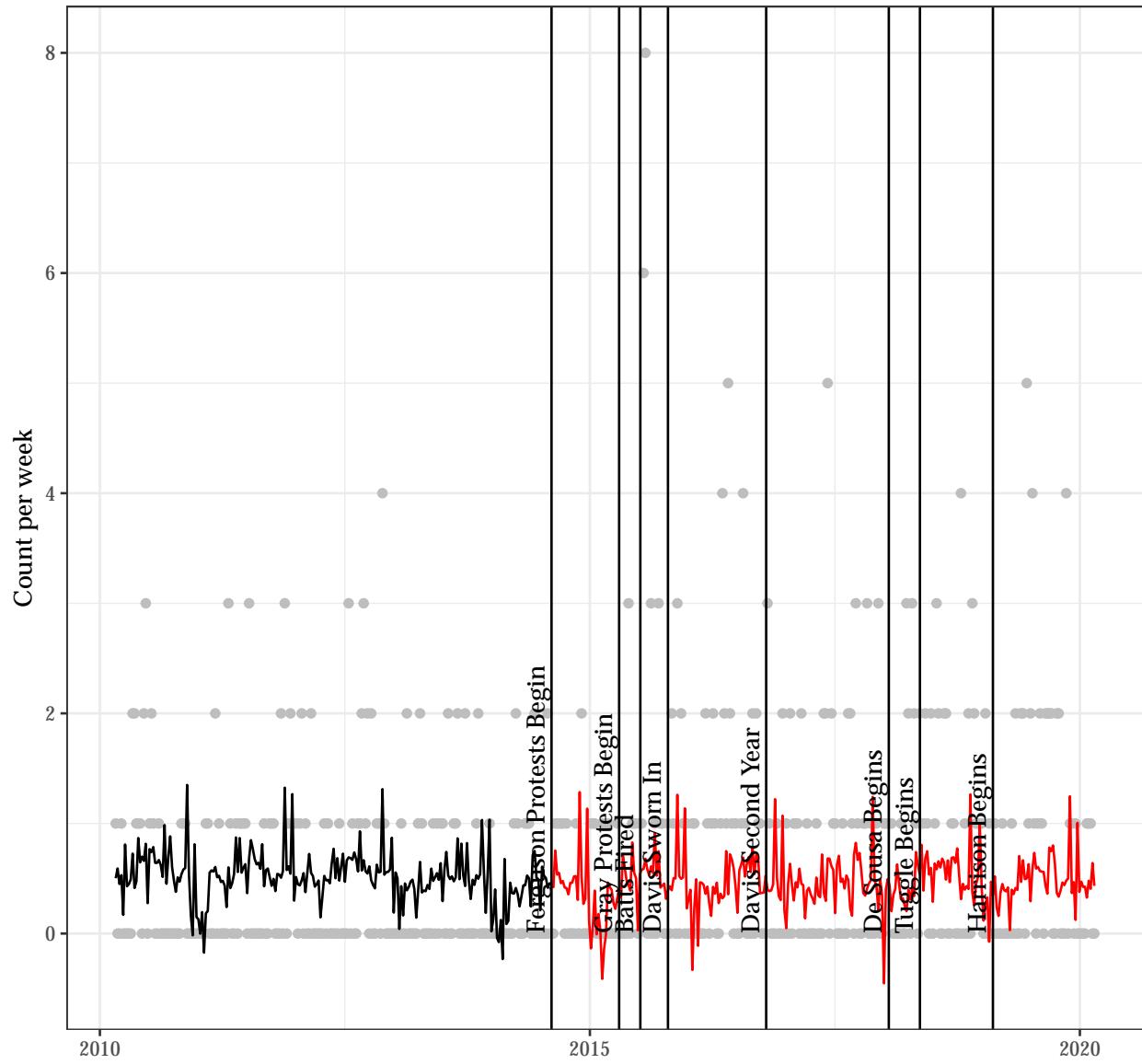
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.northern	290	0.862	1.162	0	0	1	1	8

## 37.2 Four Models for shooting.northern

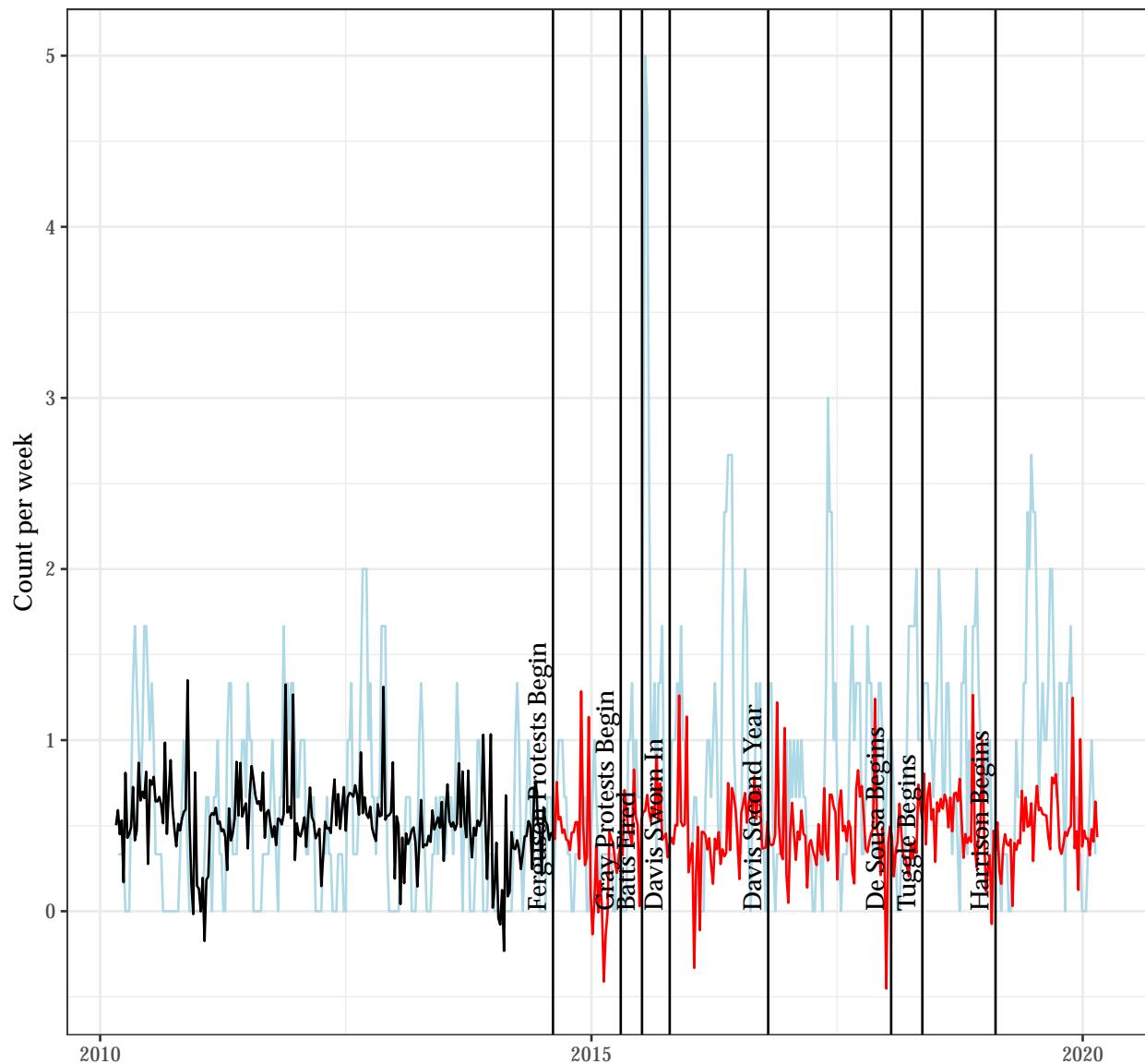
Table 37.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.0003		-0.0004
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.02		0.06	0.05
After Gray Protests Begin (week of 4/20/15 onward)	0.23		0.08	-0.02
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.64		-0.47	-0.43
After Batts Fired (week of 7/13/15 onward)	1.09		1.01	1.10
After Davis Confirmed (week of 10/19/15 onward)	-0.75		-0.67	-0.65
After Davis First Year (week of 10/17/16 onward)	-0.11		-0.13	-0.09
After De Sousa Begins (week of 1/19/18 onward)	0.10		0.14	0.11
After Tuggle Begins (week of 5/14/18 onward)	0.17		0.02	0.06
After Harrison Begins (week of 2/11/19 onward)	-0.13		-0.11	-0.09
Average Maximum Temperature to 50 Degrees		0.04		0.005
Plus Degrees in the 50s		-0.04		0.003
Plus Degrees in the 60s		-0.01		-0.02
Plus Degrees in the 70s		0.05		0.05
Plus Degrees Greater Than 80		-0.02		-0.01
Snowfall (inches)		-0.09		-0.08
Precipitation (inches)		0.09		0.10
Darkness Before Midnight (hours)		0.03		-0.05
Thanksgiving/Christmas (proportion of week)		5.57		2.91
Winter Holiday (proportion of week)		1.26		0.01
Other Out-of-School Days (proportion of week)		-0.28		-0.37
Summer Vacation (proportion of week)		-0.28		-0.21
Summer Holiday (proportion of week)		-2.41		-0.69
Observations	522	232	522	522
R <sup>2</sup>	0.06	0.08	0.06	0.09

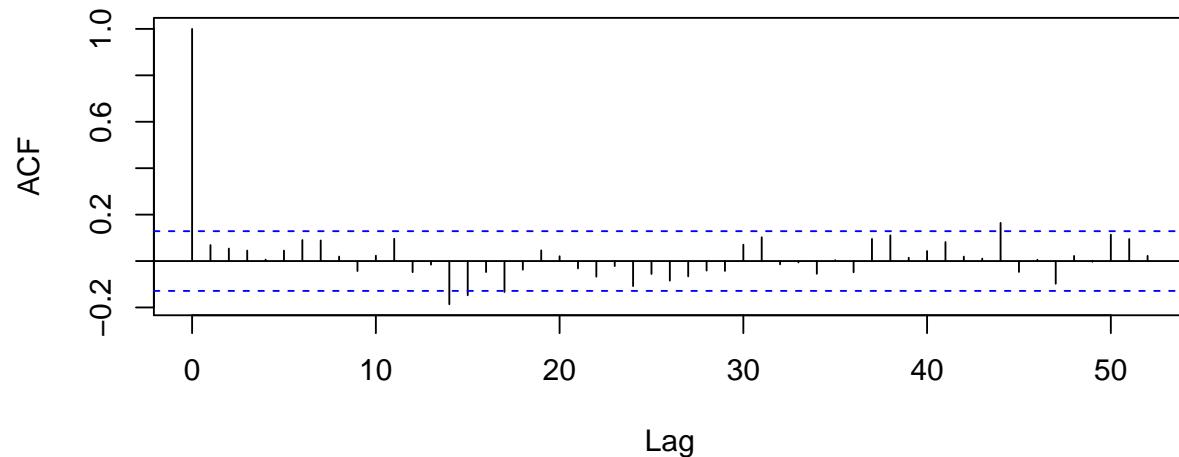
### 37.3 Least Squares Updated Model (2) for shooting.northern shooting.northern



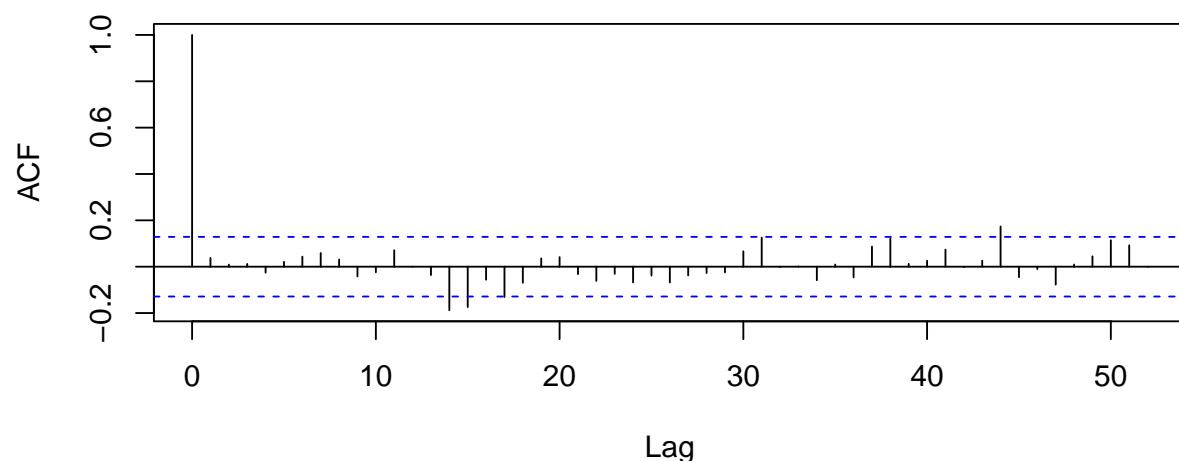
## shooting.northern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 37.4 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  
-1.8404 -1.0214 -0.8254  0.5640  2.2674  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -5.6489738  2.7289432 -2.070  0.0385 *  
t            -0.0005093  0.0014484 -0.352  0.7251  
tmax.f.spline1  0.1024031  0.0534158  1.917  0.0552 .  
tmax.f.spline2 -0.1315767  0.0882596 -1.491  0.1360  
tmax.f.spline3  0.0144152  0.0930369  0.155  0.8769  
tmax.f.spline4  0.0810650  0.0875885  0.926  0.3547  
tmax.f.spline5 -0.0310468  0.0679327 -0.457  0.6477  
snow.in       -3.5244009  2.5297588 -1.393  0.1636  
precip.in      0.2103660  0.4955642  0.424  0.6712  
dark.before.12  0.0196297  0.1446024  0.136  0.8920  
thanks.xmas     7.9571419  3.1384522  2.535  0.0112 *  
summer.holiday -4.3484934  3.1656569 -1.374  0.1696  
winter.holiday  5.1595184  4.5545015  1.133  0.2573  
summer.vacation -0.4665262  0.3563374 -1.309  0.1905  
oth.ns        -0.5728365  0.6309722 -0.908  0.3640  
---  
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: 239.00 on 217 degrees of freedom  
AIC: 457.11  
  
Number of Fisher Scoring iterations: 6
```

## 38 Results for shooting.northeastern

### 38.1 Summary Values for shooting.northeastern

Table 38.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.northeastern	232	0.970	1.145	0	0	1	1	6

Table 38.2: Descriptives for Outcome After Ferguson Protests Begin

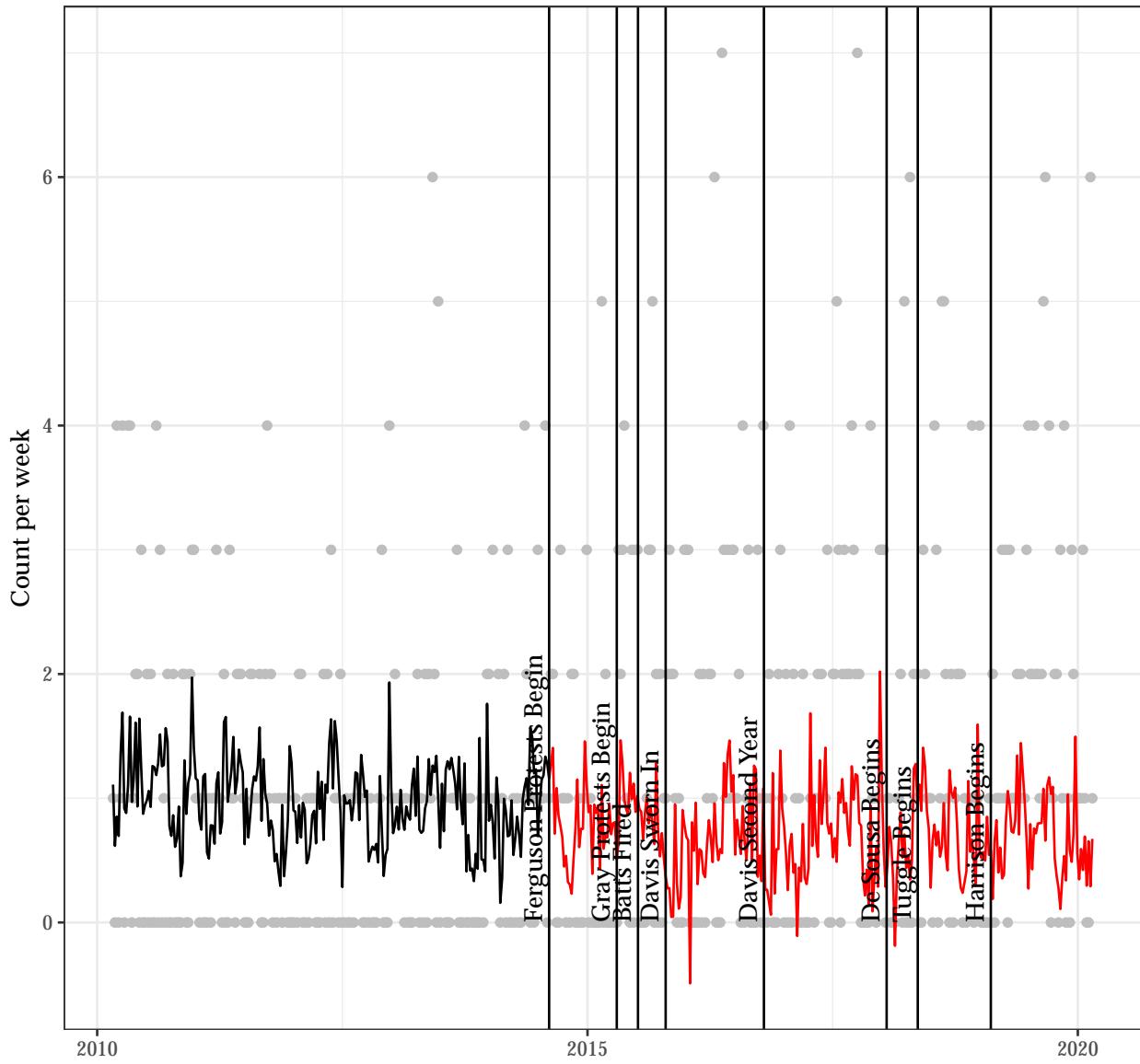
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.northeastern	290	1.414	1.498	0	0	1	2	7

## 38.2 Four Models for shooting.northeastern

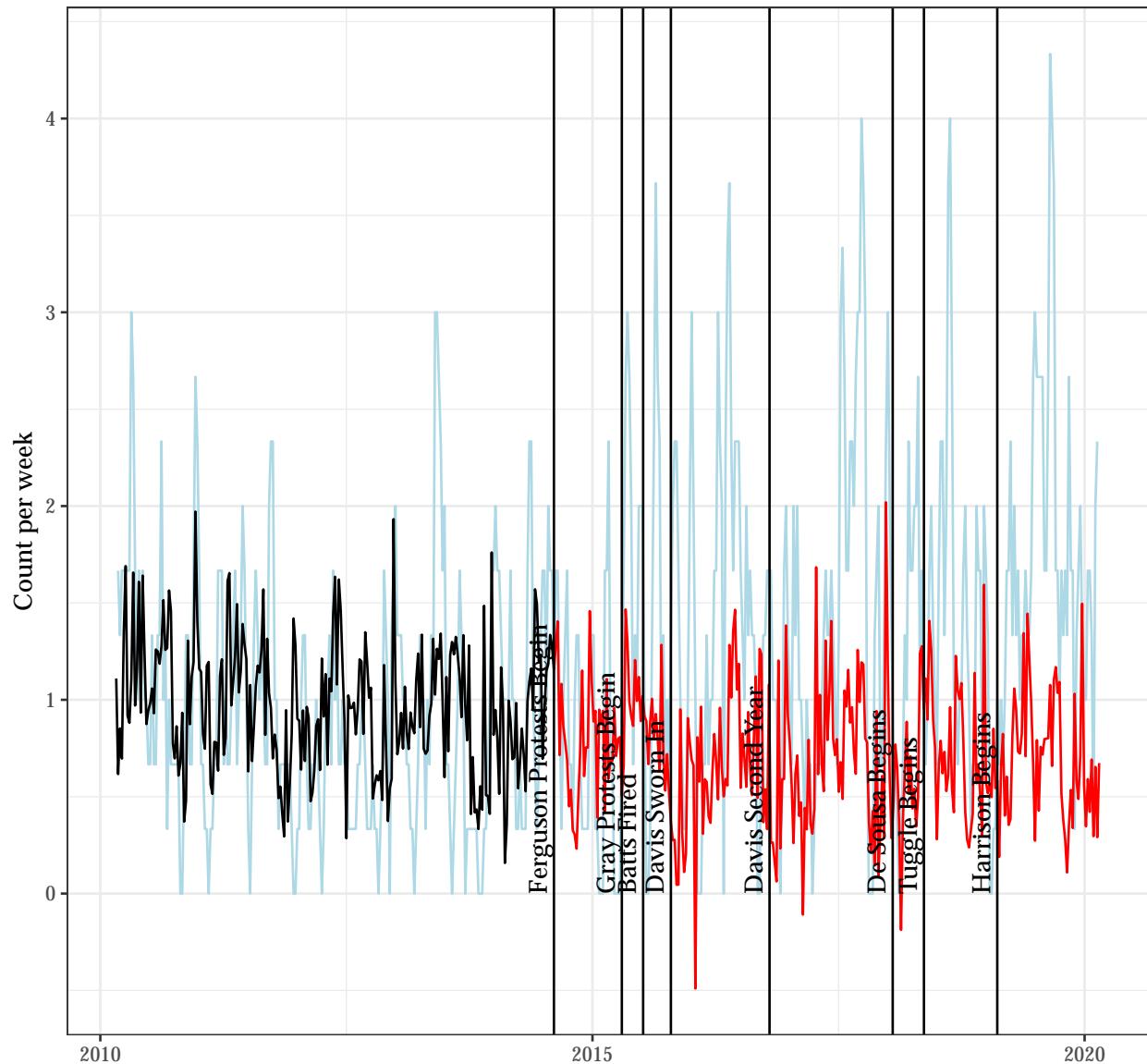
Table 38.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.001		-0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.09		0.01	0.03
After Gray Protests Begin (week of 4/20/15 onward)	1.03		0.79	0.70
Unrest and National Guard (4/27/15 - 5/3/2015)	1.18		1.54	1.65
After Batts Fired (week of 7/13/15 onward)	-0.60		-0.39	-0.51
After Davis Confirmed (week of 10/19/15 onward)	0.23		0.36	0.46
After Davis First Year (week of 10/17/16 onward)	0.06		-0.02	-0.01
After De Sousa Begins (week of 1/19/18 onward)	-0.18		-0.10	0.03
After Tuggle Begins (week of 5/14/18 onward)	0.15		-0.004	-0.08
After Harrison Begins (week of 2/11/19 onward)	0.41		0.42	0.46
Average Maximum Temperature to 50 Degrees		-0.02		-0.03
Plus Degrees in the 50s		-0.03		0.01
Plus Degrees in the 60s		0.07		0.02
Plus Degrees in the 70s		0.06		0.08
Plus Degrees Greater Than 80		-0.13		-0.13
Snowfall (inches)		-0.35		-0.59
Precipitation (inches)		-0.20		-0.26
Darkness Before Midnight (hours)		-0.13		-0.05
Thanksgiving/Christmas (proportion of week)		4.20		1.30
Winter Holiday (proportion of week)		-2.26		-0.89
Other Out-of-School Days (proportion of week)		0.49		0.60
Summer Vacation (proportion of week)		-0.20		0.16
Summer Holiday (proportion of week)		-2.69		-2.14
Observations	522	232	522	522
R <sup>2</sup>	0.05	0.09	0.09	0.12

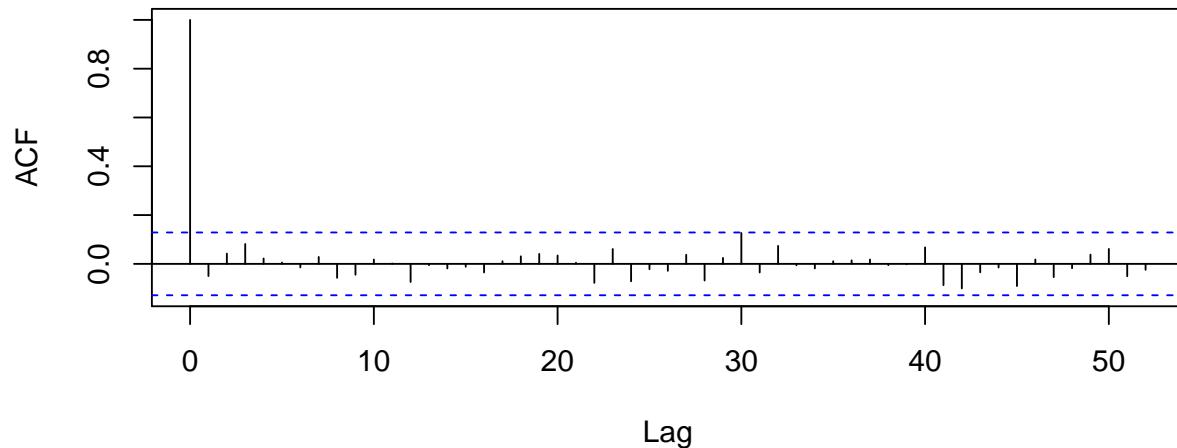
### 38.3 Least Squares Updated Model (2) for shooting.northeastern shooting.northeastern



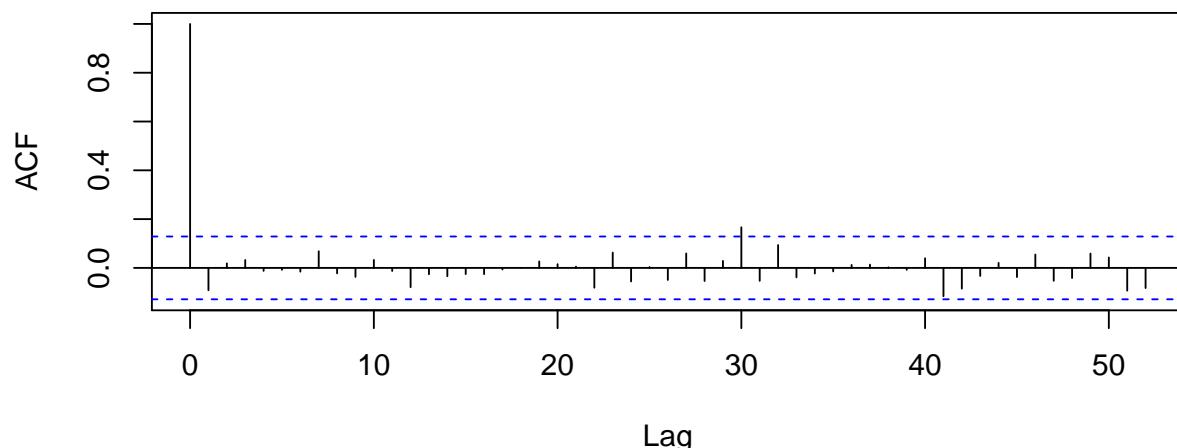
## shooting.northeastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 38.4 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  
-1.8935 -1.2511 -0.1644  0.5638  3.0357  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.213150  1.463644  1.512   0.1305  
t            -0.001122  0.001019 -1.101   0.2708  
tmax.f.spline1 -0.024801  0.025991 -0.954   0.3400  
tmax.f.spline2 -0.043188  0.057494 -0.751   0.4526  
tmax.f.spline3  0.102209  0.076262  1.340   0.1802  
tmax.f.spline4  0.033841  0.066676  0.508   0.6118  
tmax.f.spline5 -0.118528  0.050418 -2.351   0.0187 *  
snow.in       -0.474481  0.434964 -1.091   0.2753  
precip.in      -0.188109  0.399476 -0.471   0.6377  
dark.before.12 -0.153523  0.109019 -1.408   0.1591  
thanks.xmas     3.707487  2.561488  1.447   0.1478  
summer.holiday -2.564748  2.259240 -1.135   0.2563  
winter.holiday -2.667381  3.381315 -0.789   0.4302  
summer.vacation -0.170952  0.256155 -0.667   0.5045  
oth.ns         0.449911  0.333892  1.347   0.1778  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 321.79 on 231 degrees of freedom  
Residual deviance: 294.57 on 217 degrees of freedom  
AIC: 635.25  
  
Number of Fisher Scoring iterations: 5
```

## 39 Results for shooting.western

### 39.1 Summary Values for shooting.western

Table 39.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.western	232	1.241	1.378	0	0	1	2	7

Table 39.2: Descriptives for Outcome After Ferguson Protests Begin

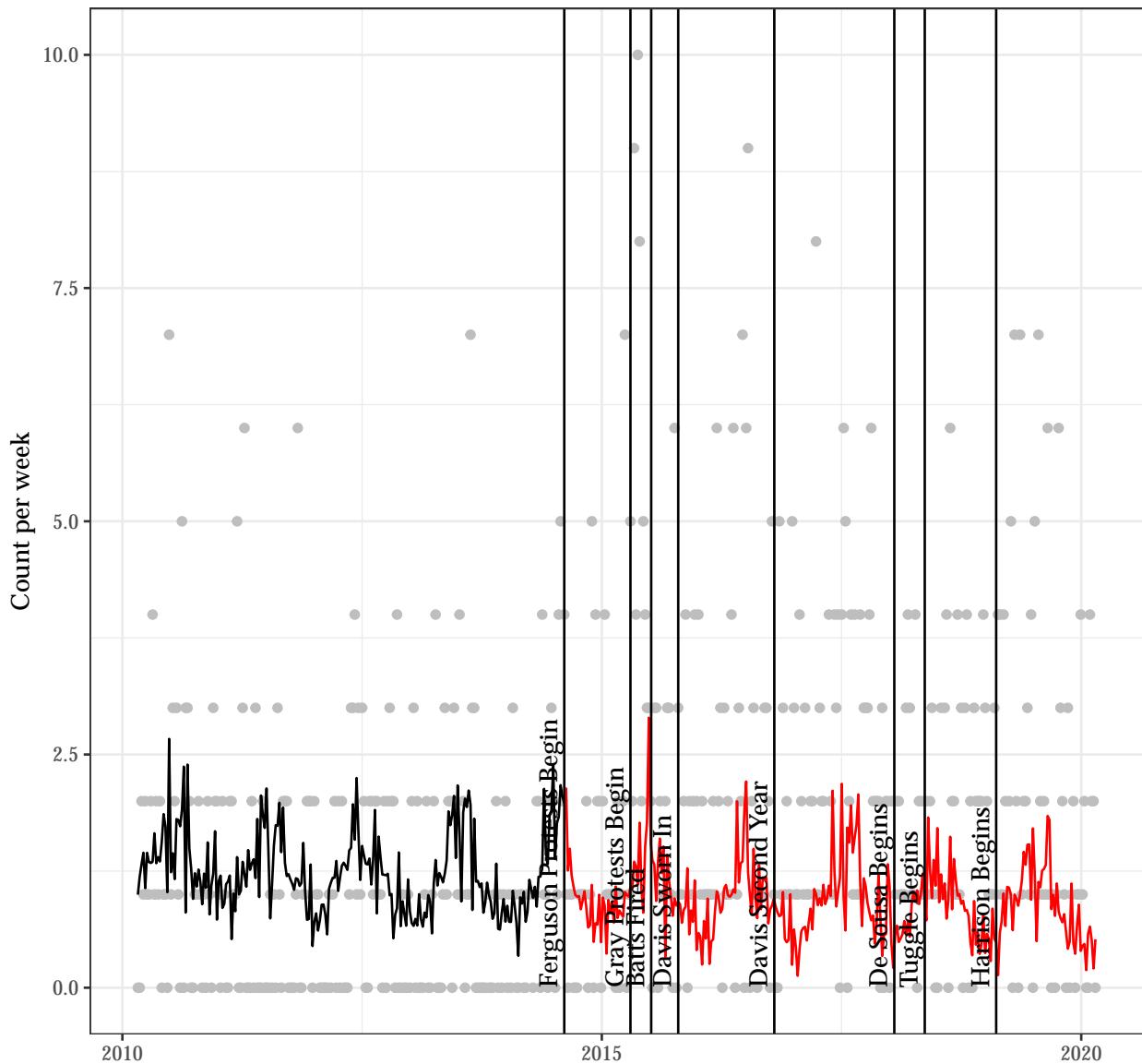
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.western	290	2.134	1.864	0	1	2	3	10

## 39.2 Four Models for shooting.western

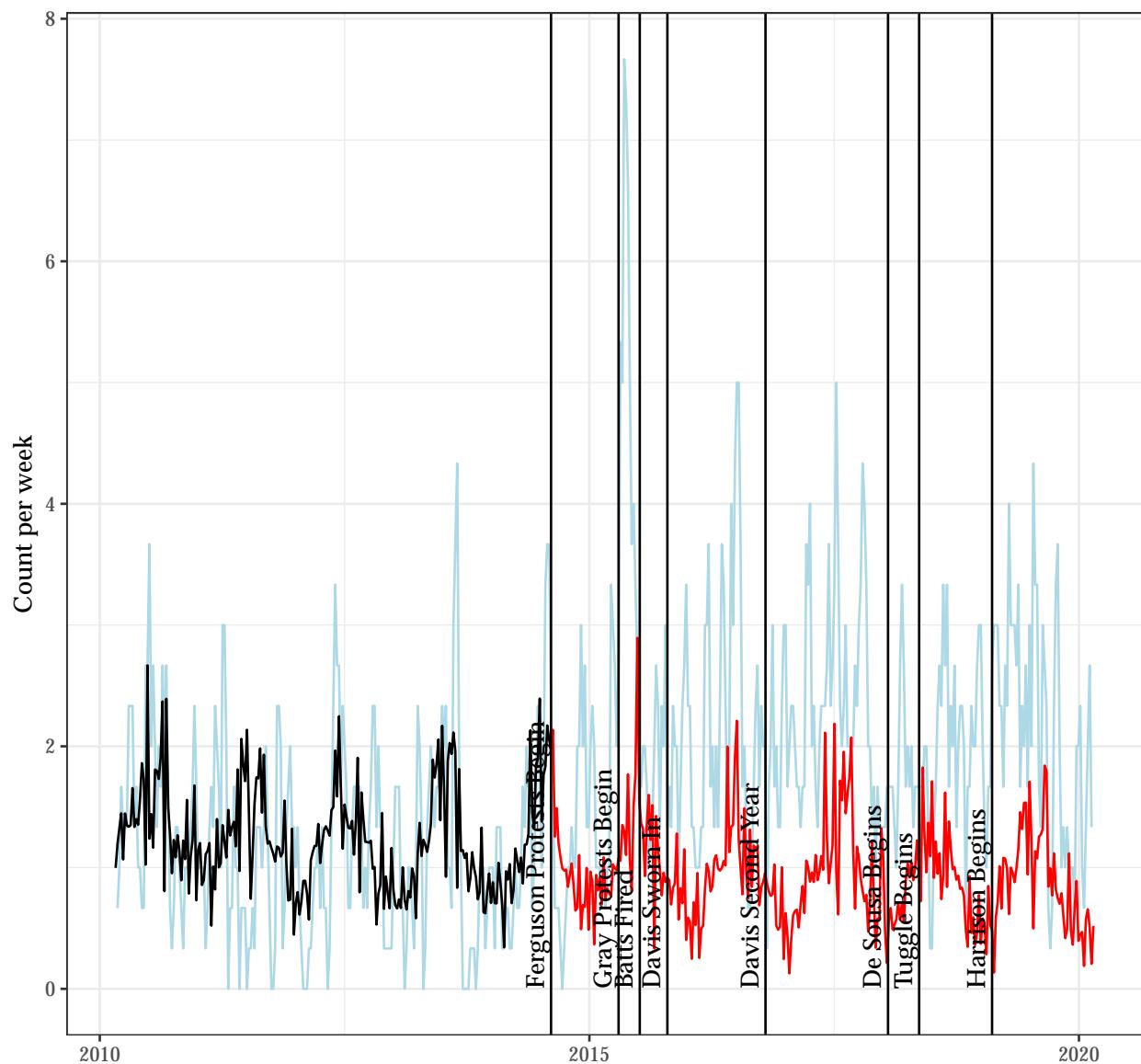
Table 39.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.001	-0.001	-0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.28		0.46	0.45
After Gray Protests Begin (week of 4/20/15 onward)	3.60		3.06	3.15
Unrest and National Guard (4/27/15 - 5/3/2015)	-3.00		-2.58	-2.81
After Batts Fired (week of 7/13/15 onward)	-3.20		-2.87	-2.95
After Davis Confirmed (week of 10/19/15 onward)	0.45		0.59	0.54
After Davis First Year (week of 10/17/16 onward)	0.09		0.08	0.14
After De Sousa Begins (week of 1/19/18 onward)	-0.41		-0.29	-0.40
After Tuggle Begins (week of 5/14/18 onward)	0.18		0.05	0.23
After Harrison Begins (week of 2/11/19 onward)	0.17		0.15	0.16
Average Maximum Temperature to 50 Degrees		-0.03		0.002
Plus Degrees in the 50s		0.07		0.02
Plus Degrees in the 60s		-0.07		-0.05
Plus Degrees in the 70s		0.06		0.05
Plus Degrees Greater Than 80		-0.14		-0.09
Snowfall (inches)		-0.12		0.18
Precipitation (inches)		-0.31		-0.32
Darkness Before Midnight (hours)		-0.10		-0.18
Thanksgiving/Christmas (proportion of week)		4.45		4.37
Winter Holiday (proportion of week)		-2.30		-2.49
Other Out-of-School Days (proportion of week)		-0.24		0.07
Summer Vacation (proportion of week)		0.72		0.36
Summer Holiday (proportion of week)		5.46		0.70
Observations	522	232	522	522
R <sup>2</sup>	0.14	0.10	0.17	0.17

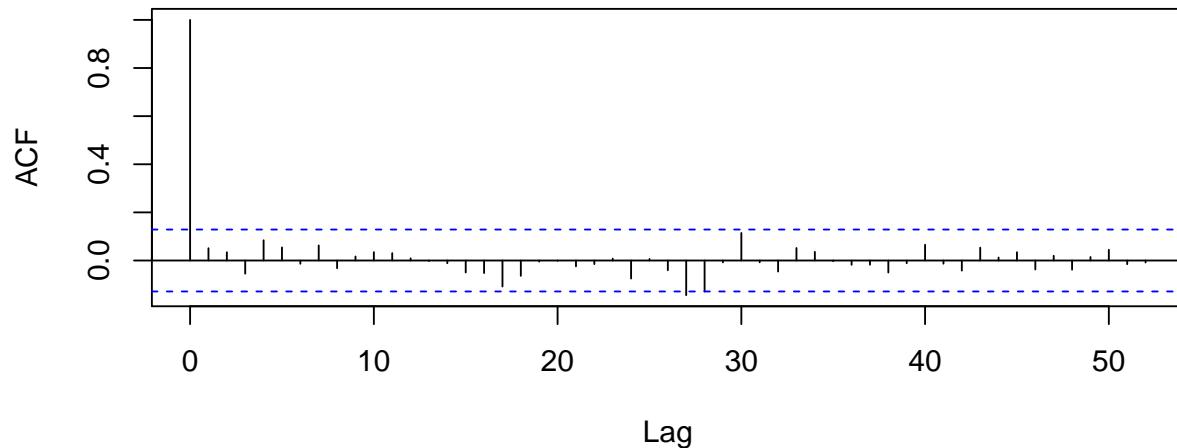
### 39.3 Least Squares Updated Model (2) for shooting.western shooting.western



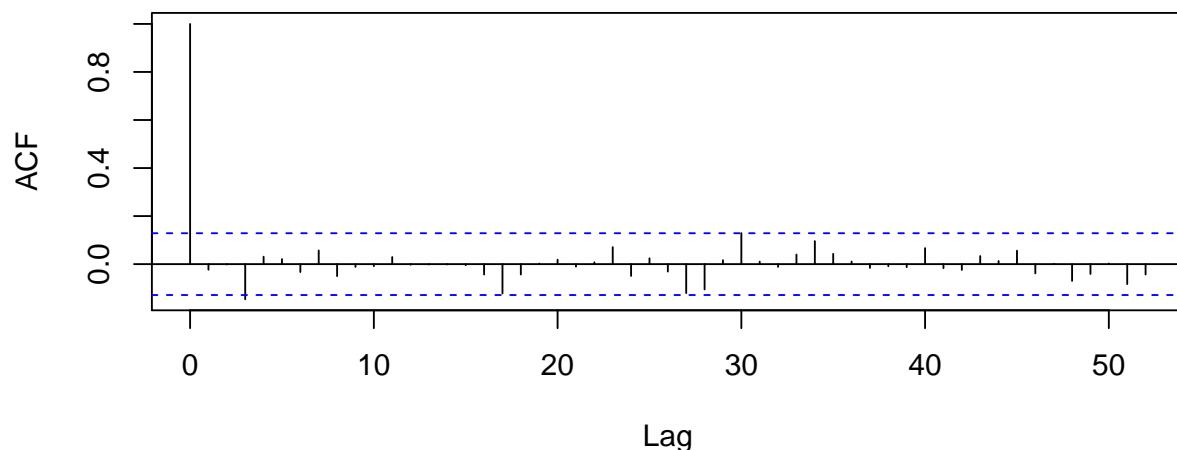
## shooting.western



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



### 39.4 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  
-2.2692 -1.3929 -0.1764  0.6116  3.2080  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 2.0171036 1.4021454 1.439 0.1503  
t            -0.0009320 0.0008903 -1.047 0.2952  
tmax.f.spline1 -0.0324167 0.0263219 -1.232 0.2181  
tmax.f.spline2  0.0789554 0.0534275 1.478 0.1395  
tmax.f.spline3 -0.0669558 0.0602934 -1.110 0.2668  
tmax.f.spline4  0.0482582 0.0557249 0.866 0.3865  
tmax.f.spline5 -0.0949629 0.0433294 -2.192 0.0284 *  
snow.in       -0.1622779 0.3615049 -0.449 0.6535  
precip.in      -0.2211046 0.3318957 -0.666 0.5053  
dark.before.12 -0.0906908 0.0960130 -0.945 0.3449  
thanks.xmas    3.9541663 2.5390939 1.557 0.1194  
summer.holiday 3.2691996 1.5943562 2.050 0.0403 *  
winter.holiday -2.8798105 3.3747082 -0.853 0.3935  
summer.vacation 0.4377156 0.2273130 1.926 0.0542 .  
oth.ns        -0.2227476 0.3848126 -0.579 0.5627  
---  
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 369.32 on 231 degrees of freedom  
Residual deviance: 336.36 on 217 degrees of freedom  
AIC: 723.11  
  
Number of Fisher Scoring iterations: 5
```

## 40 Results for shooting.central

### 40.1 Summary Values for shooting.central

Table 40.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.central	232	0.552	0.910	0	0	0	1	5

Table 40.2: Descriptives for Outcome After Ferguson Protests Begin

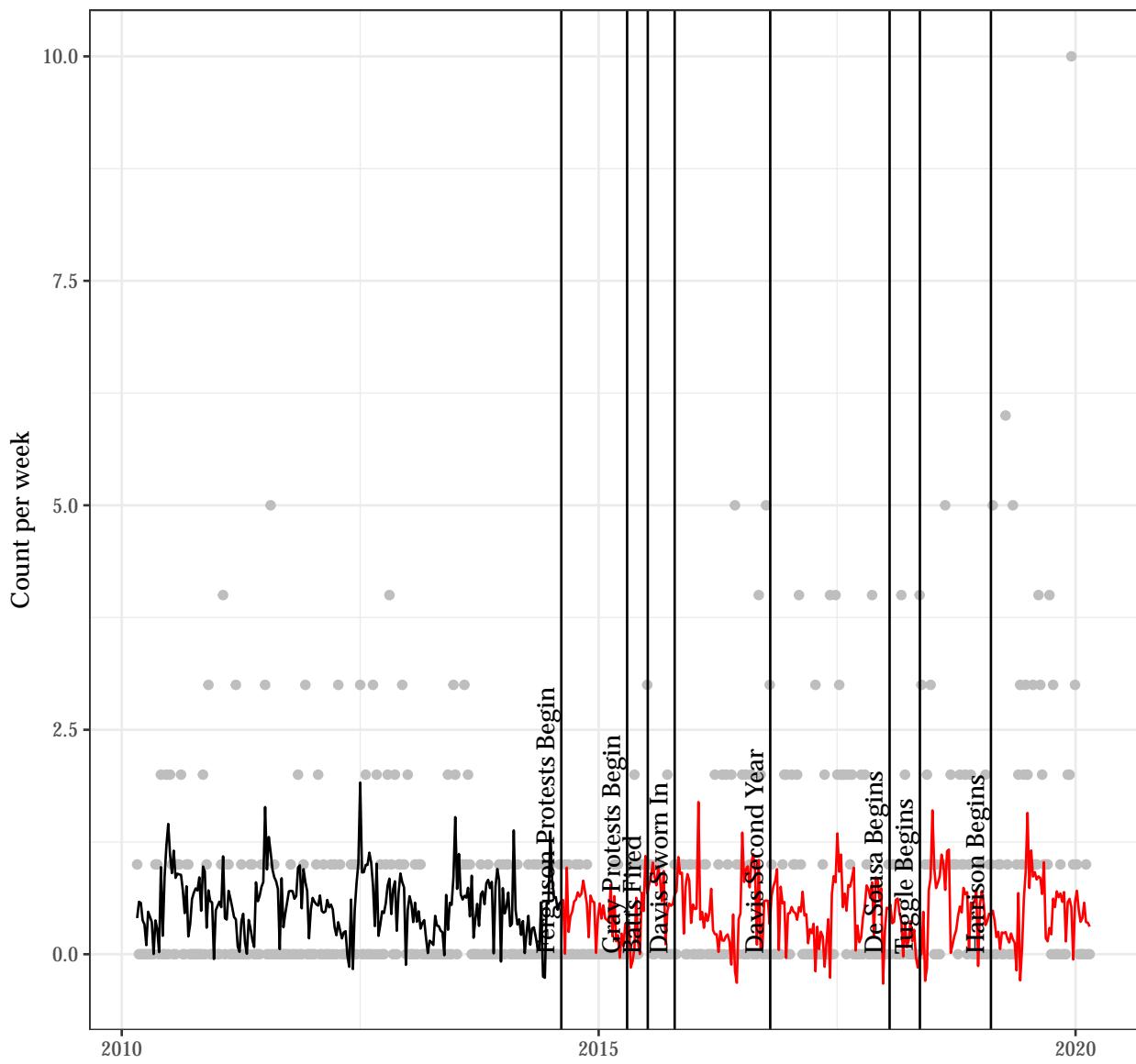
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.central	290	0.914	1.309	0	0	0	1	10

## 40.2 Four Models for shooting.central

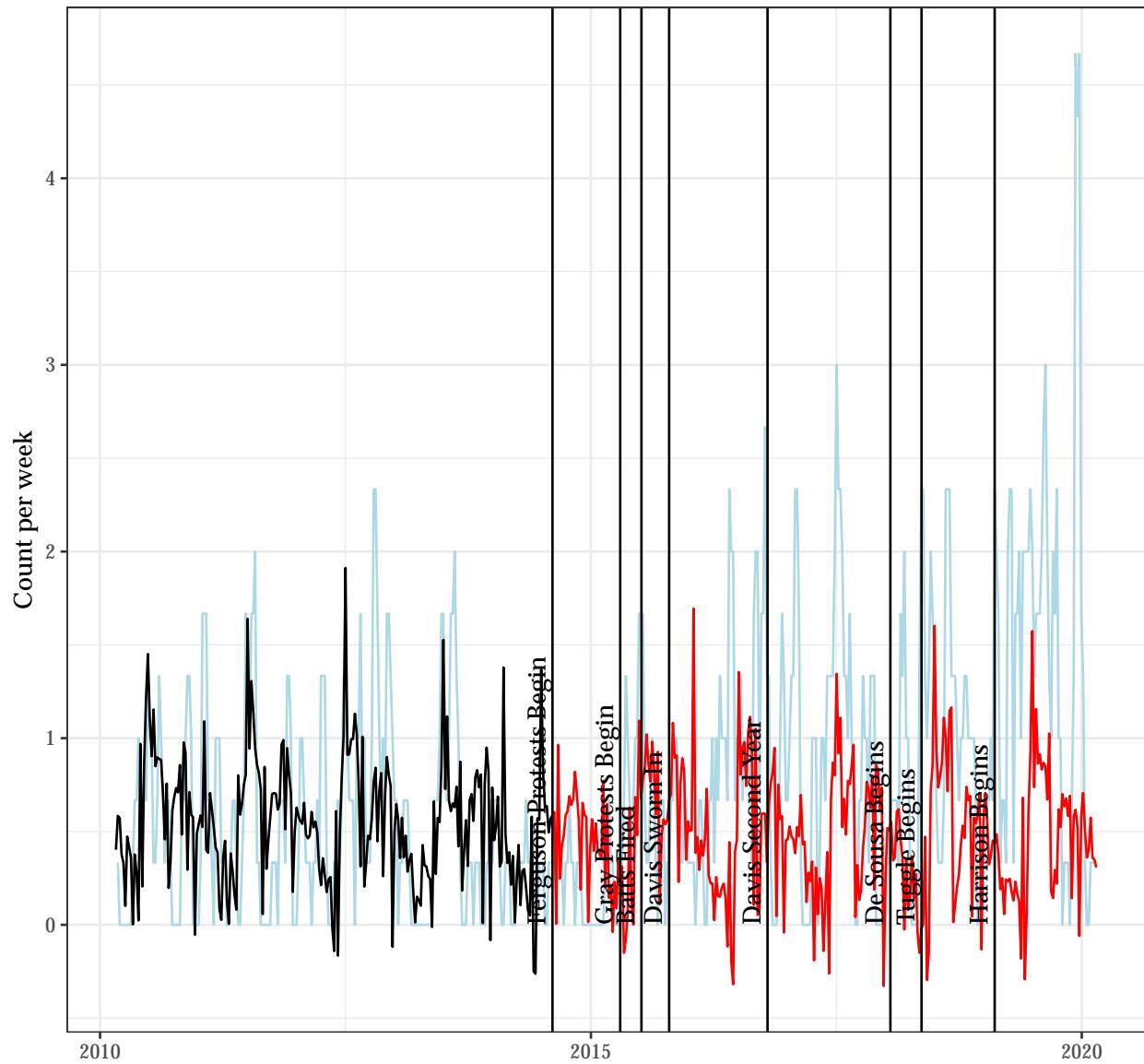
Table 40.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.001	-0.0004		-0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.25		-0.26	-0.16
After Gray Protests Begin (week of 4/20/15 onward)	0.83		0.91	0.69
Unrest and National Guard (4/27/15 - 5/3/2015)	-1.00		-0.97	-0.83
After Batts Fired (week of 7/13/15 onward)	-0.49		-0.86	-0.72
After Davis Confirmed (week of 10/19/15 onward)	0.41		0.57	0.67
After Davis First Year (week of 10/17/16 onward)	0.07		0.06	0.06
After De Sousa Begins (week of 1/19/18 onward)	-0.25		-0.08	-0.04
After Tuggle Begins (week of 5/14/18 onward)	0.50		0.22	0.22
After Harrison Begins (week of 2/11/19 onward)	0.41		0.44	0.46
Average Maximum Temperature to 50 Degrees		0.01		0.01
Plus Degrees in the 50s		0.02		-0.02
Plus Degrees in the 60s		-0.01		0.05
Plus Degrees in the 70s		-0.07		-0.04
Plus Degrees Greater Than 80		0.10		0.01
Snowfall (inches)		0.43		0.20
Precipitation (inches)		-0.01		-0.31
Darkness Before Midnight (hours)		0.25		0.12
Thanksgiving/Christmas (proportion of week)		-3.72		-2.43
Winter Holiday (proportion of week)		-0.15		0.28
Other Out-of-School Days (proportion of week)		-0.19		-0.04
Summer Vacation (proportion of week)		0.71		0.30
Summer Holiday (proportion of week)		4.66		0.65
Observations	522	232	522	522
R <sup>2</sup>	0.08	0.14	0.09	0.13

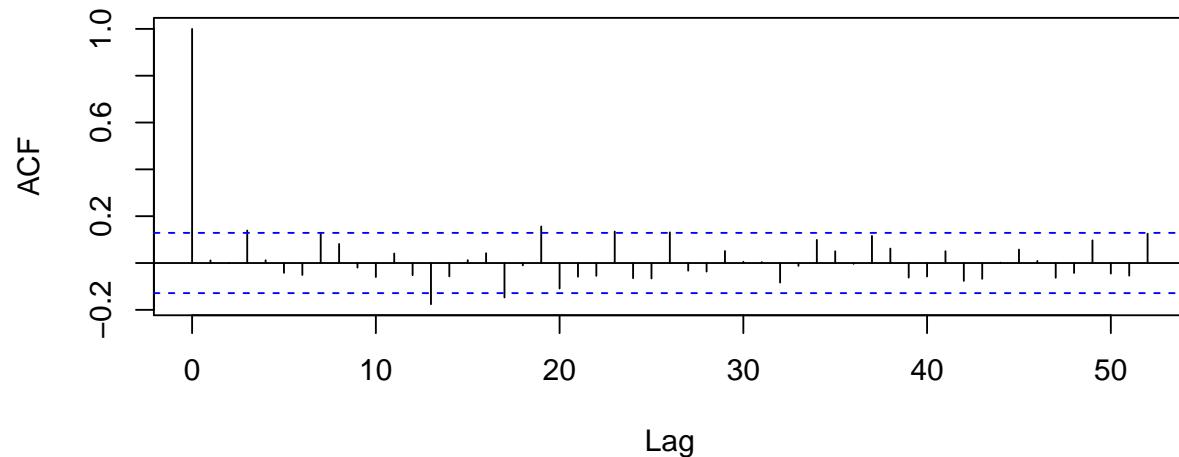
### 40.3 Least Squares Updated Model (2) for shooting.central shooting.central



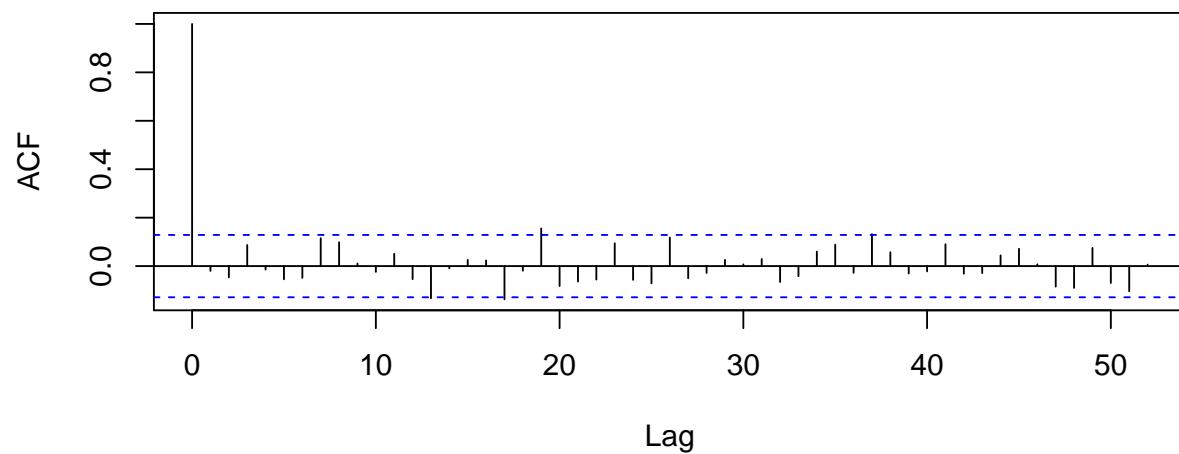
## shooting.central



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



#### 40.4 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  
-1.8815 -1.0156 -0.6876  0.5029  2.9001  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -5.397e+00  2.119e+00 -2.547 0.010869 *  
t             -9.913e-04  1.421e-03 -0.698 0.485264  
tmax.f.spline1 2.409e-02  3.818e-02  0.631 0.528043  
tmax.f.spline2 2.710e-02  7.478e-02  0.362 0.717078  
tmax.f.spline3 8.673e-03  9.041e-02  0.096 0.923575  
tmax.f.spline4 -1.533e-01  9.160e-02 -1.673 0.094311 .  
tmax.f.spline5 1.569e-01  6.814e-02  2.303 0.021290 *  
snow.in        6.423e-01  3.417e-01  1.880 0.060102 .  
precip.in       4.672e-02  4.988e-01  0.094 0.925389  
dark.before.12 5.479e-01  1.563e-01  3.505 0.000457 ***  
thanks.xmas    -1.170e+01  7.254e+00 -1.613 0.106853  
summer.holiday 6.537e+00  2.249e+00  2.907 0.003647 **  
winter.holiday 5.553e-01  3.882e+00  0.143 0.886248  
summer.vacation 1.434e+00  4.290e-01  3.343 0.000828 ***  
oth.ns         -6.170e-01  7.313e-01 -0.844 0.398883  
---  
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: 249.78 on 217 degrees of freedom  
AIC: 468.91  
  
Number of Fisher Scoring iterations: 6
```

## 41 Results for shooting.eastern

### 41.1 Summary Values for shooting.eastern

Table 41.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.eastern	232	1.181	1.393	0	0	1	2	8

Table 41.2: Descriptives for Outcome After Ferguson Protests Begin

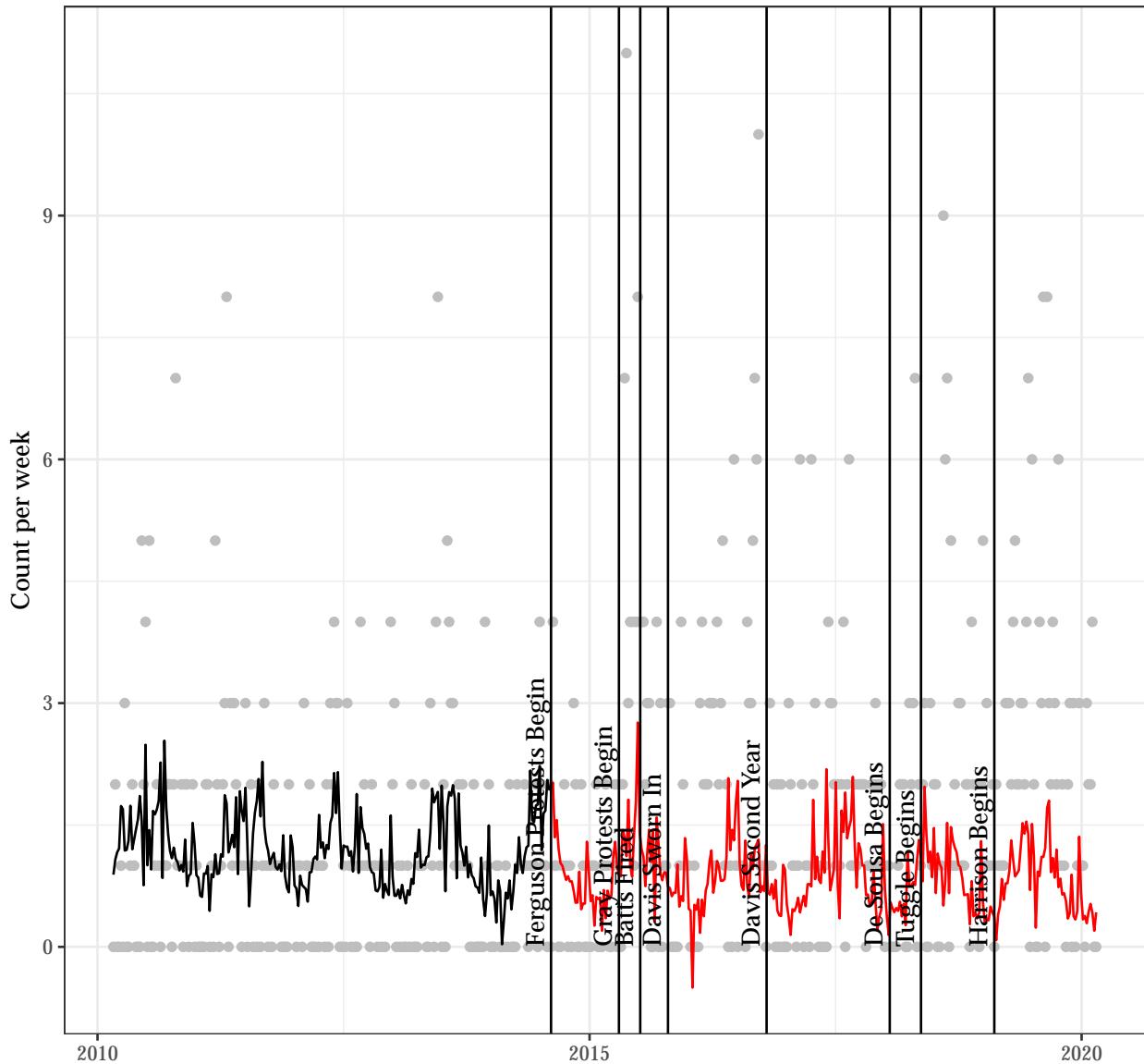
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.eastern	290	1.914	1.934	0	0.2	1.5	3	11

## 41.2 Four Models for shooting.eastern

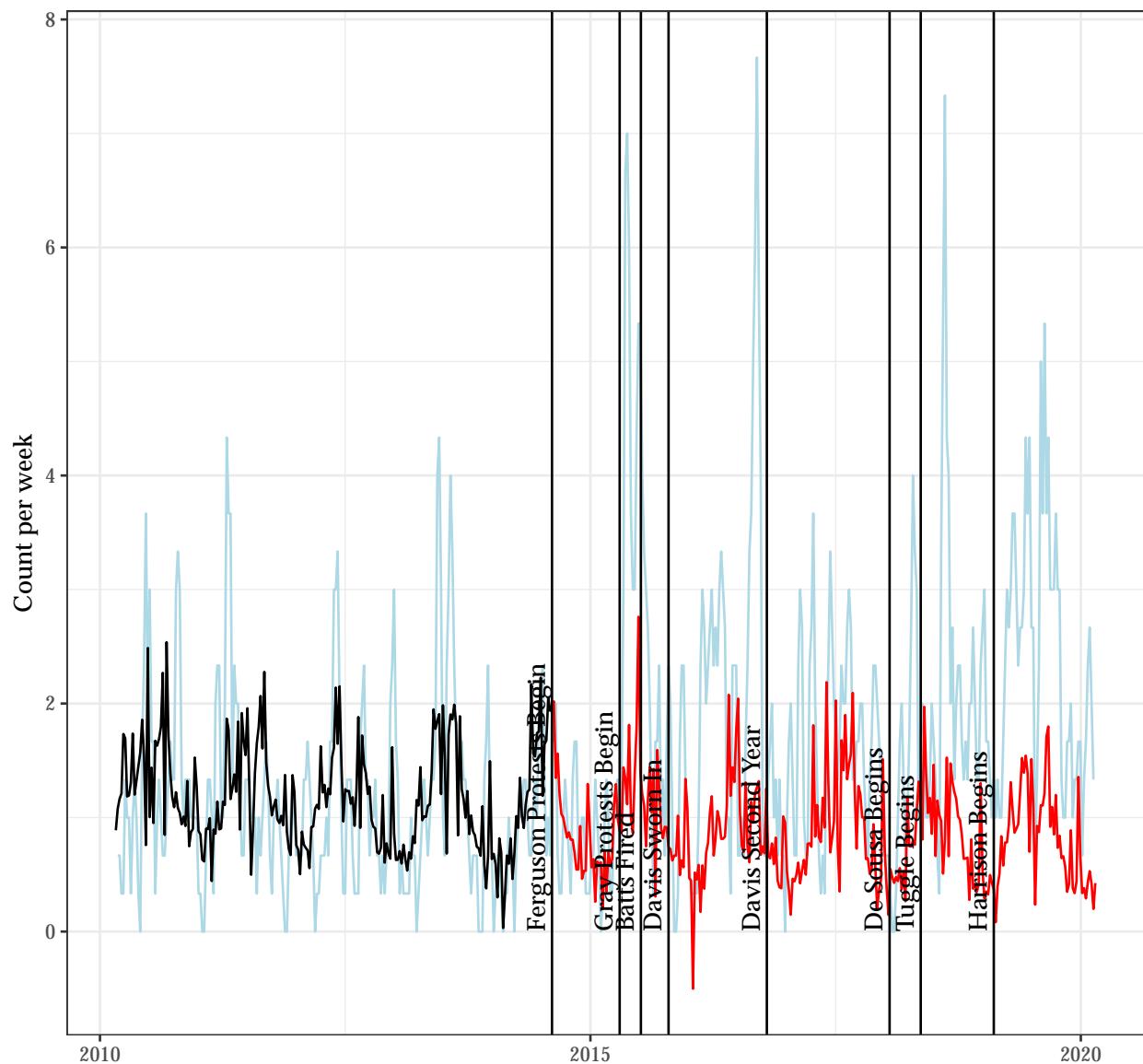
Table 41.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.0005	-0.001		-0.0004
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.26		0.01	-0.02
After Gray Protests Begin (week of 4/20/15 onward)	3.70		3.10	3.03
Unrest and National Guard (4/27/15 - 5/3/2015)	-4.55		-3.98	-4.24
After Batts Fired (week of 7/13/15 onward)	-2.68		-2.31	-2.53
After Davis Confirmed (week of 10/19/15 onward)	0.25		0.43	0.54
After Davis First Year (week of 10/17/16 onward)	-0.51		-0.53	-0.53
After De Sousa Begins (week of 1/19/18 onward)	-0.04		0.14	0.22
After Tuggle Begins (week of 5/14/18 onward)	0.64		0.44	0.43
After Harrison Begins (week of 2/11/19 onward)	0.24		0.26	0.22
Average Maximum Temperature to 50 Degrees		-0.01		0.01
Plus Degrees in the 50s		0.04		0.02
Plus Degrees in the 60s		-0.03		0.01
Plus Degrees in the 70s		0.07		-0.01
Plus Degrees Greater Than 80		-0.18		-0.11
Snowfall (inches)		-0.27		-0.26
Precipitation (inches)		-0.04		-0.53
Darkness Before Midnight (hours)		-0.07		-0.01
Thanksgiving/Christmas (proportion of week)		2.78		0.30
Winter Holiday (proportion of week)		-1.60		1.88
Other Out-of-School Days (proportion of week)		0.56		0.16
Summer Vacation (proportion of week)		0.50		0.59
Summer Holiday (proportion of week)		5.47		4.13
Observations	522	232	522	522
R <sup>2</sup>	0.13	0.11	0.16	0.20

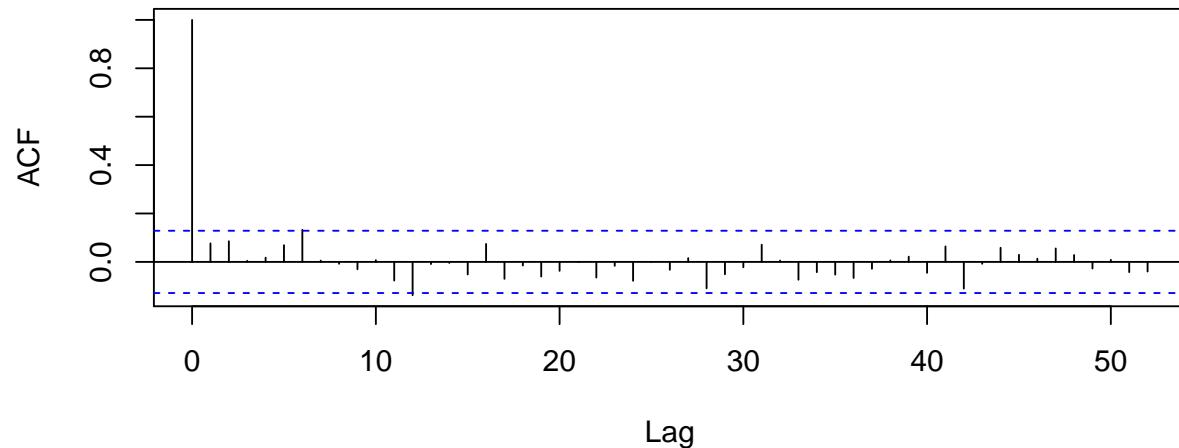
### 41.3 Least Squares Updated Model (2) for shooting.eastern shooting.eastern



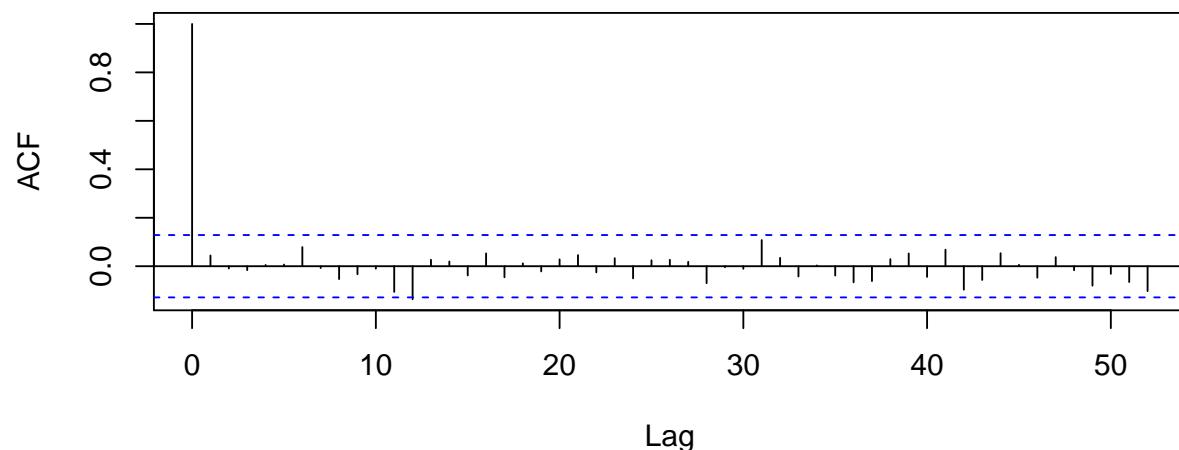
## shooting.eastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



#### 41.4 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  
-2.2252 -1.2776 -0.1787  0.5568  3.8119  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 1.0156294 1.5103611 0.672 0.50130  
t            -0.0010193 0.0009155 -1.113 0.26551  
tmax.f.spline1 -0.0157444 0.0285177 -0.552 0.58089  
tmax.f.spline2  0.0451073 0.0561689  0.803 0.42194  
tmax.f.spline3 -0.0351640 0.0634102 -0.555 0.57920  
tmax.f.spline4  0.0532595 0.0573122  0.929 0.35274  
tmax.f.spline5 -0.1255788 0.0443625 -2.831 0.00464 **  
snow.in       -0.5238751 0.5113442 -1.025 0.30560  
precip.in      -0.0318900 0.3233086 -0.099 0.92143  
dark.before.12 -0.0712548 0.0994127 -0.717 0.47352  
thanks.xmas     2.6643817 2.5576661  1.042 0.29754  
summer.holiday  3.3677391 1.6062731  2.097 0.03603 *  
winter.holiday -2.4937541 3.7641110 -0.663 0.50765  
summer.vacation 0.3175908 0.2277185  1.395 0.16312  
oth.ns         0.4890082 0.3158771  1.548 0.12160  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 362.71 on 231 degrees of freedom  
Residual deviance: 322.49 on 217 degrees of freedom  
AIC: 703.03  
  
Number of Fisher Scoring iterations: 7
```

## 42 Results for shooting.southwestern

### 42.1 Summary Values for shooting.southwestern

Table 42.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.southwestern	232	0.948	1.123	0	0	1	1	6

Table 42.2: Descriptives for Outcome After Ferguson Protests Begin

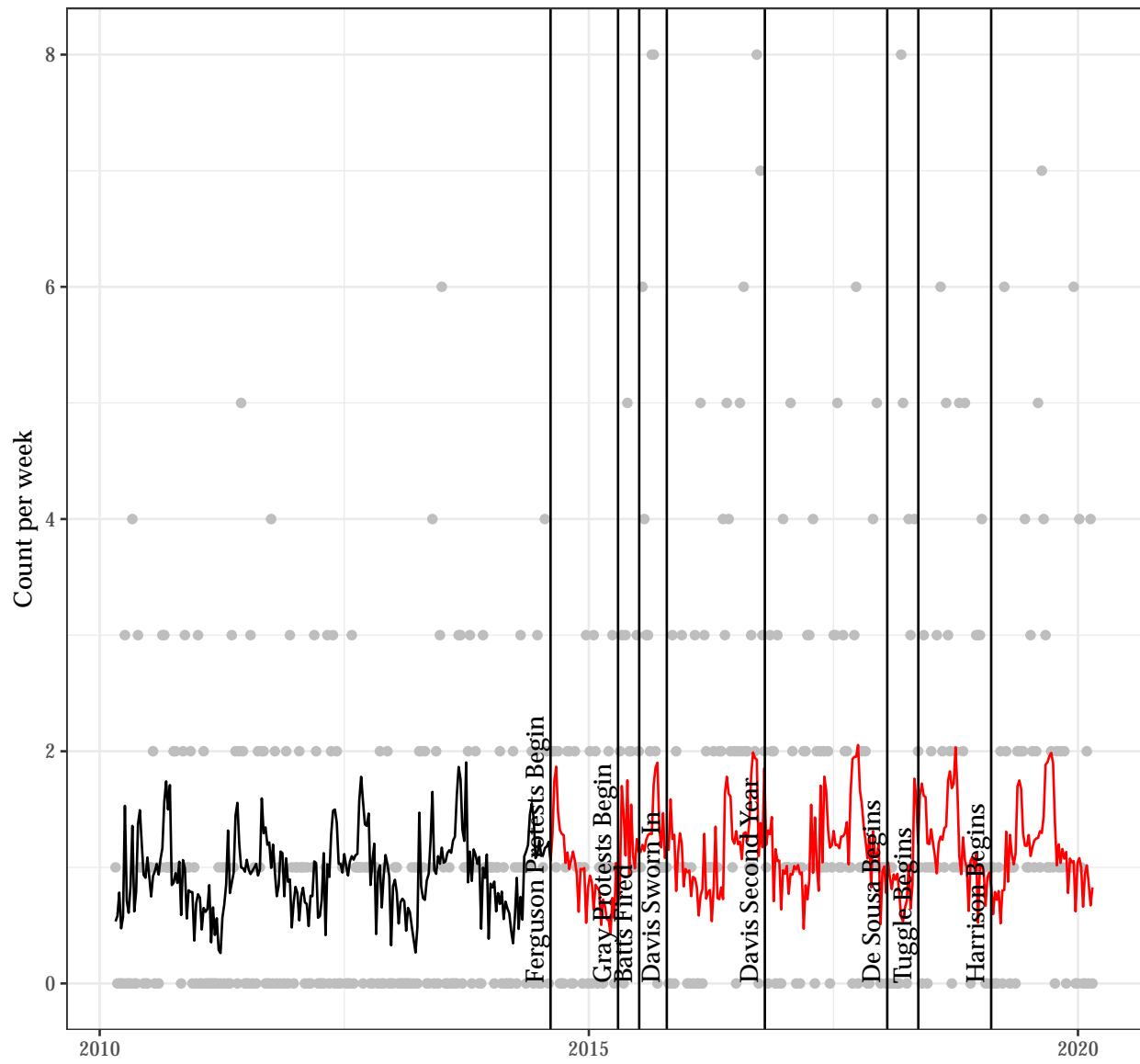
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.southwestern	290	1.752	1.680	0	1	1	2	8

## 42.2 Four Models for shooting.southwestern

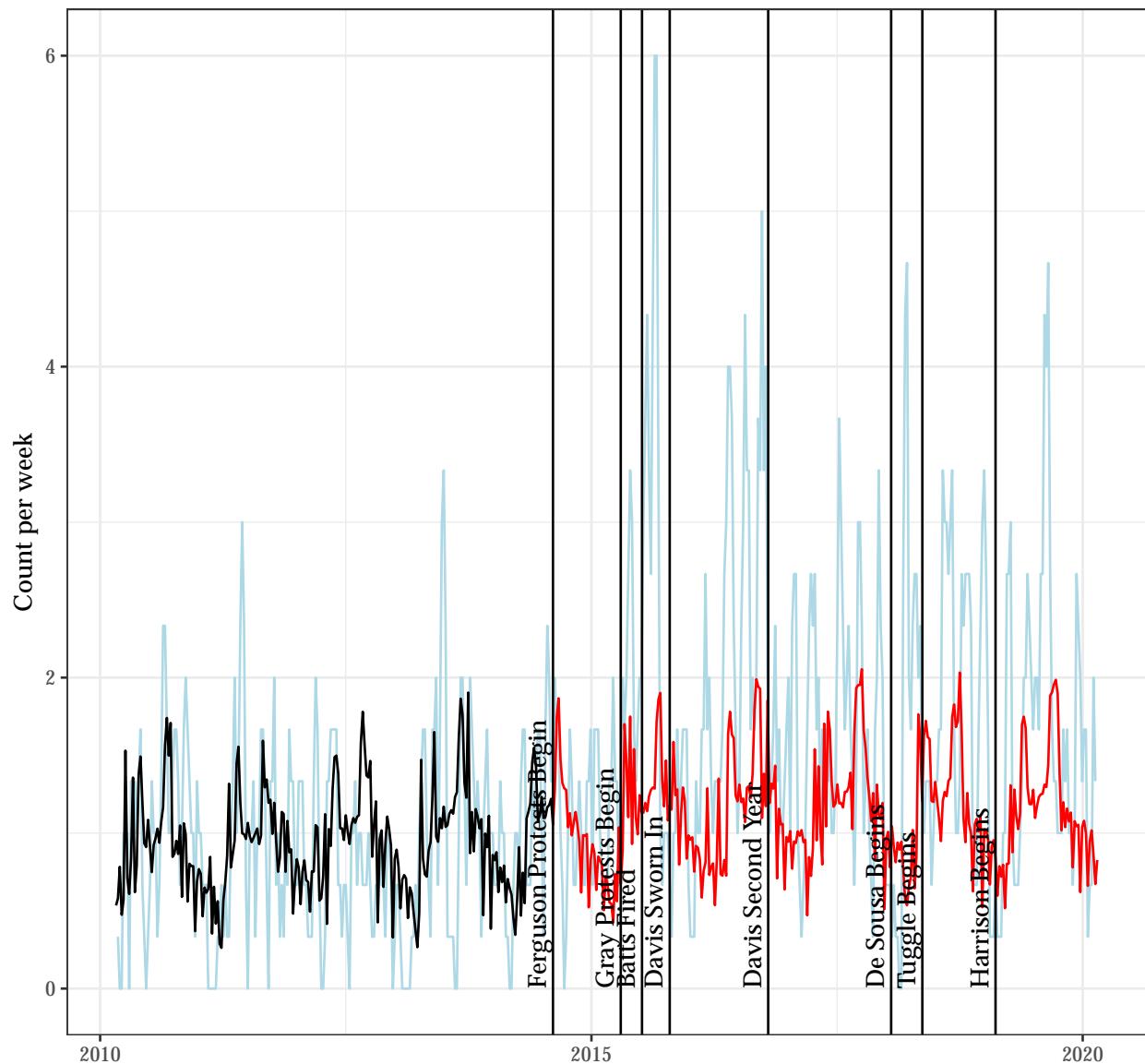
Table 42.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	0.001	0.001		0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	0.06		0.19	0.21
After Gray Protests Begin (week of 4/20/15 onward)	0.93		0.66	0.53
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.09		0.26	0.28
After Batts Fired (week of 7/13/15 onward)	0.83		0.71	0.70
After Davis Confirmed (week of 10/19/15 onward)	-0.98		-0.74	-0.71
After Davis First Year (week of 10/17/16 onward)	-0.40		-0.38	-0.38
After De Sousa Begins (week of 1/19/18 onward)	0.14		0.45	0.25
After Tuggle Begins (week of 5/14/18 onward)	-0.02		-0.31	-0.26
After Harrison Begins (week of 2/11/19 onward)	-0.23		-0.10	-0.18
Average Maximum Temperature to 50 Degrees		0.003		0.02
Plus Degrees in the 50s		0.02		-0.01
Plus Degrees in the 60s		0.01		-0.02
Plus Degrees in the 70s		0.04		0.07
Plus Degrees Greater Than 80		-0.08		-0.03
Snowfall (inches)		0.05		0.27
Precipitation (inches)		-0.29		-0.37
Darkness Before Midnight (hours)		0.21		0.05
Thanksgiving/Christmas (proportion of week)		-2.60		-1.41
Winter Holiday (proportion of week)		-1.57		-2.41
Other Out-of-School Days (proportion of week)		-0.14		-0.05
Summer Vacation (proportion of week)		-0.40		-0.18
Summer Holiday (proportion of week)		0.93		-0.30
Observations	522	232	522	522
R <sup>2</sup>	0.10	0.09	0.07	0.15

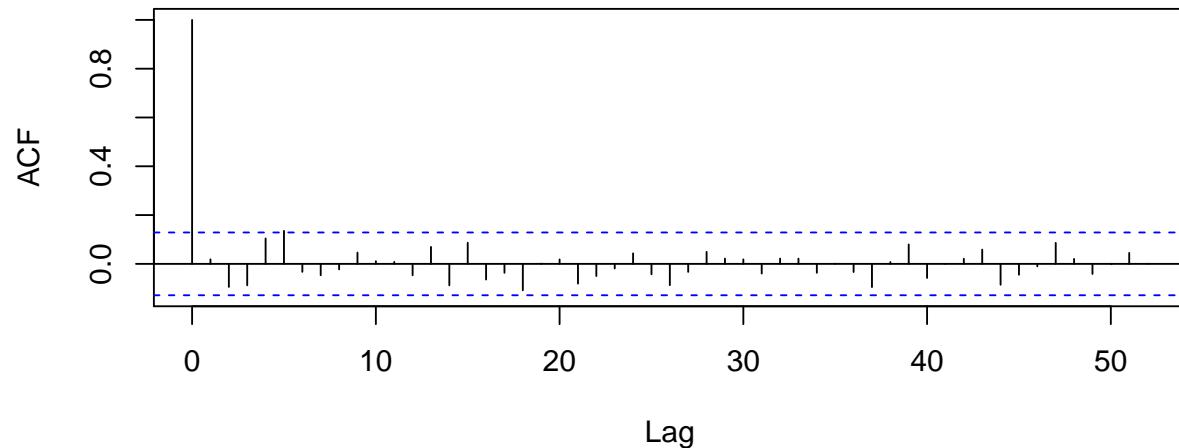
### 42.3 Least Squares Updated Model (2) for shooting.southwestern shooting.southwestern



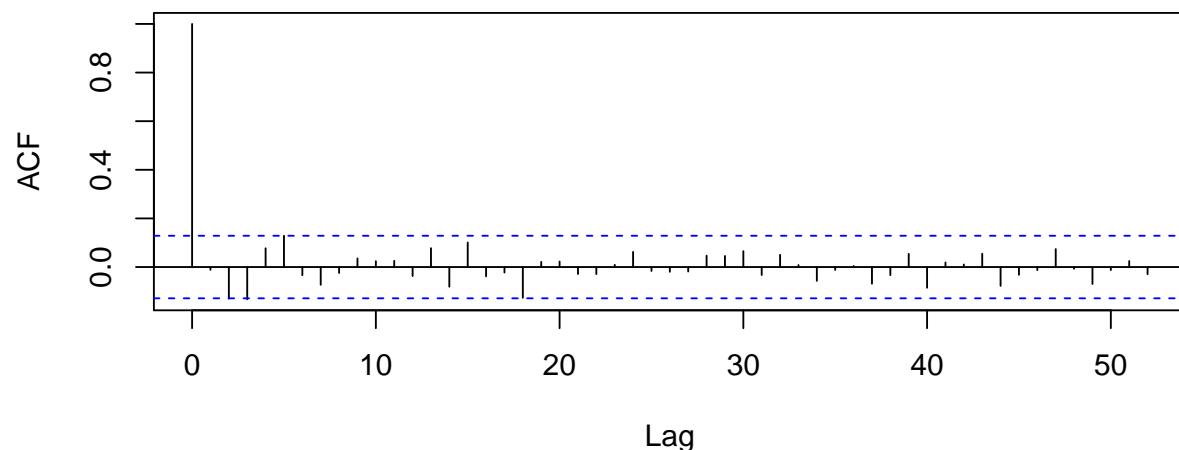
## shooting.southwestern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



## 42.4 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  
-1.8369 -1.2546 -0.2584  0.6112  3.1765  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -2.0905811  1.6421289 -1.273   0.203  
t             0.0008239  0.0010475  0.787   0.432  
tmax.f.spline1 0.0006894  0.0310849  0.022   0.982  
tmax.f.spline2  0.0302349  0.0621636  0.486   0.627  
tmax.f.spline3  0.0146411  0.0720301  0.203   0.839  
tmax.f.spline4  0.0205577  0.0626482  0.328   0.743  
tmax.f.spline5 -0.0709525  0.0488477 -1.453   0.146  
snow.in        0.0446466  0.3805695  0.117   0.907  
precip.in       -0.3093863  0.4010152 -0.772   0.440  
dark.before.12  0.2504057  0.1093348  2.290   0.022 *  
thanks.xmas     -3.6168678  3.8321839 -0.944   0.345  
summer.holiday  0.8211254  1.8578989  0.442   0.659  
winter.holiday -2.4981685  3.7705603 -0.663   0.508  
summer.vacation -0.2602571  0.2515992 -1.034   0.301  
oth.ns          -0.2255197  0.4721716 -0.478   0.633  
---  
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: 296.56 on 217 degrees of freedom  
AIC: 629.62  
  
Number of Fisher Scoring iterations: 5
```

## 43 Results for shooting.southern

### 43.1 Summary Values for shooting.southern

Table 43.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.southern	232	0.776	1.058	0	0	0	1	5

Table 43.2: Descriptives for Outcome After Ferguson Protests Begin

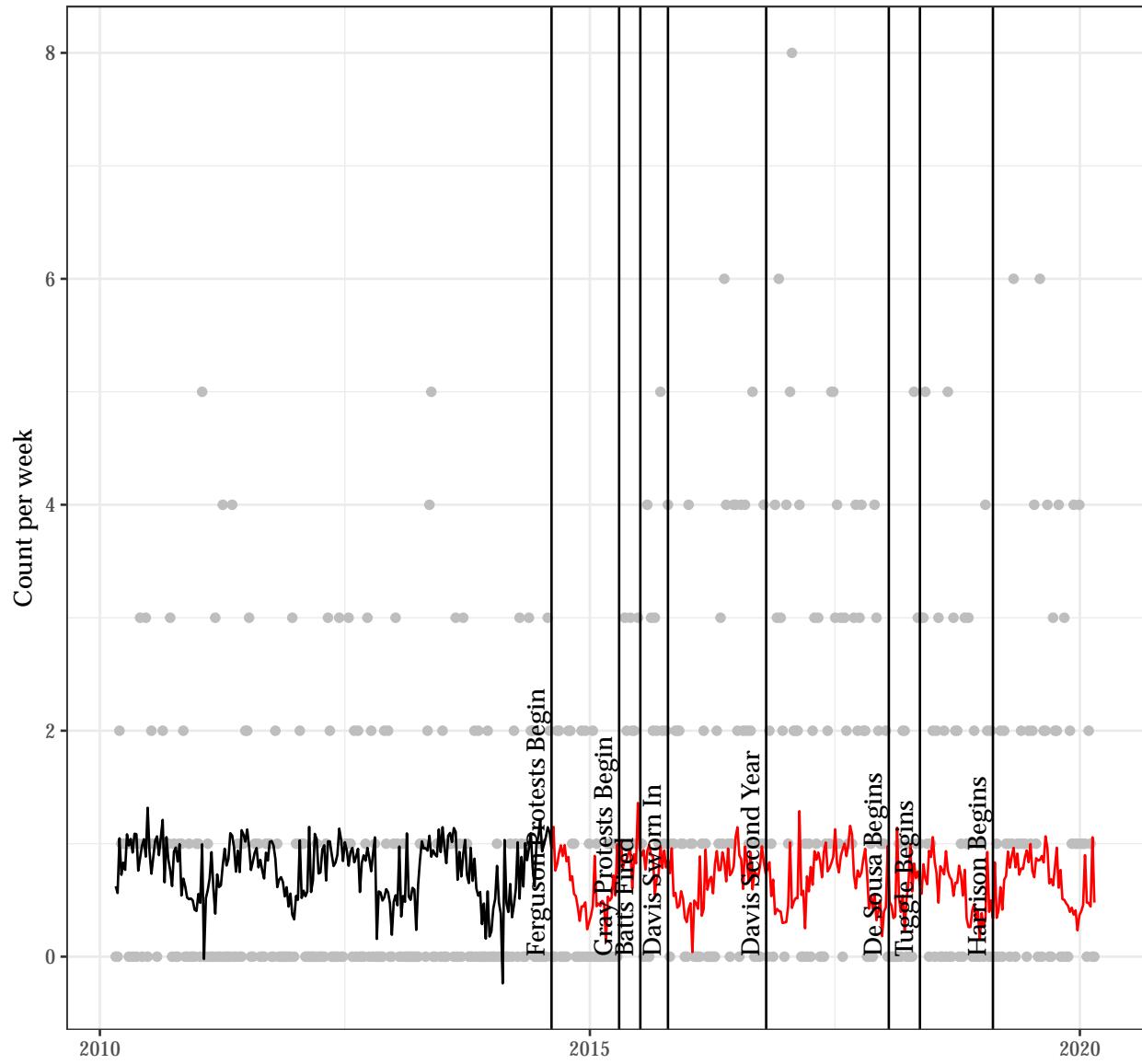
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.southern	290	1.462	1.520	0	0	1	2	8

## 43.2 Four Models for shooting.southern

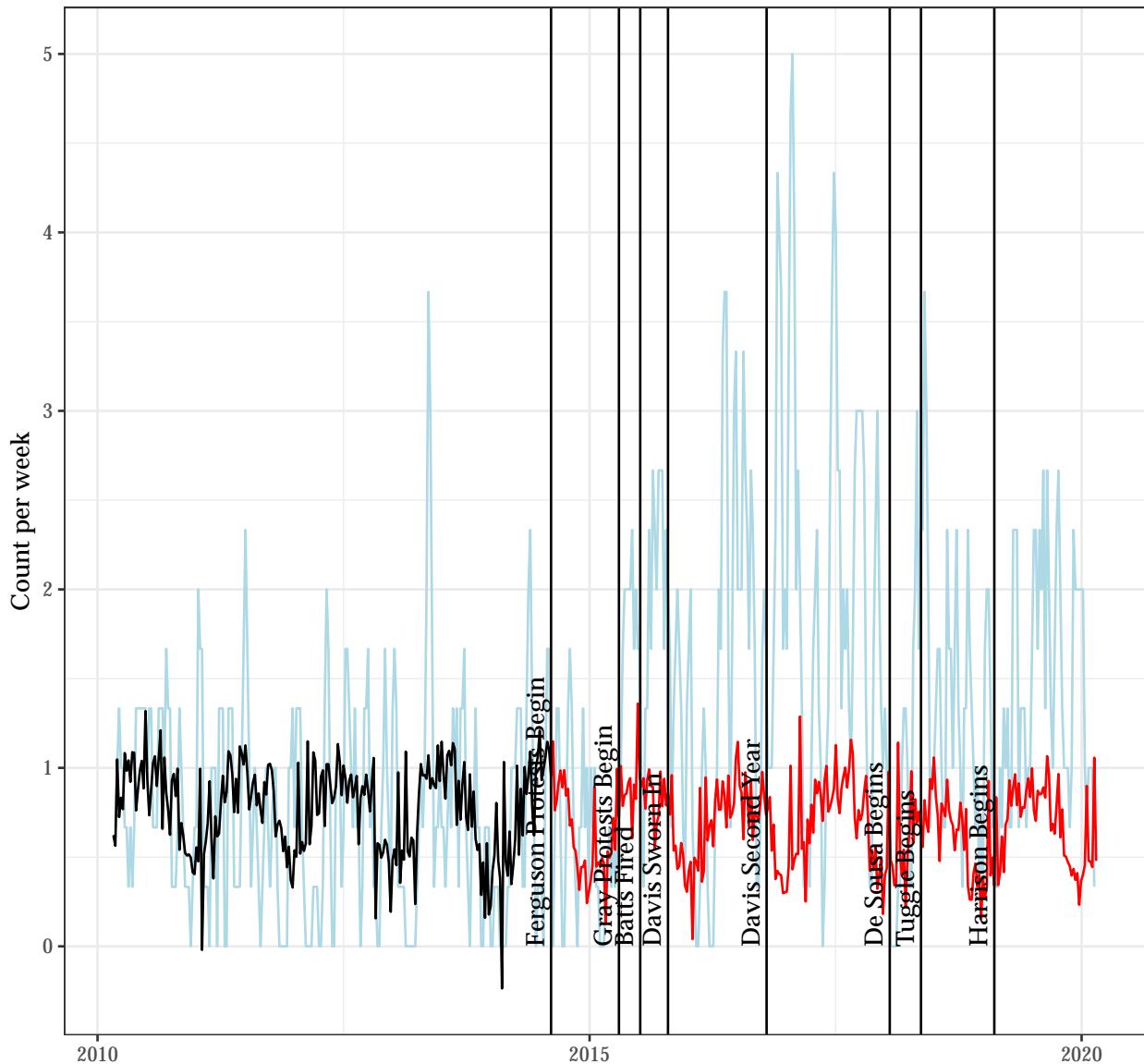
Table 43.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.0004	-0.0003		-0.0002
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.14		-0.04	-0.03
After Gray Protests Begin (week of 4/20/15 onward)	1.24		0.97	0.96
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.82		-0.94	-0.80
After Batts Fired (week of 7/13/15 onward)	0.04		0.08	-0.05
After Davis Confirmed (week of 10/19/15 onward)	-0.32		-0.19	-0.08
After Davis First Year (week of 10/17/16 onward)	0.46		0.44	0.44
After De Sousa Begins (week of 1/19/18 onward)	-1.00		-0.92	-0.86
After Tuggle Begins (week of 5/14/18 onward)	0.51		0.48	0.29
After Harrison Begins (week of 2/11/19 onward)	-0.02		-0.10	-0.01
Average Maximum Temperature to 50 Degrees		0.001		0.02
Plus Degrees in the 50s		0.01		-0.05
Plus Degrees in the 60s		0.03		0.10
Plus Degrees in the 70s		-0.07		-0.08
Plus Degrees Greater Than 80		0.003		0.03
Snowfall (inches)		-0.25		-0.21
Precipitation (inches)		-0.43		-0.09
Darkness Before Midnight (hours)		-0.03		0.04
Thanksgiving/Christmas (proportion of week)		-0.49		-0.75
Winter Holiday (proportion of week)		3.80		1.24
Other Out-of-School Days (proportion of week)		-0.18		-0.45
Summer Vacation (proportion of week)		0.34		0.06
Summer Holiday (proportion of week)		1.54		0.11
Observations	522	232	522	522
R <sup>2</sup>	0.11	0.06	0.13	0.15

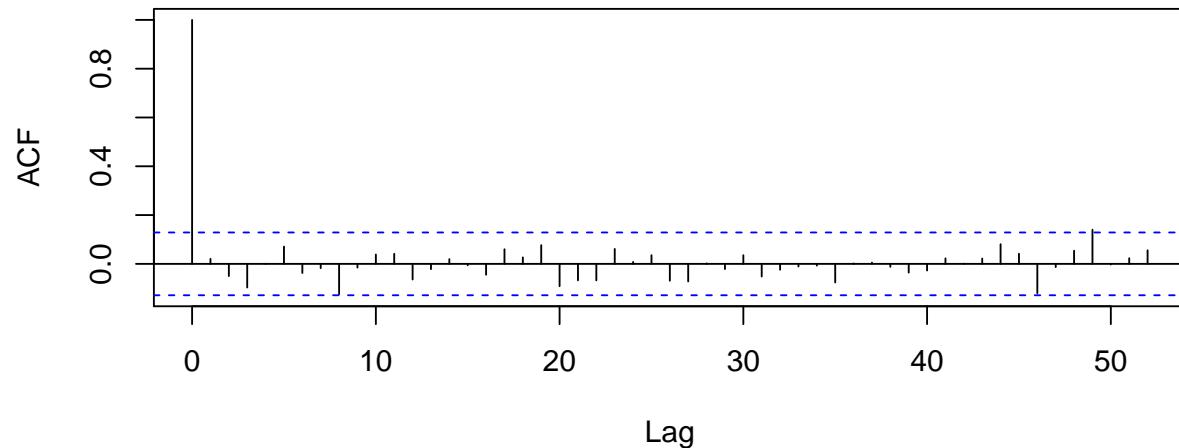
### 43.3 Least Squares Updated Model (2) for shooting.southern shooting.southern



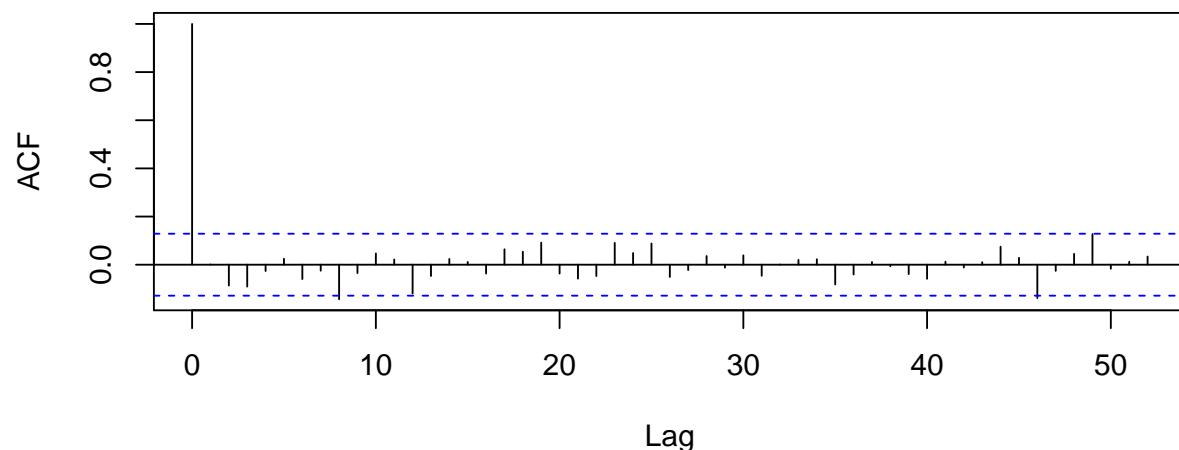
## shooting.southern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



#### 43.4 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  
-1.6999 -1.2027 -0.7579  0.4737  3.0197  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) 0.0048775 1.8323102  0.003  0.9979  
t           -0.0004344 0.0011415 -0.380  0.7036  
tmax.f.spline1 -0.0049204 0.0342978 -0.143  0.8859  
tmax.f.spline2  0.0276086 0.0675657  0.409  0.6828  
tmax.f.spline3  0.0202183 0.0768347  0.263  0.7924  
tmax.f.spline4 -0.0760535 0.0672282 -1.131  0.2579  
tmax.f.spline5  0.0052750 0.0539551  0.098  0.9221  
snow.in       -1.2328969 0.9303335 -1.325  0.1851  
precip.in      -0.5547166 0.4604023 -1.205  0.2283  
dark.before.12 -0.0469608 0.1204925 -0.390  0.6967  
thanks.xmas     -1.7478293 4.4216666 -0.395  0.6926  
summer.holiday   1.6138304 2.1903991  0.737  0.4613  
winter.holiday   6.3232129 3.0253111  2.090  0.0366 *  
summer.vacation   0.3739982 0.3005162  1.245  0.2133  
oth.ns          -0.2848445 0.5014619 -0.568  0.5700  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 326.06 on 231 degrees of freedom  
Residual deviance: 303.45 on 217 degrees of freedom  
AIC: 586.19  
  
Number of Fisher Scoring iterations: 6
```

## 44 Results for shooting.southeastern

### 44.1 Summary Values for shooting.southeastern

Table 44.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.southeastern	232	0.534	0.872	0	0	0	1	5

Table 44.2: Descriptives for Outcome After Ferguson Protests Begin

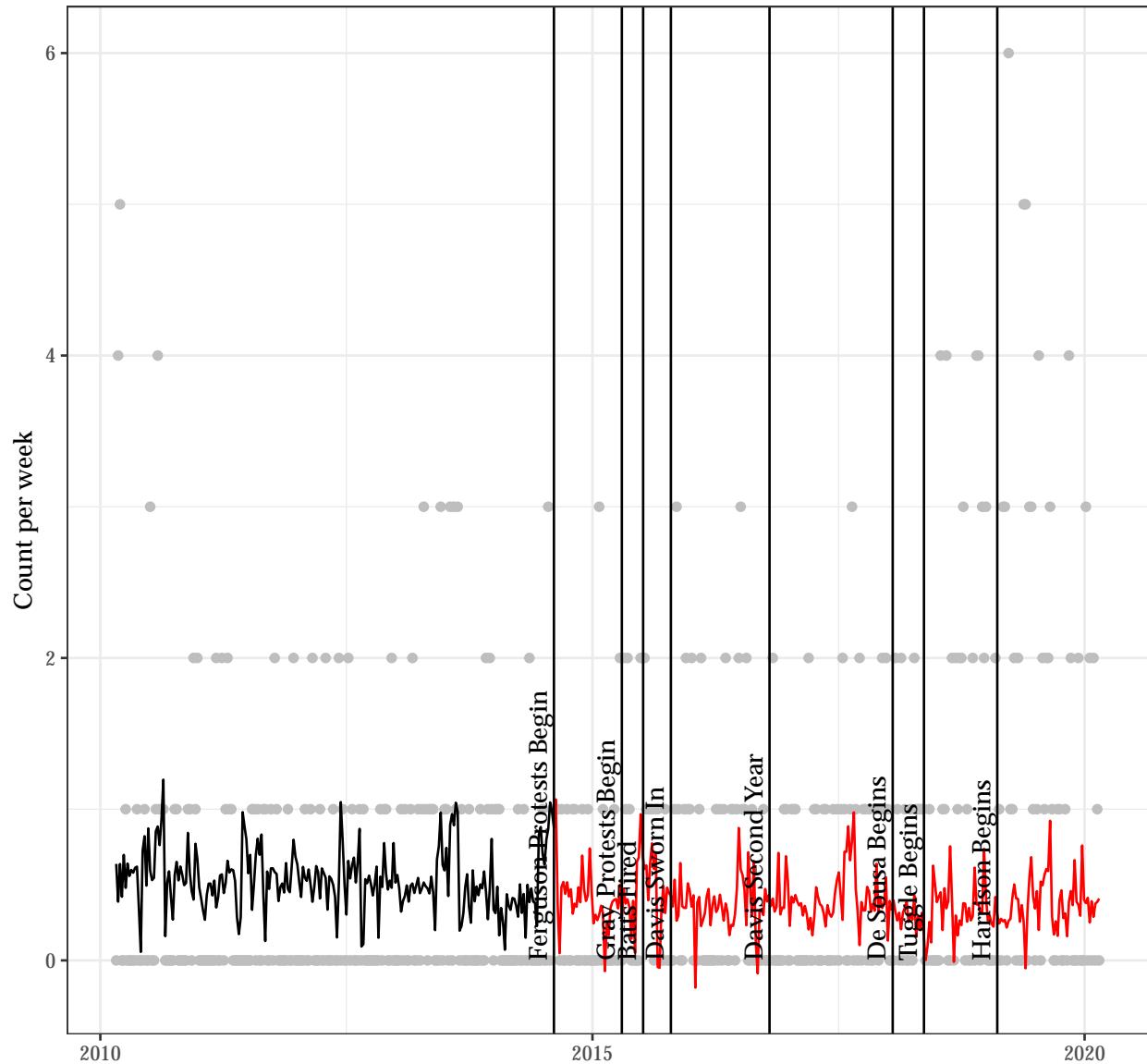
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
shooting.southeastern	290	0.814	1.081	0	0	0	1	6

## 44.2 Four Models for shooting.southeastern

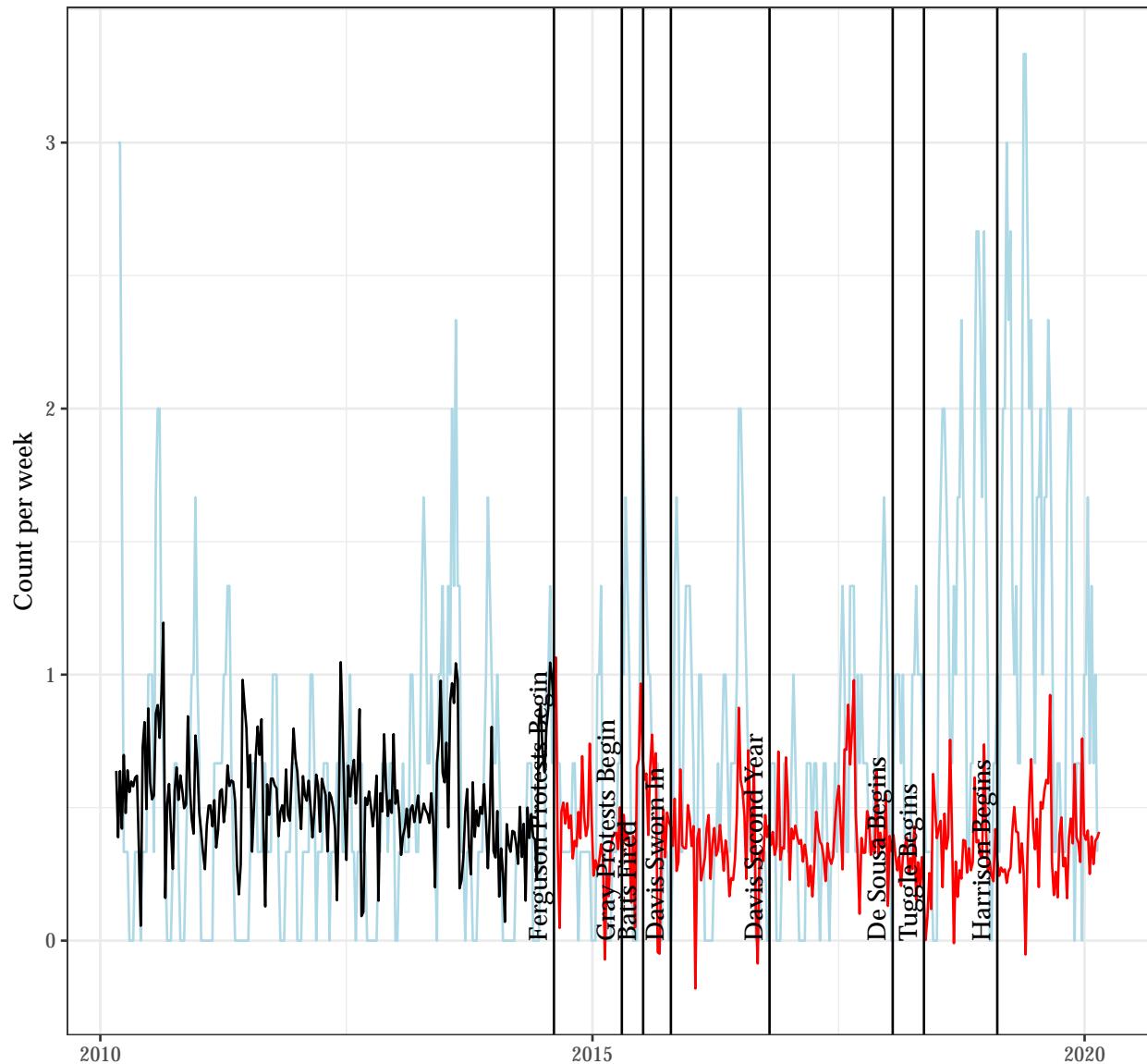
Table 44.3: Four Models that Differ on the Specification of Adjustment and Intervention Variables

	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.0004	-0.001		-0.001
After Ferguson Protests Begin (week of 8/11/14 onward)	-0.03		0.03	0.02
After Gray Protests Begin (week of 4/20/15 onward)	0.29		0.24	0.23
Unrest and National Guard (4/27/15 - 5/3/2015)	1.27		1.25	1.36
After Batts Fired (week of 7/13/15 onward)	-0.08		-0.08	-0.13
After Davis Confirmed (week of 10/19/15 onward)	0.02		0.09	0.14
After Davis First Year (week of 10/17/16 onward)	-0.05		-0.12	-0.09
After De Sousa Begins (week of 1/19/18 onward)	0.25		0.35	0.38
After Tuggle Begins (week of 5/14/18 onward)	0.35		0.31	0.27
After Harrison Begins (week of 2/11/19 onward)	0.16		0.09	0.16
Average Maximum Temperature to 50 Degrees		0.01		-0.01
Plus Degrees in the 50s		-0.03		0.02
Plus Degrees in the 60s		0.04		-0.01
Plus Degrees in the 70s		-0.03		0.01
Plus Degrees Greater Than 80		-0.04		-0.03
Snowfall (inches)		-0.07		-0.22
Precipitation (inches)		-0.38		-0.30
Darkness Before Midnight (hours)		0.02		0.03
Thanksgiving/Christmas (proportion of week)		1.67		0.25
Winter Holiday (proportion of week)		-0.36		-0.81
Other Out-of-School Days (proportion of week)		0.10		0.05
Summer Vacation (proportion of week)		0.64		0.51
Summer Holiday (proportion of week)		-0.26		-0.67
Observations	522	232	522	522
R <sup>2</sup>	0.07	0.05	0.11	0.10

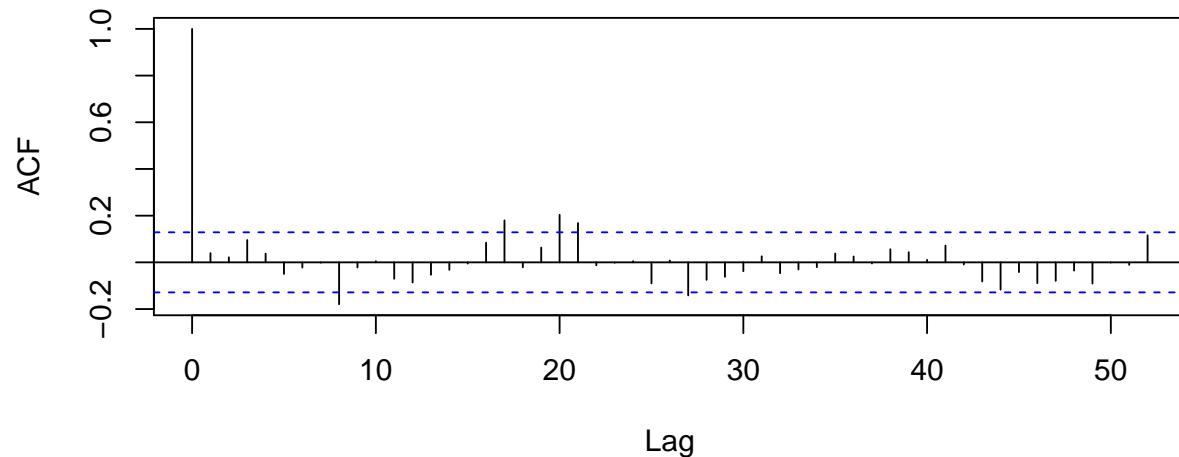
#### 44.3 Least Squares Updated Model (2) for shooting.southeastern shooting.southeastern



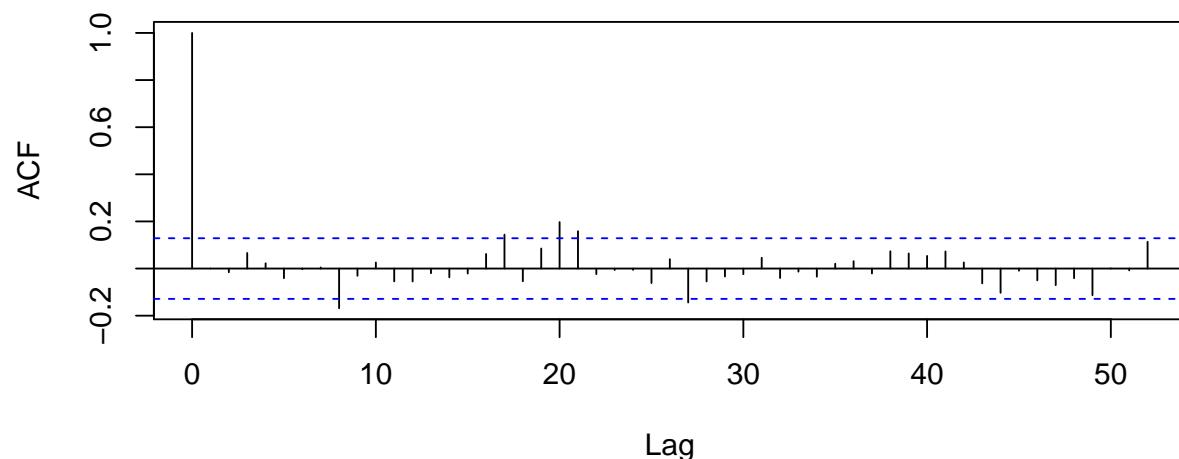
## shooting.southeastern



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



#### 44.4 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  
-1.5250 -1.0151 -0.8740  0.5416  3.4132  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -1.967764  2.088569 -0.942  0.34611  
t            -0.001252  0.001386 -0.904  0.36620  
tmax.f.spline1  0.028862  0.038187  0.756  0.44976  
tmax.f.spline2 -0.066389  0.075235 -0.882  0.37755  
tmax.f.spline3  0.085526  0.092959  0.920  0.35755  
tmax.f.spline4 -0.084373  0.089813 -0.939  0.34751  
tmax.f.spline5 -0.041910  0.070443 -0.595  0.55188  
snow.in       -0.299331  0.662751 -0.452  0.65152  
precip.in      -0.762260  0.577637 -1.320  0.18696  
dark.before.12  0.029150  0.143238  0.204  0.83874  
thanks.xmas     2.745981  3.465551  0.792  0.42815  
summer.holiday -1.172125  3.426221 -0.342  0.73227  
winter.holiday -0.712449  4.380831 -0.163  0.87081  
summer.vacation 1.150804  0.407190  2.826  0.00471 **  
oth.ns         0.189140  0.473749  0.399  0.68972  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 284.14 on 231 degrees of freedom  
Residual deviance: 267.48 on 217 degrees of freedom  
AIC: 486.26  
  
Number of Fisher Scoring iterations: 6
```

## 45 Results for assault.by.threat

### 45.1 Summary Values for assault.by.threat

Table 45.1: Descriptives for Outcome Before Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
assault.by.threat	232	11.034	6.008	0	8	12	15	28

Table 45.2: Descriptives for Outcome After Ferguson Protests Begin

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
assault.by.threat	290	0.000	0.000	0	0	0	0	0

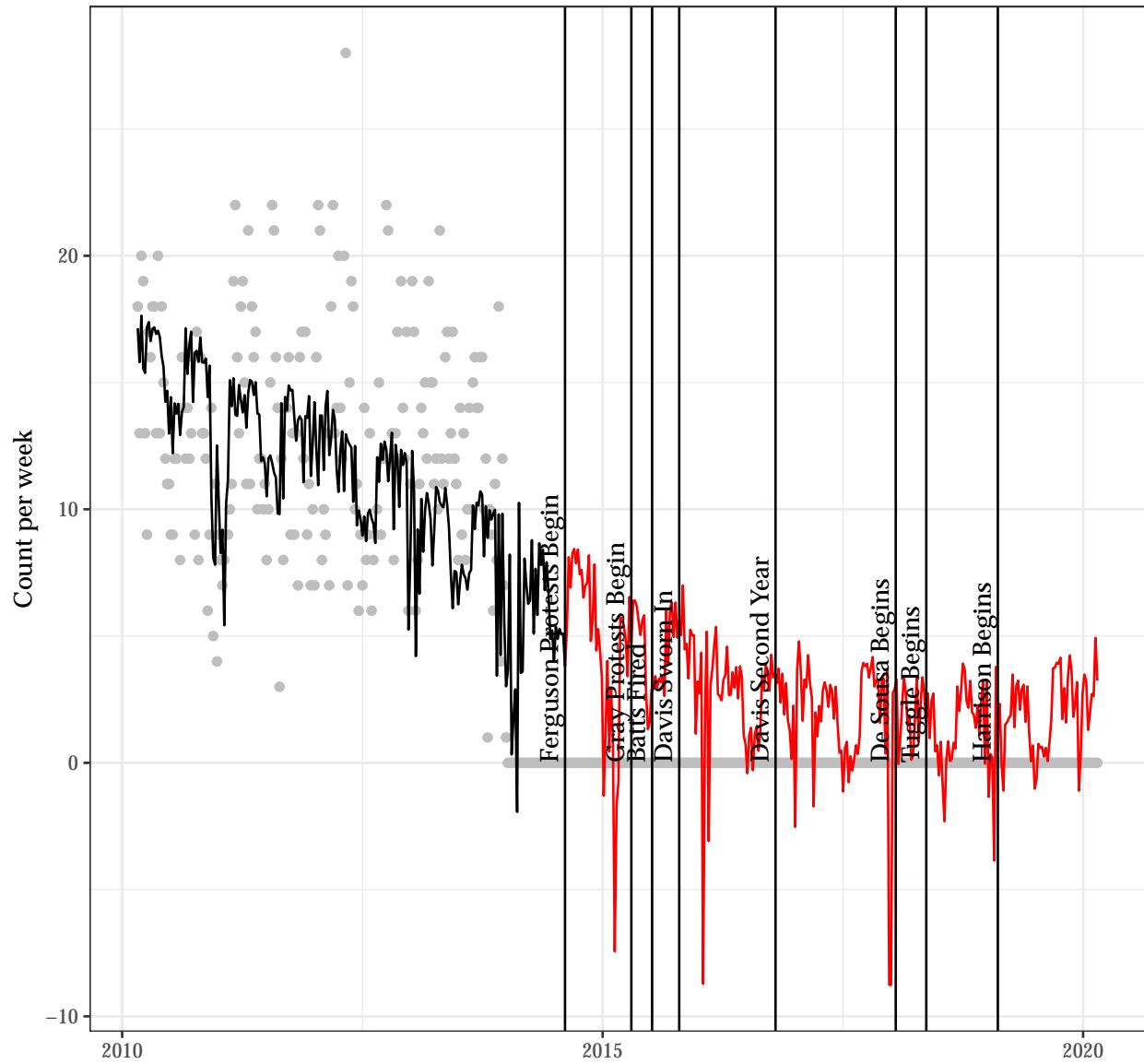
## 45.2 Four Models for assault.by.threat

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

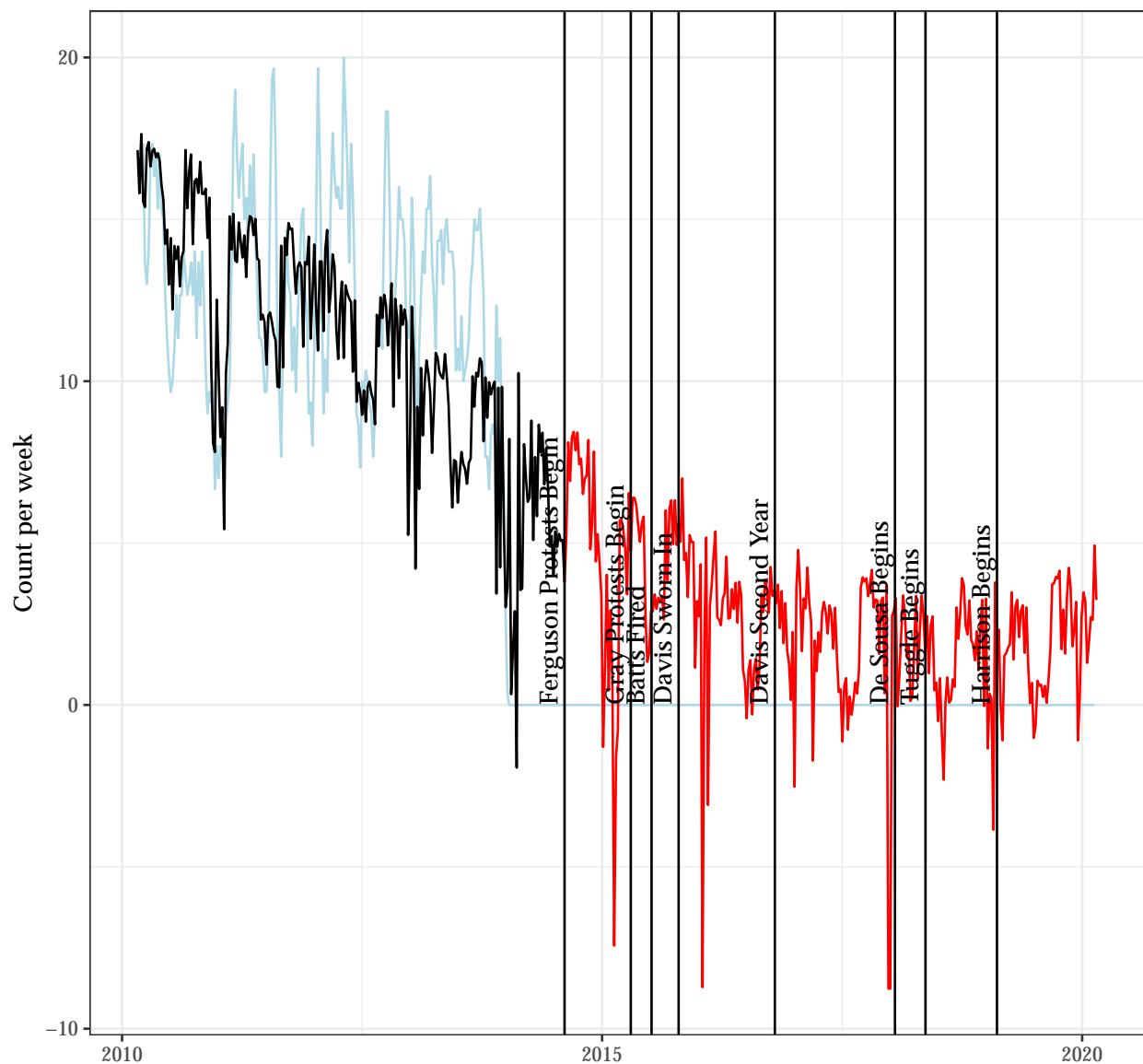
	Outcome: Count Per Week			
	(1)	(2)	(3)	(4)
Time (counter in weeks)	-0.04	-0.04	-0.04	-0.04
After Ferguson Protests Begin (week of 8/11/14 onward)	-5.42		-4.63	-5.26
After Gray Protests Begin (week of 4/20/15 onward)	1.02		0.26	0.69
Unrest and National Guard (4/27/15 - 5/3/2015)	-0.21		-2.03	-1.24
After Batts Fired (week of 7/13/15 onward)	0.53		0.06	0.29
After Davis Confirmed (week of 10/19/15 onward)	1.38		1.50	1.41
After Davis First Year (week of 10/17/16 onward)	2.47		0.96	2.33
After De Sousa Begins (week of 1/19/18 onward)	1.72		-0.08	1.60
After Tuggle Begins (week of 5/14/18 onward)	1.15		0.60	1.46
After Harrison Begins (week of 2/11/19 onward)	1.97		-0.65	1.56
Average Maximum Temperature to 50 Degrees		0.51		0.21
Plus Degrees in the 50s		-0.66		-0.29
Plus Degrees in the 60s		0.37		0.19
Plus Degrees in the 70s		-0.26		-0.16
Plus Degrees Greater Than 80		0.08		0.08
Snowfall (inches)		-1.28		-0.56
Precipitation (inches)		-2.87		-1.71
Darkness Before Midnight (hours)		0.48		0.14
Thanksgiving/Christmas (proportion of week)		-13.32		-5.79
Winter Holiday (proportion of week)		7.51		3.11
Other Out-of-School Days (proportion of week)		-1.82		-0.85
Summer Vacation (proportion of week)		-2.67		-1.19
Summer Holiday (proportion of week)		-8.71		-3.75
Observations	522	232	522	522
R <sup>2</sup>	0.73	0.37	0.15	0.75

### 45.3 Least Squares Updated Model (2) for assault.by.threat

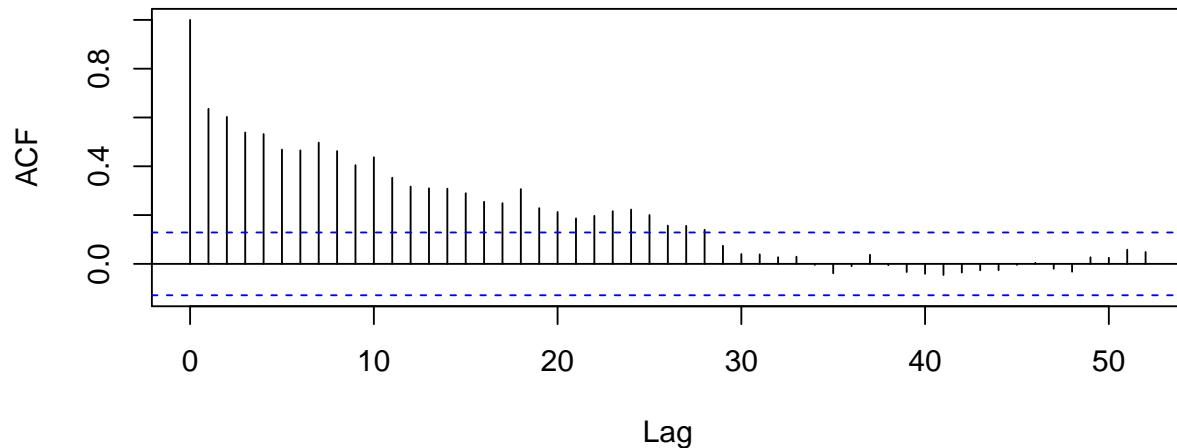
assault.by.threat



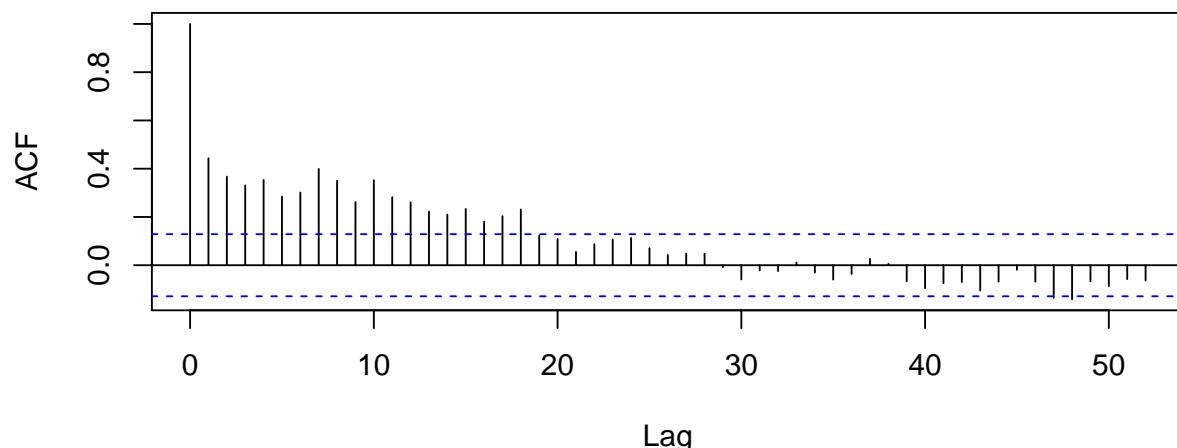
## assault.by.threat



Autocorrelation Function for the Observed Outcome for Updated Model (2)



Autocorrelation Function for the Residuals from Updated Model (2)



#### 45.4 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  
-4.4883 -1.2356 -0.0508  0.9667  3.7833  
  
Coefficients:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept) -0.0605975  0.4839119 -0.125  0.90035  
t            -0.0038678  0.0003152 -12.270 < 2e-16 ***  
tmax.f.spline1 0.0565290  0.0090856   6.222 4.91e-10 ***  
tmax.f.spline2 -0.0751478  0.0161643  -4.649 3.34e-06 ***  
tmax.f.spline3  0.0395965  0.0182946   2.164  0.03043 *  
tmax.f.spline4 -0.0246932  0.0174382  -1.416  0.15676  
tmax.f.spline5  0.0108913  0.0152926   0.712  0.47634  
snow.in        -0.5314183  0.1894044  -2.806  0.00502 **  
precip.in       -0.2539996  0.1165995  -2.178  0.02938 *  
dark.before.12   0.0510244  0.0294989   1.730  0.08368 .  
thanks.xmas     -1.5564574  0.9320599  -1.670  0.09494 .  
summer.holiday  -0.8156522  0.6673576  -1.222  0.22163  
winter.holiday  1.1796754  0.9096945   1.297  0.19471  
summer.vacation -0.2510657  0.0853633  -2.941  0.00327 **  
oth.ns          -0.1537799  0.1132110  -1.358  0.17435  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
(Dispersion parameter for poisson family taken to be 1)  
  
Null deviance: 1062.19 on 231 degrees of freedom  
Residual deviance: 752.81 on 217 degrees of freedom  
AIC: 1651.5  
  
Number of Fisher Scoring iterations: 6
```