



# ECE Professional Development ▶ in Montana

A model for understanding the availability  
of training for Early Childhood Educators

Cassie Noble

# Background



- ▶ Montana Early Childhood Project (ECP)
  - ▶ Outreach program - MSU
  - ▶ Mission: support early childhood educators
  - ▶ Practitioner Registry
    - ▶ Early childhood workforce data
  - ▶ Professional Development Approval System
    - ▶ Licensed providers: required 16 hours of PD annually



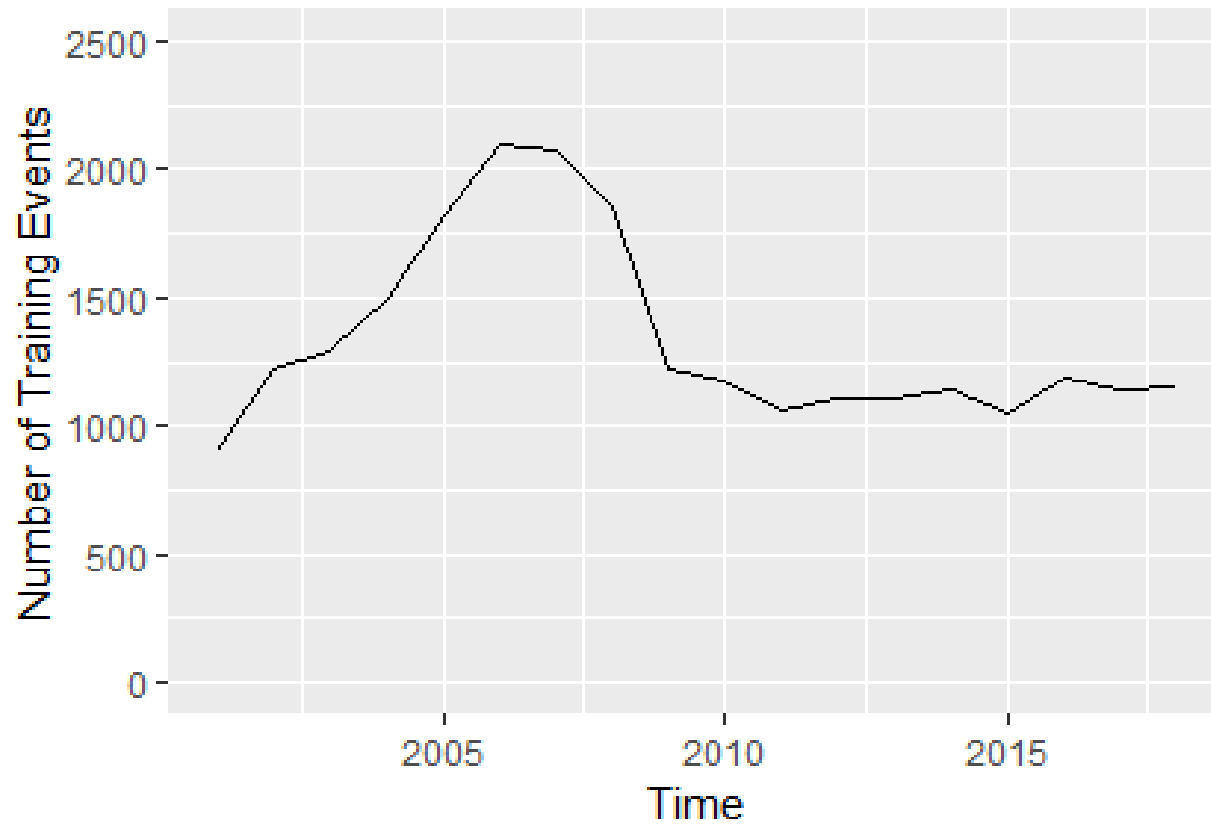
# Purpose of study

- ▶ Current landscape of child care
  - ▶ Research on importance of high quality child care
    - ▶ Links between high quality child care and professional development
  - ▶ Federal Child Care and Development Block Grant
    - ▶ Higher standards for child care providers
  - ▶ Rewrite of Montana Child Care Licensing rule
    - ▶ Require participation in Practitioner Registry
    - ▶ Increase training hour requirement from 8 to 16 hours annually
- ▶ Goal: understand history and recent availability of training
  - ▶ Increase of training requirement
    - ▶ Can we meet the need?
  - ▶ Explanatory rather than predictive

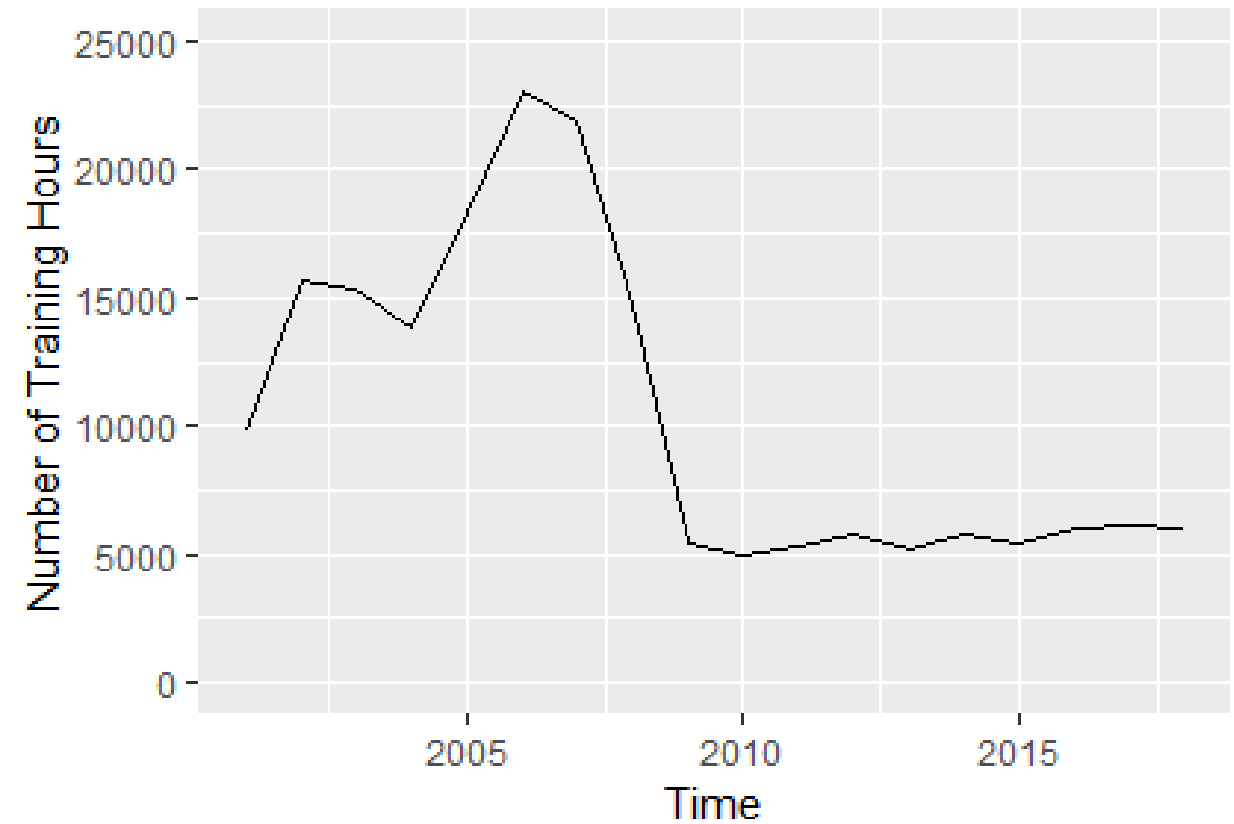
# Description of dataset

- ▶ List of all training events submitted for ECP review
  - ▶ 1998 - present
  - ▶ Event status: completed/approved vs. cancelled/denied
  - ▶ Location type: classroom or distance
  - ▶ Number of hours: minimum 2
  - ▶ End date
    - ▶ Definition for classroom vs. distance
- ▶ Aggregated trainings by month
  - ▶ Subset only completed trainings
  - ▶ Subset to more recent years
  - ▶ Added variables indicating hours for classroom vs. distance
  - ▶ Added variable indicating annual training hour requirement

Number of Training Events Offered Per Year

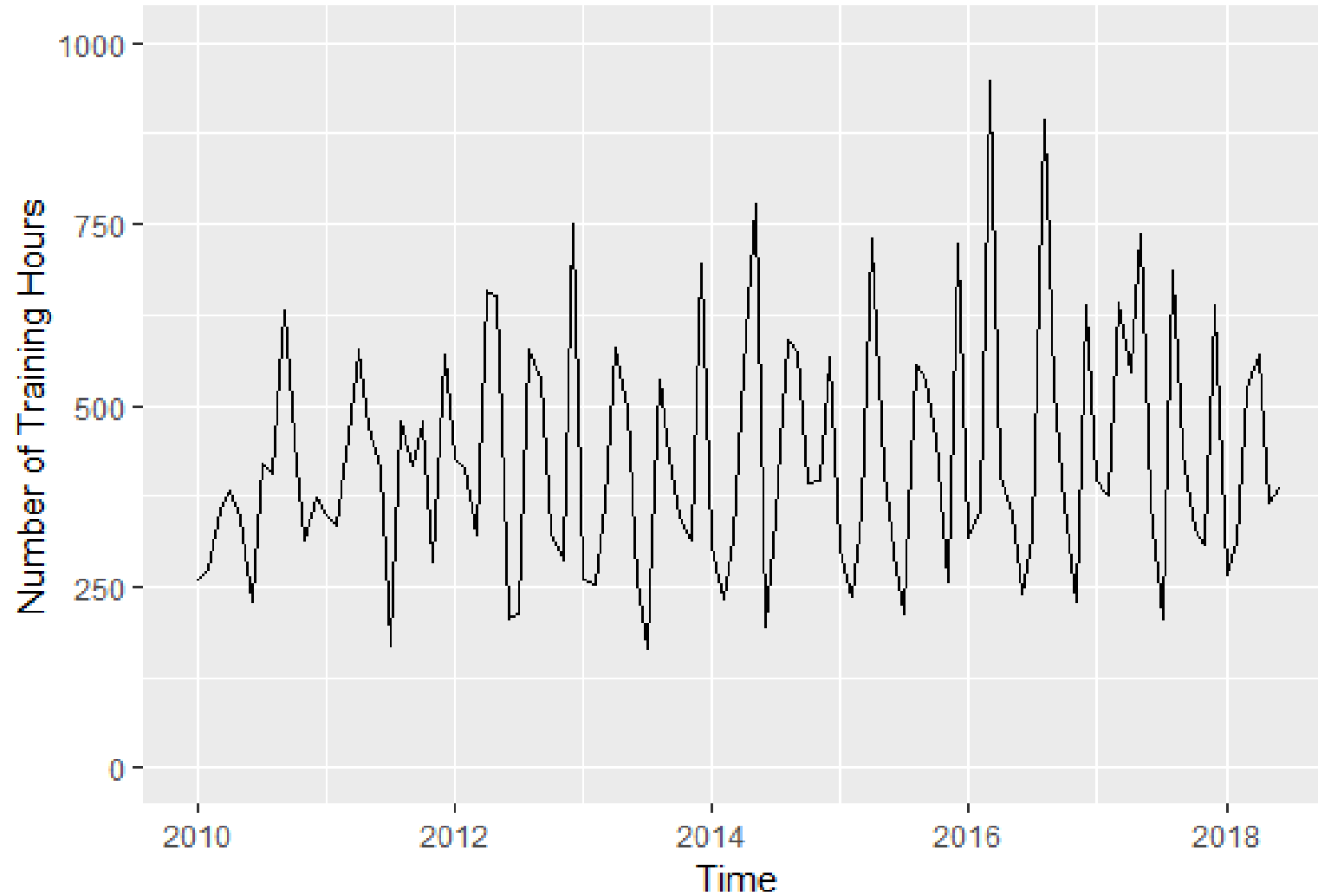


Total Training Hours Offered Per Year



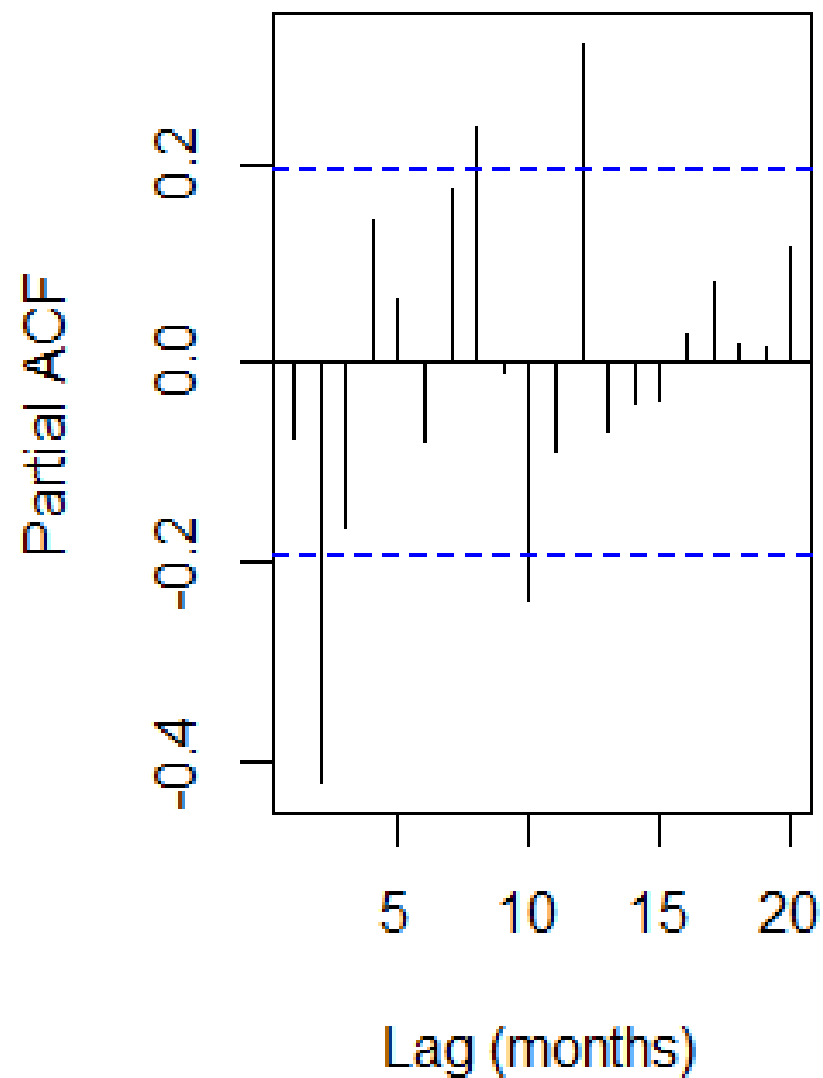
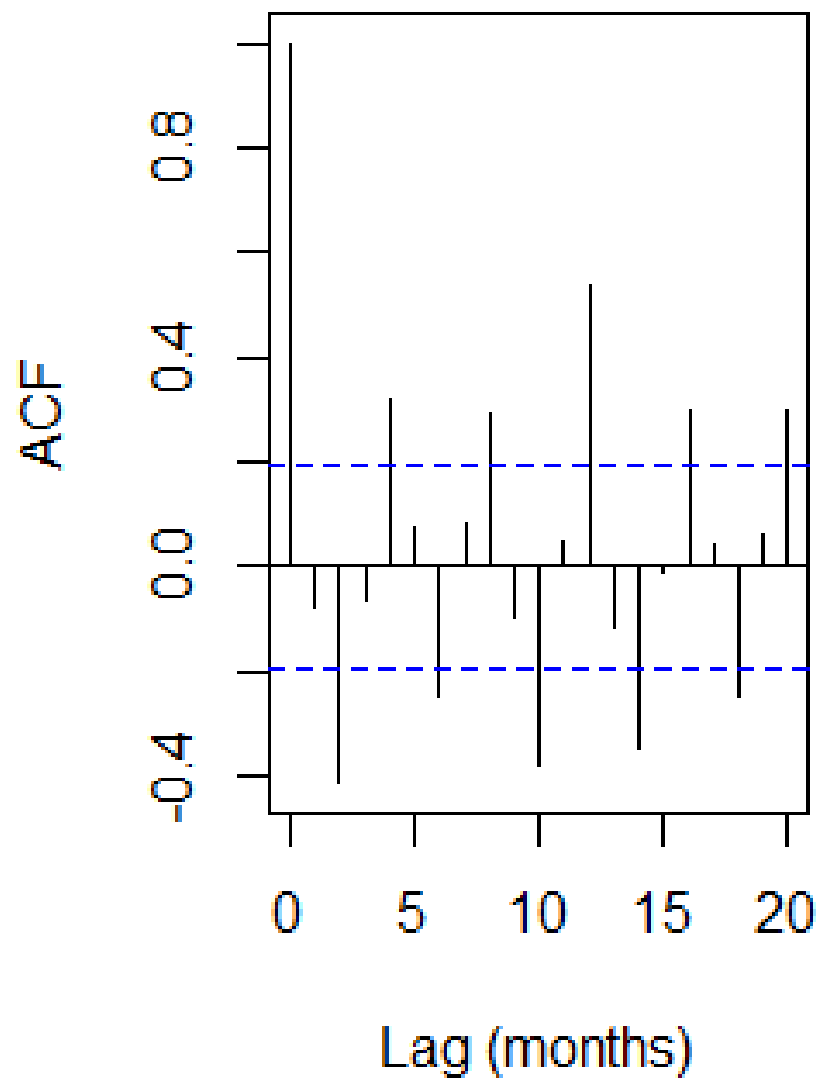
History of approved training

Classroom-Based Training Hours Offered Per Month



Dataset of focus

# ACF and PACF: Classroom-based training monthly series



# Attempted Models

- ▶ Regression models
  - ▶ Month
  - ▶ Year
  - ▶ Required annual training for Practitioner Registry
  - ▶ Lagged training hours for distance courses
- ▶ ARIMA
  - ▶ MA(4) with intercept
- ▶ ARIMA with regression
  - ▶ MA(4) with intercept and seasonal indicator for month
- ▶ Exponential smoothing
  - ▶ Exponential smoothing state space model (ets)



# Best performing model:

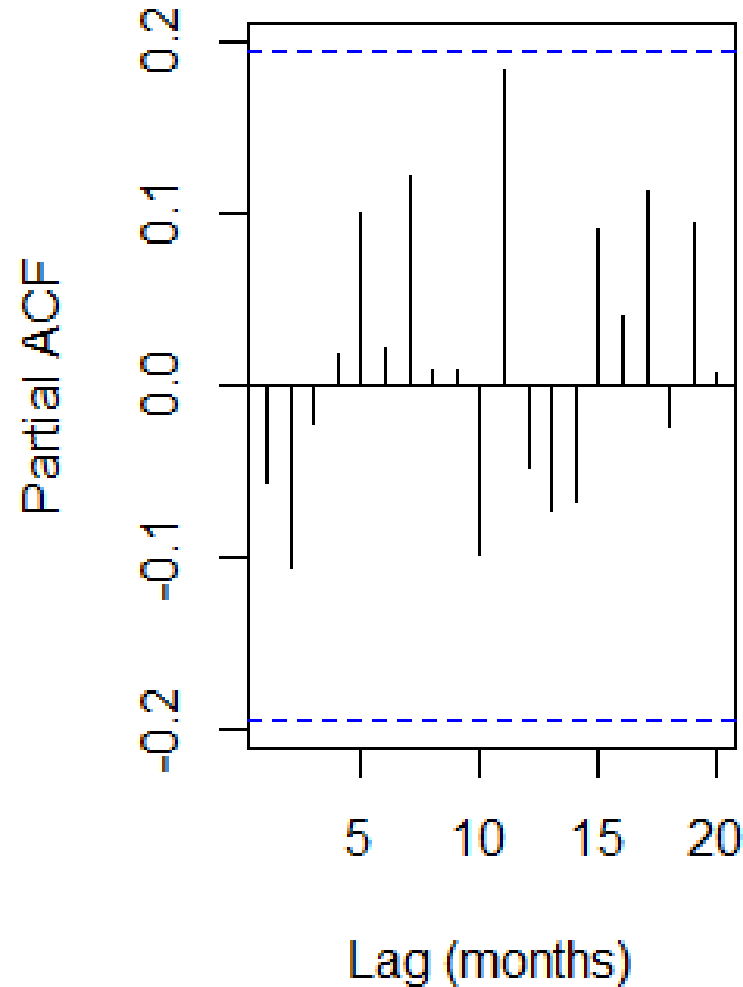
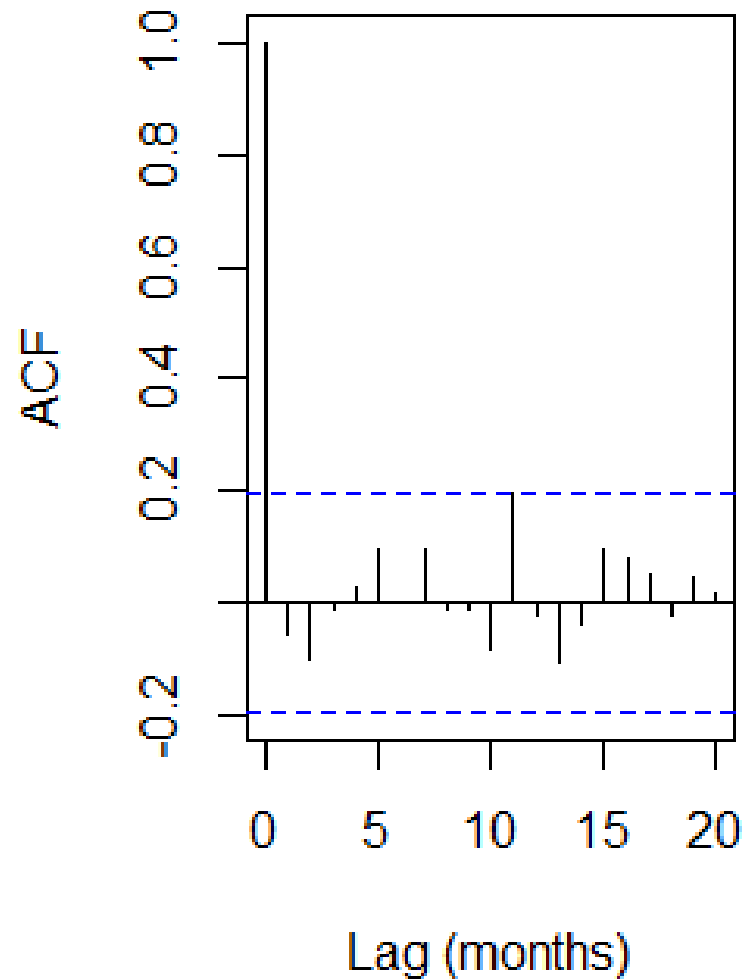
## Regression model with monthly seasonal indicator

```
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    320.67      38.20    8.394 6.25e-13 ***
month02        -11.83      54.03   -0.219 0.827121
month03         155.44      54.03    2.877 0.005009 **
month04         234.06      54.03    4.332 3.83e-05 ***
month05         191.50      54.03    3.545 0.000626 ***
month06        -33.39      54.03   -0.618 0.538122
month07        -65.10      55.69   -1.169 0.245456
month08         269.83      55.69    4.845 5.24e-06 ***
month09         190.15      55.69    3.414 0.000960 ***
month10          71.27      55.69    1.280 0.203897
month11        -21.60      55.69   -0.388 0.698970
month12         299.52      55.69    5.379 5.89e-07 ***
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 114.6 on 90 degrees of freedom
Multiple R-squared:  0.5722,    Adjusted R-squared:  0.52
F-statistic: 10.95 on 11 and 90 DF,  p-value: 1.517e-12
```

# Model diagnostics:

ACF and PACF for regression model with monthly seasonal indicators



### Classroom-Based Training Hours Offered Per Month: Realized vs. Predicted



# Conclusion and Interpretation

- ▶ Models of ECE training availability in Montana
  - ▶ Best model: Regression model with monthly seasonal indicators
  - ▶ Next best: MA(4)
  - ▶ No overall trend
- ▶ Other possible predictors
  - ▶ Number of child care providers in the field
  - ▶ Number of trainings required for Quality Rating Improvement System (QRIS)
  - ▶ Lagged training attendance
  - ▶ Other seasonal cycles
    - ▶ Winter, Spring, Summer, Fall
    - ▶ Traditional school-year

Questions?

