

```
errorcolor##  
Error  
in  
library("readr"):  
there  
is  
no  
package  
called,  
'readr',  
{  
{  
}
```

POLS/CS&SS 503:
Advanced Quantitative Political Methodology

RESIDUALS IN OLS: NON-NORMALITY, HETEROSKEDASTICITY

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Overview

Non-normal errors

Suppose that errors ϵ have $E(\epsilon) = 0$, but not normal distribution

- \mathbf{b} still unbiased
- $V(\mathbf{b})$ incorrect in small samples
- Still BLUE, but not MVUE

How to diagnose non-normal errors?

Graphical methods

- Plot studentized residuals against theoretical t -quantiles.
 - Studentized residuals (approximately standardized to have std dev of 1)

$$E_i^* \approx \frac{E_i}{S_E}$$

- Density plot
- Box-plot

SLID

- Example in Fox
- Survey of Labour Income and Dynamics (Canada)
- 3,997 employed individuals between 16–65 residing in Ontario