R Course: Lesson 2

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Introduction

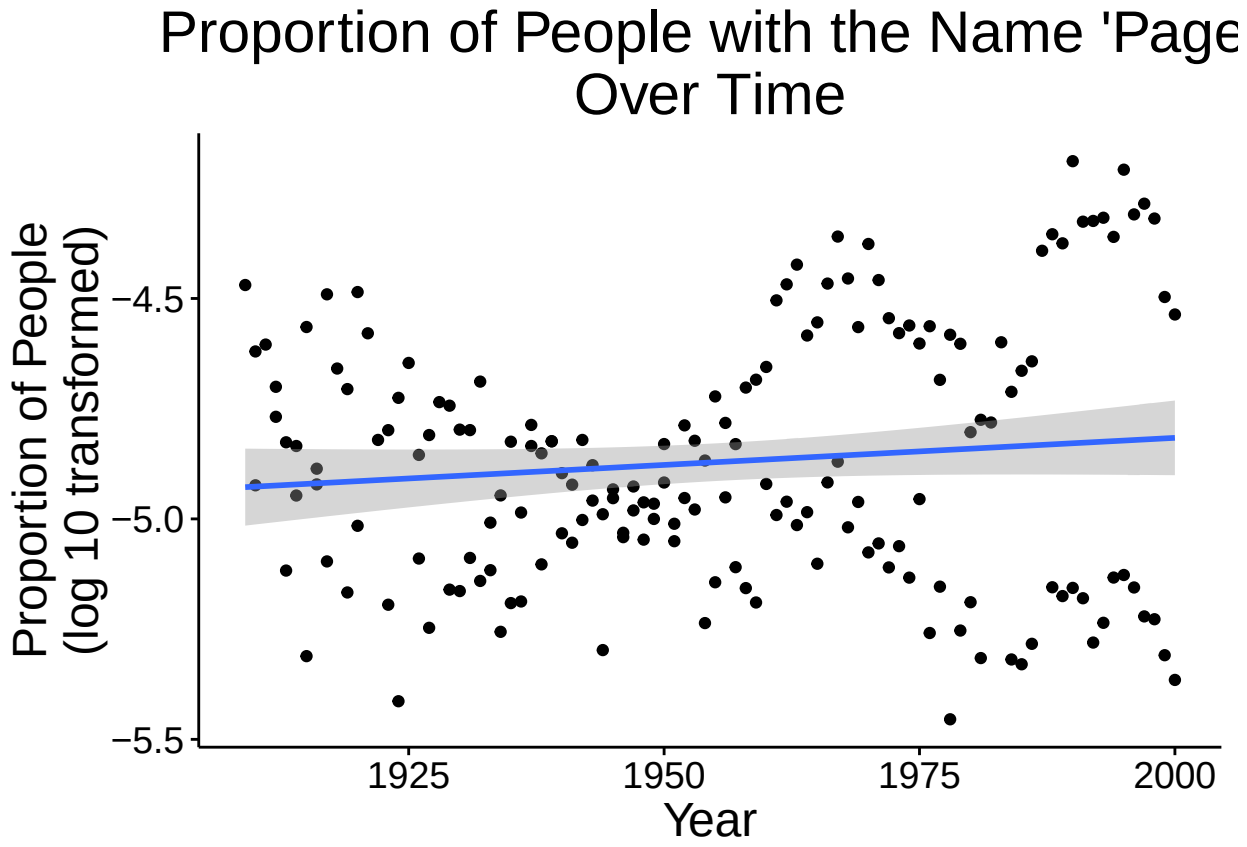
I looked at how common my name, "Page", is in the United States population both by year and sex.

Results

Prevelence by Year

Below is a plot for how the proportion of people with the name "Page" (log-transformed) has changed over time. Over the trend is pretty flat, with maybe a slight increase over time.

```
year.plot
```



To test if there is a significant effect of year a linear model was built. Proportion of the population log-transformed was the dependent variable and year the independent variable. As shown below, year was not significant, although the coefficients do show a positive slope.

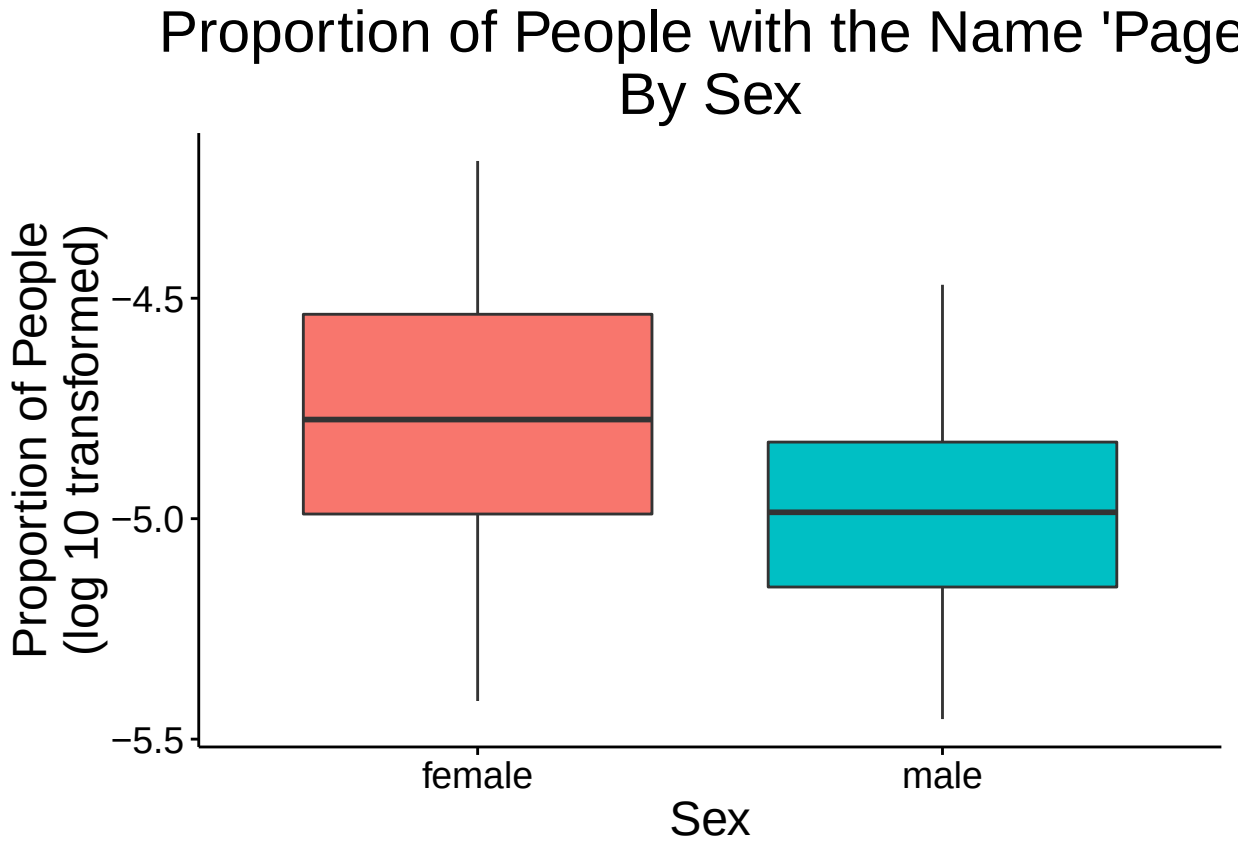
```
year.lm_sum
```

```
##
## Call:
## lm(formula = prop_log10 ~ year, data = data_stats)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.61133 -0.21655 -0.01936  0.21082  0.63981
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) -7.2724137  1.6252827  -4.475 1.39e-05 ***
## year         0.0012281  0.0008311   1.478    0.141
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2854 on 172 degrees of freedom
## Multiple R-squared:  0.01254,    Adjusted R-squared:  0.006795
## F-statistic: 2.184 on 1 and 172 DF,  p-value: 0.1413
```

Prevelence by Sex

Below is a plot for the proportion of people with the name "Page" (log-transformed) by sex. It appears there is a clear effect of sex, where it is a less popular name for males than females.

```
sex.plot
```



To test if there is a significant effect of sex a linear model was built. Proportion of the population log-transformed was the dependent variable and sex the independent variable. As show below, sex was significant, with the name being less common in males than females [$R^2 = 0.15$, $F(1, 172) = 32.23$, $p < 0.001$].

```
sex.lm_sum
```

```
##
## Call:
## lm(formula = prop_log10 ~ sex, data = data_stats)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.65869 -0.19693 -0.01146  0.18316  0.56621
##
## Coefficients:
##             Estimate Std. Error  t value Pr(>|t|)
## (Intercept) -4.75484    0.02859 -166.302  < 2e-16 ***
## sexM        -0.22695    0.03998   -5.677 5.73e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2636 on 172 degrees of freedom
## Multiple R-squared:  0.1578, Adjusted R-squared:  0.1529
## F-statistic: 32.23 on 1 and 172 DF,  p-value: 5.727e-08
```