

Interpreting Output

model: $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$

y = birth weight in ounces

x_1 = nr of cigarettes smoked per
day by pregnant mother

x_2 = family income in \$1000

```
Call:
lm(formula = bwght ~ cigs + faminc, data = bwght)
```

```
Residuals:
      Min       1Q   Median       3Q      Max
-96.061 -11.543   0.638  13.126 150.083
```

```
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 116.97413    1.04898  111.512  < 2e-16 ***
cigs        -0.46341    0.09158   -5.060 4.75e-07 ***
faminc       0.09276    0.02919    3.178 0.00151 **
```

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

```
Residual standard error: 20.06 on 1385 degrees of freedom
Multiple R-squared:  0.0298,    Adjusted R-squared:  0.0284
F-statistic: 21.27 on 2 and 1385 DF,  p-value: 7.942e-10
```

Interpreting Output

model: $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$

y = birth weight in ounces

x_1 = nr of cigarettes smoked per
day by pregnant mother

x_2 = family income in \$1000

```
Call:
lm(formula = bwght ~ cigs + faminc, data = bwght)

Residuals:
    Min       1Q   Median       3Q      Max
-96.061 -11.543   0.638  13.126 150.083

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  116.97413    1.04898  111.512  < 2e-16 ***
cigs         -0.46341    0.09158   -5.060 4.75e-07 ***
faminc        0.09276    0.02919    3.178 0.00151 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 20.06 on 1385 degrees of freedom
Multiple R-squared:  0.0298,    Adjusted R-squared:  0.0284
F-statistic: 21.27 on 2 and 1385 DF,  p-value: 7.942e-10
```

Standardization/Z-scoring

Example: Heptathlon scores in the 2012 Olympics



	athlete	run200	lj
1	Jessica Ennis	22.83	6.48
38	Tatyana Chernova*	23.67	6.54

which performance is more remarkable?

$$z = \frac{x - \bar{x}}{\sigma_x}$$

*was later disqualified for doping but we take these numbers as face values for the sake of our example