

Using a logarithmic transformation in regression

Supplementary lecture

In the lab session in Week 9 we transformed mother's current height using the natural logarithm, ln().

Here we use this in a regression.

Regression mother's weight, log transformed, on number of units of alcohol per week.

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Regression mother's weight, log transformed, on number of units of alcohol per week.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1. (Constant)	4.160	.010		400.497	.000	4.140	4.180
Units of alcohol in average week	.003	.001	.076	1.979	.048	.000	.005

Dependent Variable: lnwtwkg1

	Unstandardized Coefficients		Sig.	95.0% Confidence Interval for B	
	B	Std. Error		Lower Bound	Upper Bound
(Constant)	4.160	.010	.000	4.140	4.180
Units of alcohol in average week	.003	.001	.048	.000	.005

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Regression mother's weight, log transformed, on number of units of alcohol per week.

	Unstandardized Coefficients		Sig.	95.0% Confidence Interval for B	
	B	Std. Error		Lower Bound	Upper Bound
(Constant)	4.160	.010	.000	4.140	4.180
Units of alcohol in average week	.00270	.00137	.048	.000021	.00539

$\text{Log}_e(\text{weight}) = 4.160 + 0.00270 \times \text{units of alcohol}$

95% CI: 0.000021 to 0.00539

What does this tell us about weight?

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Regression mother's weight, log transformed, on number of units of alcohol per week.

$$\text{Log}_e(\text{weight}) = 4.160 + 0.00270 \times \text{units of alcohol}$$

95% CI: 0.000021 to 0.00539

What does this tell us about weight?

Antilog:

$$\text{weight} = 64.071523 \times 1.00270^{\text{units of alcohol}}$$

95% CI: 1.00002 to 1.00540

Weight is multiplied by 1.00270 for every unit of alcohol consumed per week.

E.g. 5 units alcohol per week multiplies weight by  $1.00270^5 = 1.01357$ .

20 units alcohol multiplies weight by  $1.00270^{20} = 1.0554$ .

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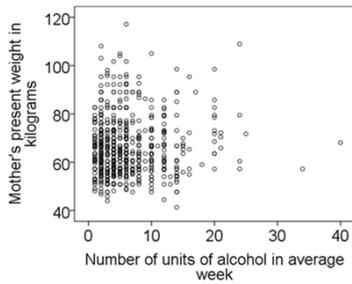
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Regression mother's weight, log transformed, on number of units of alcohol per week.

20 units alcohol multiplies weight by  $1.00270^{20} = 1.0554$ .




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