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, In().

Here we use this in a regression.

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

Coefficients ^a			Standardined		6 1-	OF OK Confidence latence for P	
Model	Coefficients		Coefficients	t	sig.	95.0% considence Interval for B	
	В	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	4.160	.010		400.497	.000	4.140	4.180
alcohol in average w Dependent Va	eek		.070	1.5/3	.048		
	nable. Inwulwą	1					
	nable. niwchwą	Unstan	dardized	4		95.0% Co	nfidence
	nable. niwulwą	Unstan Coeffic	dardized	t s	Sig.	95.0% Co Interval fo	nfidence r B
	nable. Inwinwy	Unstan Coeffic	idardized ients	5 E	Sig.	95.0% Co Interval fo	nfidence r B Upper
	naue. niwurwą	Unstan Coeffic B	idardized ients Std. Error	3 5	Sig.	95.0% Co Interval fo Lower Bound	nfidence r B Upper Bound
Constan	t)	Unstan Coeffic B 4.160	dardized ients Std. Error .010	3 t	Sig.	95.0% Co Interval fo Lower Bound 4.140	nfidence r B Upper Bound 4.180

Regression mother's weight, log transformed, on number of units of alcohol per week.							
	Unstandardized Coefficients		Sig.	95.0% Confidence Interval for B			
	В	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		

Log_e(weight) = 4.160 + 0.00270 × units of alcohol 95% CI: 0.000021 to 0.00539

What does this tell us about weight?



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

Log_e(weight) = 4.160 + 0.00270 × units of alcohol 95% CI: 0.000021 to 0.00539

What does this tell us about weight? Antilog:

weight = 64.071523 × 1.00270^{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 $1.00270^{20} = 1.0554$.



