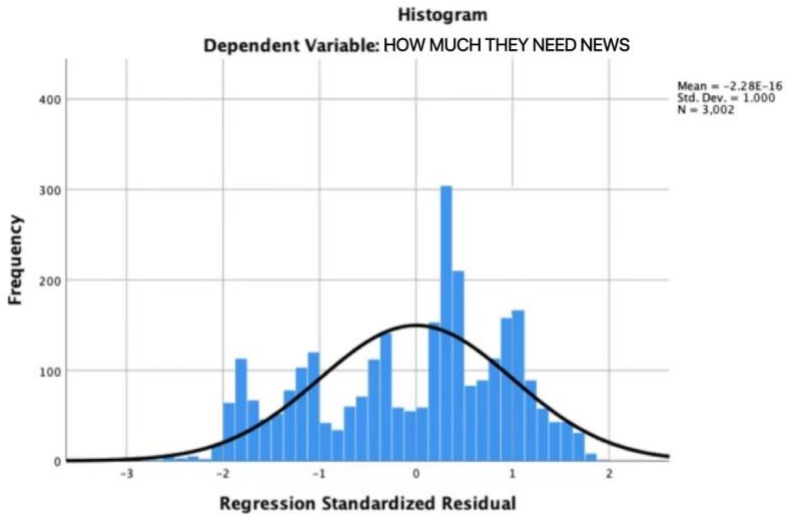
Homework Week 12
(Non-normality, non-constant variance, collinearity)

Simon Chen
Apr 19 2022

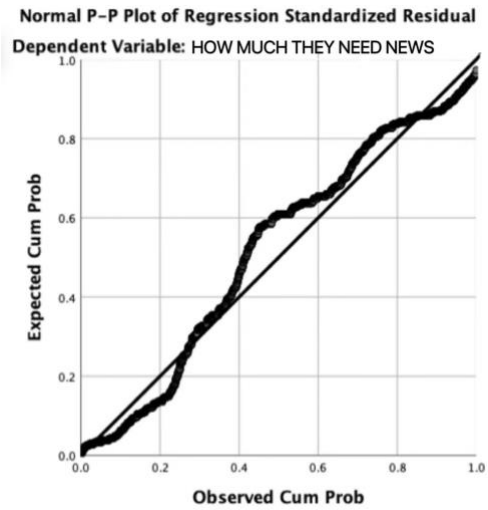
Attention: *For the remainder of the assignments this semester, it is suggested that you work with the same dataset and group that you plan to use for your final project. This gives you an opportunity to get to know your data and to do preliminary analyses (with feedback).*

For this assignment, use the dataset and model you chose for Homework Week 11 (Or, alternatively, put another model together).

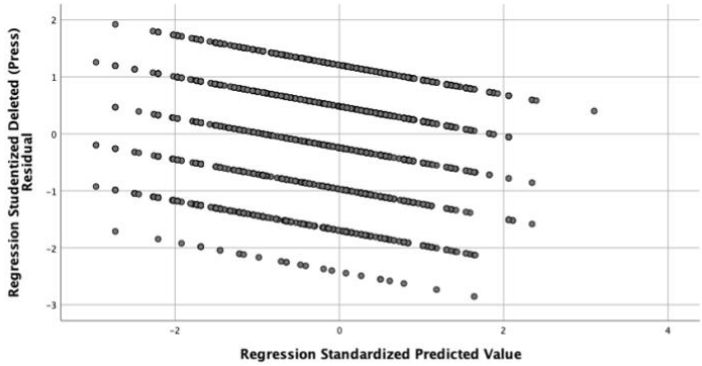
1) For your model, use methods outlined in class to check for non-normality and non-constant error variance. In each case, attempt to correct any problems that are detected.
   - Use relatively simple diagnostics to check for problems and more sophisticated methods to follow up.
   - To check for non-normality, construct a PP-plot and a histogram of the studentized deleted residuals.
   - To check for non-constant variance, plot studentized deleted residuals against fitted values.



The shape does not follow the normal distribution features.



The dots distribute along the diagonal line of the P-P plot. So the residues are fine.



There is no pattern behind it.

2) For each coefficient in your model, find the variance inflation factors (VIF's). Does collinearity appear to be a serious problem in the model? If so, is there anything reasonable that can be done about it?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.145	.107		38.718	.000		
	HOW OFTEN USE PHONE	-.187	.027	-.148	-6.956	.000	.686	1.458
	HOW OFTEN USE WEB	.084	.023	.086	3.640	.000	.564	1.773

The value of $\sqrt{}$[VIFj] is less than 2.

In all of your analyses, you should (a) diagnose the problem, (b) attempt to fix the problem, and (c) show how a new model or method deals with the problem. Be sure to show the progression in your analysis and explain to the reader (i.e. TA) what your steps were.