Question:

I am interested in a model containing an interaction between two L1-predictors and one L2-predictor. This is the model:

within = x w xw;
between = z;

model:
%within%
y on x w;
s | y on xw;

%between%
y on z;
[s];
s on z;
y with s;

How can I plot the interaction and calculate simple slopes adapting the input from example 9.2b? I would like to calculate slopes for low/ high values of w and z.

Thank you.
Answer:

You can just play with the regression equations for your model:

\[ y = a_j + b_1x + b_2w + b_3jw + \text{error} \]
\[ a_j = a + g_1z + \text{error} \]
\[ b_3j = b + g_2z + \text{error} \]

Here \( a_j \) is your random intercept which appears as \( Y \) on Between and \( b_3j \) is your random slope \( s \) in the regression of \( y \) on the \( xw \) interaction. Plugging the last 2 equations into the first, you have

\[ y = a + g_1z + b_1x + b_2w + (b + g_2z)xw + \text{error terms}, \]

where the terms involving \( x \) can be summarized as

\[ [b_1 + (b + g_2z)w]x. \]

That would be the simple slope that can be evaluated as a function of \( x \) for different combinations of values of \( z \) and \( w \). This can be done like the plot of ex 9.2b where you just have a different simple slope formula as given above and you have not only 2 expressions you want to plot but perhaps 4 (low/high \( z \) combined with low/high \( w \)).