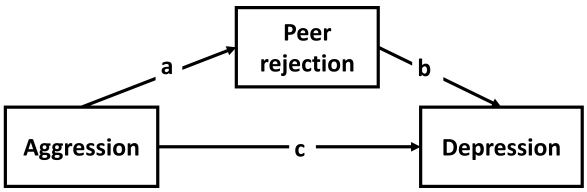
Indirect effects - Mediation

Question: Why do we multiply the two paths together rather than add them up to get an indirect effect?

Let's use the example from the lecture where we had:



One way to think about it is to re-express the prediction equations for our two endogeneous variables (omitting the residual terms) in terms of a single equation for the effects of aggression:

Our regression prediction equations are, for the effect of the predictor and mediator on the outcome:

$$Dep_i = b * PR_i + c * Agg_i$$

And for the effect of the predictor on the mediator:

$$PR_i = a * Agg_i$$

We could sub the second equation into the first:

$$Dep_i = b * (a * Agg_i) + c * Agg_i$$

And then re-arrange to give us the total effect of aggression:

$$Dep_i = a * b * Agg_i + c * Agg_i$$

and finally:

$$Dep_i = (a * b + c) * Agg_i$$

$$Dep_i = b * (a * Agg_i) + c * Agg_i$$

where a*b is the indirect effect and c is the direct effect

If we were to add up a and b rather than multiply them, this would not typically be meaningful as 'a' and 'b' refer to the effects on different endogenous variables (peer rejection versus depression). However, we *can* add $a * b$ to c to get the total effect of aggression on depression because both effects pertain to the same outcome i.e., depression.