

Knock knock. Who's there? It's regression discontinuity! But which door?

Regression discontinuity design can return a causal effect by shielding the exposure of interest from (unobserved) confounding. It does so through a forcing variable, a score or alike with a threshold that is the sole cause of exposure. For an epidemiology overview see [here](#). As always a DAG better expresses this.



For DAG aficionados, this looks a bit front doory? Front door criterion is sort of akin to a reverse instrumental variable. This is where a mediator of a confounded exposure acts as the instrument for the exposure. Examples are hard to find. The regression discontinuity example is a bit different, here the exposure rather than the mediator is the shielded variable. Also the shielding variable does effect the outcome. But does it have the property of the front door criterion? The forcing variable / exposure relationship is identifiable as the outcome (a collider) blocks the open path. Exposure / outcome relationship is identifiable by backdoor adjustment for the forcing variable.

There are different flavours of regression discontinuity design. What we might call the randomized is based on a slightly different DAG (below). Analysis focuses entirely on the threshold of the forcing variable. Here forcing variable measurement error means that exposure is effectively randomized and adjustment isn't needed.



Caveat time. This is just my drawing of the design, others exist. and this is a blog, so my language is imprecise, and mistakes even more likely. To read more about the front door criterion see [The Book of Why](#).

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