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| Family income, a confounder, is associated with differential brain structure and attention problems. Graphically, the confounder (C) creates an open backdoor path, which is a non-causal path from the exposure (A) to outcome (Y):  (1)  The path is “backdoor” because it flows backwards from the predictor to the confounder to the outcome and it therefore connects A-Y other than the direct A-Y path. It is “open” because it is unblocked. Once family income is “controlled” for, the backdoor path will be closed, as denoted by the box around C, and the observed association between brain structure and attention problems will no longer be biased by family income:  (2)    Regardless of the approach taken to control for confounding, there is also potential for bias due to residual confounding, such as in the presence of unmeasured confounders (U). In this example, genetic variations, which play an important role in both brain structure and attention problems, are not used in our study:  (3)  Unmeasured confounders cannot be controlled for and therefore create an open backdoor path between A and Y (A-U-Y). |