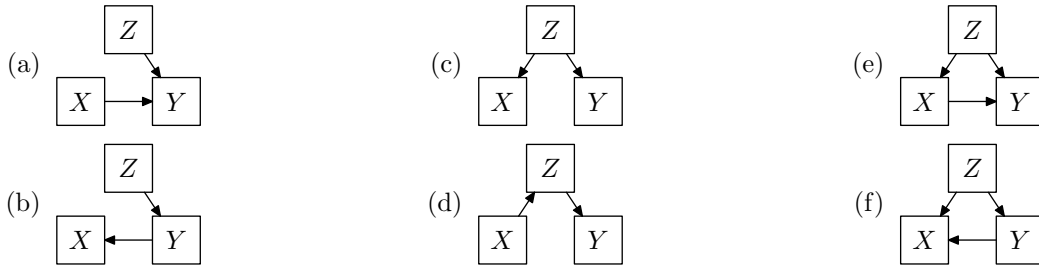


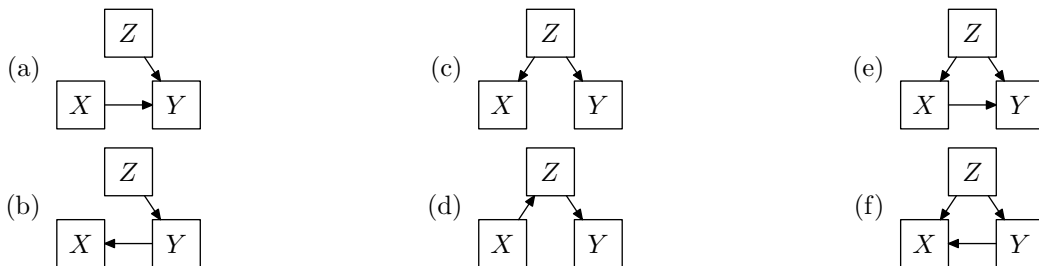
Philosophy 12: Introduction to Causal Reasoning

Study questions for Lecture 15: Experiments

1. Which of the following graphs predict that X and Y are associated conditional on Z :



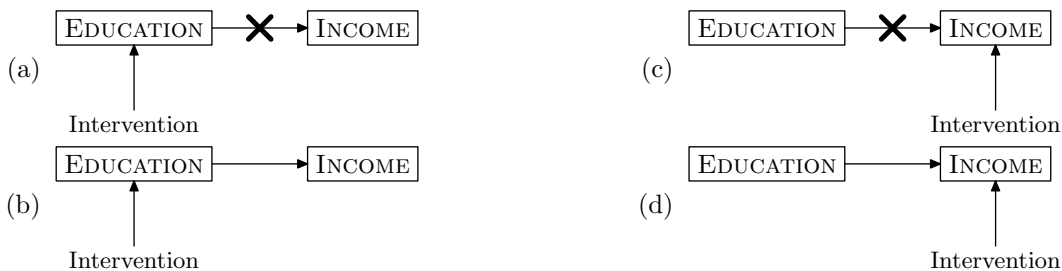
2. Which of the following graphs predict that X and Y are associated conditional on Z , and are consistent with the fact that X is prior to Y ?



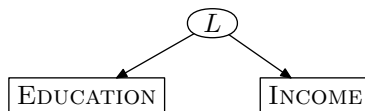
3. Consider the following causal graph:



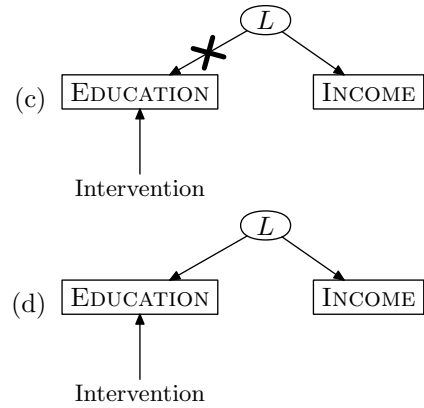
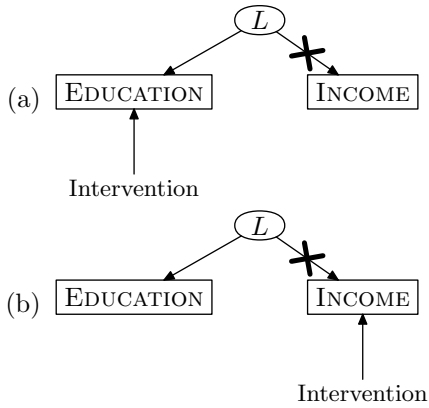
Which of the following graphs is the post-manipulation graph for an intervention on EDUCATION?



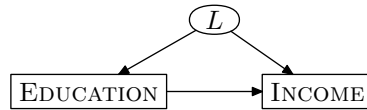
4. Consider the following causal graph:



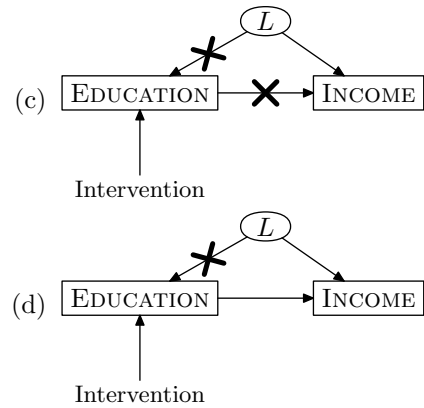
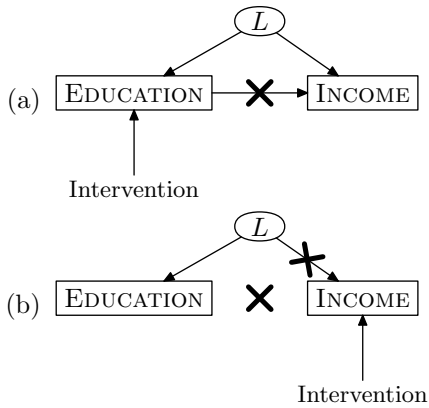
Which of the following graphs is the post-manipulation graph for an intervention on EDUCATION?



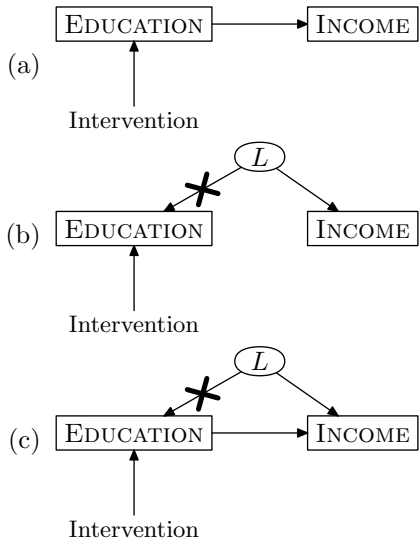
5. Consider the following causal graph:



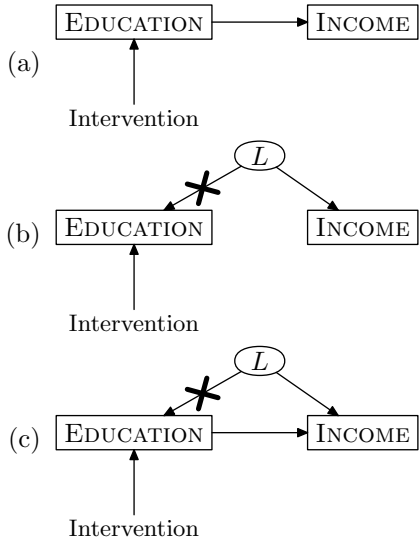
Which of the following graphs is the post-manipulation graph for an intervention on EDUCATION?



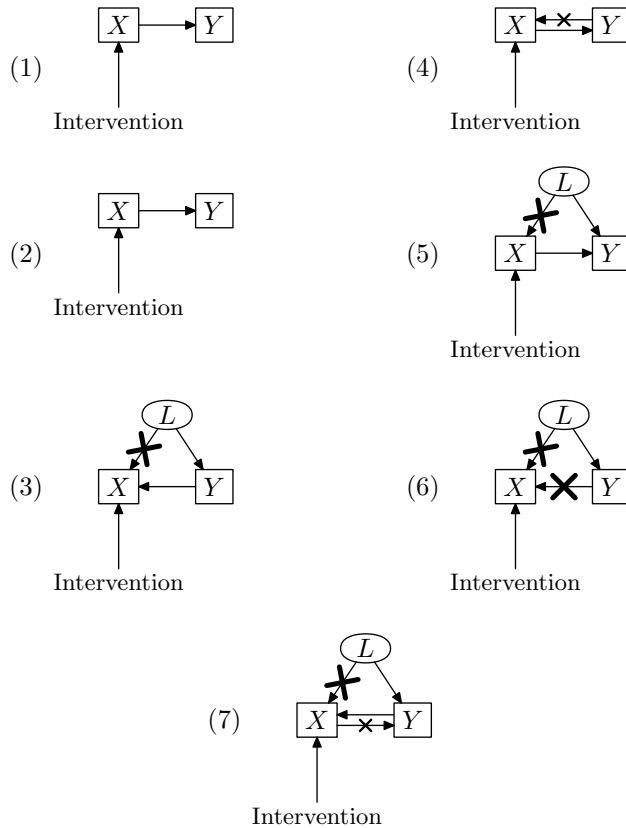
6. In which of the post-manipulation graphs below is EDUCATION still causally connected to Income?



7. Which of the post-manipulation graphs below will produce an association between EDUCATION and INCOME in the data from the experiment?



For the following two problems, consider seven post-manipulated graphs:



8. In which of the post-manipulation graphs above is there a causal connection between X and Y ?

- | | | |
|-------|-------|-------|
| (a) 1 | (d) 4 | (g) 7 |
| (b) 2 | (e) 5 | |
| (c) 3 | (f) 6 | |

9. Which of the post-manipulation graphs above predict that X and Y are associated?
- (a) 1 (e) 5
 (b) 2 (f) 6
 (c) 3 (g) 7
 (d) 4
10. Which of the following types of causal connection is in *any* of the post-manipulation graphs above?
- (a) X is a cause of Y
 (b) Y is a cause of X
 (c) There is a common cause of X and Y
11. An ideal intervention on X breaks causal connections of which types between X and another variable Y ?
- (a) Causal paths from X to Y
 (b) Causal paths from Y to X
 (c) Common causes of X and Y
12. Suppose that the American Dental Association hypothesizes that a teenage boy's chances for getting a date go up with the whiteness of his teeth. They figure that, if their hypothesis is true, they can get some extra business by getting the word out to teenage boys. They hire a research, Smith, who picks 10,000 seniors in high school at random from California and then scores each as having either white or stained teeth, as well as the number of dates they had in the last 2 months. Suppose Smith finds that boys with whiter teeth went out on 25% more dates than boys with stained teeth. This data supports:
- (a) White teeth cause dates
 (b) Dates cause white teeth
 (c) Dates and white teeth have a common cause
 (d) All of the above might be true
 (e) None of the above could be true
13. Suppose that the ADA hires another research, Jones, who performs an experiment in which he picks 10 high school seniors from Cincinnati, but pays them to either have their teeth whitened or stained. He then measures whether the group of five boys whose teeth he whitened get more dates than the group of five whose teeth he stained in the month following his treatment. The whitened group got 15 dates, the stained group got 13 dates. This experiment supports:
- (a) White teeth cause dates
 (b) Dates cause white teeth
 (c) Dates and white teeth have a common cause
 (d) White teeth and dates are not causally connected in any way.
 (e) All of the above might be true
 (f) None of the above could be true
14. The study done by Smith is inconclusive about the causal question because (pick the best answer):
- (a) Association in a non-experimental study underdetermines causation.
 (b) Because Smith did an experiment with uncontrolled causes, the association Smith found might be due to luck.
 (c) Smith didn't ask the girls why they went on dates with the guys.
 (d) Smith didn't ideally intervene on the boy's teeth.

(e) None of the above.

15. The study done by Jones is inconclusive about the causal question because (pick the best answer):

(a) Association in a non-experimental study underdetermines causation.

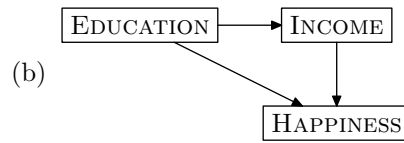
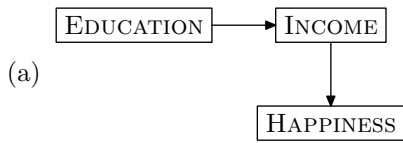
(b) Because Jones did an experiment with uncontrolled causes, the association Jones found might be due to luck.

(c) Jones didn't ask the girls why they went on dates with the guys.

(d) Jones didn't ideally intervene on the boy's teeth.

(e) None of the above.

16. Which of the following graphs predict that EDUCATION and INTERVENE are associated after an ideal intervention on EDUCATION?



(c) Neither (a) nor (b)

17. Suppose we know that X is a cause of Y , but we don't know if it is a direct or indirect cause of Y . By performing an experiment in which we ideally intervene on X :

(a) we will be able to tell because X and Y will only be associated if X is a direct cause of Y .

(b) we will be able to tell because X and Y will only be associated if X is an indirect cause of Y and not a direct cause.

(c) we will not be able to tell because ideal interventions on X do not affect causal relationships between X and any of its effects, and both a direct and an indirect cause from X to Y will produce association between X and Y .