

Today's post comes from Antony Ritz, a Veritas Prep GMAT instructor in [Washington, D.C.](#) Before you read this post, be sure to read [Part I](#) and [Part II](#)!

And now for the exciting conclusion — the correlation/causation issue in actual GMAT questions! Let's try one:

A researcher discovered that people who have low levels of immune-system activity tend to score much lower on tests of mental health than do people with normal or high immune-system activity. The researcher concluded from this experiment that the immune system protects against mental illness as well as against physical disease.

The researcher's conclusion depends on which of the following assumptions?

- (A) High immune-system activity protects against mental illness better than normal immune-system activity does.
- (B) Mental illness is similar to physical disease in its effects on body systems.
- (C) People with high immune-system activity cannot develop mental illness.
- (D) Mental illness does not cause people's immune-system activity to decrease.
- (E) Psychological treatment of mental illness is not as effective as is medical treatment.

This question appears courtesy of the *The Official Guide for GMAT Verbal Review, 2nd Edition* (page 118, question #7). Take two minutes to try it.

Were you able to spot the correlation/causation disconnect in this question? The first statement, a premise, establishes a correlation between immune-system activity and mental health. But the second statement jumps to the conclusion that a healthier immune system causes better mental health.

Well, we know better than to make such a brazen leap, don't we? There are several possible explanations for an observed correlation, including not only direct causation but also reverse causation, third cause, a mix of the above, and even total coincidence.

In this case, coincidence is unlikely; researchers tend to conduct large studies with multiple trials to reduce the chance of fluke findings. However, perhaps some third factor causes both immune system deficiencies and mental health problems — Diet? Age? Alcohol use? The list goes on. There is one more alternative explanation. Maybe we just have it backwards. Better mental health might cause better immune-system strength, instead of the other way around.

To improve the argument, we could rule some of these alternatives out, or we could show that the hypothesized causation makes sense — perhaps because it's in time order. With these possibilities in mind, let's see what we find in the answer choices.

Answer A doesn't address the correlation between low immune-system activity and mental illness. The premises never discussed whether any difference exists between normal and high immune-system functioning.

Answer B invites speculation about the mechanism by which the immune system interacts with illness. Even if mental illness affects the body differently than does physical illness, the immune system could still affect both. This also doesn't say which direction the causation runs. It may be a bit hard to figure this answer out, but it's clearly not what we were looking for, so it's best to keep looking and just come back later if necessary.

Answer C involves a misunderstanding of how causation actually works. To say that a strong immune system protects against mental illness doesn't mean that a strong immune system guarantees the absence of mental illness. Smoking may cause cancer, but that doesn't mean that everyone who smokes will get cancer. Answer C also doesn't fit with our expectations. Keep moving.

Answer D, on the other hand, is exactly what we want. What if D were false? "Mental illness DOES cause people's immune-system activity to decrease." Well, that's pretty much exactly the reverse causation explanation we considered

above. If mental illness is actually a cause, rather than an effect, of a weakened immune system, then the correlation can be explained contrary to the argument's stated conclusion. In order for the evidence to establish that the immune system protects against mental illness, it's necessary that reverse causation is not the case. So D is an assumption on which the conclusion depends, and D is correct.

Answer E lends itself to speculation that mental illness does, in fact, have a physical basis (though not necessarily immune-system based). However, this point is not necessary to the conclusion. Even if medical treatment were not more effective than psychological treatment for mental illness, this would not establish that the immune system played no part in protecting against mental illness — just that it might not be the only cause. So while E might seem helpful, this answer does not fit the correlation/causation rubric and does not fill the role (a necessary assumption) demanded by the prompt.

Want more practice? Other GMAT questions featuring the correlation/causation issue include:

- The Official Guide for GMAT Review, 13th Edition by the Graduate Management Admission Council — Section 8.4: Critical Reasoning Practice Questions: #19 (page 505); #37 (page 511); #55 (page 516); #82 (page 525); #115 (page 535); #118 (page 536)
- The Official Guide for GMAT Verbal Review, 2nd Edition by the Graduate Management Admission Council — Critical Reasoning Sample Questions: #5 (page 117); #12 (page 120); #20 (page 122); #30 (page 126); #33 (page 128); #46 (page 134); #47 (page 135); #55 (page 138); #59 (page 140); #62 (page 141)