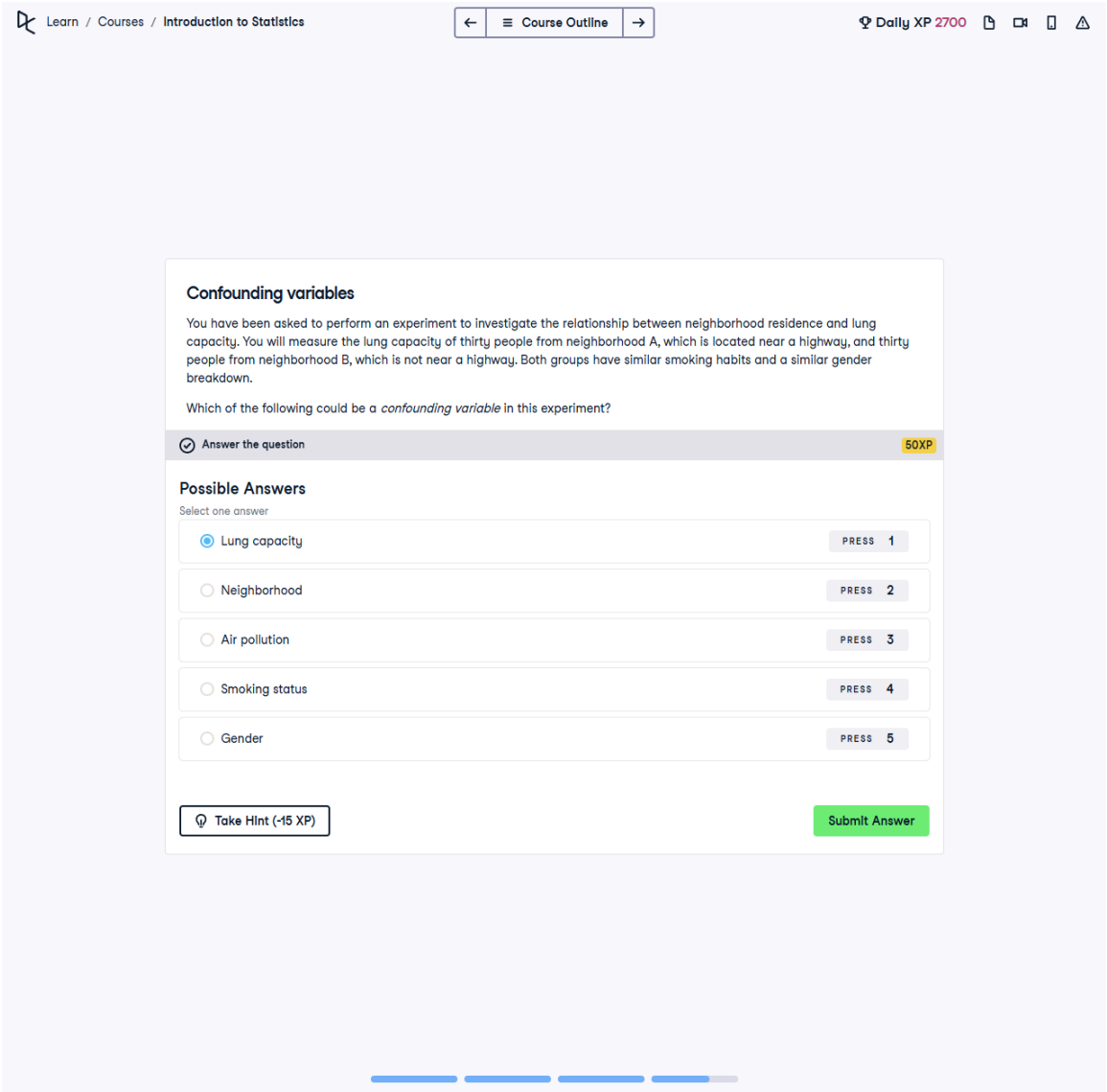
Confounding Variables

You have been asked to perform an experiment to investigate the relationship between neighborhood residence and lung capacity. You will measure the lung capacity of thirty people from neighborhood A, which is located near a highway, and thirty people from neighborhood B, which is not near a highway. Both groups have similar smoking habits and a similar gender breakdown.

Which of the following could be a confounding variable in this experiment?



Answer

Answer: Air pollution.

Explanation: Air pollution is a potential confounding variable in this experiment because it is likely correlated with both neighborhood residence (proximity to a highway) and lung capacity. It could influence the results independently of the neighborhood itself.

Explanation of the Answer

1. **Confounding Variable Definition:**
- A confounding variable is an external factor that is associated with both the independent variable (neighborhood residence) and the dependent variable (lung capacity), potentially affecting the results.

2. **Why Air Pollution?:**
- Proximity to a highway increases exposure to air pollution, which can directly affect lung capacity. Thus, air pollution could be responsible for differences in lung capacity rather than neighborhood residence alone.

3. **Controlled Factors:**
- Smoking status and gender are controlled (similar across groups), so they are not confounders in this study. Lung capacity is the outcome being measured, so it cannot be a confounder.