Critiquing Internal Validity - the smoking examples

These are clearly not focused on the design type issues (multiple groups, random assignment, blind procedures etc.). Instead these are asking you to look at covariation, temporal precedence and other beginnings of internal validity.

Study 1. Does Smoking Cause Cancer (Part 1)?

1. What kind of study would you call this?

This study was concerned with the cause of the observed disease, but was a relational study. The investigator wanted to uncover clues about causes that could be further studied.

2. Would you say that there was good evidence that smoking caused cancer from what you read?

Although in the hindsight of what we know now it would appear to be an obvious conclusion that smoking caused the man’s cancer, this conclusion is not supported by the association observed. There are plausible alternative causes not addressed with this study design.

3. What internal validity issues do you see in this study?

As suggested above, there are many alternative explanations for the observations, and in fact this became the main argument of the tobacco companies for many years.

Study 2. Does Smoking Cause Cancer (Part 2)?

1. What kind of study would you call this?

This is also a relational study because the relationship between smoking and cancer incidence was studied.

2. Would you say that there was good evidence that smoking caused cancer from what you read?

The evidence is clearly stronger than the single case provided, and the size of the effect is impressive.

3. What internal validity issues do you see in this study?
We don’t know if the researchers attempted to control for plausible alternatives to explain the relationship (e.g., occupational or other environmental issues) so still the causal case is not completely made.

Study 3. Does Smoking Cause Cancer (Part 3)?

1. What kind of study would you call this?

This study was still a relational study, but the design was stronger because it was prospective (that is).

2. Would you say that there was good evidence that smoking caused cancer from what you read?

You can see that the prospective design provides the most convincing evidence yet about the relationship between smoking and cancer.

3. What internal validity issues do you see in this study?

The study provides evidence of covariation and temporal precedence, but the absence of complete control over all plausible alternatives kept the debate about tobacco and cancer going for many years.