1.17: **(a):** Observational study

(b): It is natural to use a stratified sampling method, about 10 students from each group.

1.18: **(a):** Observational study

(b): It is natural to use stratified sampling. The strata would be the 4 years. You would then randomly sample from each strata.

1.19: **(a):** There is a positive, nonlinear association between life expectancy and internet participation.

(b): Observational study.

(c): Countries that are more set up to use fossil fuels have higher life expectancies and higher internet participation.

1.20: **(a):** Observational study.

(b): No. This study can not show a causal relationship.

(c): More caffeine or less sleep.

1.21: **(a):** Reasonable!

(b): Sure... I wonder why we think different fields would have different opinions on the student union. But, if we wanted to be sure to get every field represented, it is fine.

(c): Ages would not be clusters. I imagine the younger students are probably more interested in improving the student union, because they are more likely to be around to enjoy the improvements.

1.22: Gallup Poll is fighting a bias stemming from who is more likely to have a number in a phonebook – older people with land lines.

1.23: **(a):** The 200 participants.

(b): Disposition toward camping, disposition toward health care, disposition toward architecture, etc...

(c): Disposition toward microwave oven.

(d): Yes, the study uses random sampling.

(e): Observational study. There is no assignment to experimental groups.

(f): No. We can not establish a causal link.

(g): Yes. The sampling was random.

1.24: Well, we are more likely to ask a child from a large family because a large family probably has more children at the school. This will cause an overestimation of the true value. Of course, this could be corrected for...

1.25: **(a):** Response bias. A parent who has time is more likely to fill out the survey.

(b): Hmm... there might be a link between whether a woman moved and whether the child has respiratory problems. I'm not exactly sure what story makes most sense here. Maybe if a child has respiratory problems, the mother will be more likely to consider moving out of the city?

(c): Maybe they run because they don't have joint pain.

1.26: **(a):** Random sampling is always good.

(b): This stratified sampling could be fine.

(c): I'd worry about missing voices from a distinct neighborhood. I don't think this is effective.

(d): I'd worry about the same issue as with the previous method.

(e): This convenience sample is laughably bad.

1.27: **(a):** Random sampling with the possibility of non-response bias.

(b): Convenience sample, probably biased somehow.

(c): Convenience sample, similar to problem above.

(d): Multistage sampling. This might be fine, but I imagine there might be different relationships in different classes (like, math classes might show a stronger negative association than philosophy classes), so the sample might not be representative.

1.28: **(a):** We should not conclude a causal relationship. It is an observational study. Maybe those with dementia are more likely to smoke.

(b): Nope. Maybe the causal relationship goes the other way. Maybe bullies feel bad, and that effects their sleep. Also, maybe a third confounding variable causes both (like trouble at home).

1.29: I'd guess most Facebook users are not college students who have joined a psychology participation pool and are interested in this study. This sounds quite biased, so we can not generalize to the population.