Critical Thinking

Tutorial 7: Inference from a sample

**Exercise 1:** Identify the population, sample, and target property for each of the following inference from a sample arguments. Then comment on whether the argument provides a good reason to accept the conclusion. If it is not what are its main weaknesses?

1. About 45% of 1,000 doctors randomly selected from Melbourne hospitals are female. Therefore, between 40% and 50% of all doctors in Melbourne are female.

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| --- | --- |
| Population: |  |
| Sample: |  |
| Target Property: |  |

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| --- | --- |
| Population: |  |
| Sample: |  |
| Target Property: |  |

1. Based on a survey of 3460 homeowners in Melbourne, 95% also owned an automobile. Therefore, almost all Melbournians own a car.

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| Population: |  |
| Sample: |  |
| Target Property: |  |

1. Trust me, I’m a tour guide in New York and I meet Canadians all of the time. Canadians just dress less formally than Americans do.

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| Population: |  |
| Sample: |  |
| Target Property: |  |

1. None of the 15 social workers we investigated has behaved unethically. Therefore, if we investigate another social worker, he or she will not have behaved unethically.

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| Population: |  |
| Sample: |  |
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**Exercise 2:** Assuming that the given statement is true, indicate which conclusions would be strongly supported.

*72% of the three hundred university students who responded to a questionnaire published in the campus newspaper are opposed to the president’s economic policies.*

1. Some readers of the campus newspaper are opposed to the president’s economic policies.
2. 72% of the students attending this school are opposed to the president’s economic policies.
3. Some students attending this school are opposed to the president’s economic policies.
4. Most readers of the campus newspaper are opposed to the president’s economic policies.
5. 72% of the readers of the campus newspaper are opposed to the US president’s economic policies.

**Exercise 3:** After reading the following procedures for sampling a population and measuring the target property determine what risks, if any, there are of sampling bias and measurement bias. If you identify any risks of bias, explain what they are, and how they might affect the results.

1. Nina recently started her own podcast and she wants to figure out which segments she should prioritize to grow her audience. She directs her listeners to an online poll to evaluate the different segments she regularly holds during her podcast episodes.
2. Nadir wants to do research about energy-use habits among undergraduates at Monash University. He constructs a survey to ask respondents about a variety of energy saving and spending habits. He plans to call a representative sample of 100 undergraduates and ask them the questions on the survey over the phone, while recording their answers.
3. Noah is working on a project for his marketing class on consumer opinions of major brands. He decides to survey 500 people from within Metropolitan Melbourne in hopes of reaching some conclusions about consumer attitudes in Melbourne. He pays for a representative sample of phone numbers of Melbournian residents and calls people for a few hours when he wakes up every morning at 9 AM until he is able to complete 500 surveys with people who answer the phone.

**Exercise 4:** More complex examples involving inferences from a sample.

1. To determine the overall workplace satisfaction of their younger employees (aged 20-30 years old) the HR department at a multi-national corporation asked each of their 2000 employees (aged 20-30 years old) from their branches in Melbourne and Sydney to complete and return a survey asking the key question about job satisfaction. They received 468 completed surveys back and found that 75% say that they are at least satisfied with their current employment. Of those, 23% reported being very satisfied. Given that this is higher than the Australian national average (75.4%), the HR department concludes that no changes need to be made to improve the workplace satisfaction of young employees.

**What is the main conclusion of this article?**

**What is statistical generalization is made?**

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| --- | --- |
| Population: |  |
| Sample: |  |
| Target Property: |  |

**Is it supported by the study?**

1. People from 171 countries responded to the web survey, which was available in ten languages. It was live for seven weeks, spanning May and June 2020.

This report, based on 55,811 responses, includes data from 11 countries where we had the most respondents: Austria, Australia, Brazil, France, Germany, Ireland, Netherlands, New Zealand, Switzerland, United Kingdom, and the United States.

People reflected on how their alcohol and other drug use had changed in the past month (April to May) compared to February 2020, before the COVID-19 pandemic was declared and lockdown restrictions implemented in most countries.

The Australian sample of 1,889 people consisted mainly of younger adults (73% were younger than 35). The sample spanned Australian jurisdictions, including 40% from Victoria.

We asked people about how often they drank alcohol, how much they drank in a typical session, and how often they binge-drink, defined as drinking five or more drinks in a session.

Some 39% reported drinking more compared to before COVID-19, whereas a similar number (37%) were drinking less. A total of 17% reported drinking at the same frequency and quantity, while 7% reported a mix of effects.

This challenges the existing narratives that people are mainly drinking more alcohol during lockdown. While we acknowledge many people did drink more, our results showed a varied response.

*(*[*https://theconversation.com/forget-the-stereotypes-our-survey-shows-many-young-people-are-drinking-less-alcohol-in-lockdown-145832*](https://theconversation.com/forget-the-stereotypes-our-survey-shows-many-young-people-are-drinking-less-alcohol-in-lockdown-145832)*)*

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