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**Name of partner(s) if you worked with someone on this assignment: Elodia Lunn**

**Hands On 8**

**“A new study from Japan reports that hot baths can reduce a person’s risk for heart disease and stroke.”**

**First, read:** <https://www.healthline.com/health-news/hot-baths-reduce-risk-of-heart-disease-stroke>

**Then read the actual paper by Ukai et al. (2020**), posted in the HO8 folder on Courseworks. **Key portions of the paper are highlighted, so focus on those. Do not worry about understanding the statistical analyses or more intricate details –** we are just using this paper to think through research claims and the four types of validities, and you have plenty of other things going on as the semester wraps up!

**Construct validity**

1. The Healthline journalist’s summary identifies three major variables: bathing frequency, heart disease, and stroke. **For each of these three variables, using the actual paper by Ukai et al. (2020), indicate whether the variable was measured or manipulated and how specifically it was operationalized.***(The Ukai paper also describes other variables, but just focus on these three main variables for now.)*
2. **Bathing Frequency**
   1. **Measured: Asking participants in self report questionnaires on how often an individual bathed in a bath/tub in one week. The responses are categorized as less than once a week on average, one to two times per week, three to four times per week, or almost daily.**
3. **Heart Disease**
   1. **measured: Heart disease in the study was confirmed through documented cases of coronary heart disease. Such included: myocardial infarctions and sudden cardiac deaths were collected in medical records through specific criteria​​.**
4. **Stroke**
   1. **measured: Stroke was confirmed by the National Survey of Stroke’s criteria and was diagnosed/confirmed through examination of CT scans, magnetic resonance images or autopsy**
5. **Consider the construct validity of these measures. Identify one strength for the construct validity of the study and one possible threat to the construct validity of the study.** *(Hint: if stumped on a threat, see beginning of the last paragraph on page 735 in the paper…)*

**Strength: Heart Disease and stroke were operationalized well because they used well-established medical criteria and professional diagnostic imaging**

**Possible Threat: Lack of generalization. y only at 1 culture (Japan) and this study tries to generalize it to the entire world population. Different cultures could have different associations where bathing habits differ significantly.**

* **They stated they could conduct this observational study in a unique culture in which tub bathing is a common habit and it shows that the people in the study who bathed more were often from higher socioeconomic conditions and thus had more healthier habits which adds another variable to just isolating bathing and heart disease. Thus it seems this culture is unique in particular and different from other cultures which do not focus on bathing as much as Japan**

**Statistical validity**

1. **Was the study correlational or experimental?**

**Correlational**

1. **Does the Healthline journalist make any causal claims? If so, paste in an example sentence or phrase from the Healthline article that makes a causal claim.**

**Yes it does:**

**“A new study from Japan reports that hot baths can reduce a person’s risk for heart disease and stroke.”**

1. **How many participants did the sample ultimately include?**

**30,076 Participates aged 40-59 excluding those with a history of heart disease or cancer**

1. **Evaluate the statistical validity of the study and/or the claims made in the Healthline article. Identify one strength for statistical validity and one possible threat to statistical validity (either from the original Ukai article or the Healthline article).** *(Hint: if stumped, consider the questions above, and/or look at the summary strength/threat slide for evaluating statistical validity.)*

**Strength: This study has a large sample size. This will strengthen the statistical validity (increases power in statistics)**

**Possible Threat: unmeasured confounding variables can influence the relationship between bathing frequency and the risk of cardiovascular issues. These variables include socioeconomic status or other lifestyle factors that correlate with both bathing habits and health outcomes​​.**

1. **If you were the editor at Healthline, how would you edit the article’s headline to improve the statistical validity of the claim?**

* **Change the title: Previous Studies have shown that Frequent Hot Baths are associated with lower risk of Heart Disease and Stroke**

1. **What is one additional way the researchers could have further strengthened the statistical validity of the study?** *(Hint: are any of the strengths for statistical validity listed in the slides missing from this study?)*

* Study: To strengthen the statistical validity of the claim is to create more measurements of the confounding variable, such as measuring how socioeconomic correlates to health issues and bathing frequency.
* Or to make this experimental by trying to isolate bathing frequency in sample groups and randomly assigning them.

**Internal validity**

1. **Does this type of study (see number 3 above – correlational or experimental) have high internal validity? Why or why not?**

* **I think it has a low internal validity because you cannot isolate bathing from the other confounding variables which are more difficult to measure.**

1. **Is it possible that there are alternative explanations for the observed results? Name one possible third variable that could explain the relationship between bath-taking and health.** *(Hint: A few possible third variables are discussed in the highlighted portions of the Ukai paper.)*

* **Yes, the type of people in the study’s lifestyles greatly influence the observed results. A third variable may include this: People who take baths more frequently are more health conscious, and have healthier habits which influences the risk of stroke and heart disease**

1. Bathing frequency was measured in 1990, and people who had a history of cancer or CVD were excluded from the analyses. Heart disease and stroke were then measured years later. **Given this, does this study provide evidence of temporal precedence?** *(If you need a reminder for what this is, see page 72 of the assigned chapter and/or lecture 13.)* **How does this help to minimize the reverse causation problem?**

* **This is not a causal study. Yes, participants with pre-existing cardiovascular disease (CVD) or cancer were excluded in the beginning. This made sure that all cases of heart disease or stroke were new incidents occurring after the start of the study and after bathing habits were established. This exclusion helps avoid reverse causation, supporting the study's claim that bathing frequency might influence heart disease and stroke risk.**

1. **Design a study that the researchers could run next that would maximize internal validity. Briefly describe the study, being sure to identify what kind of study it is (correlational or experimental), what the variables are, and how the variables are operationalized.**

**I would run an experimental test:**

**Variables**

* **Independent variable → frequency of bathing**
* **Control variables → Age, sex, socioeconomic status, general health status, and lifestyle factors (diet, physical activity)**
* **Dependent variable → risk of stroke/heart disease**

**Operationalationize**

* **Tub Bathing Frequency: Participants will be randomly assigned to one of three groups:** 
  + **a control group with no change in their current bathing frequency, a low bath frequency group (1-2 baths per week), medium bath frequency 3-4 per week and a high bath frequency group (daily baths).**
* **Heart Disease and Stroke: measured similarly to the paper → medical examinations and diagnostic tests conducted at the start and end of the study period to detect any new cases or changes in cardiovascular status.**
* **Control Variables: These would be assessed through questionnaires and updates throughout the study.**

**Then I would compare the cardiovascular levels from each group and see if there is a significant difference from bathing frequency.**

**External validity**

1. **If the researchers’ intended population was middle-aged Japanese adults, would this study be likely to have high external validity? Why or why not?**

* **The study likely has high external validity for middle-aged Japanese adults because that was the sample the study used**

1. **The Healthline article (and, to some extent, the researchers themselves) suggests that the study’s findings apply to everyone. Is this conclusion justified based on the study’s sample? What is one reason why the results may not generalize to other populations?** *(Hint: If stumped, you may want to consider how often the participants reported taking baths.)*

* **The conclusion that the study that this applies to the entire world population is questionable. This is due to cultural differences in bathing and lifestyle factors. Even in the research it said that bathing frequency is culturally specific, which could reduce the level of generalizability of the findings to other populations.**

1. **What is one next step you would recommend to the researchers to test the external validity of their findings?**

* **Researchers could replicate this study in different cultural and geographic places to compare to see if the observed correlations are similar across different populations.**

*If you want to try analyzing the four validities of another study (and associated media claim) for practice, try this one!  
Media coverage:* [*https://www.insidehighered.com/news/2021/01/22/australian-study-examines-impact-pandemic-scientists*](https://www.insidehighered.com/news/2021/01/22/australian-study-examines-impact-pandemic-scientists)

*Paper:* [*https://doi-org.ezproxy.cul.columbia.edu/10.5694/mja2.50860*](https://doi-org.ezproxy.cul.columbia.edu/10.5694/mja2.50860)