INTRO PSYCH SCIENTIFIC REASONING MODULE: SOCIAL TIES AND COLD SUSCEPTIBILITY

INSTRUCTOR GUIDE FOR SMALL CLASSES

TOPIC: SOCIAL

Photo source: https://en.wikipedia.org/wiki/Kin_selection

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Summary

In this module, students discuss a study that used a correlational design to isolate the health benefits of social network diversity, in terms of resistance to a cold virus. Students learn about social determinants of health in a way that allows for discussion of key scientific ideas related to gathering evidence to support an association as well as mechanisms that might explain the association. This module emphasizes reading and understanding scatterplots, *r* and *p* values, and positive and negative correlations.

Topic Social

Source Article

Cohen, S., Doyle, W., Skoner, D., Rabin, B., & Gwaltney, J. (1997). Social ties and susceptibility to the common cold. *Journal of the American Medical Association, 277*, 1940-1944.

Content Specific Student Learning Objectives

1. Think critically about social ties and resistance to infection.
2. Identify positive versus negative patterns of correlation from scatterplots.
3. Evaluate the strengths and weaknesses of a controlled study to assess the effects of social networks on the ability of participants to resist infection from a cold virus.
4. Analyze the conclusions, particularly in terms of causality, that can be drawn from a correlational design.

APA Learning Objectives (2.0)

1.1 Describe key concepts, principles, and overarching themes in psychology.
1.3 Describe applications of psychology.
2.1 Use scientific reasoning to interpret psychological phenomena.
2.2 Demonstrate psychology information literacy.
2.4 Interpret, design, and conduct basic psychological research.

MCAT Learning Objectives (2015)

Psychological, Social, & Biological Foundations of Behavior: Foundational Concept 8C
Scientific Inquiry & Reasoning Skills
Skill 2: Scientific Reasoning and Problem-solving
Skill 3: Reasoning about the Design and Execution of Research
Skill 4: Scientific Statistical Reasoning

Class time 30 - 45 minutes.

Other resources for this module

Student Handout, Powerpoint Slides

BEFORE CLASS

Copy Student Handouts – 1 per student.

Read through this guide, getting an estimate for how much time to spend on each piece, depending on the time you have available.

Be sure you understand how the study isolated the possible health benefits of social network diversity on cold susceptibility from the possible negative health benefits of social ties.

The following article summary provides an overview of the details:

This module focuses on a study reported in Cohen et al (1997) designed to explore the role of social networks on the ability of the individual to resist infection. Using a correlational design to isolate the health benefits of social network diversity, 125 men and 151 women from the Pittsburgh, PA area (age range 18-55) participated in a study in exchange for $800. All participants had been judged to be in good health after a medical examination and were willing to submit to five days of quarantine. After the first 24 hours of quarantine, participants were given nasal drops containing a low infectious dose of 1 of 2 types of cold virus. Amount of exposure to the cold virus was held constant across participants. The quarantine continued for five days after exposure. Nasal secretion samples were collected and respiratory symptoms were assessed on each of the five days. Social network diversity was assessed by determining the number of different types of relationships each participant had, from a set of 12 different types of relationships, for which respondents indicated that they spoke to someone in that relationship at least once every 2 weeks. The total number of network members was also assessed. The results indicated that the rate of colds decreased with increased social network diversity.

DURING CLASS

SET THE STAGE

[Slide 1] (title slide)

- Ask students whether they think people with larger and/or more varied social networks are more or less likely to come down with colds.
    - Students will likely generate the following possibilities:
        - More contacts and/or more varied networks will be associated with more colds because of more frequent exposure
        - More contacts will be associated with fewer colds because social support is good for physical health
    - On the board, group student ideas so that one column has reasons why network size increases susceptibility and the other column has reasons why network size decreases susceptibility. These can be labeled after the discussion, noting that there are good

reasons to think larger networks might either increase OR decrease susceptibility to colds

[Slide 2] (positive vs negative correlations)

- Discuss slide in terms of which pattern of correlation would likely represent the various ideas listed on the board, as well as a reasonable r value for each of the example scatterplots
    - Discuss the range of possible r values and what both strength and direction of a correlation indicates
- Discuss how both the ideas about positive and negative correlations between social network size and cold susceptibility may be correct, but that they may cancel each other out in a single correlational study

ACTIVITY

[Slide 3] (design a study)

- In small groups, have students brainstorm how one could design a study to isolate one of these possibilities (e.g., positive association between social networks and colds due to more frequent explore in contrast to a negative association between social networks and colds due to health risks associated with lack of social support). Have groups outline a possible study, specifying their dependent variable (DV) and independent variable (IV) and to note whether the IV is experimentally manipulated or naturally occurring
    - (optional) Have groups report back
    - Alternatively, tell the groups to keep their ideas in mind as they think about a research study that was designed to isolate the health benefits of social support by controlling the amount of exposure participants had to a cold virus

Pass out student handout.

- Return to groups – have students read the handout then discuss the questions
    - While students work, circulate among groups to check for student errors in understanding
        - Make sure that students understand that the study was a correlational design, because social network diversity was not manipulated
        - Make sure that students understand that by isolating participants and controlling the amount of exposure participants had to the cold virus, the

researchers were able to isolate the possible positive association between social network diversity and susceptibility to illness

- Then, bring group back together to highlight key answers/points

[Slide 4] (Causal Claims)

- Consider what evidence is needed to make causal claims
  - Discuss how causality cannot be concluded because social network diversity was not manipulated. Instead, the study confirms a negative association between diversity and susceptibility to the cold virus, when exposure to the virus is controlled
    - Note that there *might* be a causal link, but that there is no way to conclude this definitively from this study
  - Discuss other possible causal explanations (e.g., extraversion causes both social network diversity and reduced susceptibility to illness), but note that an experimental design would be needed to test these
    - The authors conducted follow up analyses in which they controlled for personality; discuss how control variables help us further understand the association but still do not allow us to draw conclusions about causality
      - Ask students whether there are other variables beyond personality that they would be interested in controlling for
    - Discuss whether it would be possible to experimentally manipulate social network diversity to test causal questions

[Slide 5] (generalizability)

- Discuss whether there are limitations to generalizability given the quarantine
- Discuss whether there are limitations to generalizability given the sizable ($800) compensation participants received

[Slide 6] (future directions)

- This study focused on the benefits of social network diversity, but what about the possible negatives in terms of the potential for more frequent exposure (note that this was not tested in the current study – everyone was exposed to a fixed amount of the virus, then quarantines)
  - Discuss whether any groups developed study designs during the beginning part of class that got at this issue, or other issues not addressed in the current study

CONCLUDING THOUGHTS

- End class with discussion about the benefits of correlational design to confirm associations even given limitations in terms of causality
- Note the importance of multiple studies to understand an issue more fully. One study never answers all the questions, but it can help us hone in on a good explanation, and inspire follow up studies