



ACTIVITY 6

Understanding Well-Being Through Research

READING

ACTIVITY 6

Understanding Well-Being Through Research

ACTIVITY SUMMARY

Students read about the landmark Harvard Study of Adult Development that began in 1938 and continues today. The researchers conducted a long-term observational study to track patterns of happiness and well-being among a group of 19-year-old students for the rest of their lives. The study's design exemplifies some of the causal reasoning approaches students have been investigating in this unit, such as reducing the likelihood of alternative explanations. Students learn how scientists design studies and analyze data to be more confident in their findings. Students engage in a literacy strategy to support reading comprehension.

ACTIVITY TYPE
READING

NUMBER OF
40-50 MINUTE
CLASS PERIODS
1-2

KEY CONCEPTS & PROCESS SKILLS

- 1 Incorrect conclusions about causation can happen when the result is due to an alternative explanation, such as chance or a confound. Careful study design and analysis can reduce the likelihood of the occurrence of alternative explanations.
- 2 Confidence in a cause-and-effect relationship should depend on the quality, variety, and consistency of the evidence supporting it.
- 3 A likely alternative explanation for an effect reduces the probability that the cause being investigated is the correct one.

CONCEPTUAL
TOOLS



VOCABULARY DEVELOPMENT

confound

a factor that can distort or hide the relationship between two variables being investigated in a study

sample size

the number of individuals participating or items included in a study

effect size

the strength of an association between two variables, such as a correlation or the difference between two groups in an experiment

TEACHER BACKGROUND INFORMATION

Harvard Study of Adult Development

The Harvard Study of Adult Development is one of the longest-running studies of adult life. It began in the 1930s and continues today. It originally gathered data from two groups of men: one group of Harvard sophomores and a second group of men from low-income neighborhoods in Boston. The goal of the study was to understand the factors that contribute to healthy aging and well-being. Over the decades, the study expanded to include the wives and children of the original participants, making the research more inclusive and diverse. This expansion helped researchers test whether the connections they observed between social relationships and well-being also applied to people with different socioeconomic backgrounds, genders, and ethnicities. The study has shown that meaningful and supportive social connections and satisfying relationships are associated with long-term happiness and health, regardless of income, gender, or location. The study is recognized for its rigorous design, which includes longitudinal data collection, large sample sizes, and attention to confounding factors.

Social Connection and Well-being

The Harvard Study of Adult Development's finding that social connection predicts well-being has been supported by many other studies. Although the Harvard Study didn't account for factors such as race, studies have consistently found that strong social connections are a major predictor of happiness for people of all racial, economic, and cultural backgrounds. Research in psychology, public health, and sociology consistently shows that strong, supportive relationships are associated with better mental health, greater life satisfaction, and even improved physical health outcomes. Observational studies have found that people with high-quality social connections tend to experience lower rates of depression and anxiety, as well as better immune and cardiovascular health. For example, a meta-analysis, which combines data from multiple studies, published in *PLOS Medicine* found that individuals with higher levels of social support are more likely to live longer, even after accounting for factors such as income, education, and health behaviors.

Additionally, experimental studies have provided evidence for a cause-and-effect relationship between social connection and well-being. Randomized controlled trials, which students will learn more about in Activities 7 and 8, show that improving social connections through activities or support programs leads to better mental health and overall well-being. These studies offer stronger evidence that social ties can directly influence happiness, stress, and physical health, supporting the findings from the Harvard Study.

Observational Studies

An observational study is a type of study in which scientists observe subjects without changing or controlling any variables. Unlike experiments, researchers do not assign treatments; instead, they analyze naturally occurring behaviors or conditions. There are different types of observational studies: cross-sectional studies in which data is collected at one point in time (such as a survey on hours of social media use and happiness level); cohort studies in which a group of people is followed over time to track factors such as exercise and heart health; and case-control studies in which researchers compare people with a condition (such as lung cancer) to those without the condition to identify potential causes, such as smoking.

While observational studies can show correlations between variables, they cannot prove causation because other factors (confounds) could influence the results. For observational studies to yield reliable results, they need a large and diverse sample size to minimize the chance that results are due to random differences. Observational studies are helpful when experiments are not possible or ethical, such as studying the long-term effects of smoking. They are also good for examining real-world behaviors and studying long-term effects. However, since researchers do not have as much control over all variables, observational studies have a higher risk of confounds; therefore, these studies cannot conclusively establish direct cause-and-effect relationships.

MATERIALS & ADVANCE PREPARATION

FOR THE TEACHER

- VISUAL AID 6.1
“Read, Think, and
Take Note Guidelines”
- VISUAL AID 6.2
“Study Design Elements
and Analysis Methods”

FOR EACH STUDENT

- STUDENT SHEET 6.1
“DART: Research Methods
in the Harvard Study
of Adult Development”
- 3–5 STICKY NOTES

TEACHING NOTES

Suggestions for **discussion questions** are highlighted in gold.

Strategies for the **equitable inclusion of diverse students** are highlighted in lime.

GETTING STARTED (10 MIN)

1 Introduce the reading as an example of an observational study.

- Have students read the Introduction. Reading the Introduction aloud can better support comprehension for many students, including neurodiverse students and emerging multilingual learners who often have more highly developed listening and oral skills than reading comprehension skills. Alternatively, students can read the Introduction independently.
- Discuss the key idea that causation is not always simple. This is especially true for complex topics such as well-being where many factors can contribute to someone's level of well-being. Emphasize that studying cause-and-effect relationships related to human behavior can be especially challenging since it is complex and influenced by many factors. For example, if someone's mood improves after drinking coffee and then exercising outside on a beautiful day, multiple factors could be responsible for their mood change. The caffeine, physical activity, or pleasant weather—or a combination of these factors—might have contributed to the person's improved mood.
- In this activity, students will read about the Harvard Study of Adult Development, a famous observational study. Students may not be aware that research studies fall into different categories, such as observational studies (e.g., case studies, correlational studies, and longitudinal studies) and experimental studies (e.g., randomized controlled trials and clinical trials). While you don't need to explain all these categories, it may be helpful to clarify that this activity is about an observational study. In an observational study, researchers observe subjects without controlling or changing any variables; instead, they analyze existing behaviors or conditions. Observational studies are useful for understanding long-term effects of real-world behaviors.
- Explain to students that observational studies, such as the one they will read about, can identify correlations between variables but cannot fully prove causation because many additional factors could be influencing the results. However, by using careful study design and analysis, the researchers were able to uncover important relationships between variables, making the findings informative and valuable. Let students know that they will learn about these methods in the reading.

PROCEDURE SUPPORT (20 MIN)

2 Review the Read, Think, and Take Note Guidelines to support students' reading comprehension.

- Review the Read, Think, and Take Note Guidelines to support students in completing the reading. The Read, Think, and Take Note strategy provides an opportunity for students to record their thoughts, reactions, and questions on sticky notes as they read. The notes serve to make concrete the thoughts arising in their minds and then serve as prompts to generate conversation or write explanations. You can use Visual Aid 6.1, "Read, Think, and Take Note Guidelines," to review this literacy strategy. If your students are unfamiliar with the strategy, it can be helpful to demonstrate with a short passage of simple text, such as the Introduction to the activity. For more information about the Read, Think, and Take Note strategy, see [Appendix 1: Literacy Strategies](#).

3 Use a Directed Activity Related to Text (DART) strategy to support students' synthesis of key concepts in the reading.

- In Procedure Step 2, hand out Student Sheet 6.1, "DART: Harvard Study of Adult Development." To help synthesize the information in the reading, have students work in pairs to complete Student Sheet 6.1. For more information on a Directed Activity Related to Text (DART), see [Appendix 1: Literacy Strategies](#). The DART strategy helps students summarize the concepts related to scientific methods for studying causation. A sample student response to Student Sheet 6.1 can be found at the end of this activity.
- As students work through Student Sheet 6.1, it may help to review the terms in the left-hand column of the table. For students who need extra support, you may also want to complete a row of the student sheet as a class to model the task.

4 Review the key concept of a confound that is introduced in the reading.

- The key concept of a confound can be further explained by discussing the example provided in the reading about the number of shark attacks vs. the number of ice-cream sales. This example was also used in Activity 4, Procedure Step 5 in the Student Book. Remind students of the scatter plot in Figure 4.3 and ask, **When you looked at the two variables, was there a correlation?** Students should recall that yes, there was a strong positive correlation between the two variables because the data points are close together and are both increasing at about the same rate—the more ice cream sold, the higher the number of shark attacks. Then ask, **Was there a direct cause-and-effect relationship—did the ice-cream sales cause the shark attacks to happen?** Students should say that no, there is probably not a direct cause-and-effect relationship because there is no reasonable, logical connection between the two variables. Ask, **What other variable could be related to both sharks and ice-cream sales?** Students should recognize that weather, or the season, is a third variable affecting both factors. Warm weather increases ice-cream sales and brings more people to the ocean where shark attacks might occur. Explain that in this case, weather distorts the relationship between the tested variables, making it a confound. While students have explored confounds in this unit through alternative explanations, this activity formally introduces the term.

- Support students, particularly emerging multilingual learners, in sensemaking and language acquisition by adding new vocabulary for the unit to the word wall. Record the terms *sample size*, *confound*, and *effect size* to the word wall. Provide additional examples for each term as needed. For more information on a Word Wall, see [Appendix 1: Literacy Strategies](#).

SYNTHESIS OF IDEAS (20 MIN)

5 Review how research methods can increase confidence in results.

- Ask students to share their responses to Student Sheet 6.1. For each term, have students provide an example from the Harvard Study and explain how that design element or analysis method can help strengthen a study's findings. Use the sample responses for the student sheet to help clarify key concepts and guide students in applying them to the specific study. For example, highlight that the original sample size of 268 at the start of the study grew to 1,300. This increase in the number of participants helped ensure that the results were not due to chance. In Activity 7, students will further explore how sample size directly impacts the reliability of results. For now, it is enough to discuss how the increased sample size strengthens the evidence for association.
- Display Visual Aid 6.2, "Study Design Elements and Analysis Methods," to review the key aspects of research studies that can strengthen a study's findings: large effect size, large sample size, consistency across settings, and reduction of confounds.
- You may wish to evaluate if your students are able to identify the essential ideas of the activity by reviewing their answers to Build Understanding item 1.
- Finish the activity by revisiting the Guiding Question, *What study designs and analysis methods increase confidence in results?* Use responses to this question to formatively assess students' understanding of the key concepts and process skills related to the ideas of researching complex correlations.

EXTENSION (50 MIN)

6 Use the Extension as an opportunity for advanced learning.

The World Happiness Report is an annual publication that ranks countries based on happiness levels using data from global surveys. Have students choose a topic from an online chapter of the 2025 World Happiness Report titled *Connecting with others: How social connections improve the happiness of young adults*. This chapter specifically focuses on social connection in young adults. After reading, students can create or compare charts or infographics based on the report's data, or reflect personally on the topic they chose. For example, they could create a visual comparing happiness trends across countries, analyze how social network density affects well-being, or write a reflection on how the empathy gap influences their own views on social connections. Encourage students to share their findings with the class through a presentation, discussion, website, or video.

SAMPLE STUDENT RESPONSES

BUILD UNDERSTANDING

- ① The Harvard Study of Adult Development was a longitudinal study, meaning that it tracked participants over time, which helped strengthen its findings. What other study design elements or analysis methods made the study's results more reliable? List at least four and describe how each helped strengthen the study's findings.

The study was strong because it had a large sample size, meaning that many people participated in the study, which made the results more reliable. The study also found the same results for different groups of people, like men and women or rich and poor. This showed that the connection between good social relationships and happiness was consistent across different settings. Researchers also checked for confounds that could affect the results to make sure that social relationships were really the reason for the better chance of happiness. Lastly, the effect size for social connection was much larger than for other factors, showing that good relationships had the biggest impact on happiness and health.

- ② The Harvard Study of Adult Development found that well-being is strongly associated with social connection. How does this impact your ideas about which well-being strategy might work best for Salas High School?

The results from the Harvard Study made me think that social connection should be a big part of whichever strategy we recommend for Salas High School. For example, in the school garden, students could work in teams, forming connections while learning about gardening. In gratitude writing, having students exchange their thoughts with others could spread positivity and foster strong connections. If a bunch of students are spending time with a dog, then a school therapy dog could also increase social connection by bringing people together. The exception is the sleeping strategy. I'm not sure how to make a later school start time a social event.

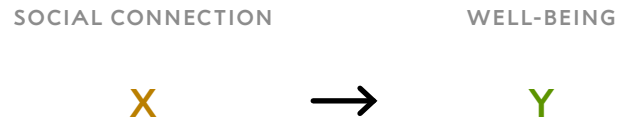
- ③ The Harvard Study reported a correlation between social connection and well being. Which of the following reasons could explain this association? (Choose all that apply.)

- a social connections (X) increase well-being (Y)
- b well-being (Y) increases social connections (X)
- c being kind (Z) increases both social connections (X) and well-being (Y)

For each reason that could be true, draw a diagram showing the cause and effect between X, Y, and Z. Label and explain your diagram(s).

All three explanations could explain the association, either independently or in combination.

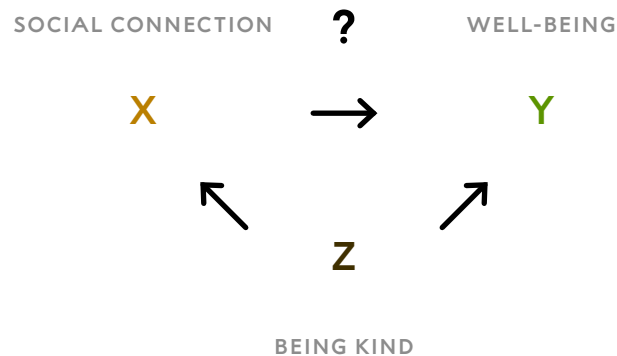
- a** When people have strong social connections, they have more support, feel less lonely, and experience more positive emotions. This could improve their overall well-being by reducing stress and increasing happiness.



- b** If someone is happy and feels good about themselves, they might be more outgoing and social. This could lead to making more friends and having stronger relationships.



- c** When people are kind to others, it can help them build friendships and stronger social connections. At the same time, doing kind things for others can also make someone feel happier and improve their sense of well-being.



CONNECTIONS TO EVERYDAY LIFE

- ④ Scientists who study the effects of loneliness are researching the following strategies to help people feel more connected:

- improving social skills,
- finding more chances to interact with others, and
- changing negative thoughts about social situations.

Which of these strategies could you use in your everyday life, and how do you think they could help you build stronger social connections?

One strategy I could try is improving my social skills. I would like to practice speaking more in class or talking to people I don't know very well. This would help me get better at making new friends. Another strategy I could try is changing negative thoughts about social situations into positive ones. If I try to think more positively about being with other people, I might feel more comfortable and willing to connect with others.

- ⑤ Researchers are studying how social media affects our well-being, but this is complicated because people use social media in different ways and for different amounts of time. Evidence suggests that using social media to connect with people can support well-being, while using it too much or to compare oneself to others can lower well-being. What might be some examples of using social media in ways that promote positive connections?

One way to use social media to promote positive connections is by following and interacting with friends and family. You could use it to keep in touch, share updates, and support each other, such as liking their posts or sending encouraging comments. Another example is joining groups or online communities where people share common interests or hobbies, which can make you feel connected to others who understand you.

REFERENCES

Adams, T. (January 25, 2019). John Cacioppo: "Loneliness is like an iceberg-It goes deeper than we can see." *The Guardian*. <https://www.theguardian.com/science/2016/feb/28/loneliness-is-like-an-iceberg-john-cacioppo-social-neuroscience-interview>

Center on Capitalism and Society at Columbia University. (September 25, 2023). Marc Schulz: *Lessons from the Harvard Study of Adult Development About Social Connection and Work* [Video]. YouTube. <https://youtu.be/EncrOR1wcUc>

Chang, J. & Becker, D. (January 2, 2024). *Lessons from the world's longest happiness study*. WBUR. <https://www.wbur.org/onpoint/2024/01/02/lessons-from-the-worlds-longest-happiness-study>

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, 7(7). <https://doi.org/10.1371/journal.pmed.1000316>

Mineo, L. (April 11, 2017). *Good genes are nice, but joy is better*. The Harvard Gazette. <https://news.harvard.edu/gazette/story/2017/04/over-nearly-80-years-harvard-study-has-been-showing-how-to-live-a-healthy-and-happy-life/>

Shenk, J. W. (June 2009). What makes us happy? *The Atlantic*. <https://www.theatlantic.com/magazine/archive/2009/06/what-makes-us-happy/307439/>

Suttie, J. (February 6, 2023). What the longest happiness study reveals about finding fulfillment. *Greater Good Magazine*. The Greater Good Science Center at the University of California, Berkeley. https://greatergood.berkeley.edu/article/item/what_the_longest_happiness_study_reveals_about_finding_fulfillment

UNSW Sydney Centre for Ideas and UNSW Medicine & Health. (2017). Robert Waldinger: Unlocking the secret to happiness. <https://www.unswcentreforideas.com/article/robert-waldinger-unlocking-secret-happiness>

STUDY DESIGN ELEMENT OR ANALYSIS METHOD	EXAMPLE FROM READING	HOW DOES IT STRENGTHEN A STUDY'S FINDING?
effect size		
sample size		
consistency across settings		
accounting for confounds		

STUDY DESIGN ELEMENT OR ANALYSIS METHOD	EXAMPLE FROM READING	HOW DOES IT STRENGTHEN A STUDY'S FINDING?
effect size	<i>Social connection had a larger effect on happiness than wealth.</i>	<i>It shows which factors have the strongest impact on outcomes.</i>
sample size	<i>The study started with 268 participants and later grew to 1,300.</i>	<i>A larger sample (more people) makes the results more reliable by reducing the chance of inaccurate results.</i>
consistency across settings	<i>The study added participants from different backgrounds (low-income neighborhoods and women).</i>	<i>It strengthens the findings by making sure that the results apply to a wide range of people and situations.</i>
accounting for confounds	<i>They compared results for different subgroups (such as wealth, gender) to check if the results were the same.</i>	<i>It helps make sure that the result is due to what you are studying (for example, social connection) and not some other factor.</i>

Read, Think, and Take Note Guidelines

Stop at least three times during each section of the reading to mark on a sticky note your thoughts or questions about the reading.

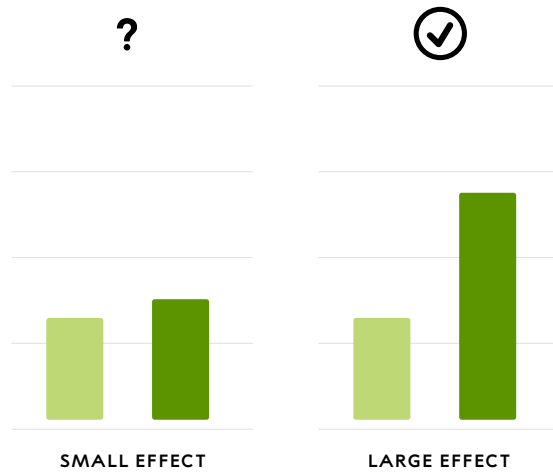
As you read, use a sticky note from time to time to:

- explain a thought or reaction to something you read.
- note something in the reading that is confusing or unfamiliar.
- list a word from the reading that you do not know.
- describe a connection to something you've learned or read previously.
- make a statement about the reading.
- pose a question about the reading.
- draw a diagram or picture of an idea or connection.

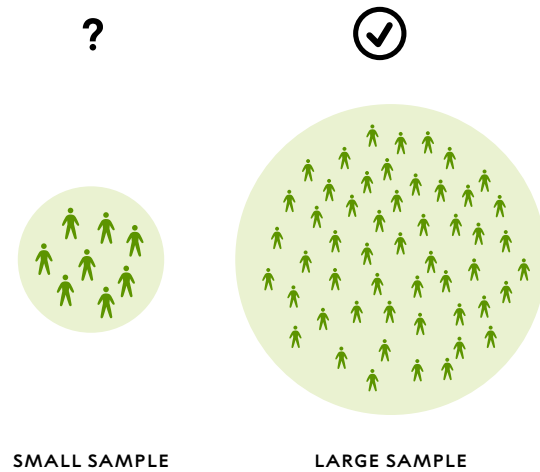
After writing a thought or question on a sticky note, place it next to the word, phrase, sentence, diagram, drawing, or paragraph in the reading that prompted your note.

After reading, discuss with your partner the thoughts and questions you had while reading.

Effect Size



Sample size



Consistency across settings



Reduction of confounds

