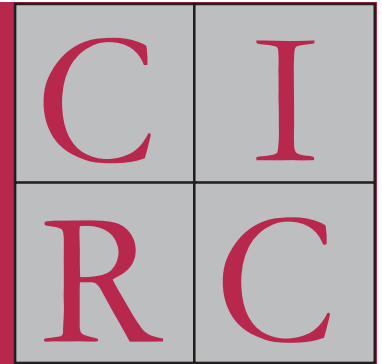


Cigarettes: Stress Relief Or Just A Bunch Of Smoke?



Source: Kassel, J.D., Stroud, L. R., & Paronis, C. A. (2003). Smoking, stress, and negative affect: Correlation, causation, and context across stages of smoking. *Psychological Bulletin*, 129, 270-304.

Goals:

Teach the concept of third factors.

Teach the importance of identifying biased sources.

Basic Idea:

Smoking is a controversial behavior performed by people of all ages all over the world. Many smokers claim cigarettes relax them and ease stress. This lesson explores the evidence for and against these claims.

Gain Attention/Interest:

Vignette

It's 11:30pm on Monday and Joe, an 18-year-old high school senior, just got out of work after a five-hour shift. He has a math assignment due in the morning and a history test tomorrow at noon. All he wants to do is go to bed, but he still has a lot of work to do. With graduation a month away, Joe is feeling really stressed out, so he lights up a cigarette to relax as he heads home.

Nearly 25% of the U.S. population smokes tobacco products, with many of these people reporting that they smoke more often when they feel stressed, worried, sad, or angry. Many state that smoking helps them relax, and feel happier and calmer. But do cigarettes actually do this, or is it just a bunch of smoke? What is the evidence about how cigarettes affect people?

Think & Write #1

Have students write whether or not they think smoking relaxes people. If so, how does it relax people? If not, why do so many smokers say it does?



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Ask: What is Science?

How could we check whether or not smoking relaxes people?

Scientists try to eliminate all other possibilities and discover the true relationship between different things (such as smoking and feeling relaxed). Science is not limited to chemicals and molecules inside laboratories; scientists study everything from agriculture and apples to video games and violence. In general, scientists seek to answer questions about the world around us. To do this, scientists eliminate wrong answers. It's kind of like taking a multiple-choice test in which you aren't sure of the right answer. You eliminate all the answers you know are wrong and once there is only one choice left, you feel confident that you have the correct answer. This is called **proof by disproof**, and it is the method scientists use to answer questions. Whereas a nonscientist tries to prove he/she is correct, scientists try to prove themselves wrong, and only if they fail to prove themselves wrong do they claim that they may have a correct answer. This may seem pretty backwards, but it is the only way scientists can be confident that their answers are correct.

If smokers reported less stress, would you say that the nicotine in cigarettes is definitely the cause behind the reduced stress? No. There are a number of things that could be happening. It could be that:

- 1. Smoking reduces stress.
- 2. Something else that goes along with smoking reduces stress.

In order to conclude that smoking reduces stress (#1), not only must you find proof that smoking reduces stress, but all other possible explanations (anything from #2) must be eliminated. More on this later.

1 Ask: What is Science?

Define the Problem: See Many Sides

Who cares about whether or not smoking helps people relax? What are the different sides? To foster potential interest, a description of job duties and education requirements is also included here.

Tobacco companies. If smoking actually helps people relax, they could put that information in advertisements and sell even more cigarettes!

Doctors. Doctors want to know as much as possible about the health risks and benefits of any activity in which their patients might take part. Doctors attend four-year colleges and then attend medical school.

Anti-Smoking groups. Organizations with the purpose of decreasing smoking would likely not want people to find information about how smoking helps people.

People. Anyone who feels stress wants to know what works best to help them relax. If smoking works to relax people, you can bet a lot of people would be glad to learn it. If smoking does not help people relax, then they want to know that, too.

Lawyers. There are frequently court cases involving health concerns over smoking, with lawyers working for both sides. To work on these cases, lawyers must be able to understand and explain the science involved. Lawyers attend four-year colleges and then attend law school.

Lobbyists. Lobbyists work in political circles in Washington D.C. and across the country. They try to gather support among lawmakers for their position or cause on certain legal issues. Lobbyists attend four-year colleges and have a love for politics and interacting with people.

Research Assistants. Researchers are hired by tobacco companies, anti-smoking groups, the government, universities, and many other institutions, to help investigate scientific questions. They collect information from books, from questionnaires they give to people, and from medical exams and interventions. Research assistants attend four-year colleges and often spend some time in graduate school afterwards.

Knowing all the different groups interested or invested in a topic is important since their goals can **bias** any information that you may get from them. For example, a soda company is likely never going to run an ad campaign showing another drink beats it in a taste test, even if they have conducted taste tests that showed this.

2

Define
the
Problem:

See
Many
Sides.

In addition to knowing about the different sides of a problem, working with a clear definition of the problem is important as well. Today we are discussing whether or not smoking lowers stress. An important aspect of science is defining all the terms. Frequently, words have multiple definitions and can mean different things in different situations. Thus, scientists create working definitions for terms. For example, what is stress? People define stress in various ways. Stress can be defined as broadly as “a situation that is interpreted as demanding, causing tension, or mental pressure.” Can anyone think of an example in which one person would interpret a situation as stressful, while another would interpret the same situation as not stressful?

SOURCE BIAS

Scientists avoid getting their information from biased sources. This is why they do their own research or get information from other scientists.

Example: Different Interpretations of Stress

- Some people enjoy working close to a deadline, while others prefer to finish in plenty of time.
- Some people enjoy going to the doctor because they find it reassuring while others get stressed out going to the doctor.
- Making dinner for a group of 10 people might be intimidating and stressful to an inexperienced cook, but it could be viewed as an exciting opportunity by a person who enjoys cooking.

Additionally, not all smokers are the same. Lumping them into one group may not be a good idea. (Example: is it fair to say that ALL students get nervous speaking in front of a group? No, some do and some do not.)

To study the relationship between smoking and stress, scientists divided smokers into 3 different groups.

Initiation: those who are just starting smoking

Maintenance: those who smoke regularly

Relapse: those who quit but have started smoking again.

Do you think the stage a smoker is in will influence whether or not smoking helps him/her relax? Why? Whom do you think smoking helps relax the least?

Think & Write #2

Have students make a hypothesis about whether the stage a smoker is in will influence whether or not smoking helps him/her relax. Who would it help the most/least?

Distinguish Fact From Opinion:

Learn What Constitutes Scientific Evidence

Based on the different sides of the problem we just discussed, are there any groups that might be biased toward wanting a particular result? For example, what result do you think tobacco companies would hope for when investigating whether smoking decreases stress? (**Solicit Answers**). Most people would think that tobacco companies are looking for a positive relationship between smoking and a relaxed feeling, because that could help sell their product. Scientists, on the other hand, want to eliminate all bias from their research. Their goal is to gather evidence, not opinions.

3

Fact Versus Opinion: What Constitutes Evidence?

Activity

Read each example aloud and discuss with the class whether it constitutes a fact or an opinion. Also discuss the different possibilities that the statement could imply. Which of these would you consider an opinion and which are evidence? Could they be both, or are you not given enough information? If so, what information would you want/need to decide? This could also be conducted as a small group activity.

Brand X cigarettes taste better than any other cigarette on the market.

- 1** *Possible answer: This is an opinion because what may taste best to one person may be different for others. This is like claiming to be the “best tasting french fry”; everyone has their own personal favorite. Additionally, this has nothing to do with relaxation.*

2 Steve is a fireman and has been smoking for the last 20 years. He frequently feels stressed out on the job and can’t smoke indoors since he works in a government building. Steve feels the stress because he is not allowed to smoke while at work. *Possible answer: Steve might feel stress at work because he doesn’t smoke, but he might also feel stress because he has a high-stress job.*

- 3 Anytime Hillary smokes a cigarette, no matter what the situation, she immediately feels more relaxed and better prepared to deal with any problems she might face.** *Possible answer: The fact that cigarettes help Hillary relax in any situation appears pretty convincing, but later in the lesson we will discuss some things that may impact your thoughts on this.*

The difference between fact and opinion is often harder to find out than you might think.

Weigh Evidence and Make Decisions

Now that we've discussed the difference between opinions and scientific evidence, we need to consider different kinds of evidence.

There is more than one way to connect smoking and stress. We can look for **direct evidence** and **indirect evidence**. Direct evidence shows a direct link between two factors, in this case, smoking and stress. Direct evidence would show that one directly influences the other. For example, smoking reduces stress, or eating makes you less hungry. One factor directly influences another. On the other hand, indirect evidence shows a link between two factors using a third factor. Two factors are connected, but only because the third is present. **Drawing two circles and connecting them with a line may help student visualize the use of direct evidence.**

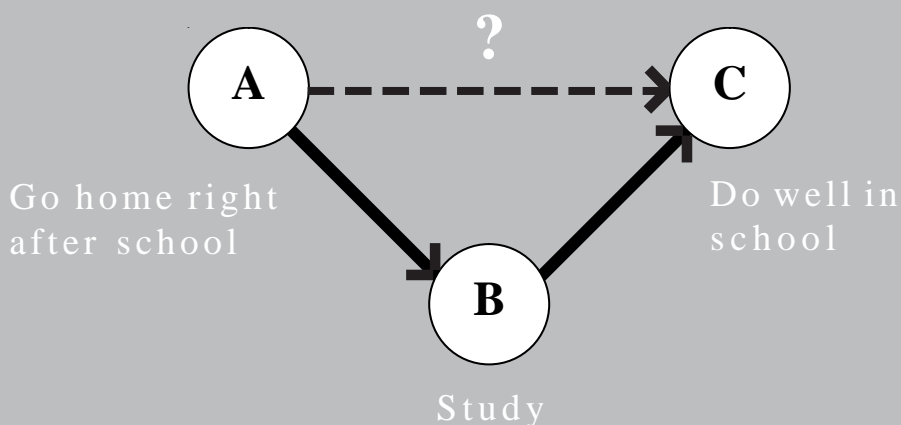
Is it smoking that makes people feel relaxed? Or is there something else that connects smoking, stress, and relaxation? This is called a **third factor**. If smoking and stress are the first two factors, there could be some third factor that connects them so that, without this factor, there would be no connection between the first two (smoking and stress).

Example: Third Factors

If I go home right after school, I will study. If I study, I will do well in school. A = going home right after school. B = studying. C = doing well in school.

Simply going home right after school does not help you do well in school. However, if going home after school means you will study, then going home after school becomes indirectly related to doing well in school.

Thus, studying is the third factor.



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**Weigh
Evidence
and
Make
Decisions.**

What are some other things that might be associated with smoking and stress? There are a lot more activities involved with smoking than simply getting nicotine to your brain. For example, smokers take deep breaths to pull in smoke. Frequently, smokers have to go outside and take a break from their work or studies to have a cigarette. On these breaks, smokers tend to hang out with other smokers and meet new smokers. Deep breathing, taking a time-out from work, meeting up with new and old friends: all of these things are relaxing. Perhaps it is events such as these that make smokers feel relaxed.

So, when people:

(A) smoke -----> (B) they take deep breaths/ ----->(C) which makes them
take a break from work, feel more relaxed.

A and C are connected by B.

The actual act of smoking may not make them feel more relaxed, but a different behavior that is associated with smoking could make them feel more relaxed.

Now, let's discuss some actual evidence. Does smoking relieve stress? To test this hypothesis, scientists gave smokers surveys, asked them questions, measured their blood pressure before and after smoking, and gave them many other tests as well. They did these things under many different circumstances, such as when smokers wanted a cigarette, right after they smoked one, or after a smoker had been deprived of smoking for a period of time. Here's what some scientists found:

In general, smokers report feeling more stress than non-smokers.

For the Initiation stage of smoking (just starting out), the relationship is unknown, as there has been little research because the time period is so short (people move from Initiation to Maintenance rather quickly).

For the Maintenance stage (regular smoking), there have been mixed findings; some reports have shown that smoking relaxes people, some investigations have shown that it does not.

In the Relapse stage (smoking after having quit), the trend seems to be that smoking has either no effect or worsens mood. (Why do you think this is? Solicit responses.)

Surprisingly, results show that not only does smoking not relax you, it may actually stimulate you, because heart-rate, blood pressure, and hormone output all increase. A nonscientist may hear that smokers report feeling more relaxed after smoking, and believe that cigarettes help people relax. But when a scientist sees that physical signs such as heart-rate, blood pressure, and hormone output all increase, the scientist thinks the opposite.

Think & Write #3

How about now?

Have students write about their thoughts now that they have heard the scientific results. Were their hypotheses correct? Do they feel the same as they did during Think & Write 1?

Move From Science to Society

After conducting their research, scientists are not done. Smokers everywhere claim that smoking relaxes them, yet the scientific research says that it doesn't. How can this be? Scientists also try to bridge the gap between their findings and how people in the real world think.

Think of why a person who smokes might be in a bad mood. It might be because she hasn't had a cigarette in a while and needs to "get a fix". If smokers are addicted to nicotine, then smoking would help them relax by satisfying their need for nicotine. However, if they hadn't been addicted to nicotine in the first place, they wouldn't have needed to satisfy their nicotine craving. And don't forget about taking a break from work! Everyone loves taking a nice break from working – that's relaxing even if you don't smoke.

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Move
From
Science
To
Society.

Smoking may simply relieve the added immediate stress a person feels due to being addicted to nicotine, and may not relieve stress related to non-nicotine-related issues such as finances, family matters, school or job problems, etc. Additionally, smoking comes with the baggage of other behaviors such as deep breathing, time-off work, and spending time with others. Could these other third factors be the real reason why smokers claim smoking relaxes them? Perhaps. We simply don't know.

Revisit, Review, Reflect, and Re-evaluate

Many smokers claim that cigarettes help relieve stress and relax them. However, research so far has failed to support this. But this does not mean that scientists are finished studying the relationship between smoking and stress. Scientists constantly revisit problems to review past solutions, to reflect on the quality of these solutions, and to re-evaluate how they could be looked at in a new light. Reviewing previous findings in order to create new ideas for new questions is what scientists do everyday.

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**Revisit,
Review,
Reflect,
and
Re-evaluate.**

Think & Write #4

What's next?

Based on what they know now, what further scientific studies should be conducted? What should the government do?

Discussion Questions

1. Do you think there will ever be a time when no one smokes? Why or why not?
2. What would happen if there were no smokers at all?
3. Does the government have a responsibility with regard to smoking?
4. Is it fair to tax cigarettes? If so, how much?
5. What type of information should the government have before it passes a law?
6. What would happen if cigarettes were outlawed?

Homework Questions

1. Find another unhealthy activity and state the reasons people give for doing it. Is the situation similar to smoking and relaxation?
2. Find an example of a biased source.
3. Find another example in which a third factor may explain the relationship between two things.

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Quiz Questions

Version A

1. Something connecting two variables that otherwise wouldn't be connected is a:

- a. third factor
- b. working definition
- c. biased source
- d. evidence

2. When a source can benefit depending on how the information is presented, it has:

- a. opinions
- b. bias
- c. facts
- d. evidence

Quiz Questions

Version B

1. A _____ connects two variables that otherwise wouldn't be connected.
2. When a source can benefit depending on how the information is presented, it has _____.

Quiz Questions

Version C

1. Define “third factor”. Give an example.

2. Why are cigarette companies biased sources in regard to the question of whether or not smoking causes stress relief?
