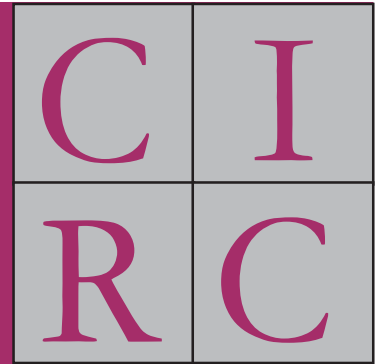


Is ESP (Extra Sensory Perception) For Real? (I Knew You Were Going to Ask That!)



Source: Bem, D. J., & Honorton, C. (1994). Does PSI exist? Replicable evidence for an anomalous process of information transfer. *Psychological Bulletin*, 115, 4-18.

Goals:

Teach method of proof by disproof (i.e., eliminating all other possible answers in order to support one specific answer).

Teach the importance of considering the source when evaluating information.

Basic Idea:

Many people are skeptical about seemingly unexplainable human powers and types of communication. This lesson discusses a scientific approach to measuring ESP and describes some surprising findings related to this phenomenon.

Gain Attention/Interest:

Many people fantasize at one time or another about having super-human powers, such as being able to fly, make things levitate, or read someone's mind. But can anyone actually do any of these things? Most people laugh at this idea, while some others are true believers. Is there a way we can actually test whether or not these things occur?

Would you believe that even the average person could have seemingly super-human powers, such as the ability to send a message or a thought to a person in another room? This ability is called ESP, which is short for Extra Sensory Perception. It means exactly what it sounds like, being able to perceive something extra.

We all know that we get information from, and interact with, the world through the five senses: see, hear, taste, smell, and touch. However, is this the only way in which we can acquire information? What about picking up a message by some other method? Some scientists tested this possibility and you might be surprised at what they found! But first—what do you think about ESP? Is it for real?



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Think & Write #1

Do you believe in ESP? Why or why not?

(Some students may need to be given a more specific question, such as: Does anyone have ESP? Do many people have ESP? Can ESP be developed through practice?)

1

Ask: What is Science?

Ask: What is Science?

When many people think about an extraordinary activity such as ESP or telepathy (sometimes referred to as mind-reading), they think it is false or a trick. In science, though, an idea is tested systematically—it's not just assumed to be either right or wrong, it's tested and given a fair chance without jumping to conclusions. To test whether or not an unexplained activity does in fact occur, we must systematically eliminate all other possibilities and explanations.

There are many ways in which ESP and related phenomena could be faked. Were the people communicating with hand movements instead of reading each other's minds? Was it arranged ahead of time—were the answers planned and memorized? In order to convince scientists (and most likely you, too!), all other possibilities must be eliminated. Whereas some people might be convinced by a few examples of people performing amazing feats, scientists are satisfied that a phenomenon is real only if no other possible means of explanation are supported by the facts. This is called the method of **proof by disproof**. Scientists support one explanation by showing that the alternatives are wrong—by disproving them. In the case of ESP, if scientists are able to disprove all other explanations and ways that people could “cheat”, then the only conclusion scientists can make is that ESP exists—meaning that some people can sometimes read another person's mind.

The lab for this lesson is similar to the procedures scientists have used to test whether or not ESP exists.

Define the Problem: See Many Sides

There are a lot of abilities that may seem super-human or unbelievable. Testing whether or not each of these exists would require many different kinds of experiments and tests.

It may seem a simple and obvious task, but the first step scientists must execute is to clearly define the problem. In this particular case, the problem being studied could be defined as simply as: Does ESP exist? Once a specific question is chosen, scientists must figure out what the different possible answers are. Then, they develop a **hypothesis**, representing one possible prediction. Two of the most basic hypotheses are: “ESP exists”, or “ESP does not exist”. A more complicated hypothesis could be that only certain individuals are capable of ESP under special circumstances.

As we already discussed, scientists and non-scientists approach these questions differently. A kid or an adult non-scientist might only need an example or two of something that appeared to be ESP to be convinced. A scientist needs much stronger evidence to sway her/his view.

If you had to make a hypothesis right now, what would you predict? Are people capable of sending/receiving information to each other using some unexplained method of communication? *Have students form a value line based on their current opinion. One side of the class can represent 100% confidence that ESP exists, while the other side can represent 100% confidence that ESP does not exist, with places in between representing varying levels of middle ground. Once students have chosen their respective places, ask for volunteers to express why they made their choice the way they did.* What are the different sides that can be argued?

Potential arguments:

ESP exists: Anecdote about people they know (Note: students may give examples that are not actually ESP. An example of this: Accurately predicting the food your best friend selects at lunch everyday. This is not ESP because it is using information gathered previously via the 5 senses); belief in religious/divine experiences.

ESP doesn't exist: It's impossible; those people are fakers trying to become rich or famous.

In between: Some people can do it but most can't; people need training/practice; it can happen in certain situations (e.g., when a loved one has been in an accident), or between identical twins.

2

Define
the
Problem:

See
Many
Sides.

Distinguish Fact From Opinion: Learn What Constitutes Scientific Evidence

Obviously there are a lot of ways to cheat when testing for ESP. However, the question we are addressing today is NOT whether or not people CAN cheat (staying focused on the problem at hand is an important part of science). Our question today is whether or not ESP exists. We want to know whether experiments that carefully screen out cheaters and that take place under carefully controlled circumstances are, in fact, able to demonstrate that ESP happens. To answer questions such as these, scientists gather the facts. The difference between a fact and an opinion is important.

3

Fact Versus Opinion: What Constitutes Evidence?

Which are facts and which are opinions?

- Your cousin tells you that he met his wife after a woman just like her was described to him by a psychic.
- A scientist talks with one of her co-workers and they both think that psychics are greedy people who want to steal money from trusting individuals. A psychic is a person who has (or claims to have) super abilities, such as ESP.

Neither is science. It may be fact that your cousin met his wife after a psychic described a woman like her, but this is not scientific evidence about the existence of ESP. Though they are scientists, the people who think psychics are greedy are merely expressing their opinions. Just because they are scientists does not change their personal opinions into fact. Though it may very well be fact that your cousin met his wife after someone resembling her was described by a

psychic, scientists would not consider this evidence that psychic powers exist. Remember our discussion of proof by disproof. This example doesn't show that psychic powers are the only way the psychic could have made a seemingly accurate prediction (e.g., the psychic could have made a very general prediction that would have described numerous people such as "medium-height brunette"). It would be incorrect to assume that the psychic's prediction was correct because the psychic could predict the future

because there are other possible explanations. Similarly, it would be incorrect to say that wearing a yellow sweater caused you to do better on a test. This is an example of confusing **correlation** (two events that are associated with each other) with **causation** (one event caused the other to happen). Confusing correlation and causation is quite common in everyday life. However, through the method of proof by disproof, scientists do their best to avoid such mistakes.

CORRELATION VS. CAUSATION

Just because event B happens after event A, does not mean that event A caused event B.

NOT ALL SOURCES ARE EQUAL

Not all sources are equal. Some sources have reasons why they would want one outcome rather than others.

What would represent good, solid evidence about ESP? What would represent good, solid evidence about ESP?

Carefully controlled experiments.

What is a carefully controlled experiment? To learn an example of a carefully controlled experiment and to understand how scientists test whether or not ESP exists, let us go through the procedure they use to test it.

CONSIDER THE SOURCE

An independent scientist does not usually have an investment in how an experiment turns out. Scientists are usually trustworthy sources.

1 First, a person known as the “sender” is brought to a room and shown a randomly selected visual picture (a horse, a beach, a person running, etc.). The sender is instructed to concentrate on the picture for 30 minutes.

2 Another person, known as the “receiver,” is brought into a quiet room (usually down the hall from the sender’s room) and told to sit in a reclining chair. That person is then blindfolded and has headphones put on over his/her ears. A light is shone directly toward the face to ensure constant visual display and a constant noise (e.g., a fan blowing) is played into the headphones. The receiver is told to provide continuous verbal feedback on what he/she is thinking. That is, the receiver should explain any thought or image that comes into his/her head.

3 Once the 30 minutes has ended the receiver is presented with four pictures and asked to rate the degree to which each matches what he/she just experienced. If the receiver gives the highest rating to the correct picture, it is considered a “hit” or a correct selection.

How often should we expect the receiver to select correctly? (Answer: 1 out of 4 or 25%.) How often would the receiver have to select correctly to convince you that ESP exists?

The odds of the receiver selecting the correct picture at random is one out of four. With just a few attempts, the results could vary, but with many attempts, the expected value is that one out of four participants, 25%, would “select” the correct picture. Because there is no other method the “sender” and “receiver” could have used to communicate, a “hit” rate higher than 25% could only be explained by ESP.

For the lab activity, we will replicate, or copy, the methods scientists use to test ESP.

Think & Write #2

Hypothesis formation

Have students form a hypothesis that can be tested with this lab.

Lab Activity

This activity is an approximate replication of the ESP experiment discussed above. Have students partner up and have each sit on opposite sides of the room facing away from each other. Have half the students draw a slip of paper with a number (1, 2, 3, or 4) or color (blue, red, yellow, or green) on it. Have the students try to send the message to their partner. Then, have each “receiver” try to select the number or color that was telepathically sent to them.

Compare the expected probability of students’ correct guesses with the actual probability they found. Is there a difference? If time permits, try it again with partners performing opposite roles. Students often want to perform this activity repeatedly. Multiple trials benefit the analysis as it increases the size of the sample. Though the procedure is not as precise as it could be, it is comparable as long as no incidental communication (whispers, chatter, hand signals, etc.) occurs.

Weigh Evidence and Make Decisions

Scientists went through a group of 28 separate studies and found that the “hit” rate was 35%. This may not seem to be a lot higher than 25%, but imagine a penny that is flipped 1,000 times and lands on heads 600 times and tails 400 times. Would you think that’s a normal coin, or that something unexplainable was happening?

Compare class results to those of the scientists. Class results may vary; this may be due to the relatively small number of trials. Discuss with the class potential reasons why class results may differ from those of scientists. Potential reasons: smaller sample, cheating, ESP communication pathways clogged from so many people trying to transmit at the same time, not enough practice, etc.

4

**Weigh
Evidence
and
Make
Decisions.**

Even if the results go against what they initially expected, scientists do not let their previous opinions override the facts; they make their decisions based on the evidence. In this case, scientists would see that the 35% “hit” rate is well above the expected 25% “hit” rate and decide that something must be going on.

Think & Write #3

How about now?

Have students write about their thoughts now that they have learned what scientists do and have tried the scientific approach themselves. Were their hypotheses correct? Do they feel the same as they did during Think & Write 1?

5

Move From Science To Society.

Move From Science to Society

What does all this mean? Do you no longer have to call people on the telephone; can you just “think” a message to them? Not likely, but it does present us with an interesting problem. How can all this be explained? Can it be explained at all? Though the evidence is strong that something is occurring, many people remain skeptical simply because it is so unexpected!

Consider the way psychics are used by some police departments to help solve difficult crimes and to help locate bodies of murder victims. Some psychics are paid to help recreate what happened in a crime seen or to help track down serious criminals. To many of us this practice may sound crazy!

But in fact there have been some people who call themselves psychics who have helped the police solve crimes when no other method of evidence gathering would have led them to the answer. This, coupled with the 35% “hit” rate, means that maybe being psychic is not so far-fetched after all. Maybe there are some people who really are able to use extra-sensory powers. This does not mean that most of the people claiming to be psychics truthfully have these talents—it just means that at least some of these people may possess real abilities.

Other careers in which people need to know the science behind ESP:

Psychologist: Psychologists study the brain and behaviors. They attend four-year colleges and earn a post graduate degree.

Magician: Knowing science can help magicians perform their tricks. Though there is no formal education requirement for magicians, it can take years of practice to master a routine.

Research Assistant: Research assistants work in laboratories, colleges, and universities. They collect information from books and from questionnaires they give to people. Research assistants attend four-year colleges and often spend some time in graduate school afterwards.

Statistician: Statisticians use numbers to calculate the likelihood of events occurring. They attend four-year colleges and frequently attend graduate school.

Psychic: Some psychics are serious individuals employed to help law enforcement agencies solve crimes. This is a very rare situation—most psychics are simply trying to separate people from their money!

What “doing science” means is that we begin with an open mind about something—in this case, ESP. Then, when we move from science to society, we maintain our open mind to see the many and varied ways science can help improve our lives. If ESP is real, and if we accept this as fact, we can begin to explore the ways ESP can be used to improve people’s lives.

Revisit, Review, Reflect, and Re-evaluate

As we have discussed, following scientific methods of testing to see if ESP exists, researchers found that participants selected the picture that was “sent” 35% of the time, when chance predicts that the correct picture should only be selected 25% of the time. Given all the steps taken to prevent cheating, it’s difficult to give a plausible explanation for the relationship other than that ESP is occurring.

However, the debate over ESP is far from over. Scientists continue to revisit the testing procedures, reflect on the results, and review other potential explanations. Scientists re-evaluate past findings because it not only is their job to answer new questions, but it is also their job to go back and check to make sure that previously-answered questions have been answered as best as they possibly could have been. Maybe knowledge that scientists have recently acquired in another area can be applied to ESP research. The job of a scientist is never finished. There are always new questions being asked and new ways of looking at old questions.

6

Revisit,
Review,
Reflect,
and
Re-evaluate.

Think & Write #4

What's next?

Based on what they know now, have students hypothesize about which further scientific studies might be done so that scientists can better understand ESP and how/if it works.

Potential ideas: Do people become better with practice? Are some people better than others? What if the people know each other or are related?

Discussion Questions

1. What could scientists do differently to test whether or not ESP exists?
2. Imagine scientists find a group of people who can actually perform ESP on a regular basis; what would this mean for society? For the government? For businesses? For you?
3. We discussed the method of proof by disproof, used by scientists to test things. Can you think of any situations in which this method should be used, but isn't?
4. What if the scientists found that the people in the experiments had a secret way to communicate? Now what would you think about ESP?

Homework Questions

1. Pretend you are a scientist and develop your own experiment to test whether or not a person has ESP. Describe.
2. Ask someone else what she/he thinks about ESP, tell her/him what you've learned and see if it changes her/his mind. Report on the results.
3. Bring in 3 examples of claims in which the source has a bias. Explain why the sources are biased and describe how you could find unbiased information.

**Cornell Institute for
Research on Children**

January 3, 2005

Quiz Questions

Version A

1. In the ESP experiment, there were 4 possible pictures for the “sender” to choose. If there was no ESP involved and the “receiver” was selecting pictures by chance, we would expect that the “receiver” would select the correct picture _____ of the time.
 - a. 15%
 - b. 25%
 - c. 35%
 - d. 50%

2. In the ESP experiment, there were 4 possible pictures for the “sender” to choose. The “receiver” selected the correct picture _____ of the time.
 - a. 15%
 - b. 25%
 - c. 35%
 - d. 50%

3. What are the two basic hypotheses of the research discussed in the ESP lesson?
 - a.
 - b.

4. You are watching TV and a commercial comes on advertising psychic readings for \$4.95 a minute. The commercial shows a previous customer complimenting the service and encouraging you to use it because it accurately predicted the kind of woman he was going to marry. This is an example of:
 - a. A great opportunity to learn about your future
 - b. Confusing correlation with causation
 - c. Applying science in society
 - d. Scientific evidence

Quiz Questions

Version B

1. In the ESP experiment, there were 4 possible pictures for the “sender” to choose from. Given this, we would expect that the “receiver” would select the correct picture 25% of the time. The study cited found a 35% “hit” rate. Is this a high enough rate to convince you that something other than chance (for example, ESP) is going on? Why / why not?
2. You are watching TV and a commercial comes on advertising psychic readings for \$4.95 a minute. The commercial shows a previous customer complimenting the service and encouraging you to use it because it accurately predicted the kind of woman he was going to marry. This is an example of (circle all that apply):
 - a. Applying science in society
 - b. A biased source
 - c. Confusing correlation with causation
 - d. A scientific hypothesis
 - e. Scientific evidence
3. Imagine that a new poll of scientists comes out that says 75% of scientists believe that does not ESP exist. Would this influence your thoughts on ESP? Why?

Quiz Questions

Version C

1. Do you think that having four choices for the “sender” and “receiver” to choose affects the findings? That is, given the 35% “hit” rate in this study, what would convince you that something other than chance is occurring in a study with 3 choices? 6 choices?
2. You are watching TV and a commercial comes on advertising psychic readings for \$4.95 a minute. The commercial shows a previous customer complimenting the service and encouraging you to use it because it accurately predicted the kind of woman he was going to marry. This is an example of _____.
3. Imagine that a new poll of scientists comes out that says 75% of scientists believe that ESP exists. Would this influence your thoughts on ESP? Why?