The Science of a Broken Heart: What Rejection Does to Us

Name Date Class

Reading

1 "Heartbreak" compares love to something that can break, like a bone or a cup. Scientists now ask a more serious question: after a breakup, is the pain only emotional, or does the body suffer real, measurable **distress**? Studies suggest both, but some early findings now look less certain.

2 In a 2005 study, US researchers including Helen Fisher scanned the brains of people deeply in love. When they saw a photo of their partner, brain areas that use **dopamine**, a chemical connected to pleasure and **reward**, became more active. A breakup takes that reward away. The body's main stress hormone, **cortisol**, may also rise. In a small 2021 study in Germany, cortisol was measured in hair samples from 101 women. Recently separated women had more cortisol than women in long relationships. However, single women and women newly in love also had more, so a breakup was not the only cause. Stress can **trigger** poor sleep and a smaller appetite.

3 In a 2003 study at the University of California, Los Angeles, volunteers played a ball-tossing game called Cyberball inside a brain scanner. After a few throws, the other two "players" stopped throwing the ball to them. During this small **rejection**, the anterior cingulate cortex, a brain region linked to physical pain, was **activated**. The lead researcher, Naomi Eisenberger, concluded that social pain and physical pain may share the same warning system in the brain. Later research questioned this idea. In 2014, a team led by Choong-Wan Woo studied 60 people who felt painful heat and also saw photos of an ex-partner. Both experiences used the same general brain areas, but the detailed activity was different.

4 Heartbreak can also affect the heart itself. In rare cases, sudden emotional shock, such as the end of a relationship or the death of a partner, can lead to a condition first identified in Japan in 1990 by the cardiologist Hikaru Sato. Its name, *takotsubo*, means octopus trap, because the heart's main pumping chamber balloons into that shape. A **surge** of stress hormones weakens part of the heart muscle. The condition, often called "broken heart syndrome," is usually **temporary**, and most people recover within days or weeks. Sad news is not the only cause: surgery or a serious illness can also bring it on. A 2025 US study of nearly 200,000 hospital patients found that 83 percent were women. Most patients survived, but men were about twice as likely to die.

5 The brain's reaction to rejection can resemble addiction. In a 2010 study, Fisher and her team scanned the brains of fifteen people who had recently been rejected by a partner but said they were still in love. When these people looked at a photo of their former partner, brain regions linked to drug **craving** became active. Fisher's team argued that rejection in love can work like a kind of **withdrawal**. This idea may explain the **obsession** some people develop with an ex-partner's messages, but it has not been proven.

6 Slowly, most people recover. In Fisher's study, people who had been rejected longer ago showed less activity in a brain area linked to attachment. Some psychologists also use the work of the British psychiatrist John Bowlby. He described a "protest" stage, when a person refuses to accept a loss and searches for what is missing. The model was built from studies of young children separated from a parent, not romantic couples, but researchers have since applied a similar **pattern** to adult breakups. For most people, strong feelings **gradually** weaken, and the craving **fades**. Scientists still do not agree on how long a full recovery usually takes.

Vocabulary Matching

Match each word from the reading with its meaning. Write the letter on the line.

1	**distress**	_____	**A**	a brain chemical connected to pleasure and reward
2	**dopamine**	_____	**B**	a way something regularly happens or repeats
3	**reward**	_____	**C**	slowly, over a period of time
4	**cortisol**	_____	**D**	lasting for only a limited time
5	**trigger**	_____	**E**	a sudden, strong increase in something
6	**rejection**	_____	**F**	gradually becomes weaker or disappears
7	**activated**	_____	**G**	to cause something to begin suddenly
8	**surge**	_____	**H**	something pleasant given or felt in return for an action
9	**temporary**	_____	**I**	made active or caused to start working
10	**craving**	_____	**J**	the unpleasant effects that follow losing something depended on
11	**withdrawal**	_____	**K**	a thought that continually occupies a person's mind
12	**obsession**	_____	**L**	a hormone released by the body during stress
13	**pattern**	_____	**M**	the act of refusing to accept or continue with someone
14	**gradually**	_____	**N**	a state of extreme worry, sadness, or physical pain
15	**fades**	_____	**O**	a powerful desire for something

Fill in the Blank

Choose a word from the box to complete each sentence. Use each word once. The words are already in the correct form.

activated	**cortisol**	**craving**	**distress**	**dopamine**	**fades**	**obsession**	**pattern**	**rejection**	**reward**
surge	**temporary**	**trigger**	**withdrawal**						

1 After a serious accident, many people feel deep _____ for weeks.

2 Chocolate can cause a small rise in _____ , a chemical linked to pleasure.

3 Finishing a difficult project can feel like its own _____ .

4 Long-term stress can keep _____ levels high for months.

5 A single stressful event can _____ a strong physical reaction.

6 Job hunters often need to cope with several rounds of _____ .

7 The alarm system was _____ automatically when smoke was detected.

8 The store reported a sudden _____ in sales before the holiday.

9 The bridge repairs are only _____ , and a permanent fix will follow later.

10 After skipping breakfast, he felt a strong _____ for something sweet by mid-morning.

11 Sudden _____ from a daily habit can cause headaches and tiredness.

12 His _____ with keeping the kitchen spotless became a running joke among his friends.

13 After a few weeks, the teacher noticed a clear _____ in the errors.

14 Without enough sunlight, the color of the paint slowly _____ .

Comprehension Questions

Answer in your notebook or discuss with a partner. Questions 10 to 12 are IELTS-style.

1 According to the reading, is heartbreak only an emotional experience, or can it also be physical? Explain.

2 What did the 2021 hair study in Germany find about cortisol, and why does the reading say a breakup was not the only cause?

3 Describe the 2003 Cyberball study. What did Naomi Eisenberger conclude, and how did the 2014 study question this?

4 What is takotsubo cardiomyopathy, and where and when was it first identified?

5 According to the 2025 US study, who usually gets broken heart syndrome, and who is more likely to die from it?

6 What did Helen Fisher's 2010 study find about the brains of recently rejected people?

7 How might Fisher's idea explain why some people check an ex-partner's messages again and again? How certain is this explanation?

8 What is the "protest" stage in John Bowlby's model, and how has it been applied to adult breakups?

9 In your own words, summarize what the reading says happens to the body and brain as a person recovers from heartbreak.

IELTS-Style Questions

10 **True, False, or Not Given:** *"Takotsubo cardiomyopathy always causes permanent damage to the heart."* Explain your answer using evidence from the reading.

11 **Yes, No, or Not Given:** *"The writer believes the 2003 Cyberball study proved that social pain and physical pain are the same."* Explain your answer using evidence from the reading.

12 **Author's purpose:** Why does the writer end the reading by saying that scientists do not agree on how long recovery usually takes? Is the aim to reassure the reader, to admit the limits of current research, or to criticize earlier studies?

True or False

Circle T (true) or F (false) according to the reading. Write a correction for each false statement on the dotted line.

1 **T / F** The reading suggests that heartbreak causes only emotional pain, with no physical effects.

2 **T / F** In the 2021 German study, cortisol was measured in hair samples.

3 **T / F** Cortisol is described in the reading as the body's main stress hormone.

4 **T / F** The 2003 Cyberball study found that social rejection had no effect on brain activity.

5 **T / F** Naomi Eisenberger was the lead researcher in the Cyberball study.

6 **T / F** Takotsubo cardiomyopathy was first identified in the United States.

7 **T / F** The reading says the condition is usually temporary, with most people recovering within days or weeks.

8 **T / F** The 2014 study found that rejection and physical pain produce exactly the same brain activity.

9 **T / F** People in Fisher's study showed brain activity in regions linked to drug craving.

10 **T / F** Scientists agree exactly on how long it takes to recover from heartbreak.

Discussion Questions

Talk with a partner or in a small group. The questions move from personal to more abstract.

1 Have you ever felt a physical symptom, such as a stomachache or trouble sleeping, during an emotional difficulty?

2 Do you think the pain of rejection feels similar to physical pain? Why or why not?

3 In your culture, what is common advice for someone who has just experienced a breakup?

4 Do you think checking an ex-partner's social media makes recovery easier or harder? Why?

5 The reading compares heartbreak to a kind of withdrawal. Do you find that comparison convincing?

6 Should schools or workplaces treat emotional pain, such as heartbreak, as seriously as physical illness?

7 Why do you think heartbreak is such a common subject in music, film, and literature worldwide?

8 Is it possible to feel heartbreak over something other than a romantic partner, such as a friendship, a pet, or a move to a new country?

9 The 2003 study used a simple computer game to create a feeling of rejection. What other situations in daily life might create a similar feeling?

10 If a friend told you they were checking an ex-partner's messages every day, what would you say to them?

11 Broken heart syndrome is more common in women, but men are more likely to die from it. What questions would you want researchers to answer next?

12 The reading says scientists do not agree on how long recovery usually takes. Why might this be hard to measure?

13 Would knowing the biology behind heartbreak change how you cope with a difficult breakup?

14 Some people avoid new relationships for a long time after heartbreak, while others move on quickly. What do you think explains the difference?

Language Focus: Passive Voice

The passive voice puts the focus on what happens to something, not on who or what causes it. It is formed with a form of 'to be' plus a past participle: was measured, was activated, was built.

In the reading:

- "In a small 2021 study in Germany, cortisol **was measured** in hair samples from 101 women."
- "…the anterior cingulate cortex…**was activated**."
- "…a condition first **identified** in Japan in 1990 by the cardiologist Hikaru Sato."

Practice: Rewrite this sentence in the passive voice: "Researchers scanned the brains of fifteen rejected people."

Activities and speed challenge
englishbridges.com/lessons/broken-heart-science

Notes