English 10 Week 1 Optional Educational Activities

The development of the teenage brain is complex, responding to potential rewards or consequences, which influences decision making. Receiving an injury while the brain is still developing is detrimental for a number of reasons.

After analyzing the sources, explain what key skills and cognitive abilities teenagers may not be able to develop if their brain is damaged during this time, according to the sources provided. Cite evidence to support your explanation from both sources (article).

Sources (Attached after this page)**:**
Source #1: "Teenage Brains Are Malleable and Vulnerable, Researchers Say" by John Hamilton
Source #2: "Teen Brain Takes Biggest Sports Hits" by Katharine Harmon

Name: _____ Class: _____

Teenage Brains Are Malleable And Vulnerable, Researchers Say

By John Hamilton
2012

This informational text explores the development of the teenage brain. As you read, identify what new research mentioned in the article contributed to earlier research done on teenagers' brains.

[1] Adolescent brains have gotten a bad rap, according to neuroscientists.

"They loved my dog." by Laura Avellaneda-Cruz is licensed under CC BY-NC-ND 2.0.

It's true that teenage brains can be impulsive, scientists reported at the Society for Neuroscience meeting in New Orleans. But adolescent brains are also vulnerable, dynamic and highly responsive to positive feedback, they say.

"The teen brain isn't broken," says Jay Giedd, a child psychiatry researcher at the National Institute of Mental Health. He says the rapid changes occurring in the brains of teenagers make these years "a time of enormous opportunity."

Part of the bad rap has come from studies suggesting that adolescent brains are "wired" to engage in risky behavior such as drug use or unsafe sex, says BJ Casey of Weill Cornell Medical College.

[5] These studies have concluded that teens are prone to this sort of behavior because the so-called reward systems in their brains are very sensitive while circuits involved in self-control are still not fully developed, Casey says. The result has been a perception that "adolescents are driving around with no steering wheel and no brake," she says.

Casey says a new study from her lab makes it clear that this isn't the case.

The study had teens and adults play a game where they got points for correctly answering questions about the motions of dots on a screen. Meanwhile researchers measured activity in brain regions involved in decisions and rewards.

When a lot of points were at stake, teens actually spent more time studying the dots than adults and brain scans showed more activity in brain regions involved in making decisions.

"Instead of acting impulsively, the teens are making sure they get it right," Casey says. She says this shows how teens' sensitivity to rewards can sometimes lead to better decisions.

[10] Two other studies presented at the Society for Neuroscience meeting showed that the adolescent brain is literally shaped by experiences early in life.

One of the studies involved 113 men who were monitored for depression from age 10 and then had brain scans at age 20. The scans showed that men who'd had an episode of depression had brains that were less responsive to rewards.

"They can't respond naturally when something good happens," says Erika Forbes at the University of Pittsburgh. She says this shows why it's important to treat problems like depression in teens.

The other study looked at how the brain's outer layer of cortex, which plays a critical role in thinking and memory, was affected by childhood experiences in 64 people. It found that this layer was thicker in children who got a lot of cognitive[1] stimulation and had nurturing parents, says Martha Farrah of the University of Pennsylvania.

Finally, a study by researchers in the U.S. and U.K. showed how much the brain changes during adolescence in regions involved in social interactions.

[15] The study involved 288 people whose brains were scanned repeatedly starting at age 7. And the scans revealed dramatic structural changes during adolescence in four regions that help us understand the intentions, beliefs and desires of others, says Kathryn Mills of the Institute of Cognitive Neuroscience in London.

The results show that the tremendous social changes teenagers go through are reflected in their brains, Mills says. They also show that these changes continue beyond the teen years, she says.

1. **Cognitive** ***(adjective):*** relating to or involving intellectual activity

Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which of the following identifies the central idea of the text?
    A. The teenage brain's wiring towards rewards most often results in risky behavior and poor choices that are unpreventable.
    B. The teenage brain is sensitive to rewards, which new studies show can aid in decision making.
    C. The underdevelopment of the teenage brain prevents teenagers from taking the time to make logical decisions or learn from past mistakes.
    D. While teenage brains' sensitivity to rewards can sometimes lead to teens making better decisions, this generally only happens for teens with nurturing parents.

2. PART B: Which quote from the text best supports the answer to Part A?
    A. "Part of the bad rap has come from studies suggesting that adolescent brains are 'wired' to engage in risky behavior such as drug use or unsafe sex" (Paragraph 4)
    B. "the so-called reward systems in their brains are very sensitive while circuits involved in self-control are still not fully developed" (Paragraph 5)
    C. "When a lot of points were at stake, teens actually spent more time studying the dots than adults and brain scans showed more activity in brain regions involved in making decisions." (Paragraph 8)
    D. "The other study looked at how the brain's outer layer of cortex, which plays a critical role in thinking and memory, was affected by childhood experiences in 64 people." (Paragraph 13)

3. PART A: What is the author's main purpose in the article?
    A. to show how dangerous the teenage brain can be due to its sensitivity towards rewards
    B. to introduce a new perspective on the teenage brain that shows its potential and flexibility
    C. to give examples of different ways in which the teenage brain can be observed
    D. to prove how important positive parental influence is for the teenage brain

4. PART B: Which detail from the text best supports the answer to Part A?
    A. "He says the rapid changes occurring in the brains of teenagers make these years 'a time of enormous opportunity.'" (Paragraph 3)
    B. "The result has been a perception that 'adolescents are driving around with no steering wheel and no brake,' she says." (Paragraph 5)
    C. "The scans showed that men who'd had an episode of depression had brains that were less responsive to rewards." (Paragraph 11)
    D. "It found that this layer was thicker in children who got a lot of cognitive stimulation and had nurturing parents, says Martha Farrah" (Paragraph 13)

5. How do paragraphs 5-6 contribute to the development of ideas in the text?

Short Response Questions

Directions: Write your answers to the following questions in the space provided.

1. Consider your experiences as a teenager and how your overall maturity has developed over the years: do you agree with the observations stated in this article?

2. In the context of the text, what does it mean to grow up? Is growing up experienced predominately in the mind? Cite evidence from this text, your own experience, and other literature, art, or history in your answer.

3. In the context of the text, what makes you who you are? How significant is the development of your brain to who you are? How permanent is it to who you are? Does it change dramatically with the development of your brain?

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Teen Brain Takes Biggest Sports Hits

By Katherine Harmon
2012

Contact sports can pose serious threats to the athletes who play them, but are teenagers in greater danger than others? In this informational text, Katherine Harmon discusses the effects that head injuries can have on the teenage brain. As you read, take notes on what happens to an athlete as a result of a head injury and the additional effect it can have on teenagers.

[1] The teenage brain is special. Less plastic than a child's developing brain, but not yet with all of the executive functions[1] of an adult noggin. And that makes them more vulnerable[2] to long-term effects of head injury, according to new research. Especially when it comes to sports-related concussions.[3]

"Tackled" by Nathan Rupert is licensed under CC BY-NC-ND 2.0.

In football, soccer, hockey or rugby, the top-front of the head usually receives the brunt of the blow. And that region is where the all-important executive function areas are forming for teenagers: the frontal cortex.

To learn more, researchers recruited 96 male sports participants ages nine through 26 — half of whom had had a diagnosed concussion in the past year. Using a battery of memory, attention, motor tests and EEG[4] monitors, the researchers found that all of the concussed athletes showed reduced working memory.

But the adolescents had the most cognitive[5] impairment, even if months had passed since their injury, and they reported feeling just fine. The findings are in the journal *Brain Injury*. [Annie Baillargeon et al., "Neuropsychological and Neurophysiological Assessment of Sport Concussion In Children, Adolescents and Adults"]

[5] So for high school athletes, a rough hit could lead to problems lasting longer than a bad headache.

1. referring to neurologically-based skills involving mental control and self-regulation
2. **Vulnerable** ***(adjective):*** capable of being wounded or hurt
3. an injury that affects your brain function, usually caused by a collision or blow to the head
4. EEG, short for electroencephalography, is a method to record electrical activity of the brain
5. **Cognitive** ***(adjective):*** connected with thinking or mental processes

Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which sentence expresses the central idea of the text?
    A. Teenagers are at greater risk of certain negative effects of concussions due to the state of their developing brain.
    B. Children and adults are safe from the negative effects of concussions due to their brains' stage of development.
    C. While teenagers are more vulnerable to concussions, they are able to recover from the damage more quickly than adults or children.
    D. No matter how much time has passed since an athlete has received a concussion, they will continue to experience difficulty with mental tasks.

2. PART B: Which detail from the text best supports the answer to Part A?
    A. "Less plastic than a child's developing brain, but not yet with all of the executive functions of an adult noggin." (Paragraph 1)
    B. "And that region is where the all-important executive function areas are forming for teenagers: the frontal cortex." (Paragraph 2)
    C. "To learn more, researchers recruited 96 male sports participants ages nine through 26 — half of whom had had a diagnosed concussion in the past year." (Paragraph 3)
    D. "Using a battery of memory, attention, motor tests and EEG monitors, the researchers found that all of the concussed athletes showed reduced working memory." (Paragraph 3)

3. Which of the following statements best identifies the author's purpose in the text?
    A. to encourage parents not to let teenagers play contact sports
    B. to show readers how to recognize and treat a concussion
    C. to provide readers with the resources to further explore the effects of head injuries
    D. to inform readers about how vulnerable the teenage brain is

4. How does the text draw a connection between the development of teenage brains and sports injuries?

Short Response Questions

Directions: Write your answers to the following questions in the space provided.

1. How are teenagers more vulnerable during this time of their life than at other ages? Is it more important for teens to be protected at this time in their lives, or to have the freedom to make their own choices and mistakes? Cite evidence from this text, your own experience, and other literature, art, or history in your answer.

2. How can studying concussed brains potentially help us prevent the harmful side-effects of participating in sports? Should teens' participation in sports be limited? Why or why not? Cite evidence from this text, your own experience, and other literature, art, or history in your answer.