英语二阅读真题同源过关练习连载八：

文章来源：**medicalxpress**　　段落：六段　　字数：**427**　　内容：心理学

要求：**A.** 做题 **B.** 找到出题处 **C.** 挑五个句子翻译 **D.** 将文中单词认真背完

The human mind can rapidly absorb and analyze new information as it flits from thought to thought. These quickly changing brain states may be encoded by synchronization of brain waves across different brain regions, according to a new study from MIT neuroscientists. The researchers found that as monkeys learn to categorize different patterns of dots, two brain areas involved in learning—the prefrontal cortex and the striatum—synchronize their brain waves to form new communication circuits.

"We're seeing direct evidence for the interactions between these two systems during learning, which hasn't been seen before. Category-learning results in new functional circuits between these two areas, and these functional circuits are rhythm-based, which is key because that's a relatively new concept in systems neuroscience," says Earl Miller, the Picower Professor of Neuroscience at MIT and senior author of the study, which appears in the June 12 issue of *Neuron*.

The phenomenon of brain-wave synchronization likely precedes the changes in synapses, or connections between neurons, believed to underlie learning and long-term memory formation, Miller says. That process, known as synaptic plasticity, is too time-consuming to account for the human mind's flexibility, he believes.

"If you can change your thoughts from moment to moment, you can't be doing it by constantly making new connections and breaking them apart in your brain. Plasticity doesn't happen on that kind of time scale," says Miller, who is a member of MIT's Picower Institute for Learning and Memory. "There's got to be some way of dynamically establishing circuits to correspond to the thoughts we're having in this moment, and then if we change our minds a moment later, those circuits break apart somehow. We think synchronized brain waves may be the way the brain does it."

Previous studies have shown that during cognitively demanding tasks, there is increased synchrony between the frontal cortex and visual cortex, but Miller's lab is the first to show specific patterns of synchrony linked to specific thoughts. Miller and Antzoulatos also showed that once the prefrontal cortex learns the categories and sends them to the striatum, they undergo further modification as new information comes in, allowing more expansive learning to take place. This iteration can occur over and over.

"That's how you get the open-ended nature of human thought. You keep expanding your knowledge," Miller says. "The prefrontal cortex learning the categories isn't the end of the game. The cortex is learning these new categories and then forming circuits that can send the categories down to the striatum as if it's just brand-new material for the brain to elaborate on."

1. novel information is taken in and examined in mind when

A. people think up new ideas

B. people stick to old thinking

C. people adapt to the new environment

D. people change their thinking patterns

2. we can learn from the paragraph 2 that

A. no direct link is found between the two

B. there is strong and obvious proof found

C. it is a very old and traditional concept

D. learning scores can be promoted greatly

3. flexibility is hard to be explained in synaptic plasticity because

A. less time is required

B. time is precious

C. more time is needed

D. time is common

4. it is implied in the paragraph 5 that

A. the correlation between the two was too obscure to be ascertained

B. the relation between the two is too good to be true

C. the interrelationship between the two was beyond people's understanding

D. the interrelation between the two is too grand to be realized

5. the author's attitude to this research can be described as

A. objective B. subjective C. admiring D. cynical

答案：DBCCA

The human mind can rapidly absorb and analyze new information as it flits from thought to thought. 第一题答案出处These quickly changing brain states may be encoded by synchronization of brain waves across different brain regions, according to a new study from MIT neuroscientists. The researchers found that as monkeys learn to categorize different patterns of dots, two brain areas involved in learning—the prefrontal cortex and the striatum—synchronize their brain waves to form new communication circuits.

"We're seeing direct evidence for the interactions between these two systems during learning, which hasn't been seen before. 第二题答案出处Category-learning results in new functional circuits between these two areas, and these functional circuits are rhythm-based, which is key because that's a relatively new concept in systems neuroscience," says Earl Miller, the Picower Professor of Neuroscience at MIT and senior author of the study, which appears in the June 12 issue of *Neuron*.

The phenomenon of brain-wave synchronization likely precedes the changes in synapses, or connections between neurons, believed to underlie learning and long-term memory formation, Miller says. That process, known as synaptic plasticity, is too time-consuming to account for the human mind's flexibility, he believes.第三题答案出处

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Previous studies have shown that during cognitively demanding tasks, there is increased synchrony between the frontal cortex and visual cortex, but Miller's lab is the first to show specific patterns linked to specific thoughts. 第四题答案出处Miller and Antzoulatos also showed that once the prefrontal cortex learns the categories and sends them to the striatum, they undergo further modification as new information comes in, allowing more expansive learning to take place. This iteration can occur over and over.

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forming circuits that can send the categories down to the striatum as if it's just brand-new material for the brain to elaborate on."

全文翻译：

在思维方式转变时，人类大脑能够快速地提取和分析新信息。麻省理工学院（MIT）神经学科学家的一项新研究结果表明，这些转瞬即逝的大脑状态改变可以通过同步大脑不同区域的脑电波被记录下来。研究人员发现，猴子学习如何分类由圆点组成的不同图案时，大脑中的前额叶皮质和纹状体会同步它们的脑电波，从而形成新的通信回路。

麻省理工学院皮考尔学院神经生物学教授，此次研究论文的第一作者 Earl Miller，在 6 月 12 日出版的《神经元》(Neuron) 杂志上发表论文："研究发现了前额叶皮质和纹状体在学习中相互作用的直接证据，这在以前从未见过。类别学习使得这两个不同区域间相互作用产生新的节奏型功能性回路，这个新概念对系统神经学很重要。"

Miller 认为脑电波同步现象的发生可能先于神经元突触的改变或者神经元的连接，这两种现象被认为是学习和形成持久记忆力的基础。这个过程常被称作突触可塑性，不过它耗费的时间过长，很难用来解释人类大脑的灵活性。

MIT 皮考尔学学习与记忆院的学者 Miller 认为，"由于塑造突触所需时间很长，所以大脑不可能做到通过不断地形成新突触，断开旧突触的方法来改变想法。大脑一定用了什么其他妙招建立产生我们现在的想法的动态回路，这些回路能在想法改变时断裂。我们认为可能是脑电波的同步建立的回路。"

以前有研究发现，大脑在进行有认知需求的任务时，额叶和视觉皮层的同步增强。但是 Miller 的实验室第一次揭露了特定脑电波同步方式与特定思考方式有关联的事实。Miller 和 Antzoulatos 同时表示，前额叶皮质学习各个类别，并把类别信息发送给纹状体之后，前额叶皮质会随着新信息的加入进行自我修正，使学习内容更广阔。这个过程会不断重复。

Miller 说，这就是人类如何在不断扩充知识中拥有开放性思维的。前额叶皮质并不仅仅学习分类，它还要形成能将类别信息输送给纹状体的回路，就好像皮层将新材料交给大脑进行精细加工一样。