

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

Inside the mind of a fan

How watching sport affects the brain

- A** At about the same time that the poet Homer invented the epic there, the ancient Greeks started a festival in which men competed in a single race, about 200 metres long. The winner received a branch of wild olives. The Greeks called this celebration the Olympics. Though the ancient sprint remains, today the Olympics are far more than that. Indeed, the Games seem to celebrate the dream of progress as embodied in the human form. That the Games are intoxicating to watch is beyond question. During the Athens Olympics in 2004, 3.4 billion people, half the world, watched them on television. Certainly, being a spectator is a thrilling experience—but why?
- B** In 1996, three Italian neuroscientists, Giacomo Rizzolatti, Leonardo Fogassi and Vittorio Gallese, examined the premotor cortex of monkeys. They discovered that inside these primate brains there were groups of cells that ‘store vocabularies of motor actions’, just as there are grammars of movement. These networks of cells are the bodily ‘sentences’ we use every day, the ones our brain has chosen to retain and refine. Think, for example, about a golf swing. To those who have only watched the Masters Tournament on TV, golfing seems easy. To the novice, however, the skill of casting a smooth arc with a lopsided metal stick is virtually impossible. This is because most novices swing with their consciousness, using an area of the brain next to the premotor cortex. To the expert, on the other hand, a perfectly balanced stroke is second nature. For him, the motor action has become memorized, and the movements are embedded in the neurons of his premotor cortex. He hits the ball with the tranquility of his perfected autopilot.
- C** These neurons in the premotor cortex, besides explaining why certain athletes seem to possess almost unbelievable levels of skill, have an even more amazing characteristic, one that caused Rizzolatti, Fogassi and Gallese to give them the lofty title ‘mirror neurons’. They note that ‘the main functional characteristic of mirror neurons is that they become active both when the monkey performs a particular action (for example, grasping an object or holding it) and, astonishingly, when it sees another individual performing a similar action’. Humans have an even more elaborate mirror neuron system. These peculiar cells mirror, inside the brain, the outside world: they enable us to internalize the actions of another. In order to be activated, though, these cells require what the scientists call ‘goal-orientated movements’. If we are staring at a photograph, a fixed image of a runner mid-stride, our mirror neurons are totally silent. They only fire when the runner is active: running, moving or sprinting.

- D What these electrophysiological studies indicate is that when we watch a golfer or a runner in action, the mirror neurons in our own premotor cortex light up as if we were the ones competing. This phenomenon of neural mirroring was first discovered in 1954, when two French physiologists, Gastaut and Bert, found that the brains of humans vibrate with two distinct wavelengths, alpha and mu. The mu system is involved in neural mirroring. It is active when our bodies are still, and disappears whenever we do something active, like playing a sport or changing the TV channel. The surprising fact is that the mu signal is also quiet when we watch someone else being active, as on TV. These results are the effect of mirror neurons.
- E Rizzolatti, Fogassi and Gallese call the idea of mirror neurons the 'direct matching hypothesis'. They believe that we only understand the movement of sports stars when we 'map the visual representation of the observed action onto our motor representation of the same action'. According to this theory, watching an Olympic athlete 'causes the motor system of the observer to resonate. The 'motor knowledge' of the observer is used to understand the observed action.' But mirror neurons are more than just the neural basis for our attitude to sport. It turns out that watching a great golfer makes us better golfers, and watching a great sprinter actually makes us run faster. This ability to learn by watching is a crucial skill. From the acquisition of language as infants to learning facial expressions, mimesis (copying) is an essential part of being conscious. The best athletes are those with a premotor cortex capable of imagining the movements of victory, together with the physical properties to make those movements real.
- F But how many of us regularly watch sports in order to be a better athlete? Rather, we watch sport for the feeling, the human drama. This feeling also derives from mirror neurons. By letting spectators share in the motions of victory, they also allow us to share in its feelings. This is because they are directly connected to the amygdala, one of the main brain regions involved in emotion. During the Olympics, the mirror neurons of whole nations will be electrically identical, their athletes causing spectators to feel, just for a second or two, the same thing. Watching sports brings people together. Most of us will never run a mile in under four minutes, or hit a home run. Our consolation comes in watching. When we gather around the TV, we all feel, just for a moment, what it is to do something perfectly.

Questions 27–32

Reading Passage has six paragraphs, A–F.

Which paragraph contains the following information?

Write the correct letter, A–F, in boxes 27–32 on your answer sheet.

NB You may use any letter more than once.

- 27** an explanation of why watching sport may be emotionally satisfying
- 28** an explanation of why beginners find sporting tasks difficult
- 29** a factor that needs to combine with mirroring to attain sporting excellence
- 30** a comparison of human and animal mirror neurons
- 31** the first discovery of brain activity related to mirror neurons
- 32** a claim linking observation to improvement in performance

Questions 33–35

Choose the correct letter, **A**, **B**, **C** or **D**.

Write the correct letter in boxes 33–35 on your answer sheet.

33 The writer uses the term ‘grammar of movement’ to mean

- A** a level of sporting skill.
- B** a system of words about movement.
- C** a pattern of connected cells.
- D** a type of golf swing.

34 The writer states that expert players perform their actions

- A** without conscious thought.
- B** by planning each phase of movement.
- C** without regular practice.
- D** by thinking about the actions of others.

35 The writer states that the most common motive for watching sport is to

- A** improve personal performance.
- B** feel linked with people of different nationalities.
- C** experience strong positive emotions.
- D** realize what skill consists of.

Questions 36–40

Do the following statements agree with the claims of the writer in Reading Passage 3?

In boxes 36–40 on your answer sheet, write:

- | | |
|------------------|---|
| YES | <i>if the statement agrees with the claims of the writer</i> |
| NO | <i>if the statement contradicts the claims of the writer</i> |
| NOT GIVEN | <i>if it is impossible to say what the writer thinks about this</i> |

36 Inexpert sports players are too aware of what they are doing.

37 Monkeys have a more complex mirror neuron system than humans.

38 Looking at a photograph can activate mirror neurons.

39 Gastaut and Bert were both researchers and sports players.

40 The mu system is at rest when we are engaged in an activity.

选段匹配 (27–32)

题号	答案	题干翻译	精确定位句 (英文) → 中译	解析 (同义改写与排除)
27	F	为什么观看体育比赛在情感上令人满足	第F段: “Rather, we watch sport for the feeling, the human drama... This feeling also derives from mirror neurons... This is because they are directly connected to the amygdala, one of the main brain regions involved in emotion.” → “相反, 我们观看体育是为了那种感觉、人性的戏剧性.....这种感觉也源自镜像神经元.....因为它们与杏仁核 (主要情绪脑区之一) 直接相连。”	题干中的 <i>emotionally satisfying</i> 对应文中的 <i>feeling, emotion, amygdala</i> 。强调观看带来的共享情绪体验。其它段落虽提到观看, 但未直接把“情感满足”与生理机制 (杏仁核) 对应。
28	B	解释为什么初学者觉得体育动作很难	第B段: “This is because most novices swing with their consciousness, using an area of the brain next to the premotor cortex.” → “这是因为大多数新手是靠‘意识’去挥杆, 使用的是前运动皮层旁边的大脑区域。”	关键词 <i>beginners = novices</i> ; “靠意识/不自动化”导致困难。第B段还以高尔夫举例, 凸显“几乎不可能 (virtually impossible)”。
29	E	达到体育卓越时, 需与“镜像”结合的一个因素	第E段: “The best athletes are those with a premotor cortex capable of imagining the movements of victory, together with the physical properties to make those movements real. ” → “最优秀的运动员既要有能想象胜利动作的前运动皮层, 还需要将这些动作变为现实的身体条件。”	题干暗含“光有模仿/镜像还不够”, 还需“physical properties (身体素质/条件)”。本句以 together with 明确“组合要素”。
30	C	人类与动物镜像神经元的比较	第C段: “Humans have an even more elaborate mirror neuron system.” → “人类拥有更为精细/复杂的镜像神经元系统。”	与前文猴子研究作对比, 明确“人类更精细”, 构成直接比较。
31	D	与镜像神经相关的大脑活动的首次发现	第D段: “This phenomenon of neural mirroring was first discovered in 1954, when two French physiologists, Gastaut and Bert, found that the brains of humans vibrate with two distinct wavelengths, alpha and mu.” → “这种神经镜像现象首次在1954年被发现, 当时两位法国生理学家 Gastaut 和 Bert 发现人脑以 α 和 μ 两种不同波长振动。”	出现明确时间标记 <i>first discovered in 1954</i> 与研究者姓名, 直接对应“首次发现”。
32	E	通过观察与表现提升之间的联系性主张	第E段: “watching a great golfer makes us better golfers, and watching a great sprinter actually makes us run faster.” → “观看优秀高尔夫选手会让我们打得更好; 看顶尖短跑选手实际上能让我们跑得更快。”	这句是把“观察”与“表现提升”直接相连的明确论断。其它段落未有如此直白的效应陈述。

单选题 (33–35)

题号	答案	题干翻译	精确定位句 (英文) → 中译	详细解析 (同义改写与错误项排除)
33	C	“运动的语法 (grammar of movement)”指什么	第B段: "...groups of cells that 'store vocabularies of motor actions', just as there are grammars of movement. These networks of cells are the bodily 'sentences' we use every day..." → “.....存储‘运动动作词汇’的一组细胞，**就像存在‘运动的语法’**一样。这些细胞网络就是我们每天使用的‘身体句子’.....”	“语法/词汇/句子”是隐喻，指细胞网络的结构化组织，对应选项 C a pattern of connected cells 。排除: A “技能水平” (概念层级不对); B “关于运动的词语系统” (误把隐喻当字面语言系统); D “某种高尔夫挥杆类型” (缩小指代范围)。
34	A	作者认为专家的动作是如何完成的	第B段: “To the expert... a perfectly balanced stroke is second nature... the motor action has become memorized... He hits the ball with the tranquility of his perfected autopilot .” → “对专家而言.....完美平衡的一击已是第二天性.....动作已经被内化记忆.....他在自动驾驶般的宁静中击球。”	“second nature/ autopilot”= 无需有意识思考，对应 A without conscious thought 。排除: B “逐段计划” (与自动化相反); C “无需规律练习” (文中未提，且不合理); D “思考他人动作” (与自身自动化冲突)。
35	C	观看体育最常见的动机是	第F段: “Rather, we watch sport for the feeling, the human drama. ... By letting spectators share in the motions of victory, they also allow us to share in its feelings... connected to the amygdala ...” → “相反，我们看体育是为了感觉、人性的戏剧性。.....让观众分享胜利的动作，也让我们分享其情感.....与杏仁核相连.....”	核心动机是体验强烈的积极情绪，对应 C 。排除: A “提升个人表现” (文中承认提升，但“最常见动机”被否定为“相反，我们是为了感觉”); B “与不同国籍的人建立联系” (虽有“brings people together”，但作者明确说“相反，是为了感觉”); D “了解技能本质” (非主因)。

判断题 (36–40)

题号	答案	题干翻译	精确定位句 (英文) → 中译	详细解析
36	YES	不熟练的运动者过分关注自己在做什么。	第B段: “This is because most novices swing with their consciousness , using an area of the brain next to the premotor cortex.” → “这是因为**大多数新手靠‘意识’**去挥杆，使用的是前运动皮层旁的大脑区域。”	too aware 与“用意识在挥杆”同义，说明注意力过强、未自动化，故 YES。
37	NO	猴子的镜像神经元系统比人类更复杂。	第C段: “Humans have an even more elaborate mirror neuron system.” → “人类拥有更为精细的镜像神经元系统。”	文意与题干相反 (人类比猴子更复杂)，故 NO。
38	NO	看照片会激活镜像神经元。	第C段: “If we are staring at a photograph, ... our mirror neurons are totally silent.” → “如果我们盯着一张照片.....我们的镜像神经元完全沉默。”	明确说“照片不激活”，与题干相反，故 NO。
39	NOT GIVEN	Gastaut 和 Bert 既是研究者也是运动员。	第D段: “two French physiologists, Gastaut and Bert...” → “两位法国生理学家 Gastaut 和 Bert.....”	文中仅说明二人为“生理学家/研究者”，并未提及二人是否为运动员，信息缺失，故 NOT GIVEN。
40	YES	从事活动时，μ (mu) 系统处于静息状态。	第D段: “The mu system is involved in neural mirroring. It is active when our bodies are still , and disappears whenever we do something active ... The mu signal is also quiet when we watch someone else being active...” → “μ系统在神经镜像中发挥作用。身体静止时活跃，一旦我们进行活动就消失.....当观看他人活动时μ信号也安静。”	题干“at rest (静息/安静)”与文中“disappears/quiet”同义；我们在进行活动时μ不活跃，故 YES。

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