C12T7P3 测试练习

Music and the emotions

Neuroscientist Jonah Lehrer considers the emotional power of music.

Why does music make us feel? On the one hand, music is a purely abstract ______ art form, devoid ______ of language or explicit ______ ideas. And yet, even though music says little, its still manages to touch us deeply. When listening to our favourite songs, our body betrays ______ at the symptoms ______ of emotional arousal ______ . The pupils in our eyes dilate ______ , our pulse ______ and blood pressure rise, the electrical conductance ______ of our skin is lowered, and the cerebellum ______ , a brain region associated with bodily movement, becomes strangely active. Blood is even re-directed to the muscles in our legs. In other words, sound stirs us at our biological roots.

A recent paper in Nature Neuroscience by a research team in Montreal, Canada, marks an important step in revealing the precise underpinnings ______ of ‘the potent ______ pleasurable stimulus’ ______ that is music. Although the study involves plenty of fancy ______ technology, including functional magnetic ______ resonance ______ imaging (fMRI) and ligand-based positron emission ______ tomography (PET) scanning, the experiment itself was rather straightforward. After screening 2017 individuals who responded to advertisements requesting ______ people who experience ‘chills’ to instrumental music, the scientists narrowed down the subject pool to ten. They then asked the subjects to bring in their playlist of favorite songs-virtually ______ every genre ______ was represented, from techno to tango-and played them the music while brain activity was monitored ______ . Because the scientists were combining methodologies ______ (PET and fMRI), they were able to obtain an impressively exact and detailed portrait ______ of music in the brain. The first thing they discovered is that music triggers ______ the production of dopamine - a chemical with a key role in setting people’s moods - by the neurons ______ (nerve cells) in both the dorsal and ventral regions of the brain. As these two regions have long been linked the experience of pleasure, this finding isn’t particularly surprising.

What is rather more significant is the finding that the dopamine neurons in the caudate-a region of the brain involved in learning stimulus-response associations, and in anticipating ______ food and other‘reward’ stimuli-were at their most active around 15 seconds before the participants’ favourite moments in the music. The researchers call this the ‘anticipatory phase’ and argue that the purpose ______ of this activity is to help us predict the arrival of our favourite part. The question, of course, is what all these dopamine neurons are up to. Why are they so active in the period preceding ______ the acoustic ______ climax? After all, we typically associate surges of dopamine with pleasure, with the processing of actual rewards. And yet, this cluster ______ of cells is most active when the ‘chills’ have yet to arrive, when the melodic ______ pattern is still unresolved.

On way to answer the question is to look at the music and not the neurons. While music can often seem (at least to the outsider) like a labyrinth ______ of intricate ______ patterns, it tums out that the most important part of every song or symphony ______ is when the patterns break down, when the sound becomes unpredictable. If the music is too obvious, it is annoyingly boring, like an alarm clock. Numerous studies, after all, have demonstrated that dopamine neurons quickly adapt to predictable rewards. If we know what’s going to happen next, then we don’t get excited. This is why composers ______ often introduce a key note in the beginning of a song, spend most of the rest of the piece in the studious ______ avoidance of the pattern, and then finally repeat it only at the end. The longer we are denied ______ the pattern we expect, the greater the emotional release when the pattern returns, safe and sound.

To demonstrate this psychological principle, the musicologist Leonard Meyer, in his classic book Emotion and Meaning in Music (1956), analysed the 5th movement of Beethoven's String Quartet in C-sharp minor, Op, 131. Meyer wanted to show how music is defined by its flirtation ______ with - but not submission ______ to - our expectations of order. Meyer dissected ______ 50 measures (bars) of the masterpiece ______ , showing how Beethoven begins with the clear statement of a rhythmic and harmonic ______ pattern and then, in an ingenious ______ tonal dance, carefully holds off repeating it. What Beethoven does instead is suggest variations of the pattern. He wants to preserve an element of uncertainty in his music, making our brains beg for the one chord ______ he refuses to give us. Beethoven saves that chord for the end.

According to Meyer, it is the suspenseful ______ tension ______ of music, arising out of our unfulfilled expectations, that is the source of the music's feeling. While earlier theories of music focused on the way a sound can refer to the real world of images and experiences - its 'connotative' ______ meaning -Meyer argued that the emotions we find in music come from the unfolding ______ events of the music itself. This' embodied meaning' arises from ______ the patterns the symphony invokes and then ignores. It is this uncertainty that triggers the surge of dopamine in the caudate, as we struggle to figure out what will happen next. We can predict some of the notes, but we can't predict them all, and that is what keeps us listening, waiting expectantly for our reward, for the pattern to be completed.