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• 中文摘要

近年來越來越多的人在推廣音樂用於放鬆及焦慮舒緩的應用，很多相關的研究也證實了音樂的效果能夠在焦慮量表及一些生理數據上反映出來，但對生理信號的變化研究較少。本研究利用 EEG 和 HRV 來測量受試者在聽音樂過程的腦波變化，並試圖釐清音樂、腦波和心率變異性之間的關係。並有以下的發現。在腦波頻率能量的分析方面， alpha power 在沒有聽音樂、聽舒緩音樂和聽搖滾樂等三種情境下有明顯的差異，沒有聽音樂時最大，聽搖滾樂時最小。在 gamma band 方面，我們發現不管聽何種音樂，其 gamma power 都比沒聽音樂大。根據相關的研究，感官刺激及選擇性注意力都能使的個體 gamma power 上昇，本實驗也驗證這樣的說法。研究也發現音樂喜好的因素會影響受試者的 alpha power 的強度。不喜歡搖滾樂受試者在聽搖滾樂時所呈現的 alpha power 會較可接受搖滾樂的受試者弱。此外也發現 alpha 波與心率變異性的數值之間有相關（ LF/HF、LFnu 爲負相關； HFnu 與 SDRR 爲正相關）。這點證實了這兩項測量的結果是一致的。雖然腦波和心率變異性的測量都可以推論個體的情緒狀態，但是這兩項測量之間的相關性是鮮少研究的。在本研究中同時做腦波和心率變異性的測量，結果證實這兩種的測量工具結果是有高度相關，也爲這兩種測量工具提出了間接性的效度證明。

• 英文摘要

The use of music for relaxing and relieving anxiety has become increasing popular in recent years; a lot of relevant researches have shown that music has both a mental and physiological effect which is quantifiable. This research measures the brain wave and heart rate variability (HRV) change during the course of experiments in listening to music. Furthermore, we attempted to distinguish the relation between the music ? BEEG and HRV. The following points have been discovered. First, it is found that alpha power under no music, listening to soft music and listening to rock music are different significantly. The biggest alpha power occurred under the situation of no music, and listening to rock music induced the least alpha power. On the other hand, we found no matter which kind

of music is listened to, the gamma powers are greater comparing with that under no music. This result is similar to the finding of the past research. According to relevant research, stimulus to the perception and selective attention caused individual's gamma power to rise. Our study also verifies such a viewpoint. Meanwhile, the music probably makes the change on experimenter's mood to cause gamma power to rise. We also find that there are greater alpha power on the people who like rock music than people who don't like when listening to rock music. Finally, the relationship between EEG and HRV were analyzed. Alpha power of EEG was positively correlated to HFnu and SDRR, and negatively correlated to LF/HF and LFnu of HRV. Therefore, the autonomic nervous system and cerebral cortex may have interplay in response to music.