

Consciousness, Imagery and Music

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One of the key aspects of high musical or artistic talent is the ability to hear or see imagined tunes or visual object with the “mind’s eye”. The Vividness of Visual Imagery Questionnaire (VVIQ) [1] measures such ability, but its auditory analogue has not been developed. Statistics on how many people are non-imagers is still controversial as most people rely on Galton’s 1880 paper [2]! Experiments that search for neural correlates of consciousness (NCC) [3] need to take the results of such tests into account, as it is quite likely that people with vivid visual or auditory imagination will show correlations between conscious perception and neural activity also in their primary sensory cortices, while people that lack such imagination will not show any correlations.

The inability to consciously imagine pitch and timbre of sounds is reflected in the Evoked Response Potentials (ERPs) in the auditory cortex [4]. Although it may be connected to associative auditory agnosia [5], it is more likely that it is due to a simple lack of sufficiently strong feedback connections leading from associative cortices responsible for memory and imagery to the auditory cortex. This seems to be a new form of amusia that may be called “imagery amusia”. Cognitive model of musical processing ignores the feedback from associative memory to the sensory cortices [6]. Learning to play music is difficult for people with imagery amusia. Although consciously they may not know what sound will be produced by pressing a particular key, they can correctly recognize wrong notes, as if they had good musical recognition memory, but no recall memory. Moreover, the inability to repeat simple melody without many trials to find correct notes does not prevent some of them to create interesting improvisations, indicating that recall memory and plans for sequences of actions to produce a melody are correctly formed in their brains. Without internal feedback the only way to learn about these plans is to produce music and hear it. Thus people with imagery amusia are not much more privileged to have conscious insight into their own brains than external observers. Perhaps this situation happens more often than we are willing to admit, with a whole range of problems related to the inability of consciously interpreting our own brain states, and the need to express and recognize them through bodily actions.

Better understanding of these issues will have far reaching implications for education, assessment of talent, and correlation of brain activity with conscious experiences.

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