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Comment

Which brain networks related to art perception are we talking about? Comment on “Move me, astonish me… delight my eyes and brain: The Vienna Integrated Model of top-down and bottom-up processes in Art Perception (VIMAP) and corresponding affective, evaluative, and neurophysiological correlates” by Matthew Pelowski et al.

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The proposal by the Vienna Integrated Model of Art Perception (Pelowski et al., [4]; VIMAP, hereafter) is a valuable and much needed attempt to summarize and understand the cognitive processes underlying art perception. Very important in their model is, as expected, to ascertain the psychological and brain processes correlated with the perception of beauty in art works. In this commentary we’ll focus exclusively on the consideration of VIMAP’s section 5, “Model stages and corresponding areas of the brain.” We’ll examine the evidence advanced by VIMAP in the section about brain networks related to the perception of art.

As it is known, the existence of a brain network is established by investigating functional connectivity. It is surprising that VIMAP uses the expression “functional connectivity” only twice (page 68 and Table 4), citing in both cases the article by Northoff et al. [3], which is a meta-analysis of the self-referential processes in our brain. Northoff et al. [3] do not mention any experiment related to the processes of art perception.

Functional connectivity is defined as the statistically temporal dependency of neuronal activation patterns of anatomically separated brain regions [6]. Temporal series of activation/deactivation of hypothetically synchronized brain regions must be obtained to detect such connectivity.

Using positron emission tomography (PET), Raichle et al. [5] identified the Default Mode Network, active during the resting state. Because the resting stage may persist for several minutes, this time span makes it possible to obtain the temporal series necessary to identify functional connectivity. However, VIMAP specifies a temporal span of only a few seconds (10–40 seconds) for Outcome I of the art perception. Consequently, neither the PET technique nor the fMRI can provide temporal series adequate for detecting functional connectivity and, thereby, brain networks in the perception of art. The only reference of VIMAP to brain networks is, as we stated above, the paper by Northoff et al. [3]. As we also stated, that article makes no reference to the perception of art. Indeed, it could not do so given that in the experiments of Northoff et al. [3] their registers are always obtained by means of PET or fMRI. As far as we
know, only one experiment has been published that qualifies for identifying functional connectivity in the perception of beauty/art [2,1]. The experiment uses temporal series obtained by magnetoencephalography (MEG). The MEG technique has the limitation of not being able to reach the deep layers of the brain, but its time span is of milliseconds. Consequently, it makes it possible to analyze the functional connectivity of the accessible regions.

It is difficult to understand why VIMAP has ignored that work. Particularly, if we take into consideration that VIMAP refers several times to the Default Mode Network, and the study by Cela-Conde et al. [2] relates the perception of beauty to the activation and deactivation of the Default Mode Network.

References