



Subconscious viewing of your own face can activate reward pathways

Graduate School of Frontier Biosciences
Associate Professor Tamami Nakano



<https://researchmap.jp/tamaminakano>

Abstract

We have found that the subliminal presentation of images of one's own face activates a central component of the dopamine reward pathway, thus illuminating the mechanisms behind our powerful ability to automatically prioritize processing of our own face. These findings have important implications for understanding the neural processes involved in automatic self-advantage in face processing, as well as discriminating the processes involved in supraliminal (conscious) and subliminal (subconscious) facial perceptions.

Background & Results

As humans, we each have a powerful ability to easily recognize our own face and quickly react toward it -it is known as "self-face advantage" or "self-prioritization effect". This effect is observed even when we are exposed to a subliminal image of our face—meaning we are not fully aware of it. However, little is known about whether this advantage involves the same brain or different areas that are activated by supraliminal presentation of our face.

To address this, we used functional magnetic resonance imaging (fMRI) to examine the differences between brain activity elicited by subliminally presented images of the faces of participants and faces of others. We also examined brain activation produced by subliminally presented images of faces with modified features. As a result, we found that activation in the ventral tegmental area, which is a central component of the dopamine reward pathway, was stronger for subliminal presentations of the participant's face compared with faces of others. Instead, subliminal presentation of the faces of others induced activation in the amygdala of the brain, which is known to respond to unfamiliar and fear-related information. This difference in brain responses to the face of the participant or those of others was consistent even when the faces were modified, as long as the shapes of the facial features were retained.

Our findings indicate that the dopamine reward pathway is involved in enhanced processing of one's own face even when the information is subliminal. Furthermore, discrimination of one's own face from those of others appear to rely on the information of facial parts.

Significance of the research and Future perspective

These findings advance the understanding of the neural mechanisms of subliminal self-facial processing. Given that the dopamine reward pathway is automatically involved in unconscious self-facial processing, this research may have applications in efforts to unconsciously manipulate motivation.

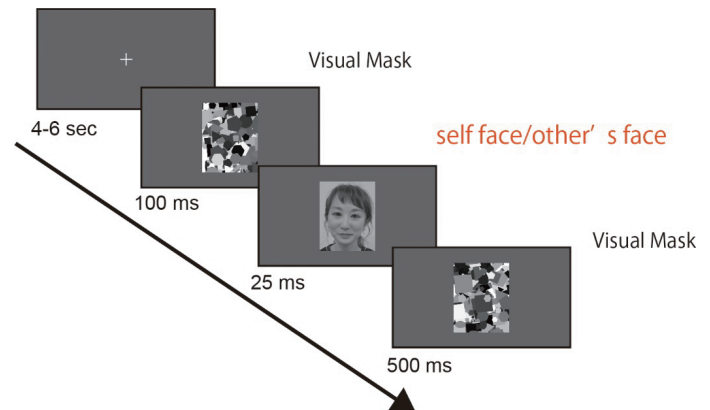


Figure 1 Procedure of subliminal face presentation



Figure 2 Brain region showing activation to the self-face (Ventral Tegmental Area)

Patent

Treatise

URL

Keyword

Ota, C; Nakano, T. Self-face activates the dopamine reward pathway without awareness. *Cerebral Cortex*. 2021; 31(10): 4420-4426. doi: 10.1093/cercor/bhab096

Ota, C; Nakano, T. Neural correlates of beauty retouching to enhance attractiveness of self-depictions in women. *Social Neuroscience*. 2021; 16 (2): 121-133. doi: 10.1080/17470919.2021.1873178

<https://kitazawa-lab.jp/>

self-prioritization effect, dopamine, ventral tegmental area, face recognition, self-consciousness