

A NEURAL PERSPECTIVE ON THE ROLE OF AFFECTIVE STATES ON INDIVIDUALS' SELECTION OF FOODS

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Abstract

This research makes an attempt to provide a better explanation of past findings which have often associated consumption of unhealthy foods with individuals' state of sadness, and of healthy foods to their feelings of happiness. Also, this research draws on existing literature on the roles of various parts of the human brain, in particular, the frontal cortex to explain the role of additional information in influencing individuals' subsequent choice.

Proposition 1: Individuals in state of sadness are expected to make food choices that are high in sugar and/or fat to increase the level of dopamine released in their brain and change their affective state.

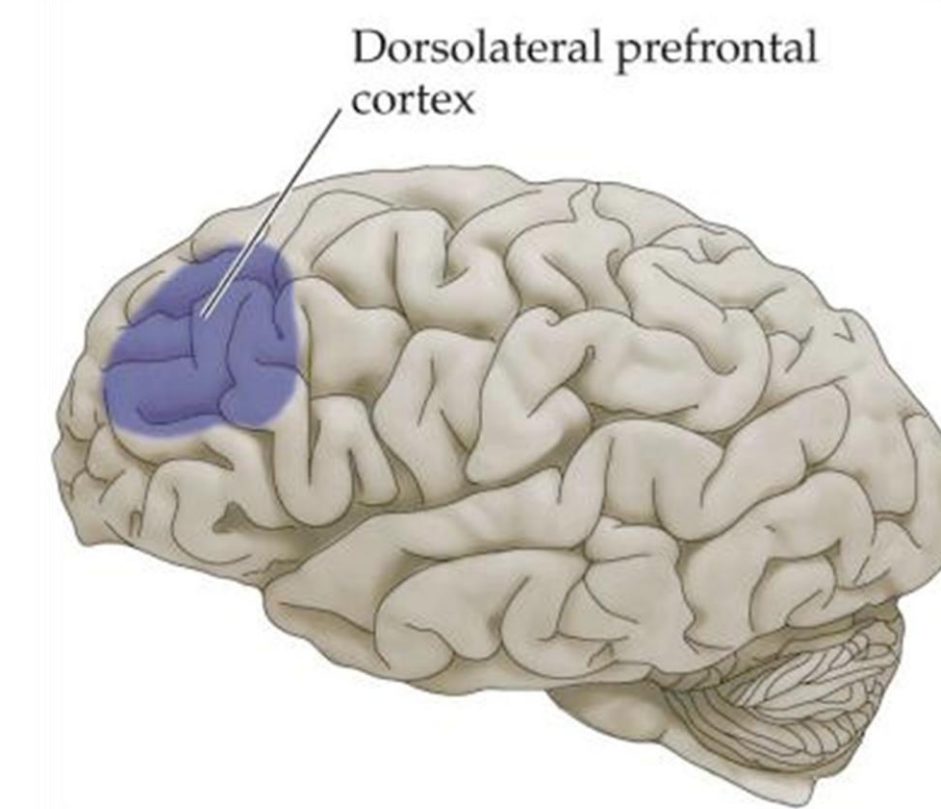
Proposition 2: Individuals in state of happiness are expected to make food choices that are low in sugar and/or fat (healthy), since they do not demand change in their current state because of the already desirable level of dopamine released in their brains

INFORMATION PROCESSING

❖ Isen (1984) suggests that a positive mood may increase the efficiency of information processing.

SELF-CONTROL

❖ Self-control group showed greater activity than non—control group in the dorsolateral prefrontal cortex (PFC) on trials where self-control was exercised. Hare, Camerer and Rangel (2009)



DOPAMINE AND FRONTAL LOBE

❖ Dopamine is one of the catecholamine neurotransmitters, and the implicated dopaminergic cell groups project forward from the head of the midbrain to several forebrain. (Wise and Rompre, 1989)

PREFRONTAL CORTEX AND DOPAMINE

❖ One effect of dopamine is to modulate the responsivity of PFC units to their input, allowing dopamine to gate inputs to PFC. Another effect of dopamine is to modulate the strength of the connection between these inputs and the dopamine neurons themselves, allowing the dopamine system to discover what information should trigger this gate, and thereby to update the contents of active memory in PFC appropriately. Braver and Cohen (2000)

Dopamine serves as a neurotransmitter in the Prefrontal Cortex (Braver and Cohen (2000)), responsible for self-control (Hare et al (2009)). The increase in self-control results in individuals making more conscious choices. Hence:

Proposition 3a: Individuals in state of sadness are expected to make less conscious decisions regarding their food choices, as the result of low level of dopamine released in their brain which serves as the primary neurotransmitter in the Prefrontal Cortex.

Proposition 3b: Individuals in state of sadness are expected to demonstrate more change in food selection behavior from unhealthy choices to healthy ones when nutritional information is provided because of change in the level of consciousness in their selection.

Methodology

FUNCTIONAL MRI

❖ Study subjects will be first exposed to a treatment to influence their affective state. Treatments in the past have mostly included short pieces of highly stimulating films.

❖ Study subjects in the desired affective state will be exposed to further stimuli and food options. Using fMRI, activity of dopamine releasing neurons will be monitored and recorded corresponding to each particular stimulus.

Managerial Implication

❖ Recent trends in public policy, particularly in Canada, have urged research and practice alike to tackle the issue that relate to public health and obesity. Understanding various aspects that influence individuals' selection of food can provide those involved with providing public health with better insight into various issues that should be taken into consideration if effective public health factors studies that take a deeper look biological and anatomical factors that form consumer behavior enable public health planners with the ability to take more objective steps into that direction. This research program makes an attempt to take steps as such.

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Literature Review

SADNESS

❖ There are different kinds of negative emotions, and decision making can be different in each affect. Raghunathan and Pham (1999)

❖ Sadness is a negative emotion, and arises from loss and helplessness (Keltner et al., 1993; Lazarus, 1991) and evokes the implicit goal of changing one's circumstances. Lerner, Small and Loewenstein (2004)

NEED FOR CHANGE IN SAD INDIVIDUALS

❖ It is also consistent with a common tendency among consumers to buy gifts for themselves when they are feeling depressed (Mick & Demoss, 1990).

❖ Bruyneel et al (2005) found subjects induced with sad emotions were more interested in buying lottery tickets.

DOPAMINE AND ITS REWARDING ROLE

❖ Dopamine is a neurotransmitter commonly associated with the reward system of the brain, providing feelings of enjoyment and reinforcement. (Wise and Rompre, 1989)

FAT AND SUGAR, DOPAMINE'S REINFORCEMENTS

❖ The dopamine system and its forebrain targets are part of the motivational system that regulates responses to many reinforcers such as food, drink, sex, social interactions and drugs (Kelley and Berridge, 2002)

❖ Fats and sugars could affect central reward systems. The ingestion of sucrose and other palatable foods has been shown to cause an increase in dopamine release. Levine, CM Kotz, BA Gosnell (2003)