

## The Relationships between Autonomy-Based Insula Activity and Learning: A Functional Magnetic Resonance Imaging Study

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**Abstract :** Learners' perceived autonomy predicts learners' interest, engagement, and learning. To understand these processes, we conducted an fMRI experiment. In this experiment, participants saw the national flag and were asked to rate how much they freely wanted to learn about that particular national flag. The participants then learned the characteristics of the national flag. Results showed that (1) the degree of participants' perceived autonomy was positively correlated with the degree of insula activity, (2) participants' early-trial insula activity predicted corresponding late-trial dorsolateral prefrontal cortex activity, and (3) the degree of dorsolateral prefrontal cortex activity was positively correlated with the degree of participants' learning about the characteristics of the national flag. Results suggest that learners' perceived autonomy predicts learning through the mediation of insula activity associated with intrinsic satisfaction and 'pure self' processes.

**Keywords :** insular cortex, autonomy, self-determination, dorsolateral prefrontal cortex

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