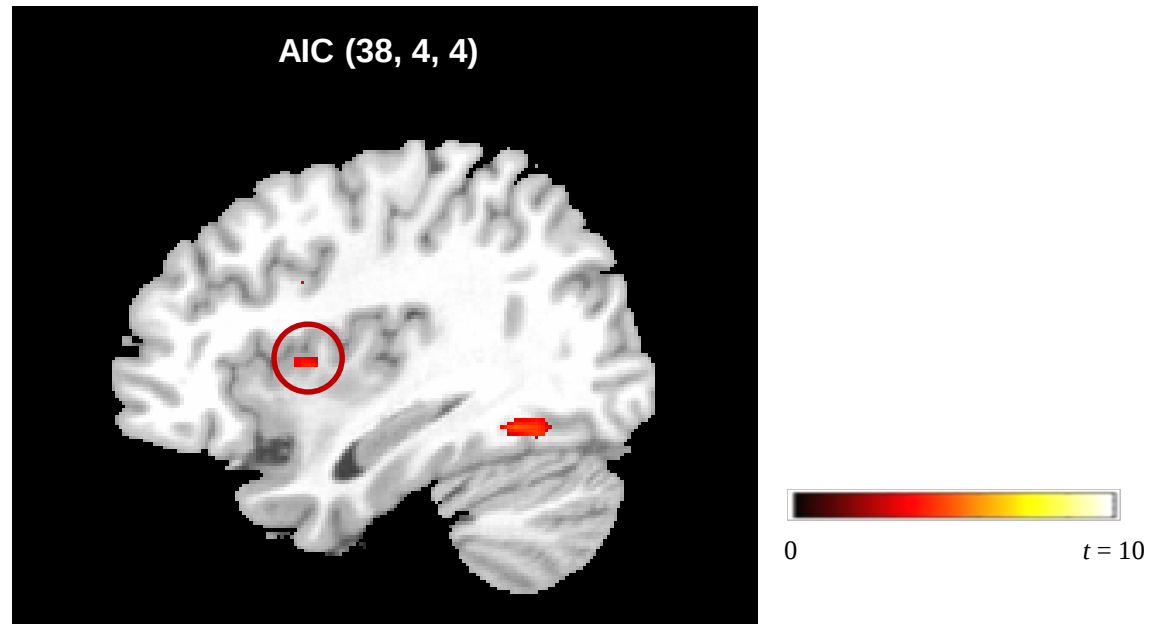


The Nature of Intrinsic Motivation and How to Support It



Johnmarshall Reeve
Korea University

Intrinsic Motivation

- The inherent desire to seek out novelty and challenge, to explore and investigate, and to stretch and extend one's capacities.

Intrinsic Motivation

A naturally-occurring tendency toward...

- **Exploration**—discovering something new.
- **Spontaneous Interest**—learning something new.
- **Environmental Mastery**
 - Extending existing capacities
 - Developing new capacities

Intrinsic Motivation

These pursuits produce subjective feelings (interest-enjoyment, a sense of satisfaction) that encourage volitional present and future engagement in that task, activity, or environment.

Spontaneous Satisfaction

- Satisfaction from a job well done
- Satisfaction for personal causation (self-as-cause)
- “It was fun—I enjoyed it.”
- “It was interesting.”
- “I liked it.”

INTRINSIC REWARDS
to encourage present and future
volitional engagement in that
activity or environment.

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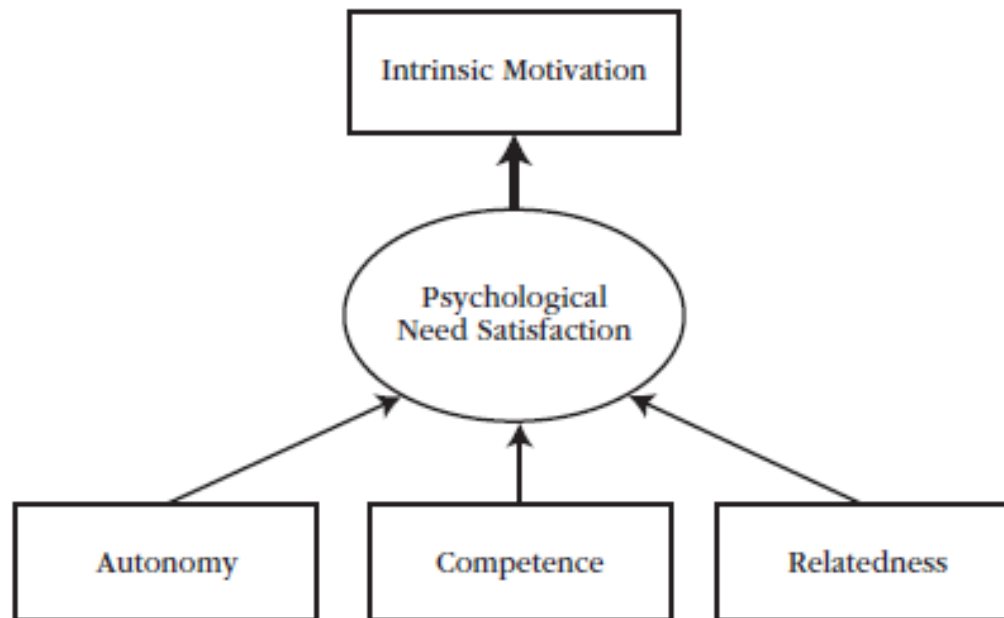
INTRINSIC REWARDS

Thus, intrinsic motivation is the desire to seek out novelty and explore, and to seek out and master optimal challenge for no reason other than the resulting feelings of interest and enjoyment.

Intrinsic Motivation

Alternative Definition

- The motivation that arises from experiences of psychological need satisfaction (autonomy, competence, and relatedness).



Psychological Need

- An inherent (inborn) psychological process that underlies the proactive desire to seek out interactions with the environment that promote personal growth, social development, and psychological well-being.
- **Autonomy**—the need to experience self-direction and personal endorsement in the initiation and regulation of behavior (goals)
- **Competence**—the need to be effective in interactions with the environment.
- **Relatedness**—the need establish close emotional connections and attachments with others.

What Is the Difference between Intrinsic Motivation & Psychological Need?

- **Intrinsic Motivation:** The inherent desire to seek out novelty and challenge, to explore and investigate, and to stretch and extend one's capacities.
- **Psychological Need:** An inherent (inborn) psychological process that underlies the proactive desire to seek out interactions with the environment that can promote personal growth, social development, and psychological well-being.

What Is the Difference between Intrinsic Motivation & Psychological Need?

- **Intrinsic Motivation:** The inherent desire to seek out novelty and challenge, to explore and investigate, and to stretch and extend one's capacities.
- **Psychological Need:** An inherent (inborn) psychological process that underlies the proactive desire to seek out interactions with the environment that can promote personal growth, social development, and psychological well-being.
- Conceptually, motivationally, behaviorally, and neurally (neuroscience)—***They are essentially the same thing.***

If you are studying one, you are also studying the other, though the psychological needs are the larger construct, because they underlie additional processes (e.g., internalization, integration).

What Self-Determination Theorists Say & What Critics Say

Self-Determination Theorists

- An activity is fun (intrinsically motivating) because it generates experiences of feeling autonomous, competent, and related. For instance, playing a game of tennis is an intrinsically motivated activity because it allows one to feel free and volitional, challenged and effective, and interpersonally close and connected to others. If playing tennis does not generate these feelings (i.e., forced to play, not being able to make the ball go where you want it to go, being criticized and devalued by one's coach), then it simply will not be much fun. So, it is not tennis per se that is fun but, rather, it is the experiences of autonomy, competence, and relatedness need satisfaction. Intrinsic motivation is quite literally the motivation that arises from experiences of psychological need satisfaction.

Critics

- C'mon; psychological needs? How do you know people have psychological needs? You are just making up an explanatory construct. It is just not scientific to use a construct for which you do have clear, concrete evidence.

Our Brain-Based Research Plan

- It it is real, then a psychological need should be in the brain (nervous system). If it is inherent, then it should be present at birth and in all people, regardless of age, race, SES, gender, etc.
- Let's take experimental activities that have been previously validated to activate intrinsic motivation and psychological needs while people lay in an fMRI scanner and observe their brain activity during that need activation/satisfaction experience.
- The question: Can you find clear evidence of intrinsic motivational processes in the brain?

Our First Study

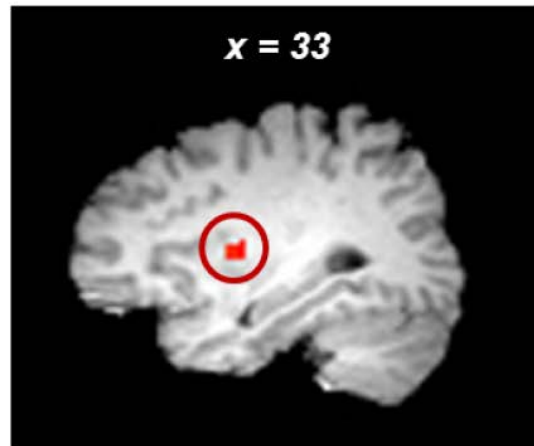
Imagine Doing the Same Activity for One of Three Reasons—IM, EM, Neutral

Table 1 Examples of phrases for each experimental condition used in the experimental task

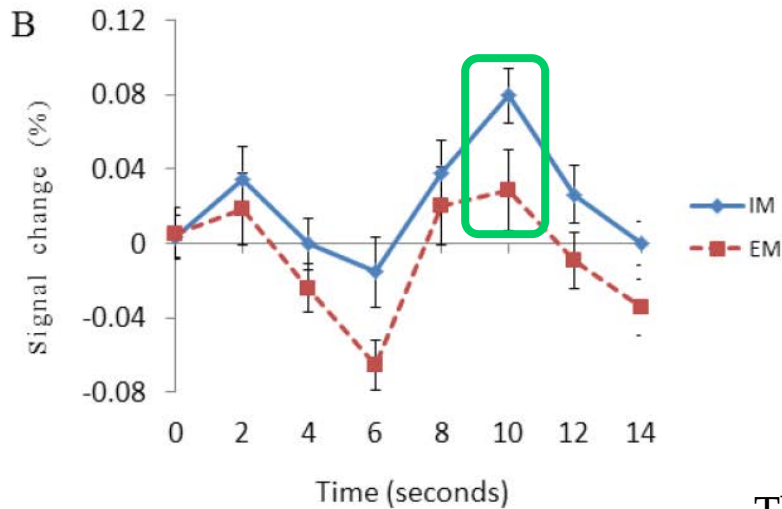
IM phrases	EM phrases	Neutral phrases
Writing an enjoyable paper	Writing an extra-credit paper	Writing a class paper
Working with freedom	Working for incentives	Working with time to spare
Participating in a fun project	Participating in a money-making project	Participating in a routine project
Having options and choices	Having prizes and awards	Having things to do
Studying for fun	Studying for a grade	Studying because it is time
Feeling curious	Feeling rewarded	Feeling neutral
Feeling interested	Anticipating a prize	Feeling normal

Unique to Intrinsic Motivation: Anterior Insular Cortex Activity

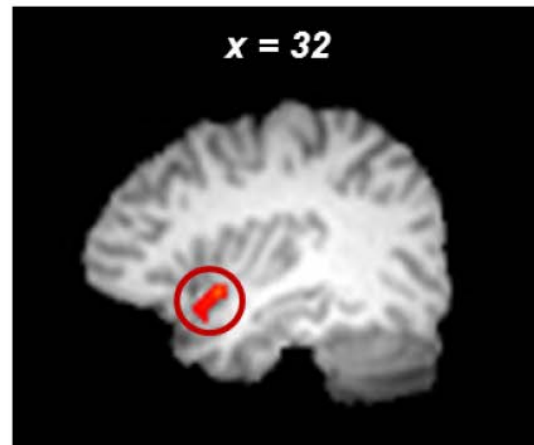
A



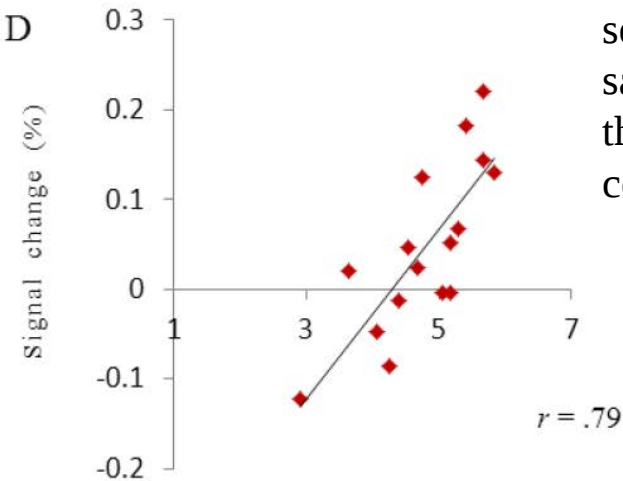
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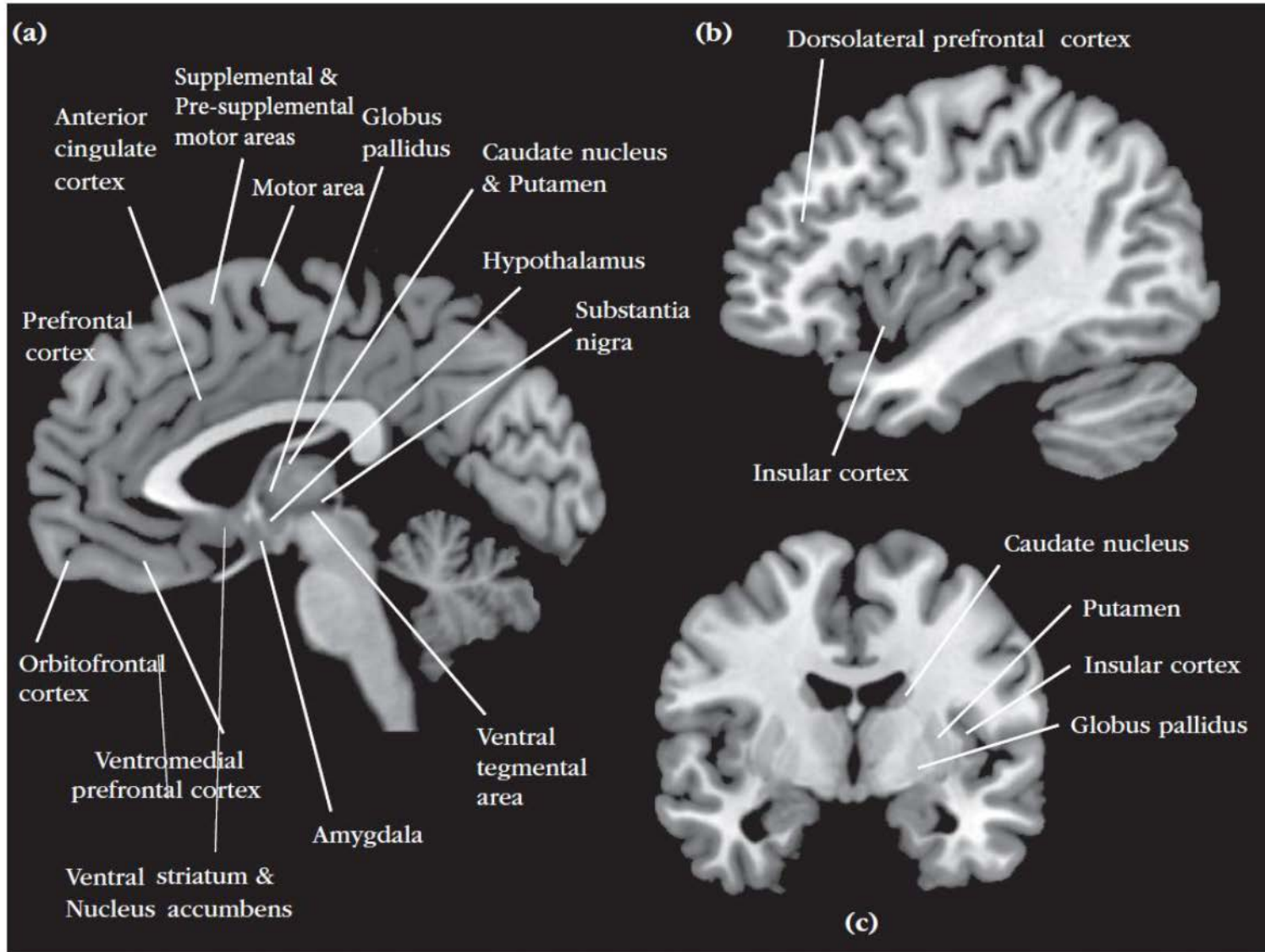


D



The greater the person's self-reported need satisfaction, the greater their anterior insula cortex activity.

Where Is the Insular Cortex?



Our Second Experiment

Anterior Insula: Unique Brain Activity during Intrinsic Motivation

Angular Gyrus: Unique Brain Activity during Extrinsic Motivation

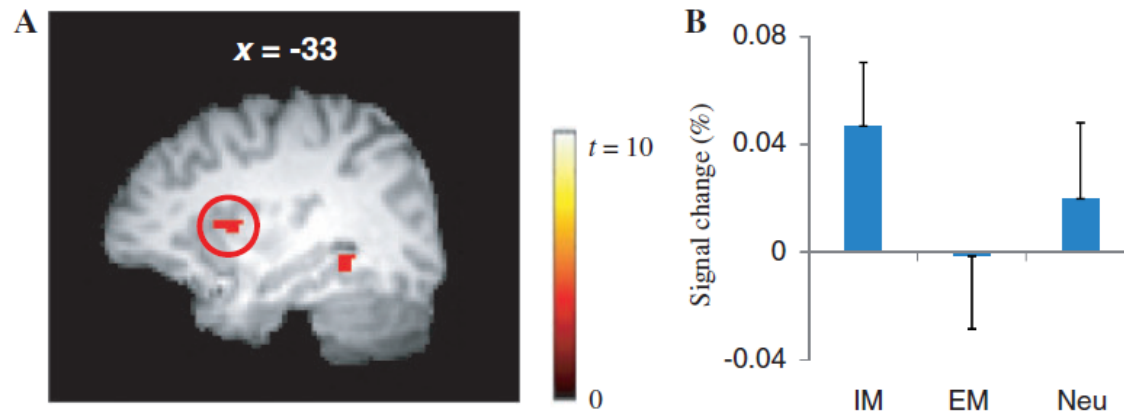


Fig. 4 There were significantly greater brain activations of the AIC in the IM condition than in the EM condition (A). The BOLD signal changes of the AIC across conditions are presented (B). Neu: neutral.

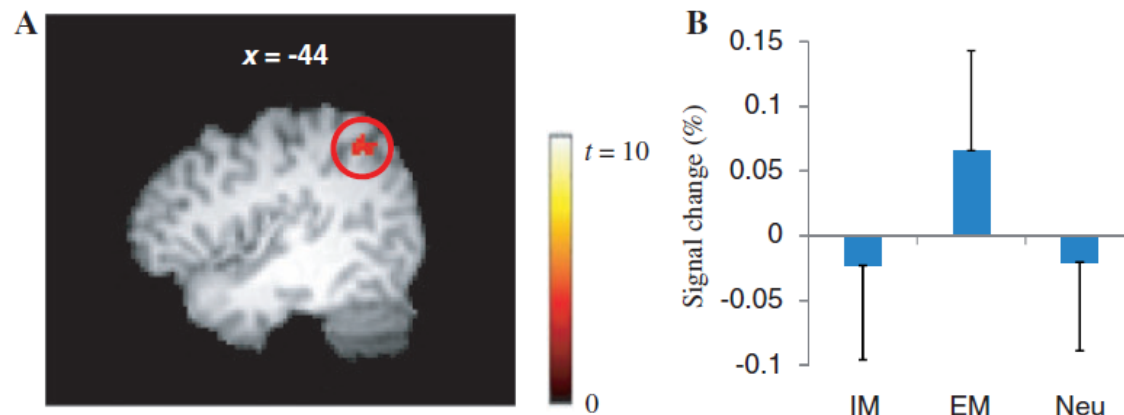


Fig. 5 There were significantly greater brain activations of the angular gyrus in the EM condition than in the IM condition (A). The BOLD signal changes of the angular gyrus across conditions are presented (B). Neu: neutral.

Bilateral Anterior Insula Activity Is

- (1) Sensitive to Experimental Manipulations of IM
- (2) Correlated with Need Satisfaction Self-Reports

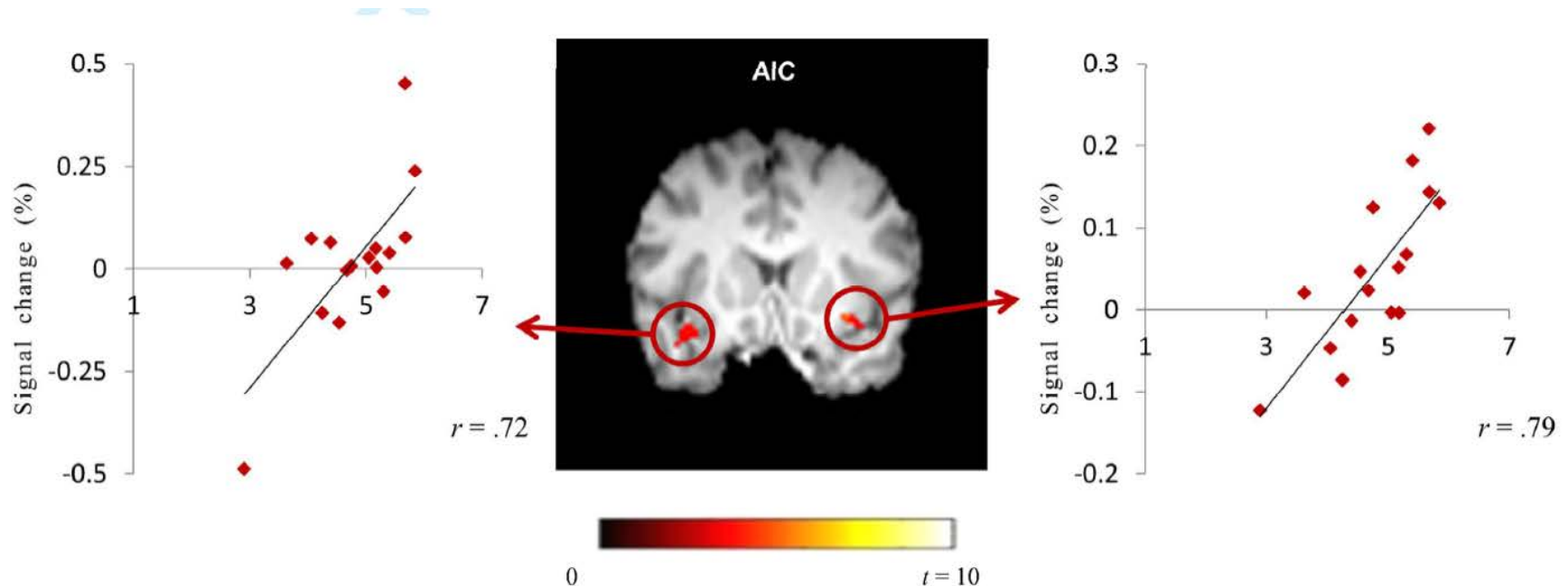


Figure 2. Bilateral anterior insular cortex (AIC) associations with self-reported need satisfaction scores.

Can You Solve This Anagram?

I'll Give You 7 Seconds...and a Hint

Can You Solve This Anagram?

I'll Give You 7 Seconds...and a Hint

N R I T A

Can You Solve This Anagram?

I'll Give You 7 Seconds...and a Hint

N R I T A

T R _ _ _

Did You Experience Competence Anticipation and Satisfaction?

- Encountering optimal challenge
- Having an opportunity to stretch and expand your skill
- Feeling enjoyment from being challenged
- Anticipating satisfaction from a job well done
- Actually experiencing mastery and effectance from making progress
- Developing greater capacity

Okay, One More...

C R P E I

Can You Solve This Anagram?

I'll Give You 7 Seconds...and a Hint

C R P E I

P R _ _ _

Experimental Task to Generate Competence Need Satisfaction

Competence Enabling Anagrams

Non-Competence Enabling Anagrams

0-2 secs.

3-4 secs.

5-7sec.

0-2 secs.

3-4 secs.

5-7sec.

OHTMN

MO _ _ _

?

CLCOK

CL _ _ _

?

CRPEI

PR _ _ _

?

WHTIE

WH _ _ _

?

NRITA

TR _ _ _

?

HAYPP

HA _ _ _

?

HUOCG

CO _ _ _

?

IFRST

FI _ _ _

?

SPEUA

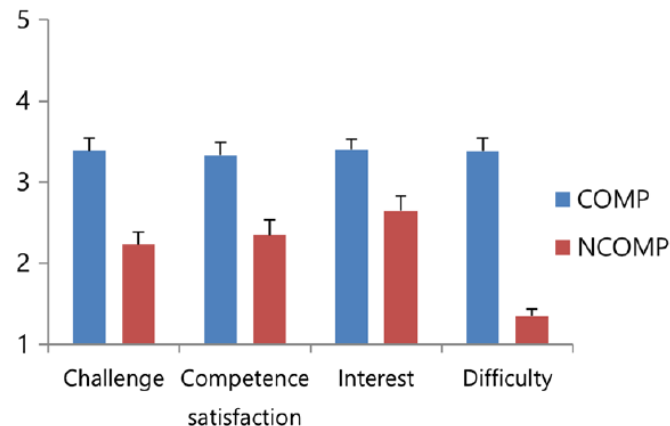
PA _ _ _

?

THIKN

TH _ _ _

?

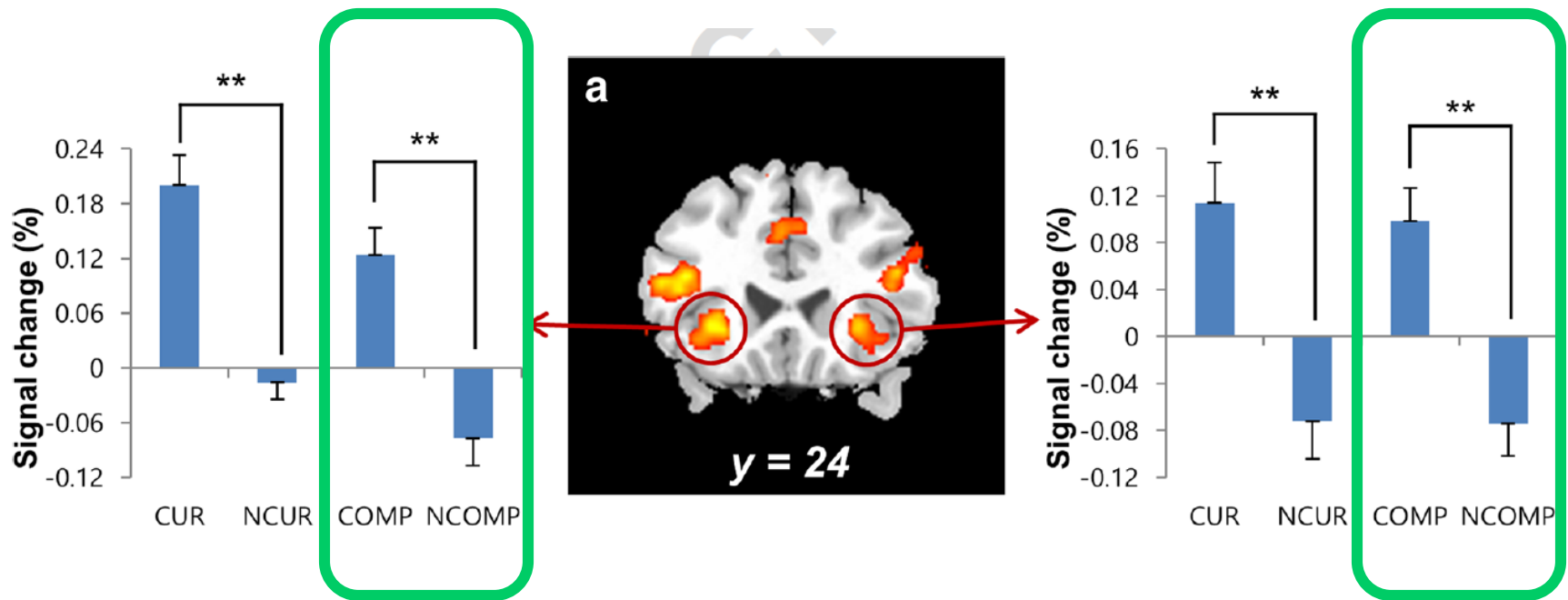


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- Encountering optimal challenge
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Our Third Experiment

Anterior Insula Associated with Competence Satisfaction



Bilateral anterior insular activity was more observed during competence-enabling anagrams (COMP) than during non-competence-enabling anagrams (NCOMP).

During Competence Satisfaction,
Anterior Insula and Striatum Activations Co-occur
[According to Psychophysiological Interaction (PPI) Analysis]

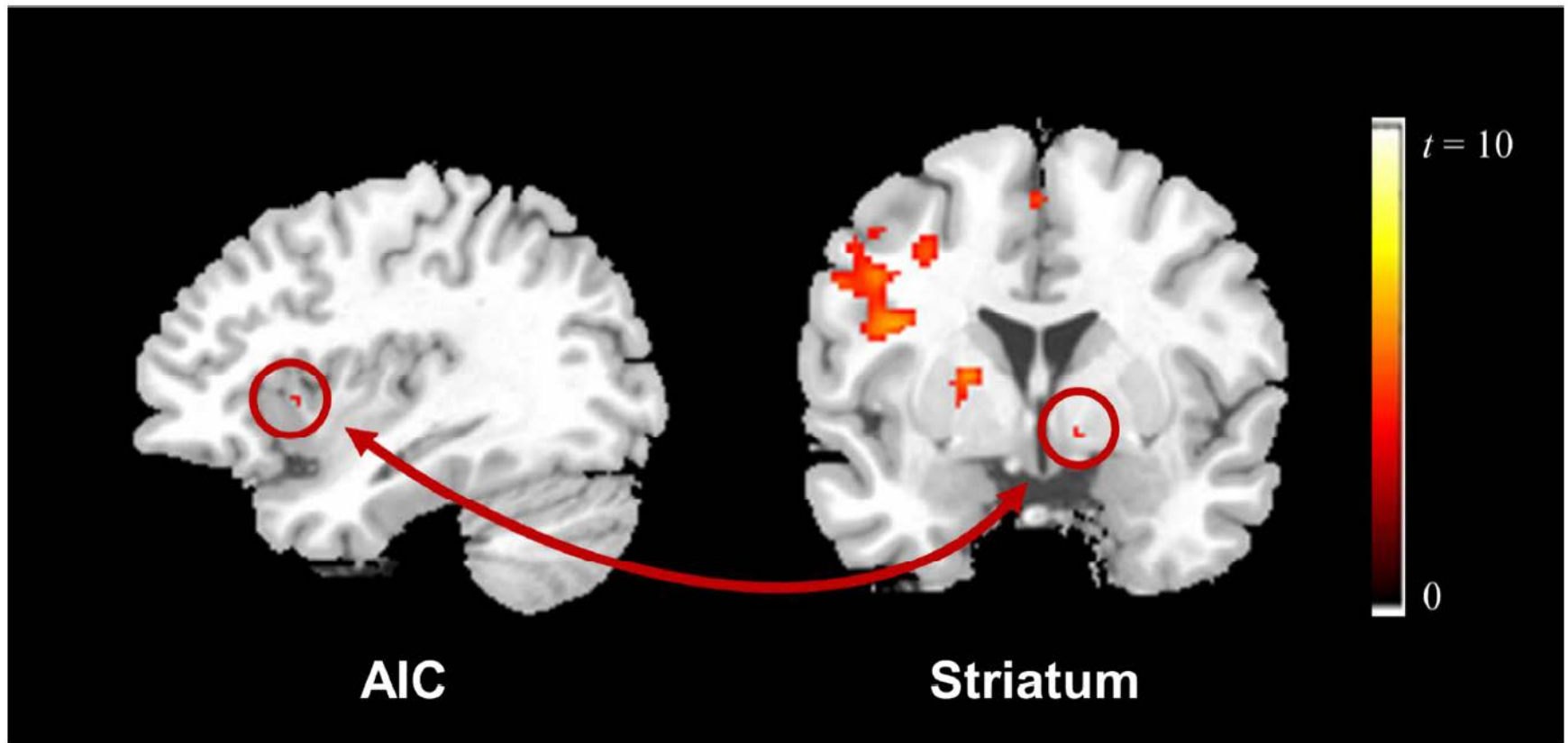
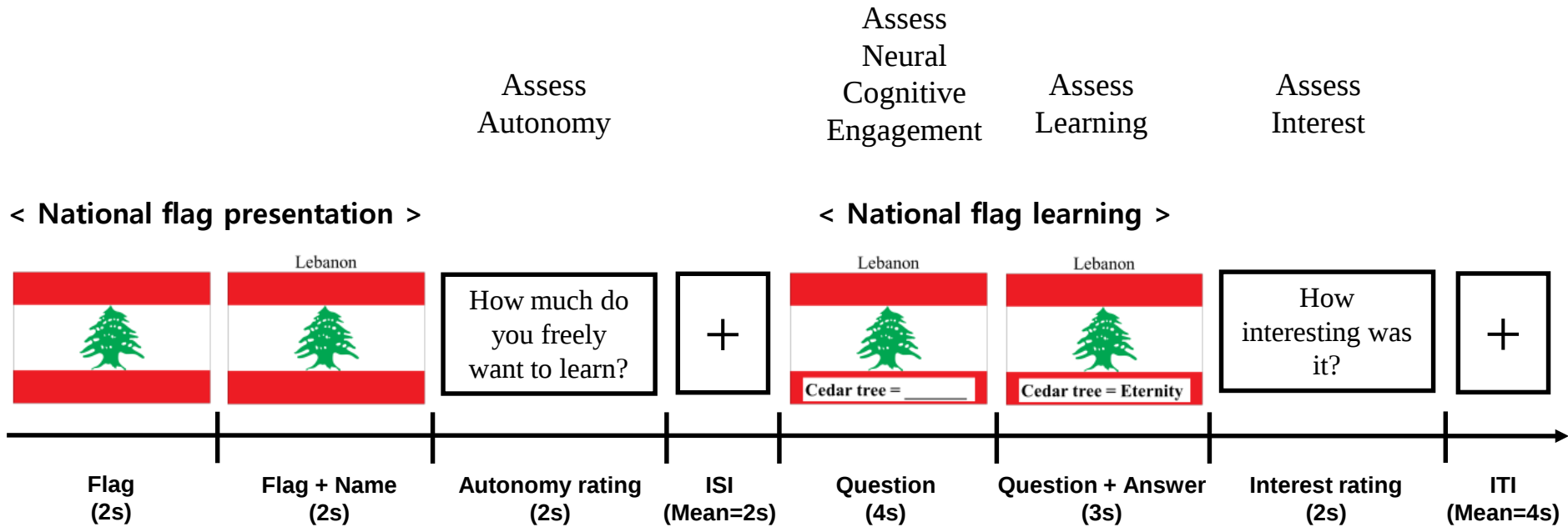


Figure 3: AIC associations with VS activations.

Our Fourth Experiment

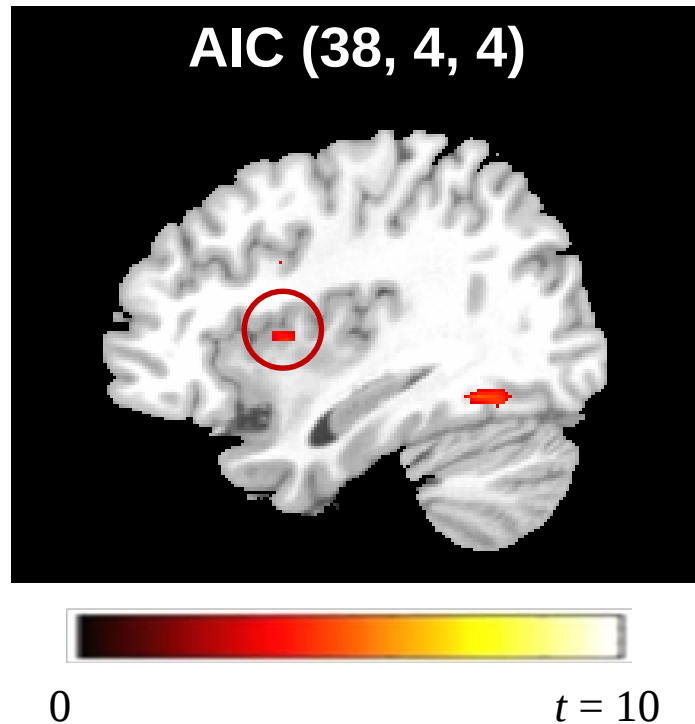


Autonomy need satisfaction was not experimentally manipulated, but assesses as a naturally-occurring extent of “want to”.

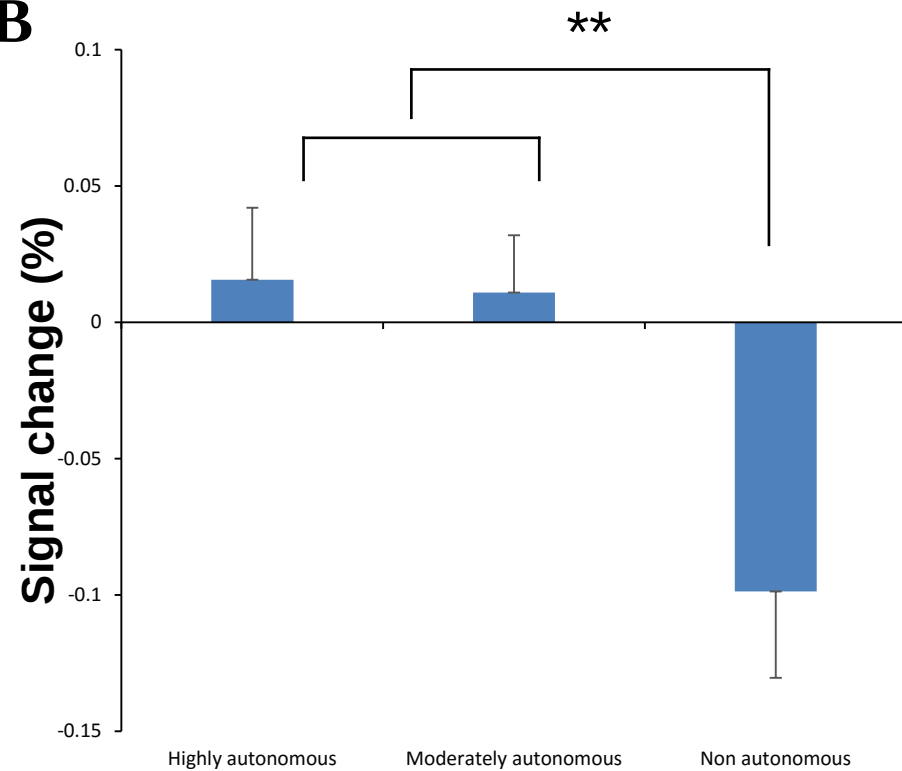
Our Fourth Experiment

Anterior Insula Associated with Autonomy Satisfaction

A

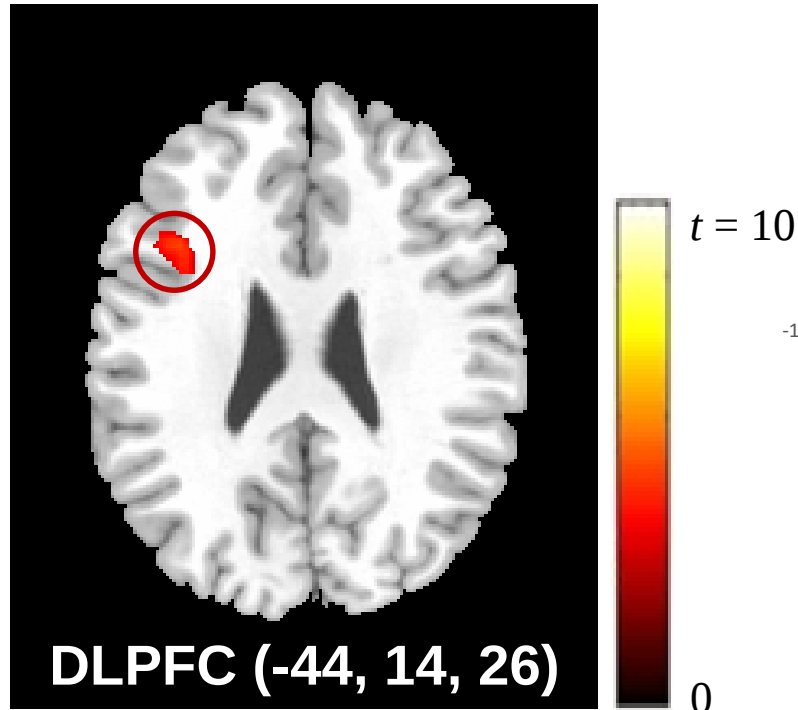


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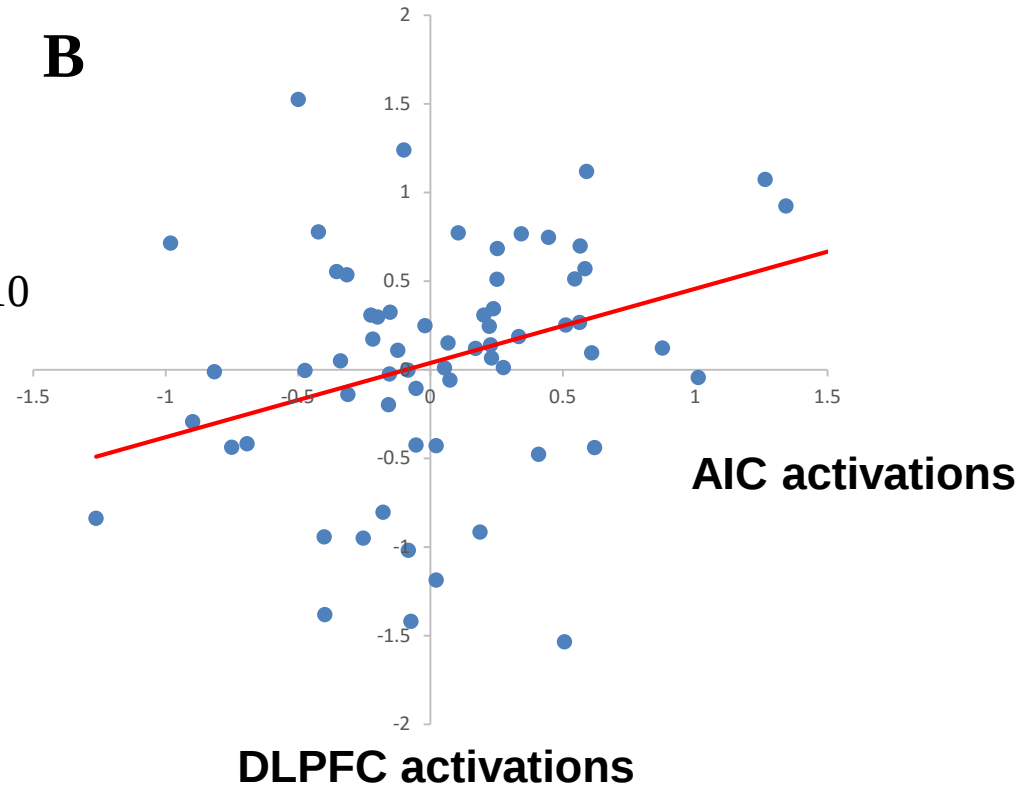


During Autonomy Satisfaction, Anterior Insula and DLPFC Activations Co-occur [According to Correlational Analyses]

A



B



DLPFC = Dorsolateral Prefrontal Cortex

Supporting Intrinsic Motivation

- Anterior Insular activations are the neural basis of both intrinsic motivation and psychological need satisfaction.
- Okay, how can we provide daily activities that activate the anterior insular cortex?
- I am going to use the example of a classroom context in which teachers try to support their students' intrinsic motivation and psychological needs.

Involve Students' Psychological Needs into the Learning Activity

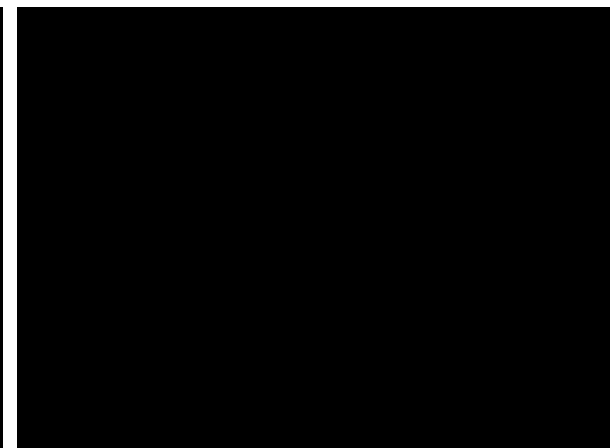
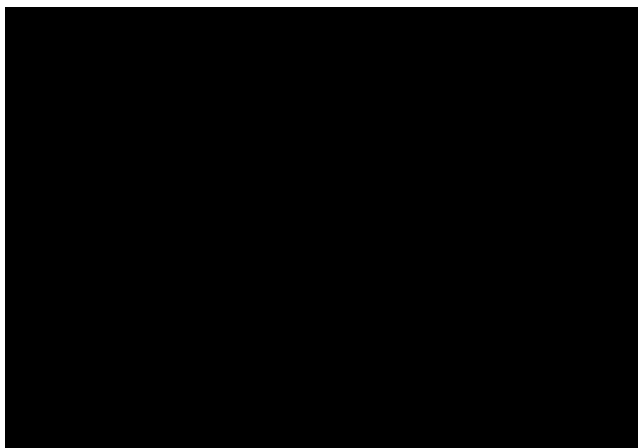
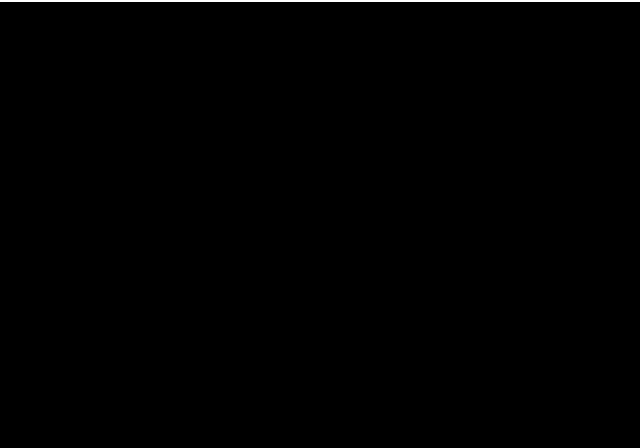
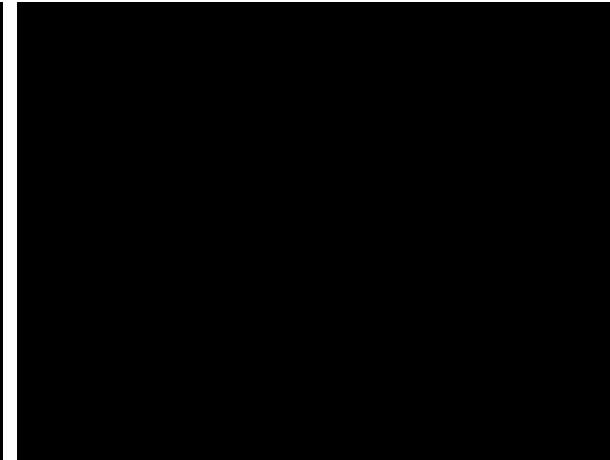
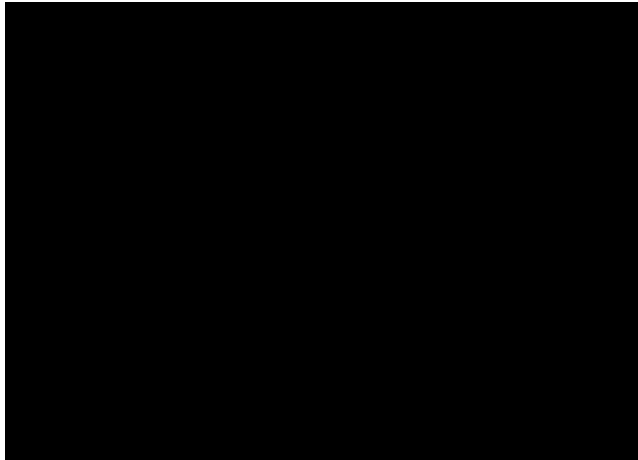
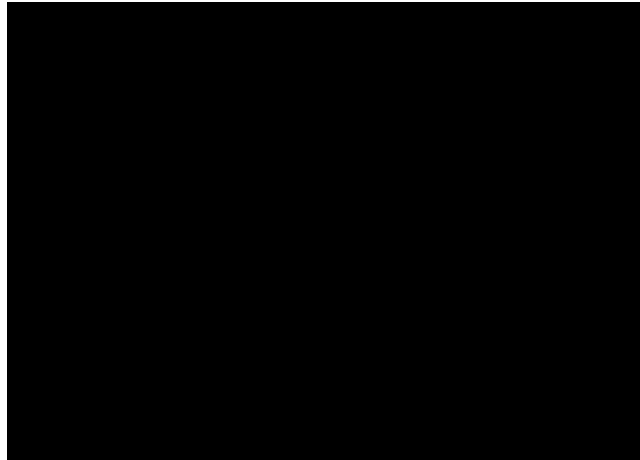
Involve Competence

Competence Defined: The need to interact effectively with one's surroundings
(with learning activities, with educational challenges)

Offer Optimal Challenge

Goal to Improve

Goal to Develop Skill



Provide Guidance

“How to” Demonstration

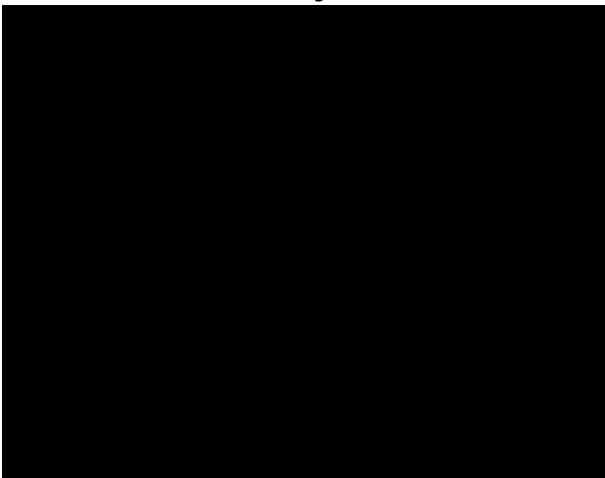
Provide Step-by-Step Help

Involve Students' Psychological Needs into the Learning Activity

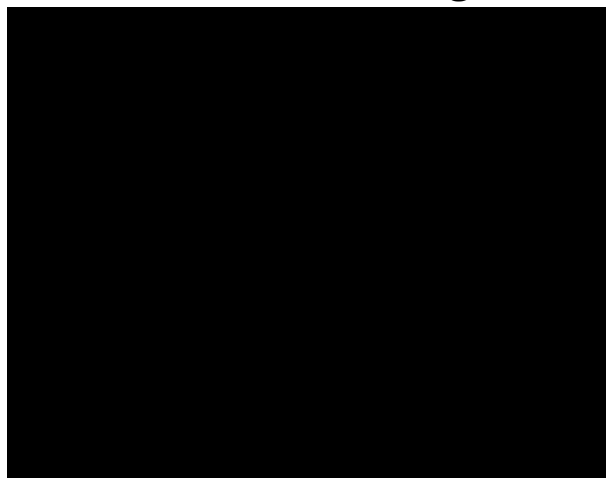
Involve Autonomy

Autonomy Defined: The need to be the origin of one's behavior.
The inner endorsement of one's behavior.
An experience of, "Yes, *I want to do this.*"

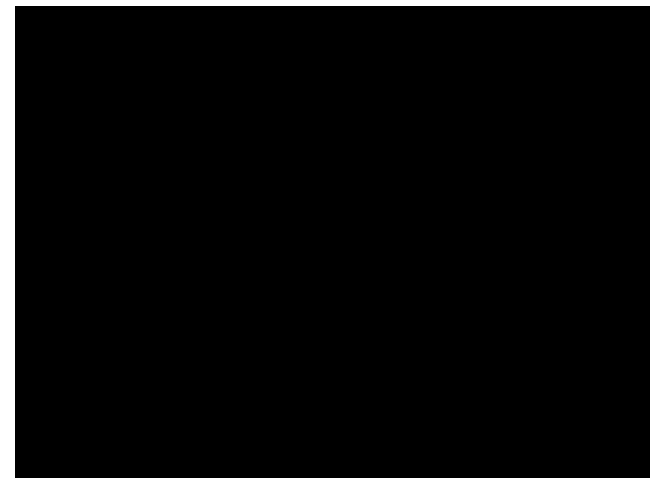
What do you want?



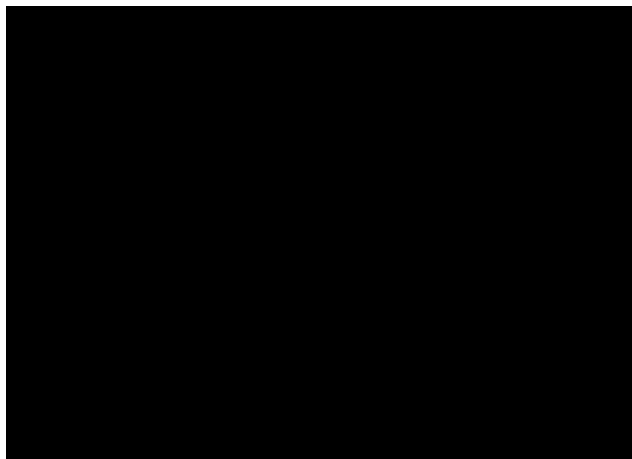
What's interesting?



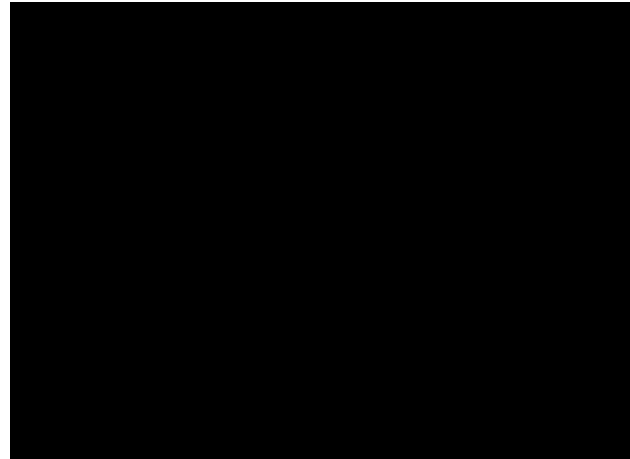
Where should we start?



Offer
choice



Encourage
intrinsic goals

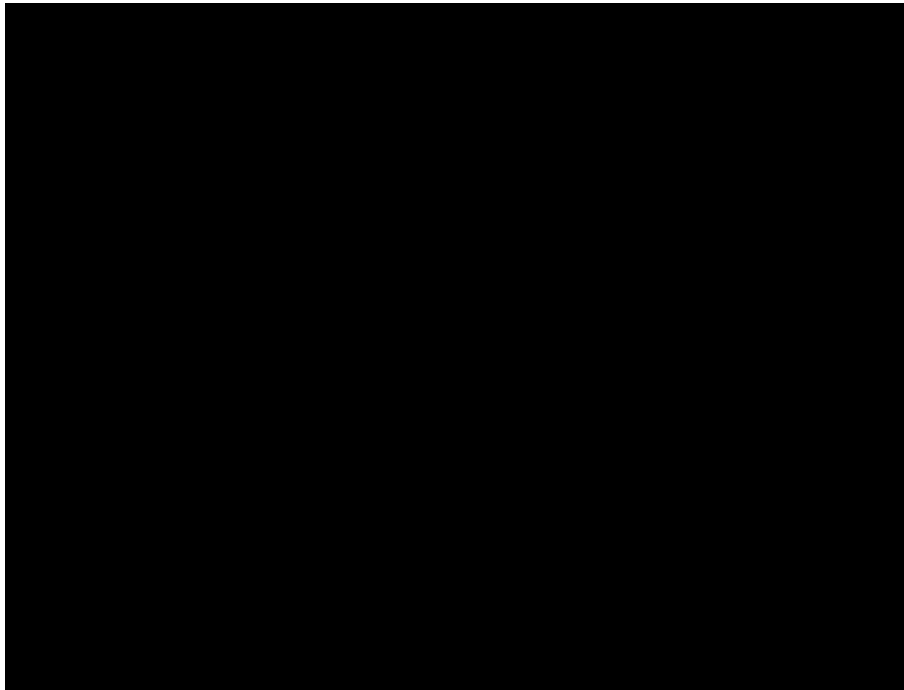


Involve Students' Psychological Needs into the Learning Activity

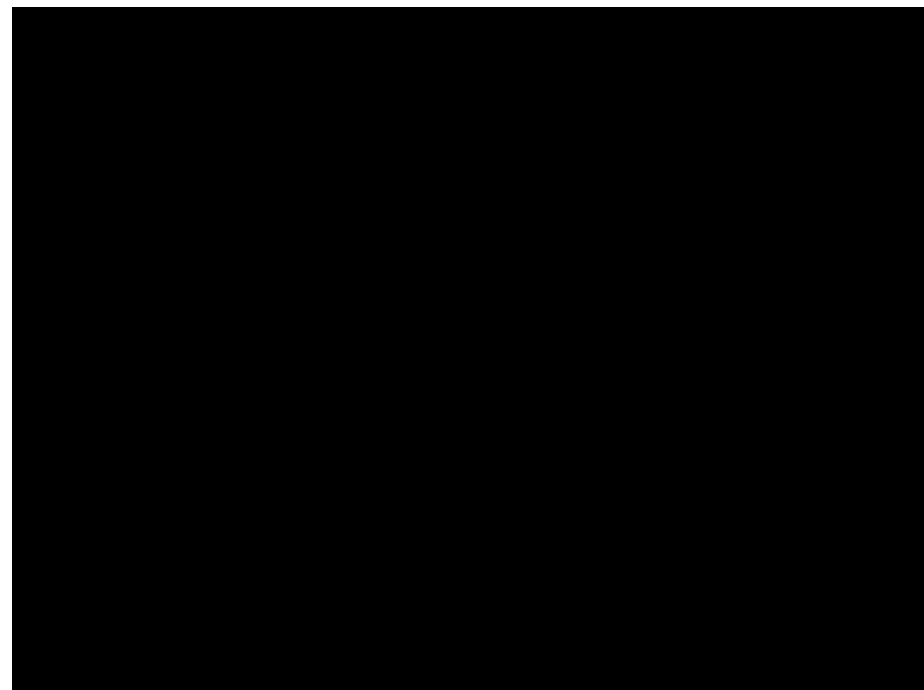
Involve Relatedness

Relatedness Defined: The need to be involved in warm relationships characterized by acceptance, liking, and mutual concern.

Work with a Partner



Work with a Group



Use Instruction to Involve Students' Psychological Needs for Autonomy, Competence, and Relatedness

Support Autonomy

Autonomy Defined:

The need to be the origin of one's behavior.
The inner endorsement of one's behavior.

- Offer students an opportunity for self-direction within the learning activity.
- When introducing a learning activity, allow students to approach that activity in a way that is consistent with their own personal interests, goals, wants, preferences, and priorities.
- When engagement originates from these inner motivational resources, students say "*I want to* do it..."
- *I want to* = an inner endorsement of behavior = autonomy.

Support Competence

Competence Defined:

The need to interact effectively with one's environmental surroundings.

- When introducing a learning activity, offer students not only the learning activity but also a:
- Optimal challenge (Can you do it?)
- Goal to strive for
- Standard of Excellence ("This is what excellence is")
- The challenge is always "Try to improve; try to perform better than before."
- Everyone wants to be *effective*
- Everyone wants to *improve*

Support Relatedness

Relatedness Defined:

The need to be involved in warm relationships characterized by acceptance and mutual concern.

- When introducing a learning activity, allow students an opportunity for face-to-face social interaction, such as:
- Pair students together
- Invite students to share their work with each other
- Invite students to exchange their answers to a question
- Simply have them initiate a conversation—invite them to ask each other about their interests, activities, perspective, concerns, plans, and so forth.
- Everyone wants to *belong*.
- Everyone want to be *accepted*.

Watch a Brief, Lesson-Relevant Video

Involve Students' Psychological Needs
Offer Interesting Things to Do

Play a Game
(Turn a Review Session into a Fun Game)

5 Questions about Motivation (Sample Video)