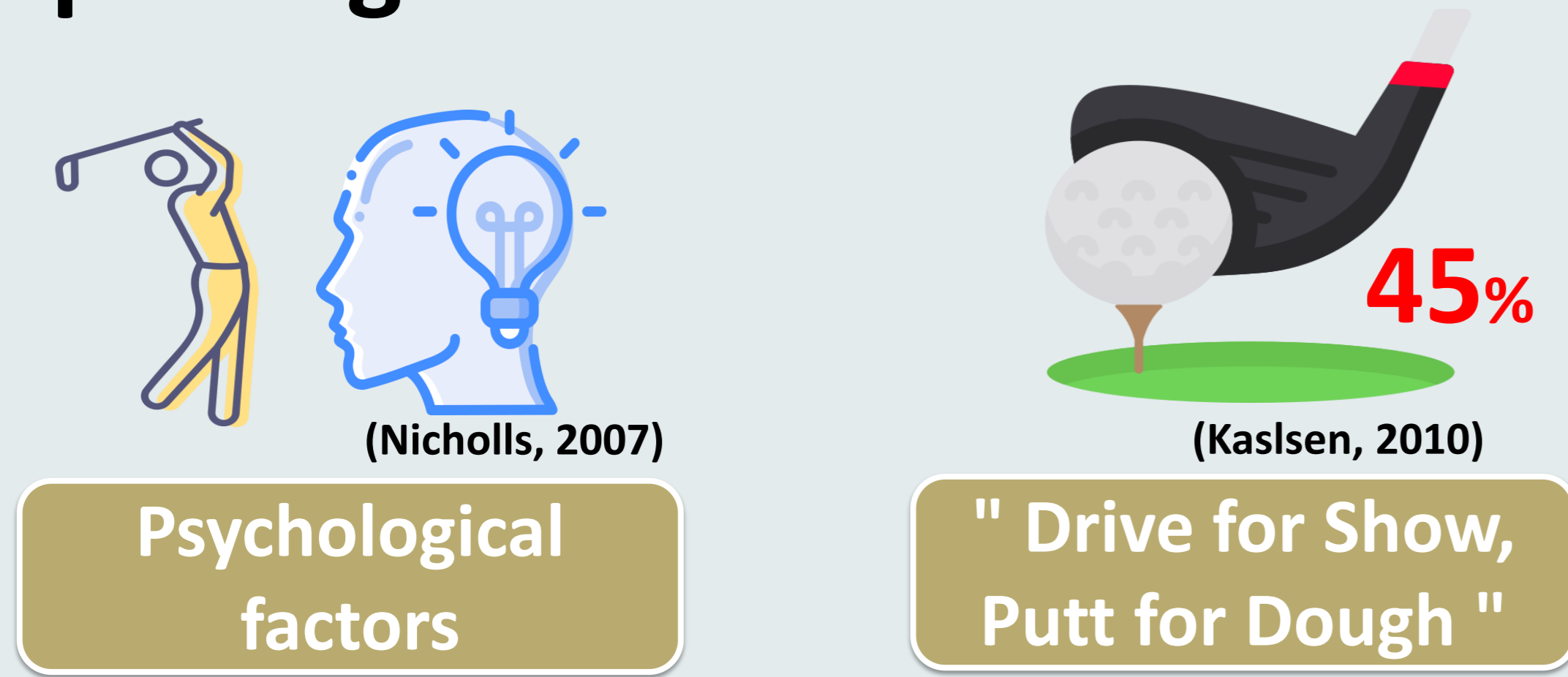


# The relationship between psychological process and golf putting related EEG in Golfers

Chang-You Hsia

## Introduction

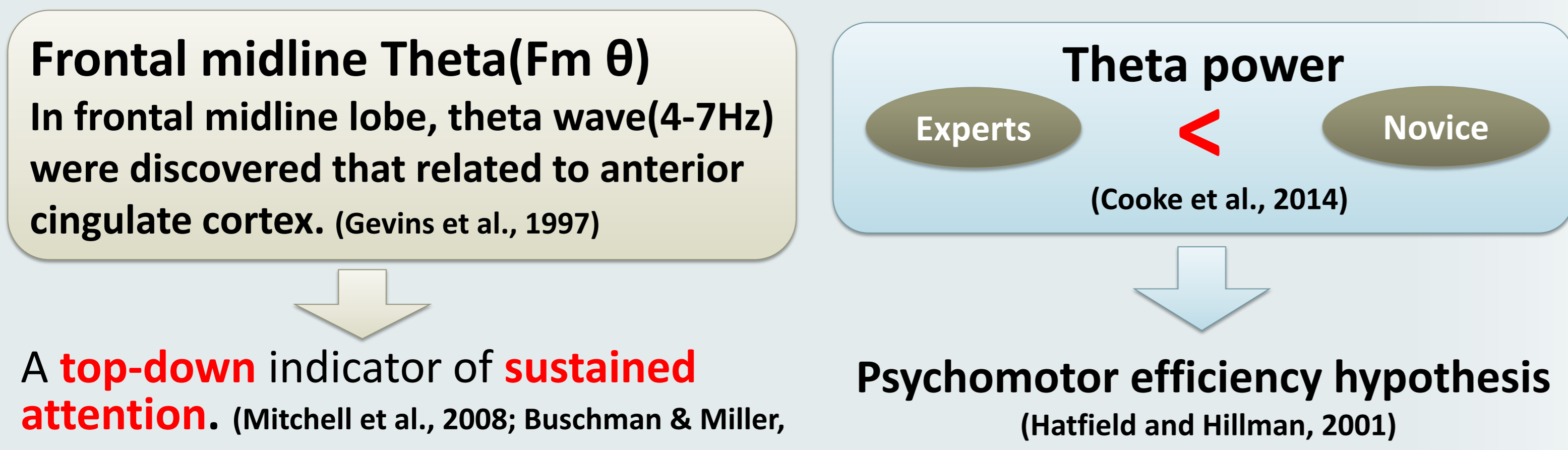
### I. Golf putting



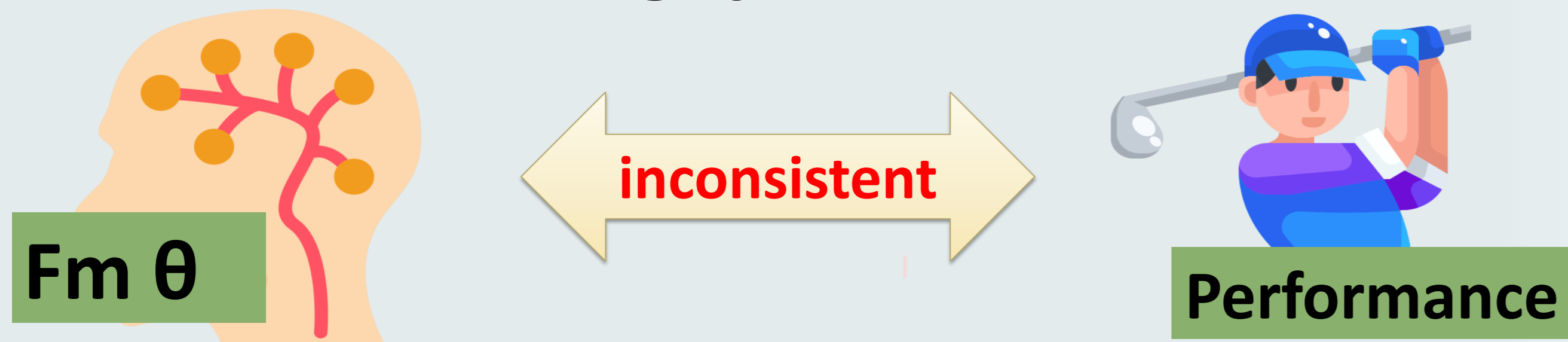
### II. Cognitive-motor process



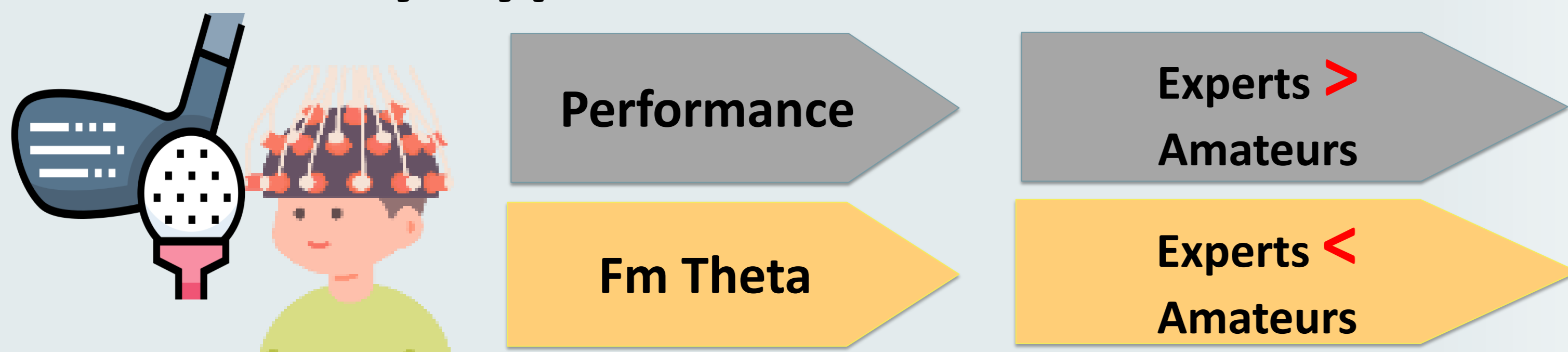
### III. Previous studies results



### IV. Previous studies gap

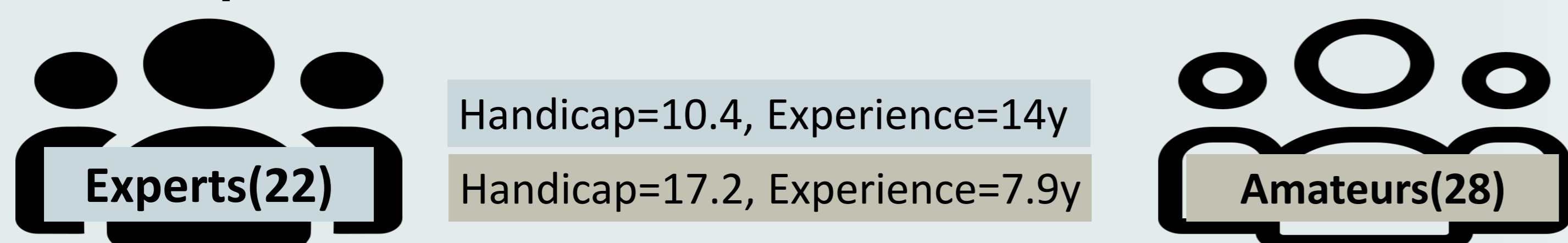


### V. This study hypothesis

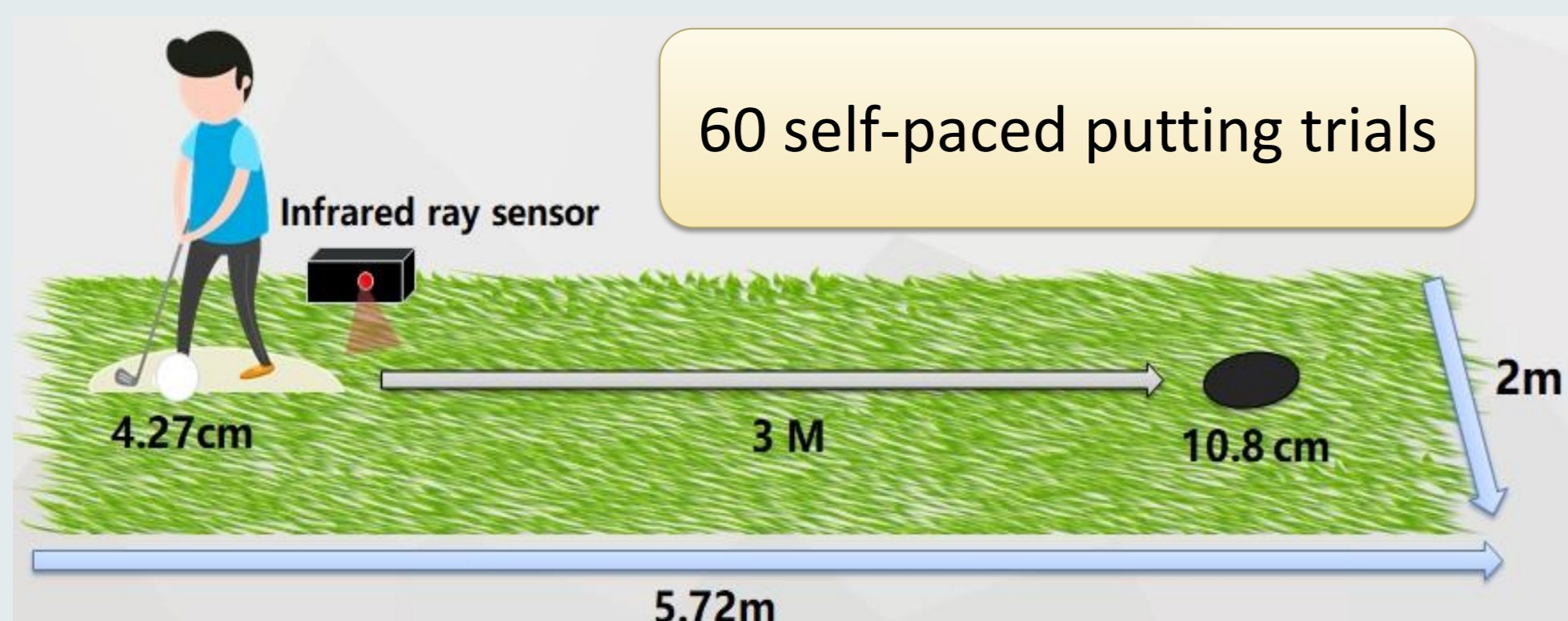


## Method

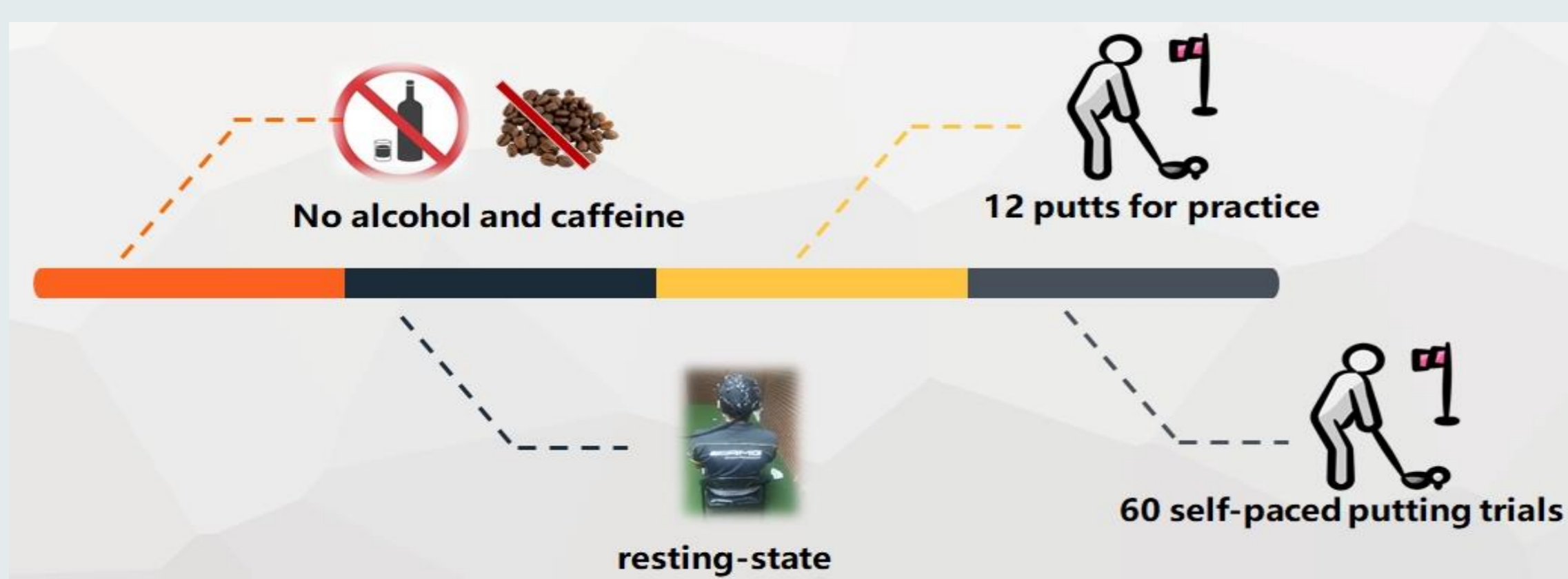
### I. Participants : 50 golfers



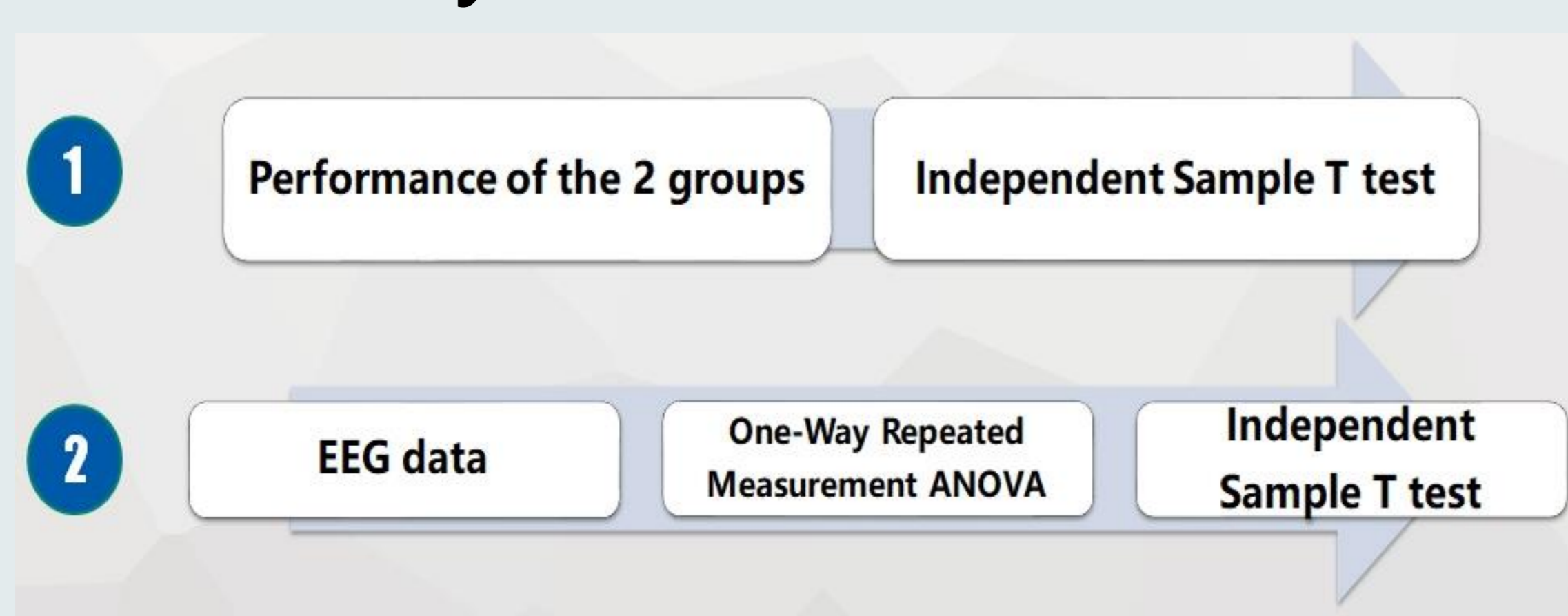
### II. Task



### III. Procedure



### IV. Statistical analysis



## Result

### • Performance

Putting	Mean success rate (%)	Mean $\pm$ SD
Experts	58.8	14.6
Amateurs	47.9	16.6

There is a significant difference in putting performance between the two groups ( $t=2.484$ ,  $p=.017$ )

### • Frontal midline Theta

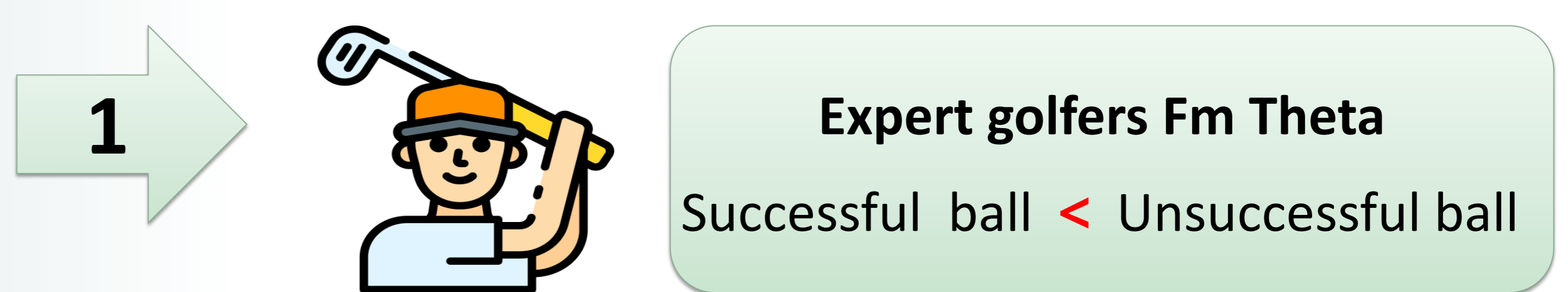
Region	t	p	Mean $\pm$ SD
Fm Theta	-3.801	.000	Experts (2.34 $\pm$ 1.02) < Amateurs (4.74 $\pm$ 2.82) * $p < .05$

### One-Way Repeated Measurement ANOVA

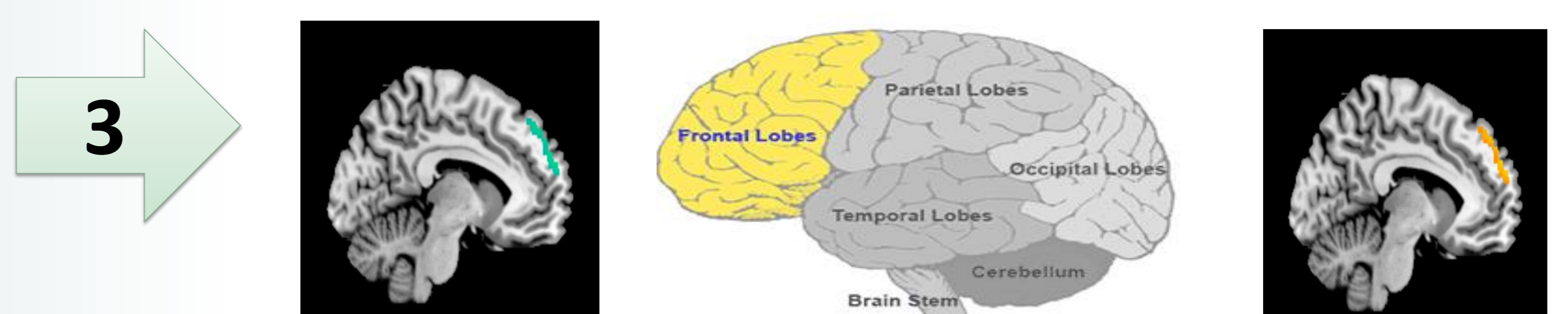
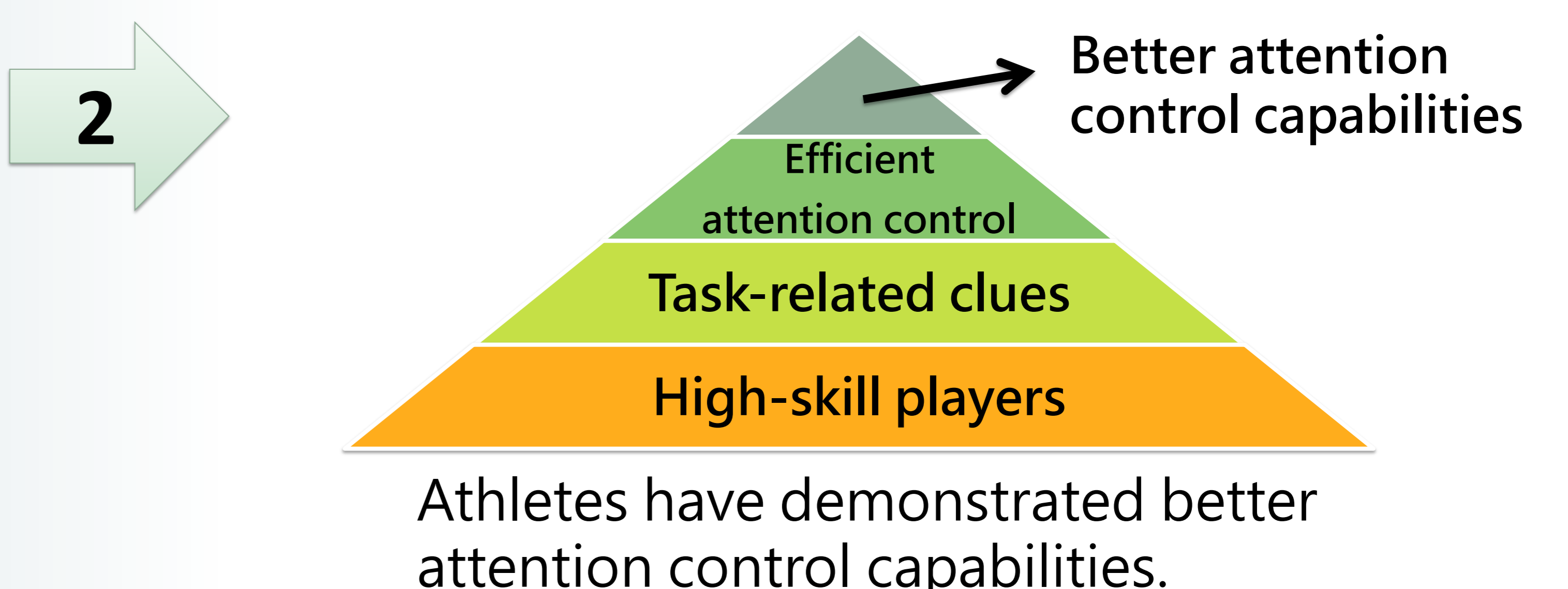
Descriptive statistics		Paired comparison		
Region	Mean $\pm$ SD			p
Fz theta	3.41 $\pm$ 3.21	Fz theta	Cz theta	.023
Cz theta	2.52 $\pm$ 1.24	Cz theta	Pz theta	.000
Pz theta	1.99 $\pm$ 0.93	Fz theta	Pz theta	.004
F=10.841, p=.002				

**Fz > Cz > Pz**

## Discussion



Kao et al. (2013) believe that **when the skill reaches a certain level, the lower Fm  $\theta$  helps facilitate the journey of automation.**



Utilizing neurofeedback to focus on the indicator of Fm theta for professional players or different skills in golf.