

# Electroencephalographic response of chess players in decision-making processes under time pressure

Villafaina S.

Collado-Mateo D.

Cano-Plasencia R.

Gusi N.

Fuentes J.P.

The game of chess offers an enabling environment for the study of basic cognitive decision making processes where different types of memories are involved. The aim of the present study was to describe and compare the brain electrical activity pattern of chess players in two different situations under time pressure to make the move: rapid, 15 min, plus 10 s additional time per move and lightning, a one-minute game. Thus, lightning game offers an appropriate environment to isolate memory chunks and rapid game will offer the perspective of a working memory task.

Encephalogram (EEG) recordings were obtained while a total of 14 male chess players (age:  $35.36 \pm 13.77$  and ELO:  $1921.07 \pm 170.67$ ) played lightning and rapid chess games. Results indicate that different activity patterns between the rapid and the lightning games were found. Increments in theta power during lightning game in posterior regions could indicate that theta power might be related with chunks retrieval. Moreover, right hemisphere is more activated in chess games, probably caused by visuospatial processing. These brain patterns characterizations could be useful for chess training or clinicians in the field of neuroscience. © 2018 Elsevier Inc.

Brain

Chess

EEG power spectrum

Memory

Theta power

adult

article

clinician

controlled study

decision making

electroencephalogram

human

human experiment

information retrieval

lightning

male

neuroscience

power spectrum

right hemisphere

working memory