

**Introduction** Human factors have been reported as the reason behind the majority of car accidents. However, to date, no studies at least in the Arab world generally and Gulf area specifically, conducted a comprehensive examination of cognitive functioning as potential predictors of car accidents and driving violations.

**Objectives** Examining the role of cognitive functions e.g., verbal working memory, attentional control as predictors of traffic accidents and driving violations.

**Aims** Examining the predictability of individual's cognition of occurrence of driving violations and accidents.

**Methods** The study was carried on a sample of hundred and thirty two participants whose age ranged between 24 and 31 years. They were classified into groups of violators and non-violators, accident free and accident involved as well. Cognitive functioning were measured using self-reports and task performance, and a series of ANOVAS as well as stepwise multiple regressions were conducted to test the research hypothesis.

**Results** Findings showed significant differences between violators and non-violators and between the accident free and accident involved groups in almost all of the considered factors, except for the decision making factor. Moreover, Pearson product-moment correlations showed that there were significant negative correlations between age, driving violations, and cognitive performance and the accidents.

**Conclusions** Human cognition such as executive functioning and mental planning are key factors for predicting driving behavior and traffic accidents. The study results have many implications in diagnosing and preventing or at least reducing driving violations and road accidents.

**Disclosure of interest** The author has not supplied his/her declaration of competing interest.

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## EW105

### Effects of negative autobiographical memories retrieval on corticospinal excitability and sensorimotor integration

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**Introduction** Previous transcranial magnetic stimulation (TMS) studies indicate that exposing the subjects to an emotionally valent stimulus results in larger motor evoked potentials (MEP). Up to date, no TMS studies have been conducted in order to investigate the effect of personal memories with emotional value on corticospinal excitability.

**Objects** To investigate changes in corticospinal excitability and sensorimotor integration induced by retrieval of negative or neutral autobiographical memories (AM).

**Aims** To contribute to a further characterization of neural circuits involved during the evocation of negative AM.

**Methods** In 12 healthy volunteers, we recorded motor evoked potentials (MEPs) elicited by TMS pulses during the retrieval of negative AM or neutral AM. Furthermore, we also tested Short-interval Intracortical Inhibition (SICI), Intracortical facilitation (ICF), Short and Long afferent Inhibition (SAI and LAI) in the two different experimental conditions.

**Results** Retrieval of negative AM induced a larger increase in MEP amplitude (35.01%) compared to neutral AM ( $F_{(1,22)} = 7.04$ ,

$P = 0.013$ ). Furthermore we showed that retrieval of Negative AM increased ICF ( $F_{(1,22)} = 5$ ,  $P = 0.03$ ) and decrease SAI ( $F_{(1,22)} = 7.04$ ,  $P = 0.039$ ). The other TMS parameters were different between conditions.

**Conclusions** Our results indicate that evocation of negative AM induce a complex modulation of excitatory and inhibitory sensorimotor networks. Further studies are needed to explore the link of these electrophysiological biomarkers with the strength, valence and specificity of negative AM.

**Disclosure of interest** The authors have not supplied their declaration of competing interest.

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## EW107

### Computational modeling of reinforcement learning using probabilistic selection task and instructional probabilistic selection task

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**Introduction** Humans learn how to behave both through rules and instructions as well as through environmental experiences. It has been shown that instructions can powerfully control people's choices, often leading to a confirmation bias.

**Aim** To compare learning parameters in reinforcement learning task with and without instructions.

**Methods** We recruited 52 healthy adult control subjects (21 males, 31 females, age  $30 \pm 6.5$  years). Participants completed Repeatable Battery of Neuropsychological Status (RBANSS). Twenty-seven participants completed additionally Probabilistic Selection Task (PST) while twenty-five participants completed Instructional Probabilistic Selection Task (IPST). To analyze learning parameters, we used Q-learning model with 3 parameters: learning rate due to positive and negative reinforcements as well as exploration-exploitation parameter.

**Results** Both groups did not differ with respect to cognitive functioning measured with RBANSS (immediate and delayed memory, visuospatial abilities, language and attention); however, participants who completed PST had trend-level statistically faster learning rates due to positive ( $P = 0.099$ ) and negative reinforcements (0.057) in comparison to participants who completed IPST. Both groups did not differ with respect to exploration-exploitation parameter (0.409).

**Conclusion** In healthy adults, interference of confirmation bias can influence learning speed independent of cognitive functioning (immediate and delayed memory, visuospatial abilities, language and attention).

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## EW108

### Risk associated to subtypes of seizure disorders in dementia patients

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