

### Review of theory of mind (intentionality) studies using the "moving shape paradigm" in Iran

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**Introduction:** The ability to understand other's mental states is called theory of mind (TOM). This ability enables individuals to predict other's behaviors according to own and others' mental states. One of the main aspects of theory of mind is intentionality which refers to people's intention in their behaviors. There are different ways to understand theory of mind and evaluate intentionality. The central goal of the current review is to explain Theory of mind with regard to The Moving Shapes Paradigms as a new method based on social attribution theories.

**Methods:** Theory of mind related with so many of brain cognitive functions, but the kind of relationship between TOM and executive functions is on the hard debates. The authors carefully summarize current research on the relationship between theory of mind and executive functions in attention deficit-hyperactivity disorder (ADHD) children with use of moving shapes task. Although, numerous studies have highlighted the relation between language ability and theory of mind, in this paper we explain that this specific task does not rely on language ability. Therefore assessing theory of mind with the animation paradigms is more appropriate in children who have some deficits in their language development.

**Results:** Several studies suggest that children with attention-deficit/hyperactivity disorder have some impairment on TOM tasks. There is no evidence addressing the issue of intentionality in children with these disorders. In this review we report just some evidence addressing the issue of intentionality and social attribution tasks in children with ADHD. Taken all these together, one might conclude that ADHD children seem to be deficient in processing others' mental states, ideas and intentionality which can partly explain their weak performance in emotional and social responses. Furthermore, due to the difficulty in emotion-regulation among ADHD patients, the problematic process of emotional and mentalizing perceptions compromises their executive function.

**Conclusion:** Keywords: theory of mind, moving shape paradigm, Iranian community, social attribution theory

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### Effects of a subchronic course of treatment with a benzodiazepine drug on memory status in Y-maze task in Wistar rat

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**Introduction:** There are numerous literatures indicating that benzodiazepines family has adverse effects on different paradigms of learning and memory. Spatial working memory is the ability of animal to remember the location in which something is perceived, and to recall a series of visited locations. In the present study effects of diazepam on spatial working memory of rats were evaluated.

**Methods:** In the present study, two-trial Y-maze test was used to evaluate effects of diazepam on spatial working memory. Twenty three adult male Wistar rats weighing around 200 g were used in this study. Animals were housed in animal room (21±2 °C) on a 12-h dark/12-h light cycle for at least 1 week before experimentation. Then, rats were randomly assigned to receive either isotonic saline (0.9%), or 1.2 mg/kg of diazepam hydrochloride (dissolved in saline), in equal volumes daily for five consecutive days (n=12, n=11; respectively). The Y-maze apparatus was made of opaque plexiglas, with three arms (each was 25 ×15 ×80) placed symmetrically at a 120 degree angle from one another. During training trials, entrance to the novel arm was blocked. Each arm had special cues on the walls and floor, so the rat could distinct different arms from each other. As previously described the task was a two trial spatial recognition memory test and was designed based on the fact that rat tends to explore new environments. The test consisted of two trials with a 1 h interval. Twenty four hours after last injection, in the first trial i.e. training trial; the mouse was placed at the end of the start arm (defined as the closest arm to the experimenter), receiving access to 2 arms of the maze (start and the other arm) for 10 min (the novel arm was blocked during the training trial). After the training trial, the mouse was removed from the maze and put in its cage for the 1 h interval. In the second trial (retention/novelty preference test), the mouse was placed back in the start arm of the maze, now allowed to explore all three arms (the previously explored start and the other arm, and the previously blocked novel arm) for 8 min. The time spent in each arm, and proportion of the number of arm entries was recorded by ethovision software. In order to determine whether the locomotor activity and motility changes would interfere with the parameters of learning and memory or not, we calculated the number of arm entries as an indicator of locomotor activity. Furthermore, with the purpose of avoiding olfactory trials, we cleaned the maze arms in between tests. Injections, training and testing were performed between 9.00 and 15.00 h. More entering the novel arm and spending more time in it than the familiar arms, is an evidence for recognition of the unfamiliar novel arm, thus the exploratory behavior of animal.

**Results:** We found that in the first trial, there was no difference in frequency and time spent in start arm and other arm between diazepam- and saline-treated groups. But, in second trial diazepam treated rats spent more time in novel arm (p <0.05) and showed a significant increase in alteration behavior compared with saline-treated (control) rats. There was no difference in locomotor activity between groups during each trial of Y-maze test.

**Conclusion:** The results of the present study suggest that subchronic administration of benzodiazepines might have a memory enhancing effect on short-term memory of Y-maze task in rat.

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