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Author: Dr. Wu Ruilin
Beihang University, China

Ms. QianYing Ma
Beihang University (BUAA), China

COGNITION PERFORMANCE OF CREWS IN A LUNAR ANALOG MISSION: CHANGE OVER
TIME AND RELATIONSHIP WITH EMOTION**Abstract**

Generally, aerospace missions are composed of elaborate tasks which require high-level attention and efficiency. Long duration mission is challenge to physical function and mood state in extreme environment. Attention and efficiency may be influenced by changes of physical function and mood state which lead to decrease of cognitive performance. Three crew members, who ware Chinese and selected from some candidates, was isolated in the Lunar Palace 1 for 80 days in 2014 at Beihang University. As one analogy of space mission, crew members were asked to complete various tasks. We also conducted some psychological studies in it, including applied questionnaires and cognitive tests to investigate change of emotion and cognition performance. To measure and monitor the changes of performance, investigators have put forward a series of cognitive tests based on working memory, logic ratiocination and so on. In these tests, reaction time is one of the most wildly used indicators. In current study, the cognitive measurement consists of two tasks, arithmetic ratiocination and judgment of picture orientation, which developed to record crew members' reaction mode and time automatically by E-prime software. Meanwhile, questionnaire of POMS is employed in every two weeks. Monotonous and social contact limitation caused by long-term isolation and confinement also could become triggers of performance discrepancy. According results of Lunar Palace 1, we found that time course had effect on crew members' reaction time. Some crew members' reaction time ware significantly negative correlated with time course of experiment on both picture orientation task and arithmetic ratiocination task. Meanwhile, through one-way ANOVA analysis, we found significant quarterly difference in some member of the crew. Another side, changes of mood state also effect on crew members' cognitive task. One crewmember who reported obvious emotional fluctuation, and there is significant correlations between reaction time on arithmetic ratiocination and some negative sub-scale in POMS. Other crew members, who reported gently oscillation, have insignificant correlation with cognitive tasks' reaction time.