4th International Congress of Turkish Neuroendocrinology Society | ISTANBUL
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The Effect Of Exposure To Music On Spatial Learning And Memory In Rats

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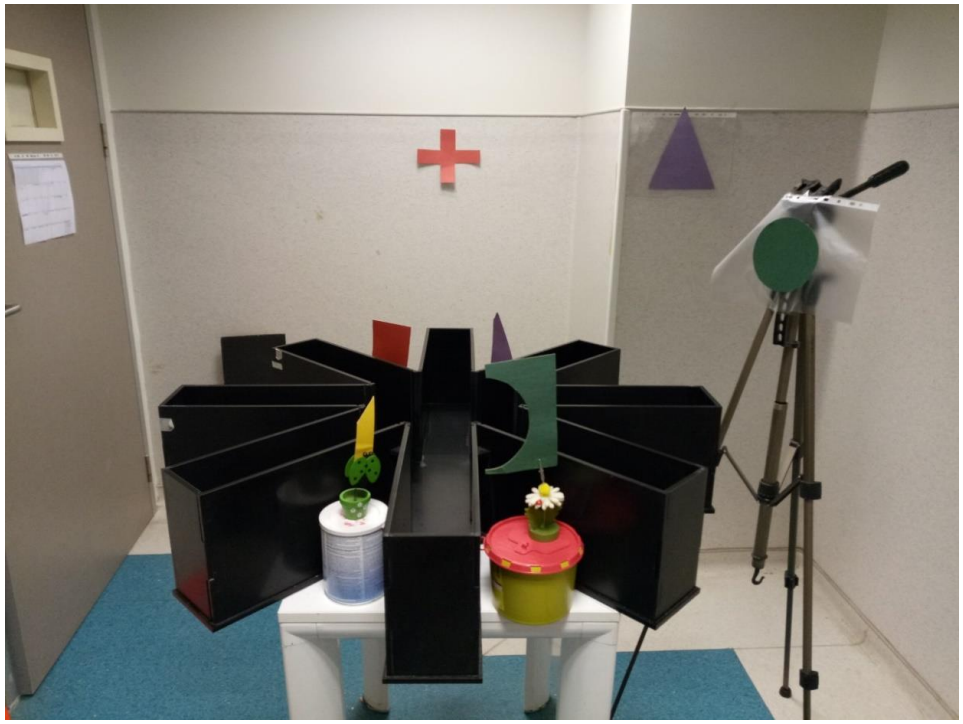
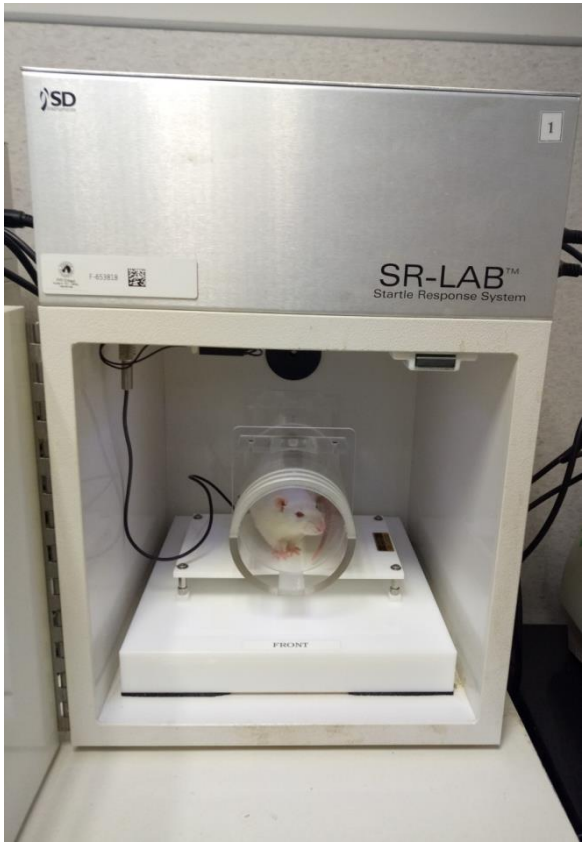
AIM: The 'Mozart effect' is an enhancement in spatial learning and memory performance after listening to Mozart's Sonata for Two Pianos (K448). Increasing the number of NMDA receptors play a role in the Mozart effect. NMDA antagonists damaged the sensory-motor gating system and led deficits in the Pre-Pulse Inhibition (PPI) of the acoustic startle reflex. Aim of this study is to investigate Mozart effect on a spatial task in rats.

METHODS: 28 male Wistar rats were used. White Noise+Control (n=8) and White Noise+Ketamine (n=6) groups were exposed to white noise, while Mozart+Control (n=8) and Mozart+Ketamine (n=6) groups were exposed to Mozart's Two Pianos Sonata (K448) from postnatal day (PND)14. On PND 56, rats were trained in an 8-arm radial maze. Then, Pre-Pulse Inhibition (PPI) of the acoustic startle reflex was measured in White Noise+Control and Mozart+Control groups, and after 3 mg/kg intraperitoneal Ketamine administration to the White Noise+Ketamine and Mozart+Ketamine groups. The data obtained from the 8-arm radial maze were evaluated using the Mann Whitney U Test in the SPSS 21.0 Statistics Software. ANOVA and post-hoc LSD Tests were used for the analysis of PPI data.

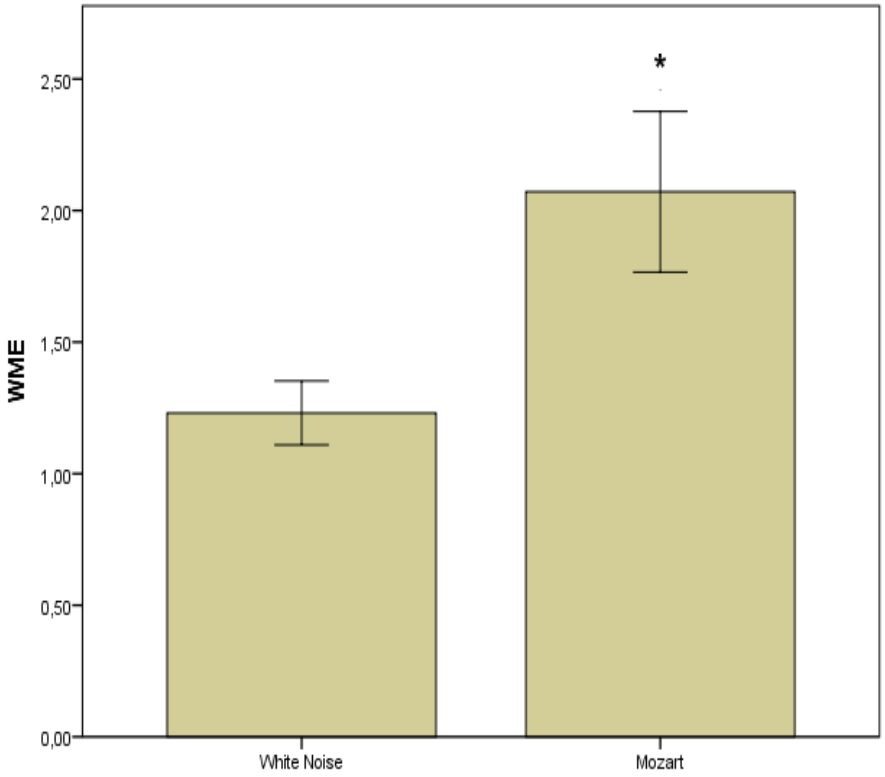


8-Arm Radial Maze

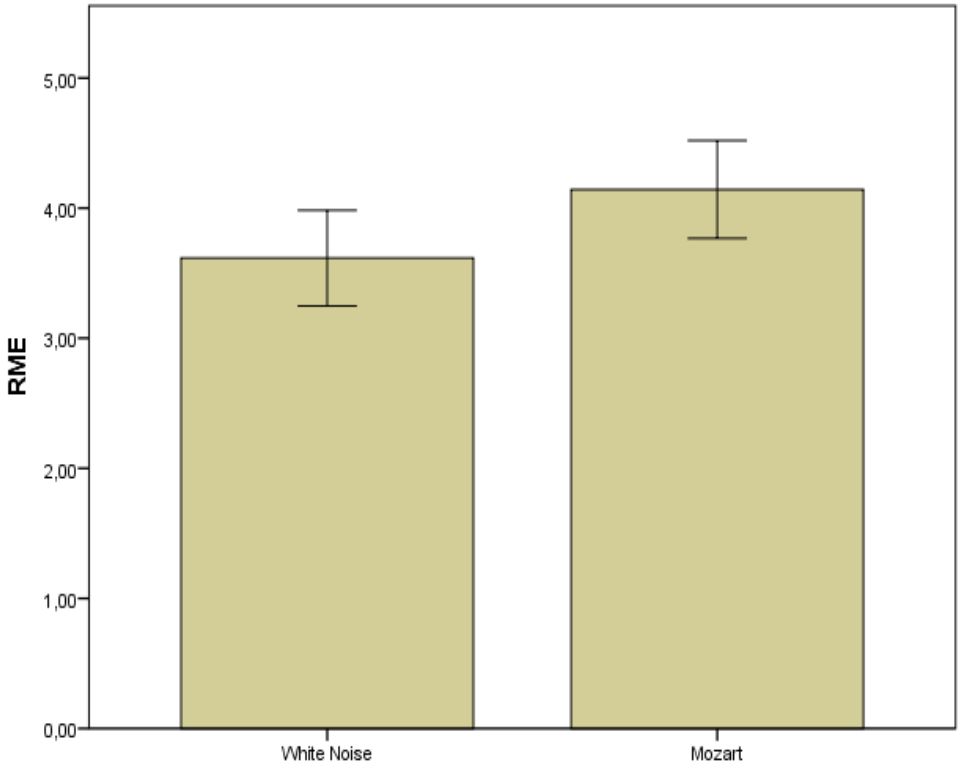


Startle Response System

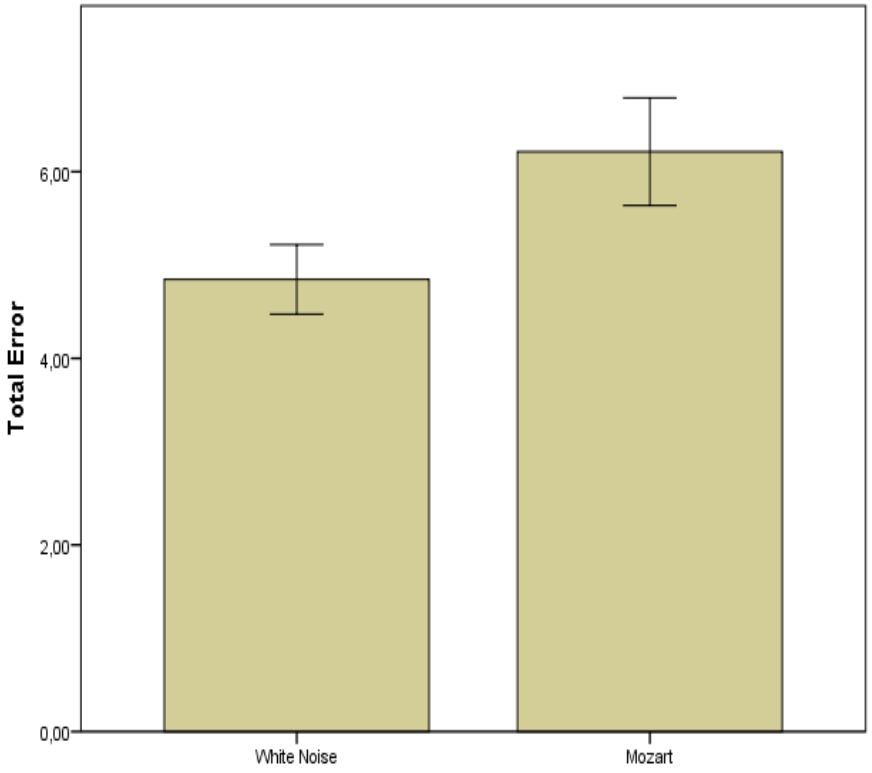
RESULTS: Groups exposed to Mozart's Sonata made more working memory errors (WME) than groups exposed to white noise ($p<0.05$). There was no significant difference between reference memory error (RME) and total error measurements. Groups exposed to Mozart's Sonata were able to complete their tasks in a longer time than groups exposed to white noise ($p<0.05$). There is no statistical difference in the levels of PPI at 74 and 78 dB between groups. At 86 dB, PPI level of the Mozart+Ketamine group was lower than White Noise+Ketamine group ($p<0.05$).



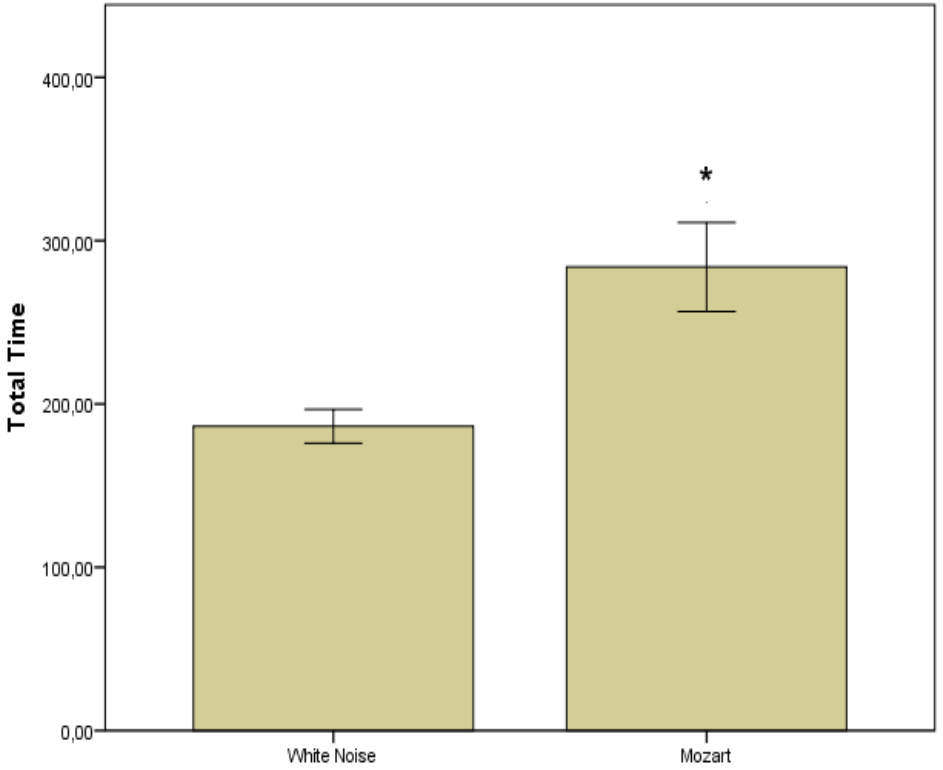
Working Memory Error. (p<0,05; Mann Whitney U Test)



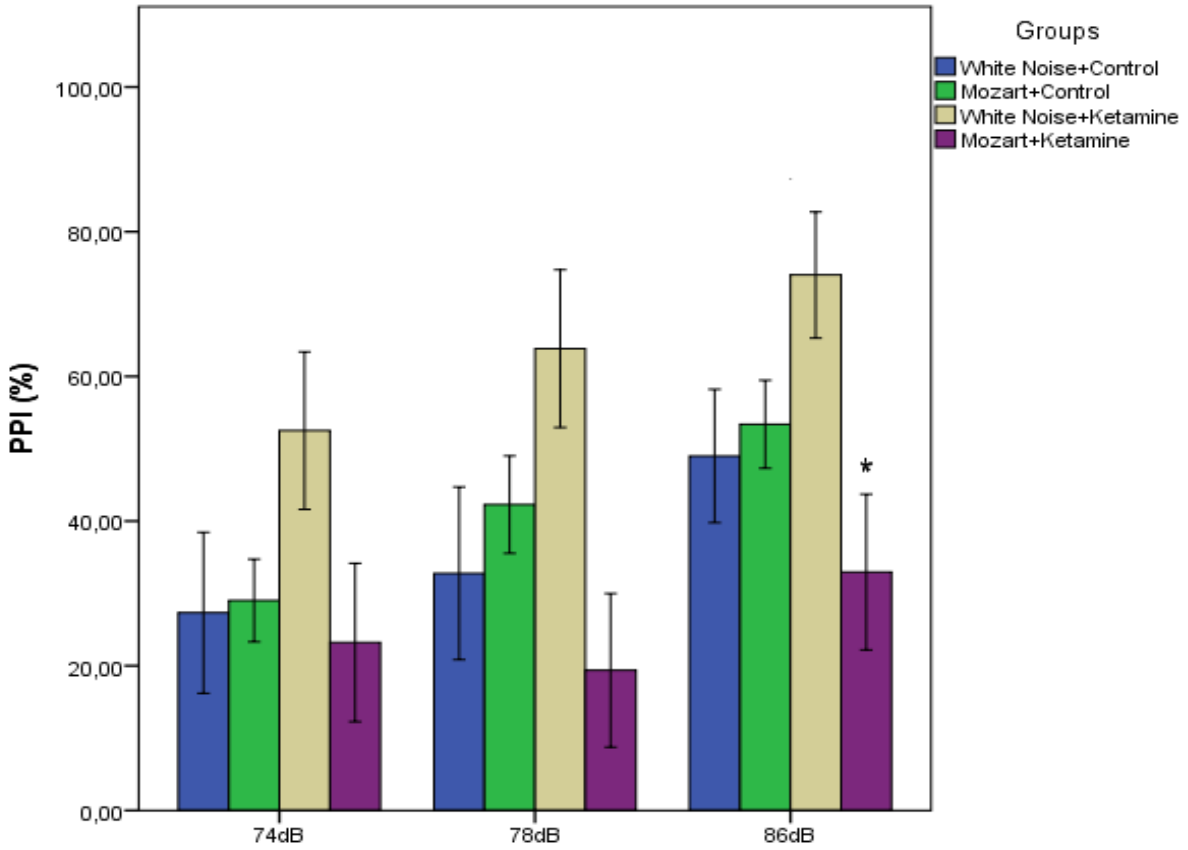
Reference Memory Error. (p>0,05; Mann Whitney U Test)



Total Error. (p>0,05; Mann Whitney U Test)



Total Time. (p<0,05; Mann Whitney U Test)



Pre-Pulse Inhibition of Acoustic Startle Reflex. *Significant difference compared to White Noise+Ketamine group ($p<0,05$; ANOVA, post hoc LSD Test)

CONCLUSION: Our results show that Mozart's Sonata for Two Pianos (K448) may not improve spatial learning and memory in rats.

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