Obsessive-compulsive disorder (OCD) is an incapacitating anxiety disorder characterized by unwanted, intrusive thoughts that lead to repetitive, ritualistic behaviors. Current treatments for OCD are only efficacious in a small portion of its sufferers. Animal models of OCD may lead to the development of novel treatment options such as those that modulate the glutamatergic system. The current study examines the effect of a metabotropic glutamate receptor 7 (mGluR7) antagonist, MMPIP, on two dopamine agonist-induced murine behavioral models of OCD. Although the T-maze alternation model of OCD failed to produce compulsive behaviors in the current study, the open field compulsive checking model of OCD did increase OCD-like behaviors, which were reversed after MMPIP administration. These results suggest that decreases in mGluR7 activity may provide a novel avenue of exploration for the treatment of OCD.