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# Meta-analytic evidence for impaired cognitive inhibition in schizophrenia

René Westerhausen<sup>\*†1,2</sup>, Kristiina Kompus<sup>3</sup>, and Kenneth Hugdahl<sup>\*1,2</sup>

<sup>1</sup>Department of Biological and Medical Psychology, University of Bergen – Jonas Lies vei 91, N-5009 Bergen, Norway

<sup>2</sup>Division of Psychiatry, Haukeland University Hospital – N-5009 Bergen, Norway

<sup>3</sup>Department of Biological and Medical Psychology, University of Bergen – Jonas Lies vei 91, N-5009 Bergen, Norway

## Abstract

Meta-analyses unambiguously indicate an impairment of executive functioning in schizophrenia. However, these previous studies treat executive functions as unitary cognitive faculty, pooling the results of different paradigms and neuropsychological instruments, and ignoring that executive functions can also be seen as group of partially independent cognitive sub-components, such as updating, shifting, or inhibition. The present meta-analysis focused on the schizophrenia-related impairment in the sub-component of cognitive inhibition as represented by the color-word interference effect in the Stroop paradigm. The analysis was based on 36 studies which in total included 1081 patients and 1026 healthy controls. A fixed-effect analyses – using the effect size statistic Hedges'  $g$  for the differences between patients and healthy controls in the interference effect as dependent variables – revealed that patients exhibit an increased interference effect ( $M(g) = 0.43$ ;  $CI_{95\%}: 0.35-0.52$ ;  $Z = 9.62$ ,  $p=0.0001$ ; Fail Safe  $N = 828$ ). A significant meta-regression analysis ( $b = -0.44$ ;  $t(32) = -2.88$ ,  $p=0.007$ ) further showed that the card version ( $M(g) = 0.60$ ) of the Stroop paradigm produces a larger effect size than the single-trial computerized version ( $M(g) = 0.19$ ). The overall group difference indicates that the reported global deficits in executive functioning in schizophrenia are at least partly due to reduced cognitive inhibition. However, the differences in mean effect size between card and computerized version also indicate that methodological aspects (even within the same paradigm) significantly affect the results and need to be considered when assessing clinical groups.

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<sup>\*</sup>Speaker

<sup>†</sup>Corresponding author: [rene.westerhausen@psybp.uib.no](mailto:rene.westerhausen@psybp.uib.no)