What is executive functioning?

Executive functions are a group of cognitive processes involving control, mental flexibility, planning, inhibition, decision-making, initiation, abstraction, self-monitoring and pursuit of goals. Any impairment in executive functioning can also reflect impairments in other cognitive functions such as processing speed, attention, and memory. Executive functioning is most commonly measured using the Wisconsin Card Sorting Task (WCST). This task requires the ability to shift cognitive sets. Other common tasks include the Trail Making Test (TMT), which requires participants to connect, in order, letters and/or numbers as quickly as possible, and the Stroop Colour Word Test (SCWT), which presents colour names printed in an ink congruent to the colour name (e.g. blue), or incongruent to the colour name (e.g. blue); participants are asked to either read the word or name the ink colour. Verbal fluency tests involve participants naming as many words as possible from a particular category in a given time, and Go/No-Go tasks involve presenting participants stimuli in a continuous stream and asking them to make a ‘go’ or a ‘no-go’ response to each stimulus.

What is the evidence for executive functioning?

Compared to people without schizophrenia, moderate to high quality evidence suggests people with schizophrenia show a medium-sized effect of impaired performance on the WCST, verbal fluency tasks, inhibition tasks, the TMT, the SCWT, and the Go/No-Go task. Compared to people with affective psychoses (including bipolar disorder), high quality evidence shows a small effect of poorer performance on verbal fluency tasks, the TMT, and the WCST in people with schizophrenia. High quality evidence suggests a small to medium-sized effect of poorer performance on the WCST in first-degree relatives of people with schizophrenia compared to people without schizophrenia. There are similar, small improvements on executive functioning tasks over time (1 to 5 years) in people at ultra-high risk of psychosis, in people with first-episode psychosis, and in people with no risk or psychosis.

High quality evidence shows a medium-sized association between higher levels of executive functioning and higher levels of insight and lower levels of negative or disorganised symptoms. Moderate quality evidence suggests no association between executive functioning and positive symptoms, however moderate to low quality evidence suggests more impaired executive functioning in people with formal thought disorder. High quality evidence shows greater improvements in verbal fluency in people receiving second generation antipsychotics compared to people receiving first generation antipsychotics. Moderate to high quality evidence suggests people receiving quetiapine, olanzapine, or clozapine may show improvements on verbal fluency tasks post-treatment, however people receiving risperidone may show no improvement.

For more information see the technical table.