Substance use and mental illness in young people

Using comorbidity to investigate and evaluate novel prevention strategies

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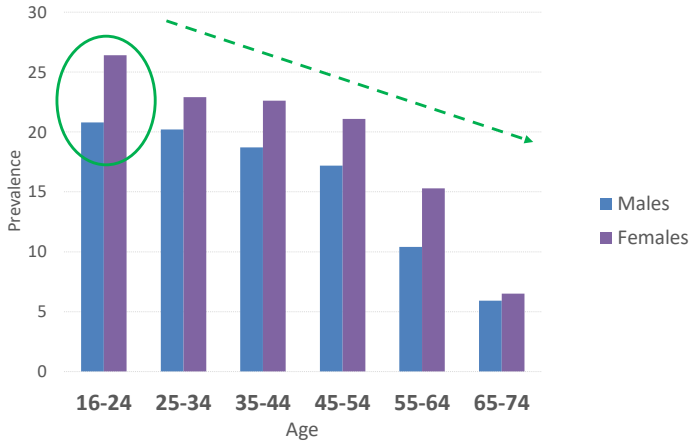
Epidemiology

- In and year 1 in 4 young people will meet criteria for a mental or substance use disorder
  - >670,000 young Australians
- 26% female; 21% males

Source: 2007 National Survey of Mental Health and Wellbeing (NSMHWB)

How do rates compare?

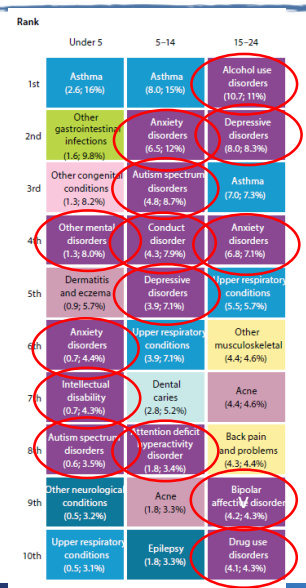


- Mental and substance use disorders are more common in young people

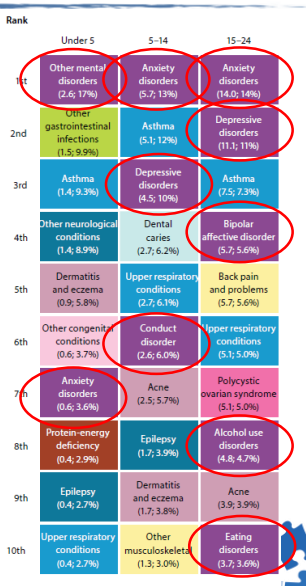
Source: 2007 National Survey of Mental Health and Wellbeing (NSMHWB)

What is the impact?

Males



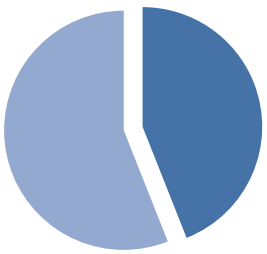
Females



Source: 2011 Australian Burden of Disease Study

Comorbidity

- 44% of young people with alcohol dependence have an anxiety disorder; 25% have an affective disorder



Anxiety disorder

Affective disorder

- Comorbidity is the rule rather than the exception

Source: 2007 National Survey of Mental Health and Wellbeing (NSMHWB)

Models of Comorbidity

- Direct causal relationship
  - Substance use disorder may result from mental illness
    - i.e., "self-medication"

Mental illness → Substance use

  - Mental illness may result from substance use
    - i.e., substance-induced depression, bipolar disorder, anxiety, psychosis

Substance use → Mental illness

Source: National Comorbidity Guidelines

Models of Comorbidity

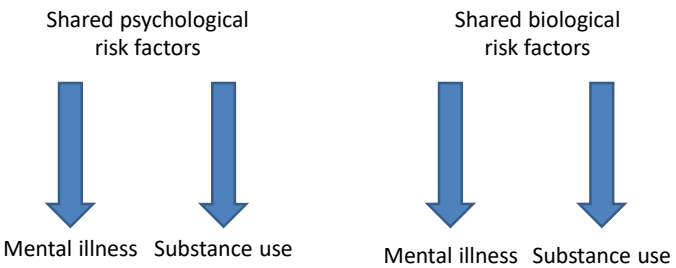
- Indirect causal relationship
  - One condition has an effect on an intermediary factor increases the likelihood of developing the other condition

Mental illness → Unemployment → Substance use

Source: National Comorbidity Guidelines

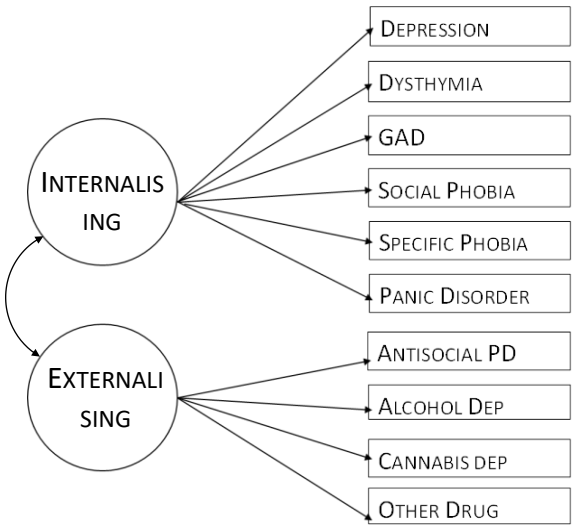
Models of Comorbidity

- Common factors
  - shared psychological, biological, social, or environmental risk factors cause both conditions



Source: National Comorbidity Guidelines

Internalising and externalising



Came out of the childhood/adolescent literature

Have been replicated internationally: Australia, Brazil, Chile, China, France, Germany, Greece, India, Italy, Japan, the Netherlands, NZ, Nigeria, Turkey, UK, US

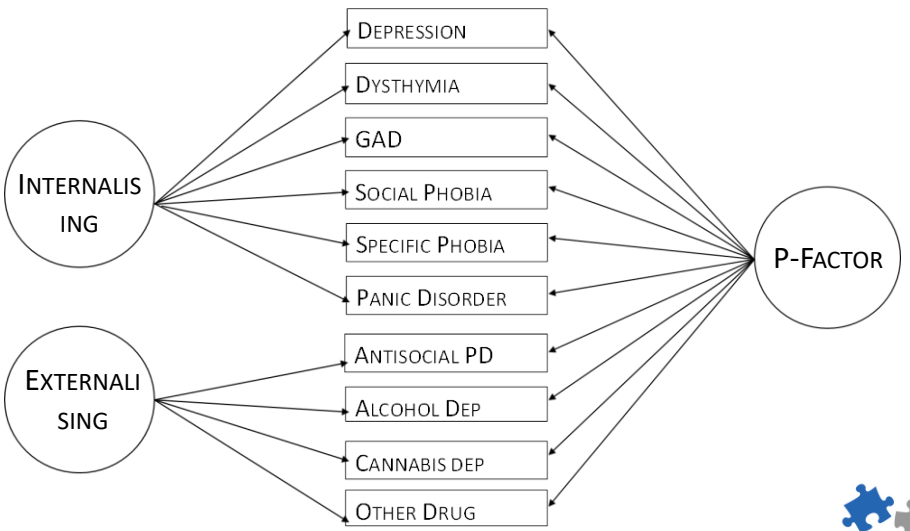
Stable over time

Thought disorder dimension may also be added

Links with personality

High correlations between dimensions

The P-Factor

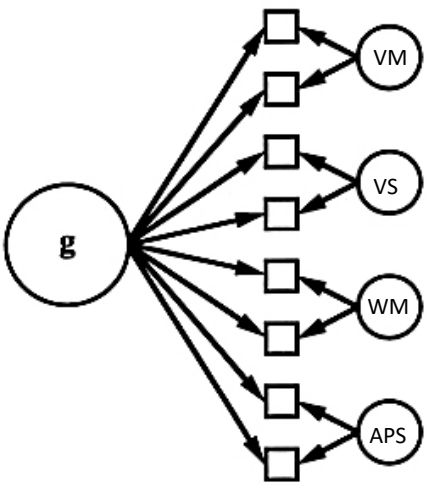


The P-Factor

- Fully explains relationship between internalising and externalising
- High predictive utility
- Higher scores associated with
  - More life impairment
  - Greater familiality
  - Worse developmental histories
  - More compromised childhood brain function

Source: Caspi et al. (2014) *Clinical Psychological Science,* 2 (2): 119-137

Analogy with intelligence

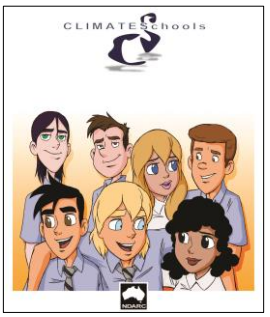


Prevention – CLIMATE Schools

Source: Teesson et al. (2014) *BMC Psychiatry,* 14: 32

CLIMATE Schools Combined

CLIMATE Schools Substance Use



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CLIMATE Schools Mental Health

=

CLIMATE Schools Combined

climate schools combined

Source: Teesson et al. (2014) *BMC Psychiatry,* 14: 32

CLIMATE Schools Combined

CLIMATE Combined (n=1,503)

CLIMATE Substance Use (n=1,753)

CLIMATE Mental Health (n=1,596)

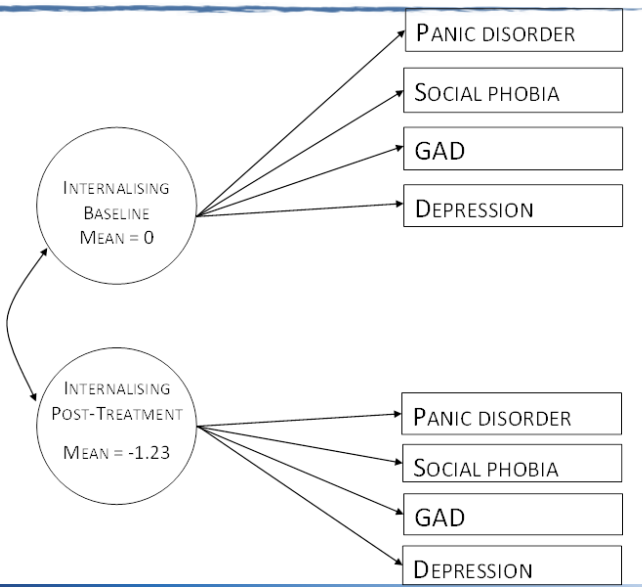
Education as usual (n=1,557)

18-month follow-up:

- ✓ Reducing the use and harmful use of alcohol and cannabis
- ✓ Reducing substance use related harms,
- ✓ Reducing levels of anxiety,
- ✓ Reducing levels of depression, and
- ✓ Increasing knowledge of alcohol, cannabis, anxiety and depression.

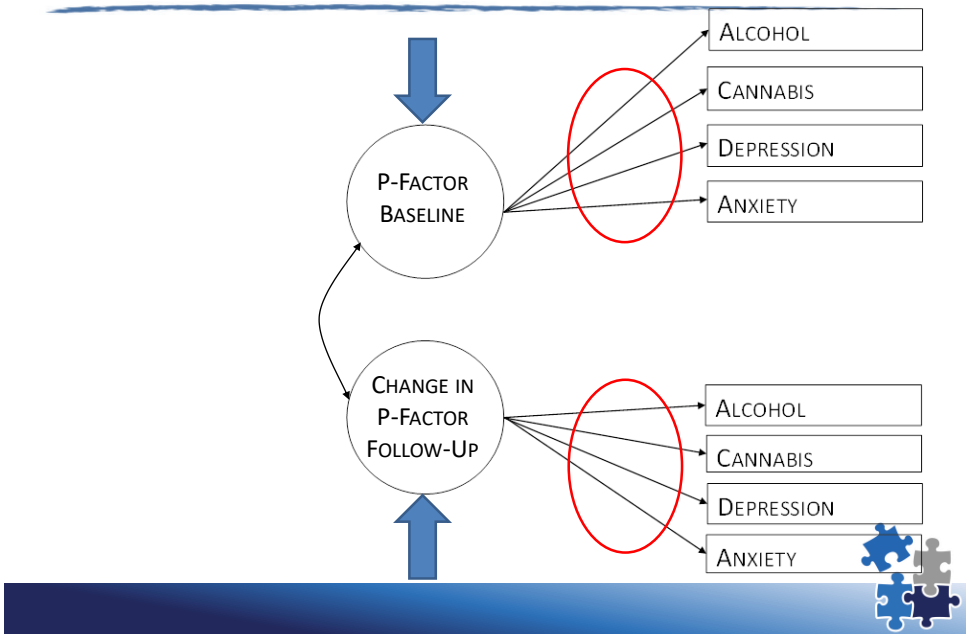
Source: Teesson et al. (2014) *BMC Psychiatry,* 14: 32

Reductions in Internalising



Source: Mewton et al. (2014) *Behaviour Research and Therapy,* 63: 132-138

P-Factor outcomes



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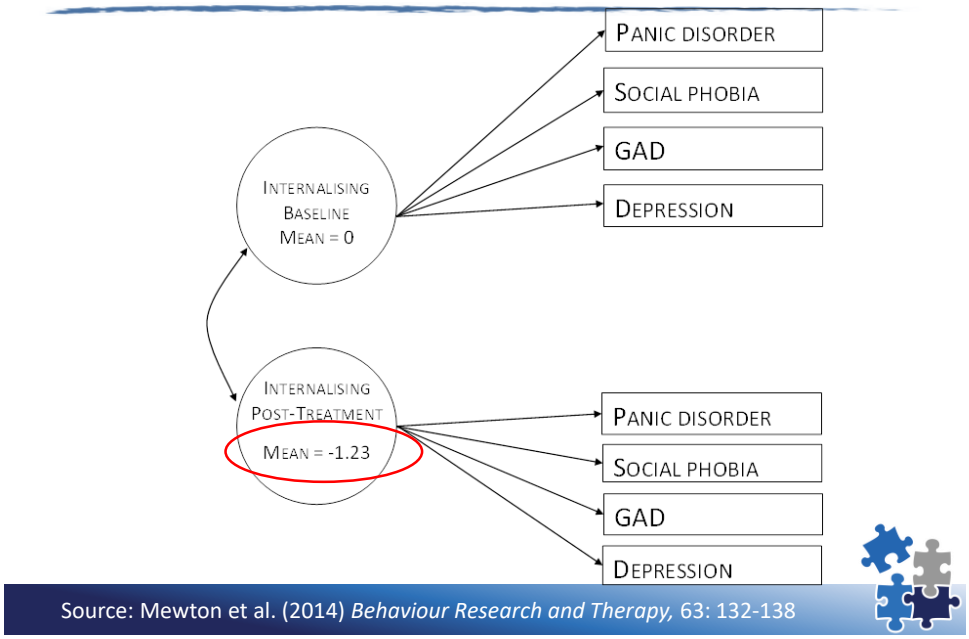

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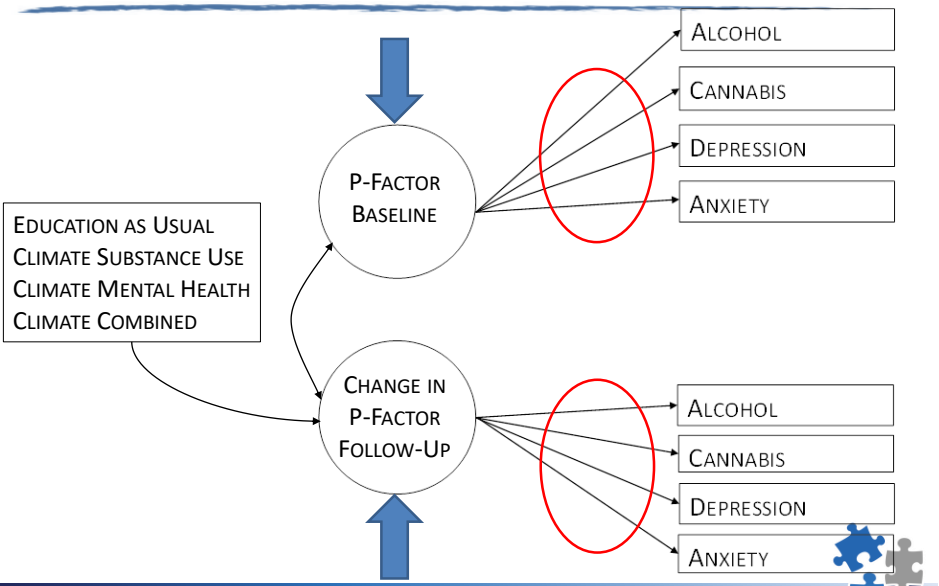
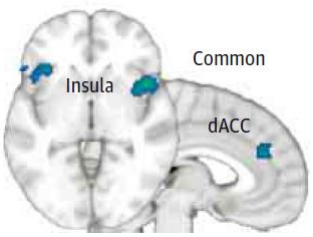
P-factor outcomes



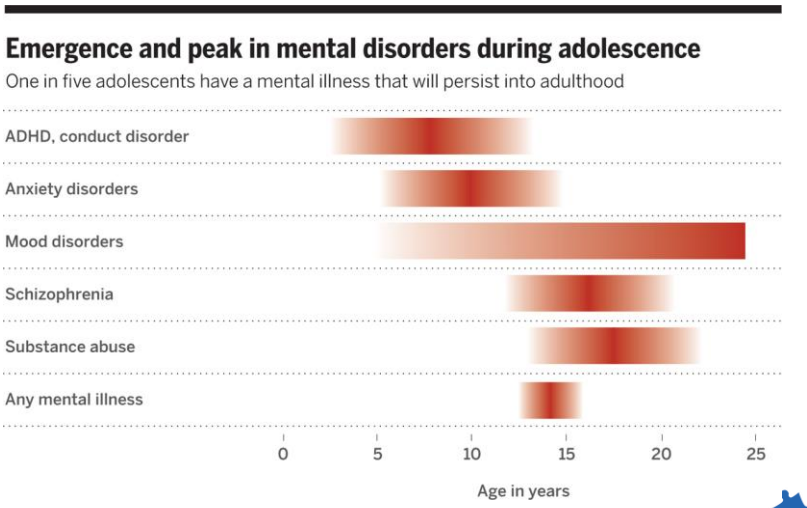
Common Neurobiology



- Meta-analysis of 193 imaging studies
- Focused on a range of mental illnesses: schizophrenia, bipolar disorder, depression, obsessive-compulsive disorder, anxiety, substance use disorders
- A loss of grey matter in the dorsal anterior cingulate cortex (dACC) and bilateral anterior insula
- Areas important for executive functioning

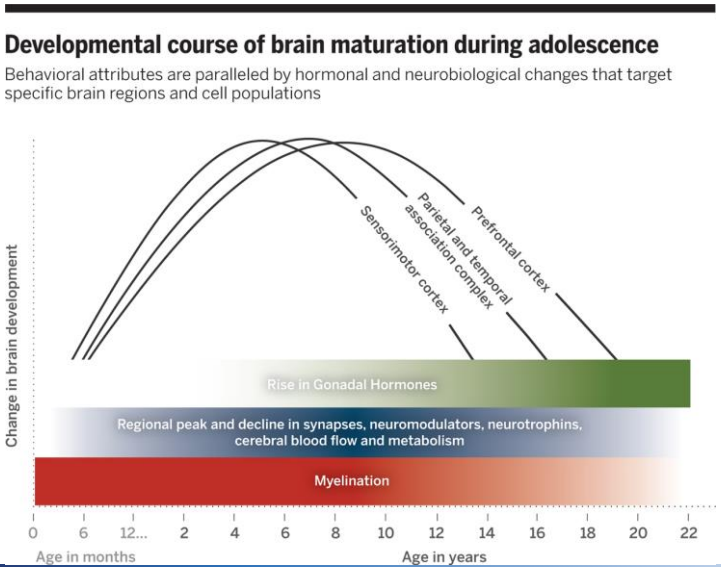
Source: Goodkind et al. (2015) *JAMA Psychiatry*, 72(4): 305-315

Adolescent mental illness



Source: Lee et al. (2014) *Science*, 346(6209): 547-549

Adolescent brain development



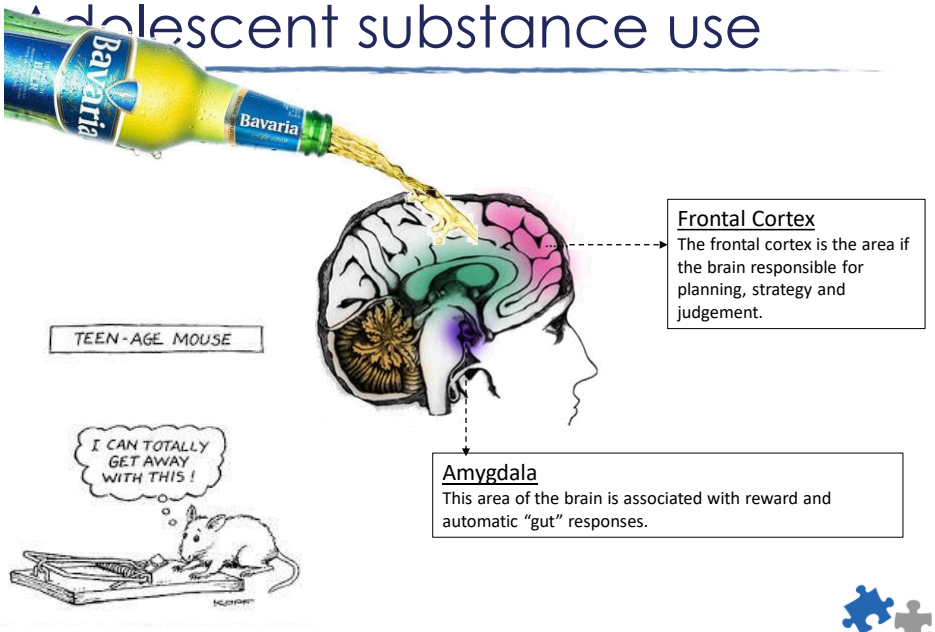
Source: Lee et al. (2014) *Science*, 346(6209): 547-549

Adolescent mental illness

"Exacerbations in these imbalances by biological, environmental, and genetic factors may contribute to a risk for mental illness."

Source: Lee et al. (2014) *Science*, 346(6209): 547-549

Adolescent substance use



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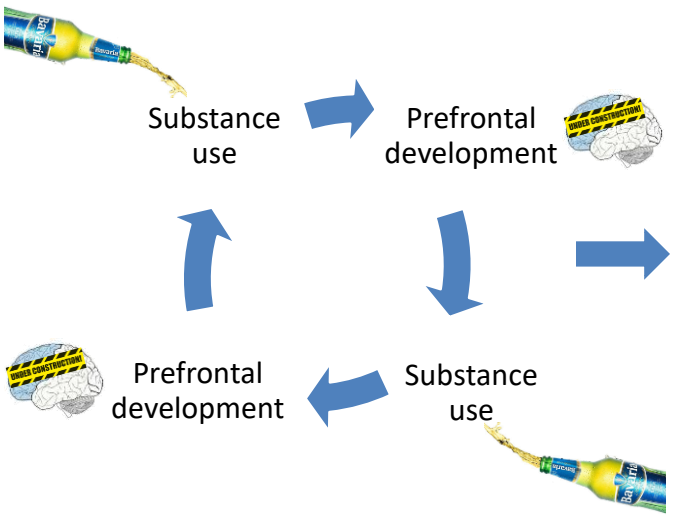

Cognitive training

- Using video games or other devices to build prefrontal areas
- Aims to enhance cognition through repetitive training on cognitive tasks
- Improvements in cognition translate to:
  - Improvement in functioning
  - Improvement in symptoms

Cognitive training

- Promising as an intervention
  - Schizophrenia
  - Bipolar disorder
  - ADHD
  - Major depression
  - Anxiety
  - Substance use disorders

- But what about as a prevention strategy?

Source: Keshavan et al. (2014) *Am J Psychiatry*, 171: 510–522

Cognitive training

- Pilot study 1:
  - 15 adolescents (~13 years) experiencing social, emotional and behavioural problems
  - Brain training intervention: 30-40 minute battery of brain training tasks, five days a week, for five weeks
  - Training group showed improvements in IQ, inhibition, test anxiety, and teacher-reported behaviour, attention and emotional symptoms

Source: Roughan & Hadwin (2011) *Learning and Individual Differences*, 12: 759-764

Cognitive training

- Pilot study 2:
  - 14 young people (15-35 years) at clinical high risk for psychosis
  - Brain training intervention: 40 hours online brain training tasks over 8 weeks
  - Improvements in cognition, reductions in positive symptoms

Source: Hooker et al. (2014) *Schizophrenia Research*, 157: 314-316

The Brain Games study

- 220 adolescents aged16-24 years at risk for developing a mental illness
- Intervention: Executive functioning tasks, 5 days per week over 5 weeks
- Control: tasks which do not focus on executive functioning, 5 days per week over 5 weeks
- Assessments: cognition, personality, alcohol use, functioning, symptoms of mental illness

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Thank you

- NSW CSC team: Maree Teesson, Tim Slade, Cath Chapman, Nicola Newton, Gavin Andrews, Louise Birrell and Brad Shaw
- Brain training team: Antoinette Hodge, Nicola Gates, Maree Teesson

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