Targeted Interventions for Youth: Individual- and population-level benefits of targeting personality risk in school-based interventions.

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Addiction from a developmental perspective:

- Adolescent onset substance misuse
  - Most substance use disorders have their symptom onset during adolescence
  - Heightened risk of developing addictive disorders and other internalising/externalising disorders (Grant & Dawson, 1998)
  - More severe, complex course of disorder with significant health and social consequences.

- Alcohol and drug toxicity and adolescent susceptibility
  - Fronto-striatal and fronto-parietal pathways, important for higher level executive functions, develop late in adolescence (Levin, 1991).
  - Neuropsychological and neuroimaging findings with adolescent SUDs suggest these very brain circuits are abnormal in adolescents who recently misused alcohol (Tapert, 2002).
Costs of Substance Abuse to Canadian Society

attribution to substance abuse by cost category in Canada, 2002

- Indirect costs: productivity losses $24.3 (61%)
- Direct health care costs $8.8 (22%)
- Direct law enforcement costs $5.4 (14%)
- Other direct costs $1.3 (3%)

Total cost: $39.8 billion

Figure 2: Per capita costs of substance abuse in Canada, 2002

[Note: Numbers may not add up because of rounding]
<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illegal drugs</th>
<th>TOTAL TAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Direct health care costs: total</td>
<td>4,360.2</td>
<td>3,306.2</td>
<td>1,134.6</td>
<td>8,800.9</td>
</tr>
<tr>
<td>1.1 morbidity - acute care hospitalization</td>
<td>2,551.2</td>
<td>1,458.6</td>
<td>426.37</td>
<td>4,436.2</td>
</tr>
<tr>
<td>- psychiatric hospitalization</td>
<td>-</td>
<td>19.6</td>
<td>11.5</td>
<td>31.2</td>
</tr>
<tr>
<td>1.2 inpatient specialized treatment</td>
<td>-</td>
<td>754.9</td>
<td>352.1</td>
<td>1,107.1</td>
</tr>
<tr>
<td>1.3 outpatient specialized treatment</td>
<td>-</td>
<td>52.4</td>
<td>56.3</td>
<td>108.7</td>
</tr>
<tr>
<td>1.4 ambulatory care: physician fees</td>
<td>142.2</td>
<td>80.2</td>
<td>22.6</td>
<td>245.0</td>
</tr>
<tr>
<td>1.5 family physician visit</td>
<td>306.3</td>
<td>172.8</td>
<td>48.8</td>
<td>527.9</td>
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<tr>
<td>1.6 prescription drugs</td>
<td>1,360.5</td>
<td>767.6</td>
<td>216.8</td>
<td>2,344.9</td>
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<tr>
<td>2. Direct law enforcement costs</td>
<td>3,072.2</td>
<td>2,335.5</td>
<td></td>
<td>5,407.8</td>
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<tr>
<td>2.1 police</td>
<td>-</td>
<td>1,898.8</td>
<td>1,432.0</td>
<td>3,330.7</td>
</tr>
<tr>
<td>2.2 courts</td>
<td>-</td>
<td>513.1</td>
<td>330.6</td>
<td>843.7</td>
</tr>
<tr>
<td>2.3 corrections (including probation)</td>
<td>-</td>
<td>660.4</td>
<td>573.0</td>
<td>1,233.4</td>
</tr>
<tr>
<td>3. Direct costs for prevention and research</td>
<td>78.1</td>
<td>53.0</td>
<td>16.5</td>
<td>147.6</td>
</tr>
<tr>
<td>3.1 research</td>
<td>9.0</td>
<td>17.3</td>
<td>8.6</td>
<td>34.9</td>
</tr>
<tr>
<td>3.2 prevention programs</td>
<td>69.1</td>
<td>33.9</td>
<td>7.9</td>
<td>110.9</td>
</tr>
<tr>
<td>3.3 salaries and operating funds</td>
<td>-</td>
<td>1.8</td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>4. Other direct costs</td>
<td>87.0</td>
<td>996.1</td>
<td>79.1</td>
<td>1,162.2</td>
</tr>
<tr>
<td>4.1 fire damage</td>
<td>86.5</td>
<td>156.5</td>
<td></td>
<td>243.0</td>
</tr>
<tr>
<td>4.2 traffic accident damage</td>
<td>-</td>
<td>756.9</td>
<td>67.0</td>
<td>823.9</td>
</tr>
<tr>
<td>4.3 losses associated with the workplace</td>
<td>0.5</td>
<td>17.0</td>
<td>6.6</td>
<td>24.1</td>
</tr>
<tr>
<td>4.3.1 EAP &amp; health promotion programs</td>
<td>0.5</td>
<td>17.0</td>
<td>4.2</td>
<td>21.7</td>
</tr>
<tr>
<td>4.3.2 drug testing in the workplace</td>
<td>N/A</td>
<td>-</td>
<td>2.4</td>
<td>2.4</td>
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<tr>
<td>4.4 administrative costs for transfer payments</td>
<td>0.0</td>
<td>65.8</td>
<td>5.4</td>
<td>71.3</td>
</tr>
<tr>
<td>4.4.1 social welfare and other programs</td>
<td>-</td>
<td>4.3</td>
<td></td>
<td>4.3</td>
</tr>
<tr>
<td>4.4.2 workers' compensation</td>
<td>-</td>
<td>61.5</td>
<td>5.4</td>
<td>66.9</td>
</tr>
<tr>
<td>5. Indirect costs: productivity losses</td>
<td>12,470.9</td>
<td>7,126.4</td>
<td>4,678.6</td>
<td>24,275.9</td>
</tr>
<tr>
<td>5.1 due to long-term disability</td>
<td>10,536.8</td>
<td>6,163.9</td>
<td>4,408.4</td>
<td>21,109.1</td>
</tr>
<tr>
<td>5.2 due to short-term disability (days in bed)</td>
<td>24.4</td>
<td>15.9</td>
<td>21.8</td>
<td>62.0</td>
</tr>
<tr>
<td>5.3 due to short-term disability (days with reduced activity)</td>
<td>36.2</td>
<td>23.6</td>
<td>-0.1</td>
<td>59.8</td>
</tr>
<tr>
<td>5.4 due to premature mortality</td>
<td>1,873.5</td>
<td>923.0</td>
<td>248.5</td>
<td>3,045.0</td>
</tr>
<tr>
<td>Total</td>
<td>16,996.2</td>
<td>14,554.0</td>
<td>8,244.3</td>
<td>39,794.4</td>
</tr>
<tr>
<td>Total per capita (in $)</td>
<td>541</td>
<td>463</td>
<td>262</td>
<td>1,267</td>
</tr>
<tr>
<td>Total as % of all substance-related costs</td>
<td>42.7</td>
<td>36.6</td>
<td>20.7</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Public Health Intervention Strategies

- Limited evidence for efficacy of universal school-based approaches
- Evidence-based programmes:
  - Life Skills Training Program
  - Strengthening Families

Indicated

- Brief motivational interventions for heavy drinkers
- Time-limited effects

Selective

- Moderate generic treatment effects
- Complicates and complicated by comorbid disorders
- "decade of harm"
- 5% receive treatment

Universal
Age at onset of alcohol use and DSM-IV alcohol abuse and dependence: A 12-year follow-up

Bridget F. Grant\textsuperscript{a,\,*}, Frederick S. Stinson\textsuperscript{a}, Thomas C. Harford\textsuperscript{b}

Table 4
Logistic regression analysis of DSM-IV alcohol abuse and dependence in 1994 using the 1982 age at drinking onset baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alcohol abuse</th>
<th>Alcohol dependence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Intercept</td>
<td>$-0.94^{a}$</td>
<td>0.46</td>
</tr>
<tr>
<td>Age at drinking onset (years)</td>
<td>$-0.07^{b}$</td>
<td>0.02</td>
</tr>
<tr>
<td>Male</td>
<td>$0.69^{b}$</td>
<td>0.09</td>
</tr>
<tr>
<td>Black</td>
<td>$-0.52^{b}$</td>
<td>0.14</td>
</tr>
<tr>
<td>Married</td>
<td>$-0.66^{b}$</td>
<td>0.08</td>
</tr>
<tr>
<td>Age (years, 1982)</td>
<td>$-0.06^{b}$</td>
<td>0.02</td>
</tr>
<tr>
<td>High school dropout</td>
<td>0.19</td>
<td>0.13</td>
</tr>
<tr>
<td>Parental education (less than high school)</td>
<td>0.07</td>
<td>0.13</td>
</tr>
<tr>
<td>Antisocial behaviors (1 to 3 symptoms)</td>
<td>$0.86^{b}$</td>
<td>0.16</td>
</tr>
<tr>
<td>Antisocial behaviors (4+ symptoms)</td>
<td>$1.16^{b}$</td>
<td>0.16</td>
</tr>
<tr>
<td>Family history of alcoholism</td>
<td>$0.18^{a}$</td>
<td>0.08</td>
</tr>
<tr>
<td>Lifetime marijuana use (10+ times)</td>
<td>$0.54^{b}$</td>
<td>0.08</td>
</tr>
</tbody>
</table>

\textsuperscript{a} $P < .05$.

\textsuperscript{b} $P < .01$. 
Personality Risk Factors for Substance Use Disorders

- **Risk factor:**
  - Predicts vulnerability to alcohol dependence (Caspi, et al., 1997)
  - Predicts vulnerability to other mental disorders (Caspi et al., 1997)
  - Mediates relationship between genetic factors and substance misuse (Laucht, et al., 2002; Conrod et al., 1998; McGue et al., 1998)

- **Informs on motives for substance use, typology**
  - Risky motives for drinking (Comeau, et al., 2002; Cooper, et al., 1995)
  - Drug of choice (Conrod, et al., 2000a)
  - Different patterns of coping
  - Sensitivity to drug effects and drug reinforcement (e.g., Conrod, Pihl & Vassileva, 1997; Leyton, et al., 2002).
PERSONALITY TRAITS

Impulsivity

MOTIVATIONAL PROFILE

Sensation Seeking

Poor response inhibition and emotional reactivity

Hopelessness

Negative affect regulation

Anxiety Sensitivity

Hyperarousal and sensitivity to dampening effects of substances/increased withdrawal symptoms

CO-OCCLUDING DISORDER

Externalising Problems

SUBSTANCE USE

Drug/Alcohol Misuse

Mood Disorders

Anxiety Disorders

From Castellanos & Conrod, 2012
Substance Use Risk Profile Scale:
23-item scale assessing impulsivity, sensation seeking, anxiety sensitivity and hopelessness

- Internal consistency (Woicik et al., 2009)
- Concurrent validity (Woicik et al., 2009)
- Incremental validity (Woicik et al., 2009)
- Predictive validity (Krank et al., 2010)
- Test-retest reliability (Woicik et al., 2009)
- Sensitivity/specificity (Castellanos-Ryan et al., 2013)
- Generalisability, applications in different cultural and clinical contexts (Jolin-Castonguay et al., submitted)
- Translated: French, German, Spanish, Czech, Dutch, Cantonese, Japanese, Sri Lankan
Table 5. Sensitivity and false positive rates (1-specificity) of the baseline SURPS subscales in the prediction of substance use, emotional and behavioural symptoms within the next 18 months (by T4) in the overall sample (N = 1057).

<table>
<thead>
<tr>
<th>%</th>
<th>Hopelessness</th>
<th>Anxiety Sensitivity</th>
<th>Impulsivity</th>
<th>Sensation Seeking-R (^\uparrow)</th>
<th>Selecting HR adolescents based on ROC cut-offs</th>
<th>Selecting HR adolescents (1SD &gt; mean cut-offs) (^\dagger)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly binging (13%)</td>
<td>20, 12</td>
<td>27, 31</td>
<td>61, 32</td>
<td>48, 30</td>
<td>72, 49</td>
<td>70, 42</td>
</tr>
<tr>
<td>Drinking problems (17%)</td>
<td>49, 34</td>
<td>32, 31</td>
<td>55, 31</td>
<td>36, 30</td>
<td>84, 63</td>
<td>75, 53</td>
</tr>
<tr>
<td>Smoking (9%)</td>
<td>61, 49</td>
<td>33, 30</td>
<td>55, 33</td>
<td>38, 30</td>
<td>81, 65</td>
<td>72, 55</td>
</tr>
<tr>
<td>Drug use (21%)</td>
<td>60, 49</td>
<td>27, 22</td>
<td>54, 30</td>
<td>43, 28</td>
<td>91, 75</td>
<td>74, 52</td>
</tr>
<tr>
<td>BSI depression (23%)</td>
<td>54, 31</td>
<td>42, 28</td>
<td>51, 30</td>
<td>34, 30</td>
<td>91, 70</td>
<td>73, 47</td>
</tr>
<tr>
<td>Emotional problems (13%)</td>
<td>54, 34</td>
<td>59, 27</td>
<td>46, 34</td>
<td>32, 31</td>
<td>91, 72</td>
<td>80, 53</td>
</tr>
<tr>
<td>Conduct problems (41%)</td>
<td>26, 13</td>
<td>33, 29</td>
<td>58, 20</td>
<td>35, 28</td>
<td>77, 50</td>
<td>72, 46</td>
</tr>
<tr>
<td>Hyperactivity problems (32%)</td>
<td>26, 15</td>
<td>37, 28</td>
<td>58, 25</td>
<td>38, 28</td>
<td>78, 55</td>
<td>74, 49</td>
</tr>
</tbody>
</table>
DSM-IV Structure of Externalising Behaviours

- Conduct Disorder
  - Truancy
  - Vandal
  - Shop-lift
  - Bullying
  - Fighting

- Substance use disorders
  - Dependence
  - Abuse
One factor model:
Krueger et al (2005)
Higher order two-subfactor model (2)
Hierarchical two-subfactor model (3)

Externalising spectrum in adults (e.g. Krueger et al., 2002).
Validation in Adolescents, (Castellanos-Ryan & Conrod, Journal of Child Abnormal, 2011)
Hierarchical two-subfactor model (3)

Cognitive correlates of risk
(Castellanos-Ryan, Rubia & Conrod, ACER, 2010)

- Enriched sample of 100 adolescents followed longitudinally:
  - CD+, SM+, CDSM+, CTL
- IMP – poor response inhibition (SSRT) mediates common and specific relationship between IMP and antisocial behaviour

![Diagram of impulsivity at age 14 and conduct symptoms at 16-17](image)
Cognitive correlates of risk

(Castellanos-Ryan, Rubia & Conrod, ACER, 2010)

- SS - reward-dependent disinhibition mediates specific relationship between SS and substance misuse latent factor.
Project Title: Reinforcement-related behaviour in normal brain function and psychopathology
Coordinator: Gunter Schumann
Funding volume: European Commission

- First multicentre functional and structural genetic-neuroimaging study of a cohort of 2000 14 year old adolescents.

- Assessed on traits related to response inhibition, reward, punishment and emotional behaviour
London
Nottingham
Dublin
Mannheim
Hamburg
Berlin
Paris

Multicentric recruitment and characterisation of 2000 adolescents

Impulsivity
Emotional learning
Novelty seeking
Reward sensitivity

3T fMRI
Structural MRI
DTI

Identification of regional distribution patterns of candidate gene products in animals

Cambridge (rat)
Sussex (mouse)

fMRI-registered behavioural tasks

Impulsivity
Emotional learning
Novelty seeking
Reward sensitivity
Drug self-admin.

Detection and haplotype analysis of genetic variations in human homologues

WGA analysis of brain region-specific gene effects

Replication: Canadian Saguenay Youth MRI study (n=1000)

Detection and haplotype analysis of genetic variations in human homologues

In vitro analysis of functional genotypes/haplotypes
Figure 8: Whelan, Conrod, et al., Nature Neuroscience, in press. A graphical representation of substance misuse results. (a) The mean factor score for those who had never tried illicit substances, those with four or fewer lifetime uses, and those with five or more lifetime uses, with use of alcohol and nicotine as nuisance variables. (b-d) Mean factor scores for those who had never tried alcohol, nicotine or illicit substances, those who had tried either alcohol or nicotine, those who had tried alcohol and nicotine, and those who had tried alcohol, nicotine and at least one illicit substance (groups 0, 1, 2 and 3, respectively) for the pre-SMA/PCG, right frontal and stop success orbital networks. Error bars represent ±1 s.e.m.
Factor loadings for the general-specific Model 3 at 16 years (follow-up; N=1210)

<table>
<thead>
<tr>
<th>Factor CD/ADHD at 16</th>
<th>Factor SM at 16</th>
<th>Factor EXTGEN at 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load p load p load p</td>
<td>load p load p</td>
<td>load p load p</td>
</tr>
<tr>
<td>CD band</td>
<td>.19 .316</td>
<td></td>
</tr>
<tr>
<td>CD screen SR</td>
<td>-.15 .647</td>
<td></td>
</tr>
<tr>
<td>CD screen PR</td>
<td>.35 .001</td>
<td></td>
</tr>
<tr>
<td>ADHD band</td>
<td>.44 &lt; .001</td>
<td></td>
</tr>
<tr>
<td>ADHD screen SR</td>
<td>.09 .446</td>
<td></td>
</tr>
<tr>
<td>ADHD screen PR</td>
<td>.64 &lt; .001</td>
<td></td>
</tr>
<tr>
<td>Bullying</td>
<td>.03 .393</td>
<td></td>
</tr>
<tr>
<td>age of drinking onset</td>
<td></td>
<td>.36 &lt; .001</td>
</tr>
<tr>
<td>Drugs use frequency</td>
<td></td>
<td>.51 &lt; .001</td>
</tr>
<tr>
<td>Drunkenness</td>
<td></td>
<td>.85 &lt; .001</td>
</tr>
<tr>
<td>Bingeing</td>
<td></td>
<td>.83 &lt; .001</td>
</tr>
<tr>
<td>Drinking Q*F</td>
<td></td>
<td>.84 &lt; .001</td>
</tr>
<tr>
<td>drinking-related problems</td>
<td></td>
<td>.56 &lt; .001</td>
</tr>
</tbody>
</table>

Correlations between factors

<table>
<thead>
<tr>
<th>r</th>
<th>p</th>
<th>r</th>
<th>p</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD/ADHD at 14</td>
<td>.56 &lt; .001</td>
<td>-.01 .800</td>
<td>.21 .004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM at 14</td>
<td>.00 .814</td>
<td>.45 &lt; .001</td>
<td>-.03 .392</td>
<td></td>
<td></td>
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<tr>
<td>EXTGEN at 14</td>
<td>-.09 .178</td>
<td>-.07 .062</td>
<td>.61 &lt; .001</td>
<td></td>
<td></td>
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</table>
Standardized model parameter estimates for concurrent associations between covariates - personality, response inhibition, and reward sensitivity - and ADHD/CD, SM and General Externalizing SEM factors as established in the general-specific Model 3 at 14 years (N=1778).

<table>
<thead>
<tr>
<th>Predictor</th>
<th>CD/ADHD Std estimate</th>
<th>CD/ADHD p</th>
<th>Substance Misuse Std estimate</th>
<th>Substance Misuse p</th>
<th>General Externalizing Std estimate</th>
<th>General Externalizing p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence Quotient:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>-.17</td>
<td>.000</td>
<td>-.02</td>
<td>.376</td>
<td>.03</td>
<td>.756</td>
</tr>
<tr>
<td>Performance</td>
<td>-.16</td>
<td>.000</td>
<td>-.10</td>
<td>.023</td>
<td>-.04</td>
<td>.345</td>
</tr>
<tr>
<td>Personality measures</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURPS Impulsivity</td>
<td>.27</td>
<td>.000</td>
<td>-.03</td>
<td>.549</td>
<td>.53</td>
<td>.000</td>
</tr>
<tr>
<td>SURPS Sensation-seeking</td>
<td>.01</td>
<td>.746</td>
<td>.11</td>
<td>.009</td>
<td>.06</td>
<td>.241</td>
</tr>
<tr>
<td>Behavioral Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay-Discounting: K</td>
<td>.06</td>
<td>.000</td>
<td>.07</td>
<td>.006</td>
<td>.11</td>
<td>.001</td>
</tr>
<tr>
<td>Go No-Go: Commission Errors</td>
<td>.09</td>
<td>.007</td>
<td>.02</td>
<td>.410</td>
<td>.04</td>
<td>.230</td>
</tr>
</tbody>
</table>
Personality-Targeted Interventions:
Conrod et al., *Psych Addictive Beh*, 2000

- **Psychoeducational Component**
- **Motivational Component**
  - Motivational interviewing techniques
  - Goal setting exercises
- **Cognitive-Behavioral Component**
  - Personality-specific cognitive distortions
    - Anxiety sensitivity:
      - Decatastrophizing & exposure *(Barlow & Craske, 1988)*
    - Hopeless:
      - Negative thought challenging *(Beck & Young, 1985)*
    - Impulsive:
      - Response inhibition “stop”, “focus”, “choose” *(Kendall & Braswell, 1985)*
    - Sensation seeking:
      - Thought challenging for boredom & need for stimulation
introduction to impulsivity
An impulsive person acts on the spur of the moment without thinking much about the consequences of their actions. When you feel as if you are being treated unfairly, are frustrated or are angry, you might experience a lack of control and may say or do something that you later regret.

how much do you agree with the following statements?
1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree

I often don’t think things through before I speak.
I often involve myself in situations that I later regret.
I usually act without stopping to think.
Generally, I am an impulsive person.
I feel I have to be crafty and manipulative to get what I want.

Add your total to determine your level of impulsivity.
under 9 = low 9-14 = medium 14 and above = high

What does impulsivity mean to you?

CHARACTERISTICS OF impulsivity
1. Strong-minded and easily frustrated.
2. Acting or speaking without thinking much about what could happen.
3. Sometimes getting involved in situations that you later regret.
4. Being or feeling angry or aggressive and sometimes acting on it.
5. Sometimes feeling as if you are being treated unfairly.
6. Difficulty resisting urges.

MARK’S father owns a restaurant, and Mark gets paid to help move deliveries to the storage room. Mark hates the job—it’s hard and boring, and he sometimes misses out on fun stuff. Plus, his dad always points out the things he does wrong and that makes him resent the job even more. One afternoon, Mark’s friends show up and want him to come hang out. Mark doesn’t want to be stuck in this dark back room alone when he could be out doing something fun. He tensions up. This is so unfair! he thinks. He angrily kicks a box and hears a bottle break. “Great. Dad will take this out of my pay. I don’t deserve this!” he mutters. Feeling like he’s going to explode, he grabs a case of beer and leaves with friends.
introduction to negative thinking

Some people experience negative thoughts and sadness more than others. For example, they might feel worthless and believe that they can never measure up to their friends’ expectations, even though no one has ever said they come up short. They tend to experience ongoing despair and feel as though they will never accomplish anything. A person who often feels sad, worthless, guilty and irritable and finds him- or herself looking at the world in a negative, hopeless way is said to be susceptible to negative thinking.

how much do you agree with the following statements?

1 - strongly agree 2 - agree 3 - disagree 4 - strongly disagree

I am content.
I am happy.
I believe that my future holds great promise.
I feel proud of my achievements.
I feel cheerful.
I am very enthusiastic about my future.

Add your total to determine your level of negativity.

under 8 = low 8-14 = medium 14 and above = high

What does negative thinking mean to you?

JOSH loves being with his friends. He depends on his friends Candice, Nick and Amy to make him feel better when he feels down. When his friends can’t hang out with him, Josh feels like he did something wrong. He assumes nobody wants him around and ends up pulling away from his friends.
Personality-Targeted Interventions: The Evidence

Phase I: Proof of concept (Conrod et al., 2006).
Phase II: Efficacy (Conrod et al., 2008; 2010; 2011)
Phase III: Effectiveness (Conrod et al., 2013)
Phase IV: Process, secondary outcomes, pathways, delivery models (O’Leary-Barrett et al., 2013)
Phase V: Special populations (Stewart et al., 2012), contexts, generalisability (Lammers, et al., 2010), optimisation (Newton et al., 2012)
Drinking Outcomes

Intervention: F(1,334)= 10.30, p<0.01

Conrod et al., *Journal of Consulting and Clinical Psychology*, 2011
UK Adventure Trial: Effectiveness when delivered by teachers

- **Phase III trial** funded by Action on Addiction, 2006-2010

- **Hypotheses**
  - **Primary:**
    - Effectiveness when delivered by schools and teachers
  - **Secondary:**
    - Mental health benefits?
    - ‘Herd effects’?: secondary effects on general population?
3,021 were invited to participate
55 (1.8%) parents did not wish for their child to take part
61 (1.2%) students declined participation for full study (survey + intervention trial)
94 (2.6%) students declined participation in the intervention phase of the trial only
161 (5.3%) were eliminated because of unreliable data or not having answered enough questions in the survey

2,650 completed screening survey
Adjusted n=2,506 as 1 control school excluded from 6 month analysis due to systematic problems at follow-up

1,533 (61.2%) intervention
(n=11 schools)
696 (45.4%) met personality risk criteria

973 (38.8%) control
(n=7 schools)
463 (47.6%) met personality risk criteria

Intent to treat sample (n=1,159)

696 invited to take part in interventions
165 (23.7%) scored high in NT
195 (28.0%) scored high in AS
162 (23.3%) scored high in IMP
174 (25.0%) scored high in SS

Not invited to take part in interventions:
106 (22.9%) scored high in NT
120 (25.9%) scored high in AS
115 (24.8%) scored high in IMP
122 (26.3%) scored high in SS

624 (89.7%) of intervention high-risk sample completed 6-month post-intervention follow-up
384 (82.9%) of control high-risk sample completed 6-month post-intervention follow-up

Overall follow-up rate 1,008 (87.0%)
Exclusion of 30 unreliable cases at follow-up: final intent to treat sample n=1,129
Personality-Targeted Interventions Delay Uptake of Drinking and Decrease Risk of Alcohol-Related Problems When Delivered by Teachers


TABLE 5  Comparison of Effect Sizes across Personality-Targeted Intervention Trials: Full Intent-to-Treat Samples and Drinkers Only

<table>
<thead>
<tr>
<th></th>
<th>Full ITT Sample (Drinkers and Nondrinkers at Baseline)</th>
<th>Alcohol Users at Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Binge-Drinking at Follow-up (%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Intervention</td>
</tr>
<tr>
<td>Canadian trial\textsuperscript{17}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventure UK\textsuperscript{15}</td>
<td>37.5</td>
<td>30.3</td>
</tr>
<tr>
<td>Adventure (present trial)</td>
<td>28.2</td>
<td>24.9</td>
</tr>
</tbody>
</table>

Note: ITT = intent to treat; NNT = number needed to treat; OR = odds ratio.
Two-Year Impact of Personality-Targeted, Teacher-Delivered Interventions on Youth Internalizing and Externalizing Problems: A Cluster-Randomized Trial

Maeve O’Leary-Barrett, B.A., Lauren Topper, Ph.D., Nadia Al-Khudhairy, M.Sc., Robert O. Pihl, Ph.D., Natalie Castellanos-Ryan, Ph.D., Clare J. Mackie, Ph.D., Patricia J. Conrod, Ph.D., C.Psychol.

TABLE 2 Intervention Effects on Internalizing and Externalizing Symptoms Over 2-Year Follow-Up (High Risk [HR] Sample, N=1,024)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Symptom Description</th>
<th>Mean (SD) Control</th>
<th>Mean (SD) Intervention</th>
<th>β (SE)</th>
<th>Severe Symptom levels OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalizing symptoms</td>
<td>Depression</td>
<td>13.15 (3.87)</td>
<td>12.71 (3.85)</td>
<td>0.09 (0.05)*</td>
<td>0.74 (0.58–0.96)*</td>
</tr>
<tr>
<td></td>
<td>Suicidal ideation</td>
<td>0.34 (0.31)</td>
<td>0.31 (0.31)</td>
<td>0.09 (0.04)*</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
<td>8.60 (2.57)</td>
<td>8.22 (2.57)</td>
<td>0.12 (0.05)**</td>
<td>0.79 (0.59–1.05)</td>
</tr>
<tr>
<td></td>
<td>Panic attacks</td>
<td>1.20 (0.35)</td>
<td>1.23 (0.36)</td>
<td>−0.04 (0.04)</td>
<td>—</td>
</tr>
<tr>
<td>Externalizing problems</td>
<td>Conduct problems</td>
<td>3.26 (1.17)</td>
<td>3.07 (1.16)</td>
<td>0.10 (0.03)***</td>
<td>0.79 (0.65–0.96)*</td>
</tr>
</tbody>
</table>

Note: β = standardized beta; OR = odds ratio.

*Although analyses were carried out on log-transformed data, means (SDs) were provided for non—log-transformed variables for ease of interpretation.

*p < .05, **p ≤ .01, ***p ≤ .001.
“Gee, Tommy, I’d be lost without your constant peer pressure.”
3,021 were invited to participate
55 (1.8%) parents did not wish for their child to take part
61 (2.0%) students declined participation for full study (survey + intervention trial)
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Overall follow-up rate 1,008 (87.0%)

Exclusion of 30 unreliable cases at follow-up: final intent to treat sample n=1,129

Followed 6, 12, 18 & 24 months
Figure 1. Estimated probability of reporting drinking \( \times \) frequency of drinking in high-risk and low-risk youth attending intervention and control schools on the basis of 1217 respondents (53.1%) reporting none at 6 months (T2), 1252 (54.6%) at 12 months (T3), 1020 (44.5%) at 18 months (T4), and 934 (40.7%) at 24 months (T5).

Figure 2. Estimated probability of reporting drinking \( \times \) quantity of drinking in high-risk (HR) and low-risk (LR) youth attending intervention and control schools. T2 indicates 6 months after intervention; T3, 12 months after intervention; T4, 18 months after intervention; and T5, 24 months after intervention.

Figure 3. Estimated probability of reporting binge drinking \( \times \) frequency of binge drinking in high-risk (HR) and low-risk (LR) youth attending intervention and control schools. T2 indicates 6 months after intervention; T3, 12 months after intervention; T4, 18 months after intervention; and T5, 24 months after intervention.

Figure 4. Estimated probability of reporting problem drinking symptoms \( \times \) severity of problem drinking symptoms in high-risk (HR) and low-risk (LR) youth attending intervention and control schools. T2 indicates 6 months after intervention; T3, 12 months after intervention; T4, 18 months after intervention; and T5, 24 months after intervention.
32 public and private schools, each with approximately 150 Year 7 students, recruited from Greater Montreal Area, randomly assigned to treatment condition.

16 schools (50%) Intervention Condition
16 schools (50%) Control Condition

2208 (92%) students complete screening survey and consent to trial
2208 (92%) students complete screening survey and consent to trial

1004 invited to take part in interventions
251 (25%) score high in NT
251 (25%) score high in AS
251 (25%) score high in IMP
251 (25%) score high in SS

1004 Not invited to take part in interventions:
251 (25%) score high in NT
251 (25%) score high in AS
251 (25%) score high in IMP
251 (25%) score high in SS

2018 (92%) students complete screening survey and consent to trial
1004 (45.5%) high risk
1004 (45.5%) low risk
1004 (45.5%) high risk
1004 (45.5%) low risk

1854 (84%) of control sample completed 12-month FU
1854 (84%) of control sample completed 24-month FU
1854 (84%) of control sample completed 36-month FU
1854 (84%) of control sample completed 48-month FU
1854 (84%) of control sample completed 12-month FU
1854 (84%) of control sample completed 24-month FU
1854 (84%) of control sample completed 36-month FU
1854 (84%) of control sample completed 48-month FU

Preventure training of school staff
NEURO-Venture Brain structure-function

Early Use ↓ Cognitive dev ↓ Em / Behav Problems ↓ Academic Failure ↓ ADDICTION OUTCOMES

Baseline
12mo
24mo
36mo
48mo
Thank you

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- My team: Natalie Castellanos, Maeve O’Leary-Barrett, Eveline Perrier-Ménard, Clare Mackie, the IMAGEN Consortium.
- Action on Addiction
- CIHR - INMHA
- ABMRF
- ERAB
- MRC-UK
- European Commission, FP6-Health and FP7-Humanities and Social Sciences.
- FRSQ Chercheur-Boursier