



Canadian Mental
Health Association
Mental health for all



Cost-Benefit Analysis of the PATHS Program in Canada

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**DALHOUSIE
UNIVERSITY**
Inspiring Minds

**Funded by the
Public Health
Agency of Canada**

Our Project: SEAK

Socially and Emotionally Aware Kids

Vision:

Socially and Emotionally Competent Children
in a Healthy Community.

Approach:

Based in Population Health & Health Promotion.

Core Intervention:

Promoting Alternative Thinking Strategies (PATHS)

SEAK Partners

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- **Canadian Mental Health Assoc.- Nova Scotia Division (NGO)**
- **Researchers– Dalhousie University**
- **Provincial School Board in 5 Sites**
 - Nova Scotia (2 sites)
 - Manitoba (1 site)
 - Alberta (2 sites)

The Context: Canada

- Large land mass
- Small Population
≈34 M





SEAK Outcomes to Date

- ▶ PATHS resulted in positive gains
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Challenge: PATHS Sustainability & Scale Up

- All sites are committed to PATHS sustainability
 - **3** sites have introduced PATHS to additional schools within their School Board (horizontal scale up)

BUT

- Sustainability raises critical questions around ***COST!!!***

.....hence the need for a cost-benefit analysis

Cost-Benefit Analysis (CBA)

- Provides information for decision-makers to evaluate a program for **adoption** ...or **sustainability**
- Provides an economic tool to assess **whether the use of resources yields a net benefit**:
 - **Within a Program**: Helps determine economic value of within a program
 - **Across Programs**: Helps compare the relative values with other programs purporting to produce similar benefits

Of all the SEL Components: Is there a key element? Literature Review

➤ Child Self-Control

- A longitudinal study (Moffitt et al., 2011) of a complete birth cohort (n=1037) in Dunedin, New Zealand, followed until 32 years of age showed that **self-control** predicted critical outcomes later in life:
 - Better **physical health**
 - Higher **personal finances**
 - Lower **substance dependence**
 - lower **criminal offences**
- Similar links found in 30 year study in Christchurch, NZ (Ferguson, et al., 2013)

Self Control

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The capacity to **regulate** one's thoughts, feelings, and actions and it is the element that helps people to **resolve motivational conflicts** between concrete, proximal goals and abstract, distal goals" (Miller, Yu, Chen, & Brody, 2015)

Good self-control enables one to

- resist temptations
- initiate and sustain actions toward one's goals

Self Control: How it Develops

An executive function managed by the brain's frontal cortex

- **Birth-3 months** – hand-to-mouth thumb sucking
- **3-9 months** – alter behavior in response to events/environmental stimuli (sensory modulation)
- **12-18 months** – ability to initiate and cease physical acts according to compliance & self-initiated monitoring
 - **Critical elements:** intentionality, goal-directed action with conscious self-awareness & memory

Self Control: How it Develops

- **24+ months** – The true beginning of self control - behave according to social expectations or delay upon request in the **absence of external monitors**
 - **Critical elements:** Representational thinking, memory recall, symbolic thinking, continuing sense of identity
- **36+ months** – ability to create a strategy & conscious introspection
 - Show flexibility in control processes that meet changing situational demands
- Continues to develop through early and middle **adolescence**
- Is a powerful determinant of success across the lifespan

SEAK Study: PATHS Impact on Self-Control

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Self-Control Indicator

- Teacher evaluation data (13,900 evaluations)
 - Aggression/disruption
 - Attention subscales
 - Child social competences

Results

- Regression analysis showed a significant effect of PATHS on observed self-control in participants.
- Boys & girls showed fairly similar self-control results
- Boys and Girls had approximately equal effects from PATHS
- Self-control improved with age ...but different levels were observed across schools

SEAK CBA: Our Approach

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- **Studies providing guidance:**
 - Dunedin (Moffitt et al., 2011)
 - Christchurch studies (Ferguson, et al., 2013)
- Our base case included a **prospective approach** with 250 students, a discount rate of 3%, and a timeframe of 20 years.
- Our analysis also integrated **Canadian data** (e.g., health, income, etc.) where possible.

The Prospective Approach

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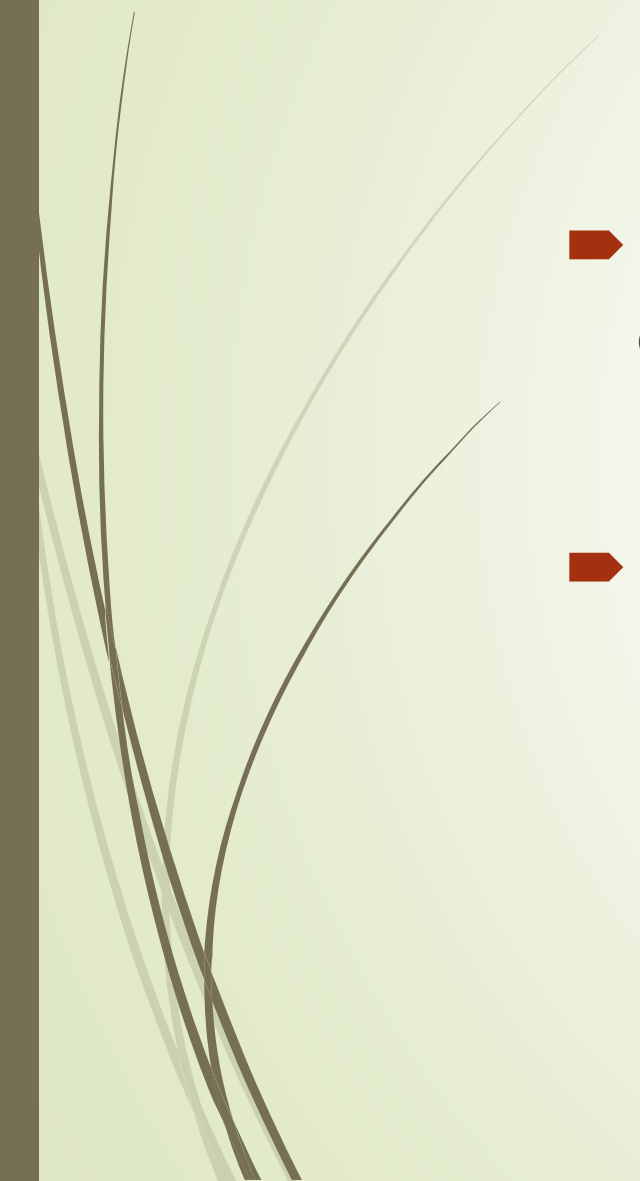
- **Costs (inputs/resources)**
 - Materials & expenses required for training & delivery of PATHS
- **Benefits (outputs/results)**
 - Short- & Long-term changes in students competencies attributable to PATHS
- **Baseline Scenario**
 - Cohort of students who do NOT receive PATHS & proceed to adulthood
- **Alternative Scenario**
 - Cohort of students who receive PATHS & proceed to adulthood

Costs of PATHS

- Curriculum & supplies/photocopying
- Training & On-Going Mentoring
 - Coach
 - Classroom teachers (including staff turnover)
- Orientation
 - Non-homeroom school staff
- Sub fees for Professional Development



Our Assumptions

- ▶ PATHS was implemented using most recent curriculum
 - ▶ Delivered as directed
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SEAK: The Benefits Assessed

- Reduction in ***crime***
- Reduction in ***obesity***
- Reduction in ***tobacco dependence***
- Reduction in ***illicit drug dependence***
- Increase in ***income***

SEAK: Scenarios

➤ **Baseline Scenario**

- Cohort of students **who do NOT receive PATHS** & proceed to adulthood

➤ **SEAK cohort**

- wait-list school (1-2 years)

- Not randomized

- Student follow-up varied depending on study start-up

➤ **Alternative Scenario**

- Cohort of students **who receive PATHS** & proceed to adulthood

➤ **SEAK Cohort**

- PATHS rolled into school over 2-3 years

- Student follow-up varied depending on study start-up



Our Prospective Results



SEAK: PATHS Impact on Crime

- ▶ Moffitt reports an odds ratio for criminal conviction at age 32 years of 1.714 (95% confidence interval: 1.425-2.063).
- ▶ Building on this finding, the effect of PATHS on self-control is estimated to reduce the likelihood that a child will have a criminal conviction at age 32 years by **20.4 percent**.

SEAK: PATHS Impact on Obesity

- ▶ Moffitt reports an odds ratio for obesity at age 32 years of 1.30 (95% confidence interval: 1.07-1.48) after controlling for current smoking (nicotine keeps weight down & low self-control children tend to become smokers).
- ▶ After linking the odds ratio with the PATHS effect on self-control, PATHS is found to reduce the likelihood that a child will become obese at age 32 years by **11.3 percent**.

SEAK: PATHS Impact on Tobacco Dependence

- Moffitt reports an odds ratio for tobacco dependence of 1.437 (95% confidence interval: 1.228-1.682).
- After linking the odds ratio with the PATHS effect on self-control, PATHS is found to reduce the likelihood that a child will become dependent on tobacco at age 32 years by **14.9 percent**.

SEAK: PATHS Impact on Drug Dependence

- Moffitt reports the odds ratio for drug dependence at age 32 at 1.582 (95% confidence interval: 1.189-2.104).
- After linking the odds ratio with the PATHS effect on self-control, PATHS is found to reduce the likelihood that a child will become dependent on drugs at age 32 years by **18 percent**.

SEAK: PATHS Impact on Income

- ▶ The increased income per person attributed to PATHS is calculated as the standard deviation of income (converted to 2014 dollars) multiplied by the Moffitt regression coefficient (0.112) multiplied by the estimated effect of PATHS on self-control (0.49).
- ▶ Using age 25 years as an example, the standard deviation of income for 25 year olds is \$25,283 (in 2014 dollars). We would expect the average 25 year old who received PATHS as a child to **earn \$1,388 more** for that year than the average 25 year old who did not receive PATHS as a child.

SEAK: Benefit-Cost Results

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- The results showed a positive net benefit of just under \$1.2 million (2014 dollars), or just under **\$5,000 per PATHS participant**.
- ***The benefit-cost ratio was 17.96 – meaning every dollar spent on PATHS will generate \$17.96 in benefits.***

And while the net benefits are not realized immediately

- they ***turn positive after 13 years***
- ***continue to rise*** 20 and 30 years following PATHS
- the benefits cross ***multiple sectors*** of society.



Comparison with other Benefit-Cost Estimates of PATHS

Washington State Institute for Public Policy (2015)

- ▶ Using 2014 data - had similar results
 - ▶ ***The benefit-cost ratio was 22.19 – meaning every dollar spent on PATHS will generate \$22.19 in benefits.***

The Challenge

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PATHS takes 20-30 years to realize major impact.

➤ **Little Impact following 10 years**

- benefit-cost ratio is less than 1 as the benefits of increased income and cost reductions are 0 or extremely limited in the early years....

➤ **Following 30 Years**

- the benefits continue to rise – reaching \$3.4 Million (benefit-cost ratio of 49.86)....with the vast majority of benefits generated by income (starting at year 12).
- But even if the income stream were removed the other items generate a positive net benefit after year 16.

So how to ensure program sustainability?

How to build sustainability: Lessons Learned

Engage multi-level stakeholders from the start

➤ ***Multi-Sectors of Government***

➤ Education

➤ Health

➤ Justice

➤ Check policy documents for related SEL/mental health promotion commitments

➤ ***Employers***


➤ ***Community Champions***

➤ ***Organizational support***

➤ ***Collaborative for Academic, Social, and Emotional Learning (CASEL)***

How to build sustainability: Lessons Learned

- ▶ **Collaboratively identify *relevant*** outcome indicators from the start
 - ▶ Short Term
 - ▶ Education – classroom disruption
 - ▶ Long-term
 - ▶ Health – BMI, smoking
 - ▶ Education – years in school, academics
 - ▶ Justice – criminal offence (drug, crime)
 - ▶ Employers – healthy workplace
 - ▶ Community - income



How to build sustainability: Lessons Learned

- ▶ **Collaboratively build a sustainability plan**
 - ▶ Using data relevant to **each** stakeholder
 - ▶ Keep stakeholders informed re program enhancements
 - ▶ Take advantage of opportunities to make presentations when **policy**, **practice** or **budget** changes are being considered
- 



Thank You



Your Questions?
Comments?

Selected References

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