On being everyday scientists: Principles for influencing human behavior

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Everyone can become an everyday scientist

Every baby born is an everyday scientist.

Adults can become proficient everyday scientists by learning to measure cause and effect using simple measures and simple ways of measuring the reliability of change.

Being an everyday scientist is what makes humans powerful in the world at solving problems, provided we have psychological flexibility.
A major threat to validity to our collective ability to influence lies in Cook & Campbell methods book…

…Time of History
New combinations of events predict new challenges

- Fear of Violence & Crime
- Increased Electronic Media Use
- Omega 3 Fatty Acid Deficiency
- Reduced Outdoor Activities
- Vitamin D Deficiency
- Change in Genes
- Rise in Depression Rates
- Rise in Aggression Rates
- ATOD Addictions
- Increased Cancer
- Rise in Obesity Rates
- Increased Autism
- Increased Schizo.

Factors:
- Omega 3 Fatty Acid Deficiency
- Vitamin D Deficiency
- Reduced Outdoor Activities
- Fear of Violence & Crime
- Increased Electronic Media Use

Events:
- Rise in Depression Rates
- Rise in Aggression Rates
- ATOD Addictions
- Increased Cancer
- Rise in Obesity Rates
- Increased Autism
- Increased Schizo.

Correlations:
- Reduced Outdoor Activities → Vitamin D Deficiency
- Fear of Violence & Crime → Reduced Outdoor Activities
- Omega 3 Fatty Acid Deficiency → Rise in Depression Rates
- Vitamin D Deficiency → Change in Genes
- Change in Genes → Rise in Obesity Rates
- Rise in Obesity Rates → ATOD Addictions
- ATOD Addictions → Increased Cancer
- Rise in Depression Rates → Increased Schizo.
Rates of behavior

Can be stable
Can be ascending
Can be descending
Can be variable

Plus behavior can be characterized by:

- Duration
- Intensity
Learning to “read” trends versus averages...

- **Stable**
  - Before: Mean Score
  - After: Mean Score

- **Descending**
  - Before: Mean Score
  - After: Mean Score

- **Ascending**
  - Before: Mean Score
  - After: Mean Score

- **Variable**
  - Before: Mean Score
  - After: Mean Score
Sifting for “gold” versus gravel at different “places”

Places where problem rarely happens

Places where problem happens sometimes

Places where problem often happens

Individuals
Families
Small groups
Organizations
Communities
States/Regions
Nations
### Gold Sifting by eco-behavioral assessments

<table>
<thead>
<tr>
<th>Rates of Target Behaviors</th>
<th>Antecedents</th>
<th>Behaviors</th>
<th>Consequences</th>
<th>Relational Frames</th>
<th>Bio-Physiological-Epigenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Rate Settings</td>
<td><strong>Physical cues or events before behavior</strong></td>
<td>Increase or decrease in rate, duration or intensity</td>
<td><strong>After a behavior, increase or decrease future rate, duration or intensity of that behavior</strong></td>
<td><strong>Words altering rate, duration, intensity or generalization of behavior</strong></td>
<td>Extrinsic or internal bio-physical events that change rate, duration or intensity of behavior</td>
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<tr>
<td>Medium Rate Settings</td>
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<td>High Rate Settings</td>
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What is a kernel?

- Is the smallest unit of scientifically proven behavioral influence.
- Is indivisible; that is, removing any part makes it inactive.
- Produces quick easily measured change that can grow much bigger change over time.
- Can be used alone OR combined with other kernels to create new programs, strategies or policies.
- Are the active ingredients of evidence-based programs
- Can be spread by word-of-mouth, by modeling, by non professionals.
- Can address historic disparities without stigma, in part because they are also found in cultural wisdom.
Four Types of Kernels: 52 examples

- **Antecedent Kernel**: Happens BEFORE the behavior
- **Reinforcement Kernel**: Happens AFTER the behavior
- **Physiological Kernel**: Changes biochemistry of behavior
- **Relational Frame Kernel**: Creates verbal relations for the behavior

Some key everyday scientist skills

- Counting rate, duration or intensity of behavior
- Graphing/recording behaviors
- Using “repeated measures designs”
- Trying strategy
- Collecting more data
- Graphing/recording changes, if any
Everyday Scientist Test: Withdrawal (off-on-off-on) Designs

Primary strategy involves the systematic starting and stopping of intervention.

Intervention control (internal validity) happens by showing that the target behavior changes as a result of alternation of starting and stopping intervention.

Particularly well-suited for intervention involving environmental change strategies.
Student Behavior During Reading

Baseline No Game

Baseline No Game

GAME

Rules Only

GAME

Rules & Signal Lights

Disruptions per Hour

SUCCESSIVE DAYS

Group A Group B

Using multiple-baselines data to monitor and create effective practices

This example teaches children and parents how to do safety skills often lacking families with difficulties.
Survival analysis to show long-term advantage of a strategy
Basic understanding of kernels


Using kernels for population change


Behavioral vaccines for disease control

Lessons for the day and future

for a longer more detailed version of this, please check out:

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