Classifying prevention: form, function and theory

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Why is prevention important?

Factors that affect health and mortality are principally behavioural.

- **Access**: 10%
- **Genetic**: 20%
- **Environmental**: 20%
- **Behaviour**: 50%

Source: IFTF, Center for Disease Control and Prevention

McGinnis et al. Health Aff (Millwood) 2002;21(2):78-93
A focus for prevention research

- The systematic study of **interventions** to reduce the incidence of maladaptive behaviours, and to promote adaptive behaviours, in populations.

- A central characteristic is the importance of **behaviour** as a determinant of ill-health and health inequality.

**BUT**

- A 1994 US Institute of Medicine Report argued that
  
  “without a system for classifying specific interventions, there is no way to obtain accurate information on the type or extent of current activities, . . . and no way to ensure that prevention researchers, practitioners, and policy makers are speaking the same language”
What is the focus for EUSPR?

• First EUSPR meeting 2010: “Can research on prevention contribute to the reduction of inequalities in health in Europe?”
  - Joan Benach: two ways to conceptualise prevention: one where we target those at significant risk of ill-health, the other by providing universal approaches for the whole population

• Second EUSPR meeting 2011: “Synergy in prevention and health promotion: individual, community, and environmental approaches”
Summary 1

- Prevention is important, and behaviour is a central focus for prevention

...but how do we conceptualise prevention...?
Form of prevention

- **Universal**: interventions are delivered across a whole population, community or setting, regardless of the level of risk for individuals receiving the intervention.

- **Selective**: groups are identified as being at increased risk because of their health history or psychological and social characteristics.

- **Indicated**: only with those individuals, rather than groups, who are personally identified to be at high risk for a problem or disease.
Function of prevention

- **Environmental**: interventions to limit the *availability* of maladaptive behaviour opportunities, through system wide policies and restrictions

- **Developmental**: interventions to promote adaptive behaviours, and prevent maladaptive behaviours, through the *socialization* of appropriate norms, values and habits

- **Cognitive**: interventions to address existing cognitions about specific behaviours, through *persuasion*: providing information, raising awareness and challenging pre-conceptions
## Classifying Prevention: form and function in a prevention matrix

<table>
<thead>
<tr>
<th>Class</th>
<th>Universal</th>
<th>Selective</th>
<th>Indicated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental</strong></td>
<td>Making behaviours illegal; tax policy for smoking, junk food, alcohol; minimum unit pricing for alcohol; gun controls</td>
<td>Reducing alcohol retail outlet density in high risk neighbourhoods;</td>
<td>legislation to prevent violent individuals from obtaining firearms</td>
</tr>
<tr>
<td><strong>Developmental</strong></td>
<td>Parenting programmes; classroom behaviour management programmes; social / life skills programmes</td>
<td>Home visiting programmes for at-risk new mothers; Family / parenting programmes with high risk family groups</td>
<td>Multi-systemic therapy for individuals with serious antisocial or criminal behaviour</td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td>Advertising / information campaigns; school-based knowledge and awareness curricula</td>
<td>Screening and brief intervention programmes; social normative feedback with higher risk groups</td>
<td>Substantive cognitive or motivational interventions with problem behaving individuals</td>
</tr>
</tbody>
</table>
Summary II

• Prevention is important, and behaviour is a central focus for prevention

• Considering both form and function of prevention may provide an improved classifying framework

...but what sort of effectiveness might we expect from the functional levels of prevention...?
What sort of effectiveness might we expect from the functional levels of prevention?
Summary III

• Prevention is important, and behaviour is a central focus for prevention
• Considering both form and function of prevention may provide an improved classifying framework
• Logic, and Evidence, point to the potential effectiveness of environmental over developmental over cognitive prevention

...but what about theory...what can we say about theory and the different functional levels of prevention...?
Theory for Prevention

- **Environmental**: Systems Dynamic models; Ecological Psychology

- **Developmental**: Social Learning Theory; Social Control Theory; Attachment Theory; Problem Behaviour Theory; Social Development Model

- **Cognitive**: Health Belief Model; Health Action Process Approach; Theories of Reasoned Action / Planned Behaviour; Dual Process models
The Prototype/Willingness Model

(Gibbons et al 2008; Gibbons & Gerrard 1995)
Theory for Prevention

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Social Development Model

Positive and negative pathways for youth development

Positive path
- Perceived opportunities for positive interactions and involvement
- Involvement in positive opportunities and interactions
- Perceived rewards for positive interaction and involvement
- Attachment and commitment to positive others and activities
- Skills for interaction/involvement
- Belief in the moral order
- Behaviour

Negative path
- Perceived opportunities for problem behaviour and negative interactions
- Involvement in problem behaviour and negative interactions
- Perceived rewards for problem behaviour and negative interactions
- Attachment and commitment to negative others and activities
- Belief in negative values

Source: Adapted from Catalano and Hawkins (1996).
Theory for Prevention

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Theory (environmental prevention) I

Figure 2. Section of a graph depicting network model of alcohol-use-related behavior.

Notes:
- ⦿ = alcohol outlet (node)
- ⧫ = population groups, each denoted by an S
- ⦮ = visits to node from population groups, each denoted by a p
- ⦰ = freeway ramp
- ⦭ = flow of individuals from alcohol outlet to freeway ramp, denoted by \( \beta \)
- SL = number of visitors present at any given time
• Gibson argued that animals and humans stand in an 'ecological' relation to the environment, such that to adequately explain behaviour it was necessary to study the environment or niche in which the behaviour occurs.

• Affordances are “action” properties of the environment (or objects in the environment) as perceived by individuals, and are important for behaviour.
Summary IV

- Prevention is important, and behaviour is a central focus for prevention
- Considering both form and function of prevention may provide an improved classifying framework
- Logic and Evidence point to the potential effectiveness of environmental over developmental over cognitive prevention
- Do dual process models imply or challenge cognitive prevention?
- Theory for environmental prevention should be informed by system dynamics and Gibson’s concept of affordances for action

...so what are some of the research challenges for prevention...?
Prevention Research Challenges

• How do we measure spontaneous behaviours, e.g. “willingness” on a social reaction causal pathway?
• Understanding external validity, e.g. which surrogate endpoints to use, if health outcomes are some way into the future?
• What methods can be used to systematically measure affordances?
• If “most published research findings are false”, what does this mean for prevention?
• How can we improve implementation effectiveness across different settings?
• Is there a risk of a compositional fallacy with prevention research?
Putting it all together:
A multilevel, multisystems model of driving behaviour.

Social context
- Culture
- Neighborhood
- Family
- Peers

Individual characteristics

Public policy
- State laws
- Local laws
- Enforcement

Transportation infrastructure:
speed limit, stop lights, road design

Driving behavior

Crash outcome
- Injury
- Death
- Cost

Vehicle design
- Policy
- Vehicle age
- Safety equipment

Educational community interventions

Local conditions:
road, weather, light

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Summary V

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• Logic and Evidence point to the potential effectiveness of environmental over developmental over cognitive prevention
• Do dual process models imply or challenge cognitive prevention?
• Theory for environmental prevention should be informed by system dynamics and Gibson’s concept of affordances for action
• Methodological challenges include measurement, implementation, replication, and the right level of evaluation
Differences in Male Life Expectancy within a small area in London

Travelling east from Westminster, every two tube stops represent over one year of life expectancy lost - Data revised to 2004-08

Electoral wards just a few miles apart geographically have life expectancy spans varying by years. For instance, there are eight stops between Westminster and Canning Town on the Jubilee Line - so as one travels east, every two stops, on average, mark over a year of shortened lifespan. ¹

¹ Source: Analysis by London Health Observatory of ONS and GLA data for 2004-08. Diagram produced by Department of Health
Theory (cognitive prevention) I

- Attitude Toward Behaviour
- Subjective Norm
- Perceived Behavioural Control
- Intention
- Behaviour

Icek Ajzen, 1991
Theory (developmental prevention) I
Theory (developmental prevention) II

### Program Goal

**Improve pregnancy outcomes by helping women improve prenatal health**
- Home visits weekly the first month following program enrolment, then every other week until birth of infant. Nurses address:
  - Effects of smoking, alcohol and illicit drugs on fetal growth, and assist women in identifying goals and plans for reducing cigarette smoking, etc.
  - Nutritional and exercise requirements during pregnancy and monitor and promote adequate weight gain.
  - Other risk factors for pre-term delivery/low birth weight (e.g., genitourinary tract infections, pre-eclampsia).
  - Preparation for labor and delivery/childbirth education.
  - Basics of newborn care and newborn states.
  - Family planning/birth control following delivery of infant:
    - Adequate use of office-based prenatal care.
    - Referrals to other health and human services as needed.

**Improve child health and development by helping parents provide sensitive and competent caregiving**
- Home visits weekly postpartum period, every 2 weeks until toddler is 21 months, monthly until child is 2 years. Nurses:
  - Educate parents on infant/toddler nutrition, health, growth, development and environmental safety.
  - Role model PIFE activities to promote sensitive parent-child interactions facilitative of developmental progress.
  - Assess parent-child interaction, using NCAST sleeping and teaching scales and provide guidance as needed.
  - Assess infant/toddler’s developmental progress at selected intervals using Ages and Stages Questionnaire or similar tool, and provide guidance as needed.
  - Promote adequate use of well-child care:
    - Guidance to new parents in building and fostering social support networks.
    - Guidance assessing safety of potential/actual child care arrangements.
    - Referrals to other health and human services as needed.

**Improve parental life-course by helping parents develop a vision for their future, plan subsequent pregnancies, continue their education and find work**
- Home visits during postpartum period, every 2 weeks until toddler is 21 months, monthly until child is 2 years. Nurses:
  - Facilitate decision-making regarding planning of future children and selection of birth control to achieve goals.
  - Assist parents to set realistic goals for education and work, and identify strategies for attaining goals.
  - Coaching parents in building and fostering relationships with other community services.
  - Parents’ family planning, education and work goals.
  - Referrals to other health and human services as needed.

### Activities

**Pregnant women display improved health behaviors,**
- ↓ cigarette smoking
- ↓ pregnancy-induced hypertension
- ↑ use of community resources

**Newborns are ≥37 weeks gestation & weigh ≥2500 grams or more,**
- ↓ pre-term delivery among smokers
- ↑ birth weight among young teens (<17 years)
- ↓ neurodevelopmental impairment

**Parents demonstrate sensitive and competent caregiving for infants and toddlers,**
- ↓ childrelated beliefs associated with child maltreatment (Bavelek AAPI)
- ↓ verified cases of child abuse & neglect
- ↓ incidents of child injuries or ingestions
- ↓ stimulating home environments, i.e., increase in appropriate play materials (HOME inventory)

**Child displays age and gender appropriate development,**
- ↓ language & cognitive/mental delays
- ↑ responsive in interactions with mothers (NCAST) less distress to fear stimuli

**Parents have developed plans for economic self-sufficiency,**
- ↓ subsequent pregnancies
- ↑ interval between 1st and 2nd child
- ↑ number of months women employed during child’s 2nd year
- ↓ months on welfare
- ↑ father involvement in child care and support

**Early childhood (4-4 yrs):**
- ↓ safety hazards in home
- ↑ stimulating home environment - HOME score
- ↓ incidents of injuries & ingestions noted in medical records
- ↑ Preschool language scale scores
- ↑ Executive Functioning Composite scores
- ↓ problems in clinical range on Achenbach CBCL

**Early parental life course (3-4 yrs following program completion):**
- ↓ additional pregnancies and live births
- ↓ spacing between 1st and 2nd child
- ↓ months on AFDC and Food Stamps
- ↓ rates of living with father of child
- ↓ rates of marriage

**Adolescence (15 yrs):**
- ↓ self-reported reports of child abuse and neglect from 0-15 years
- ↓ arrests and adjudication for lewd or lascivious behavior (e.g. truancy, destroying property)

**Later parental life course (13 yrs following program completion):**
- ↓ additional pregnancies and live births
- ↓ spacing between 1st and 2nd child
- ↓ months on AFDC and Food Stamps
- ↓ arrests and convictions
- ↓ days in jail