Behavioral Science in Health and Health Care
An ACCORDS Seminar Series

- Please **sign in** and be sure to **fill out an evaluation** before you leave.

- Global Alliance for Behavioral Health and Social Justice & Colorado School of Public Health Workshop October 4-6, 2018
  - **bhjustice.org/comingtogether2018**

- Recorded seminars can be found on our website https://goo.gl/1q9nUx

- Request a Planning or Support Consultation with the Education Program

Introduction to behavioral science in health and health care

ACCORDS Seminar Series

Bethany M. Kwan, PhD, MSPH

ACCORDS Education Program

Wednesday, September 26, 2018

Adult and Child Consortium for Health Outcomes Research and Delivery Science (ACCORDS)

ACCORDS focuses on the entire life spectrum as well as on "delivery science," encompassing comparative effectiveness, patient-centered outcomes and implementation and dissemination research.

The **mission** of ACCORDS is to improve health, both locally and nationally, by supporting state-of-the-art outcomes and community translational research to guide clinical practice and policy.

Programs:
1. Dissemination & Implementation
2. Education
3. Research Training & Mentorship
4. Practice Transformation
5. Community Engagement & Outreach

Cores:
1. Qualitative Methods
2. Practice-Based Research Networks
3. Biostatistics
4. Colorado Program for Patient Centered Decisions
5. Mobile Health & Informatics

ACCORDS Education Program

- The **mission** of the educational program is to foster an active learning community on state-of-the-art outcomes and community translational research methods and application.

- Our **educational focus** is on methods in health outcomes research, health services research, dissemination and implementation (D/I) science, comparative effectiveness and patient-centered outcomes research, and delivery science.

Director: Bethany M. Kwan PhD MSPH

Program Coordinator: Bryan Ford

- http://www.ucdenver.edu/academics/colleges/medicalschool/programs/ACCORDS/sharedresources/education/Pages/Home.aspx

Series Overview

Date	Seminar Title	Presenter
19-Sep	Overview of Behavioral Science Theory and Methods	Bethany Kwan, PhD, MSPH
17-Oct	Systems Level -Social Ecological Model	Jeni Cross, PhD CSU
28-Nov	Individual Level - Behavioral Theory	Jenn Leiferman, PhD CO SoPH
19-Dec	Individual Level - Mechanisms of Behavior Change	Kevin Masters, PhD UC Denver
16-Jan	Individual Level - Judgment and Decision Making - Distinguished Lecturer	Gretchen Chapman, PhD Carnegie Mellon
20-Feb	Practice/Provider Level - Implementation Strategies	Danielle Loeb, MD and Amy Huebschmann, MD, MPH
20-Mar	Organization Level	TBD
TBD	Policy Level – Behavioral Medicine and Health Policy	Jim Sallis, PhD, UC San Diego

Seminar Series Learning Objective

To prepare researchers to identify and apply appropriate behavioral science theories and frameworks to the design and testing of interventions intended to change human behavior

- The series will emphasize theory- and evidence-based strategies for behavior change at the individual, practice, system, organizational, and policy levels.

- Presenters will instruct on selection of measures and methods for assessing theoretical constructs to allow for testing of mechanisms of change.

Introduction to behavioral science

- Learning objectives
  - Identify domains of expertise and fields of research related to or grounded in behavioral science
  - Describe the value of behavioral science and theory for designing interventions in health and health care
  - Describe the relative role of reflective and automatic processes in health behavior change
  - Identify key constructs in popular behavioral theories

be·hav·ior·al sci·ence

/bəˈhāvyərəl ˌsīəns,bēˈhāvyərəl ˌsīəns/

noun

the scientific study of human and animal behavior.

- Psychology (social, cognitive, clinical, developmental, experimental, industrial/organizational)
- Sociology
- Anthropology
- Health Communications
- Public Health
- Urban Planning
- Human Factors Engineering

- Nutrition
- Exercise Science/Kinesiology
- Social Work
- Implementation Science
- Behavioral Medicine
- Psychiatry
- Education
- Marketing
- Etc

The Audience

- Poll questions
  - What is your training and experience in behavioral science?
    A. I have a doctoral-level degree in a field related to behavioral science
    B. I have a masters-level degree in a field related to behavioral science
    C. I have completed a fellowship or other non-degree program in a field related to behavioral science
    D. I have no formal training but I have conducted research in a field related to behavioral science
    E. I have no formal training but I have clinical experience in a field related to behavioral science
    F. I am interested in behavioral science but have no formal training or experience
    G. Other

Behavioral Science May Prove to Be Our Most Important Science

By Anthony Biglan

Anthony Biglan, Ph.D.

OREGON RESEARCH INSTITUTE

Contact

Education & Training

B.A., 1966
University of Rochester, Rochester, NY
Psychology

M.A., 1968
University of Illinois, Urbana, IL
Social Psychology

Ph.D., 1971
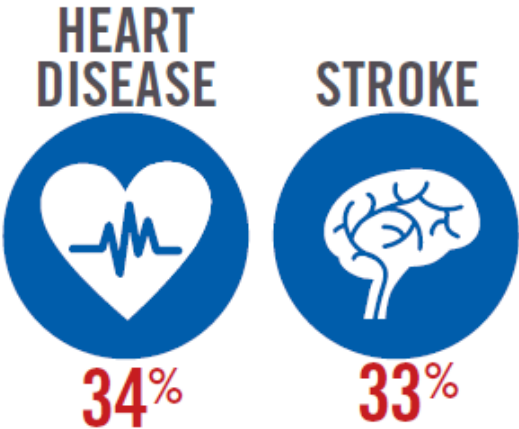University of Illinois, Urbana, IL
Social Psychology

PALLAB SETH VIA GETTY IMAGES

Science has changed our world. We take for granted the impact of the physical and biological sciences on our world, forgetting that it once took months to get from the East coast to the West coast or to communicate with someone across the ocean. Science has dramatically improved our health too. In nineteenth century England more than 100,000 people died of cholera before John Snow showed that contaminated water was the cause of cholera.

It might seem that no such stunning changes are possible when it comes to human behavior. We continue to have significant problems with crime, drug abuse, depression, academic failure, and poverty. Reading the headlines, you might think that we have made no progress on these problems and that no change is possible.

https://www.huffingtonpost.com/anthony-biglan/perhaps-behavioral-science-may-prove-to-be-our-most-important-science_b_6764296.html
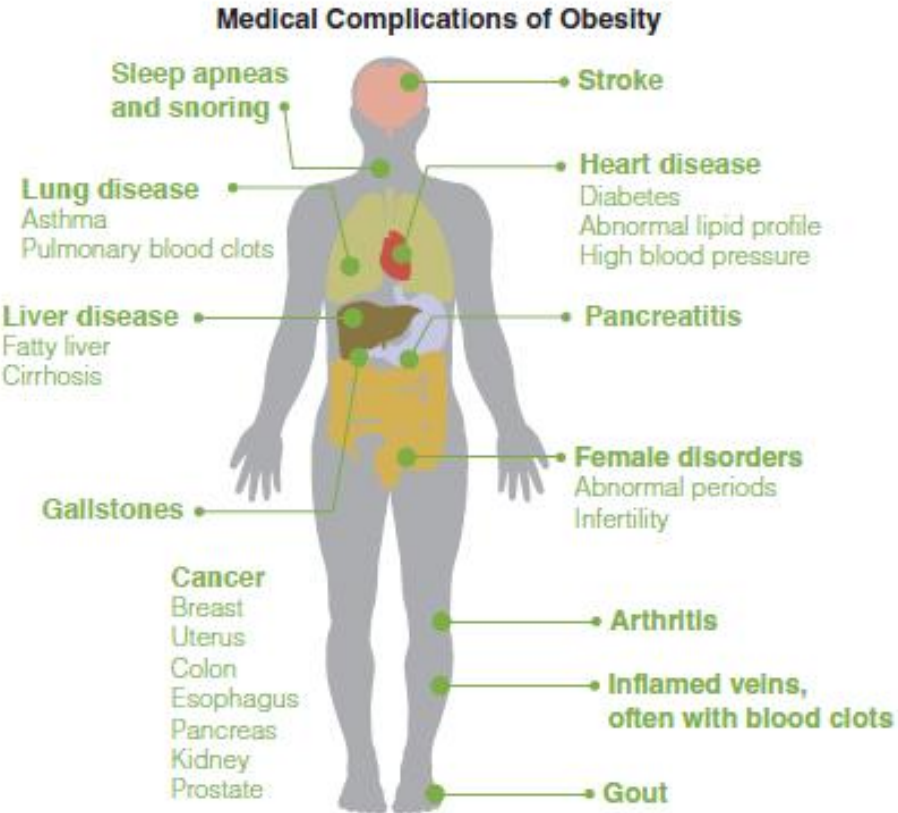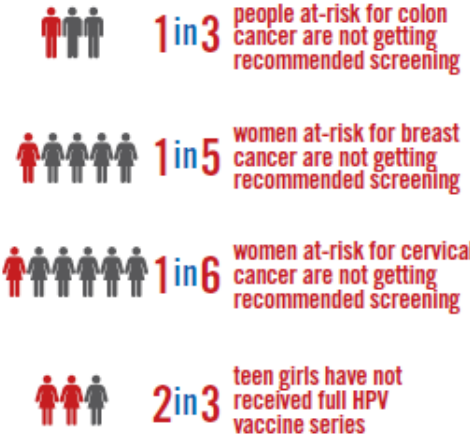
"We are on the cusp of a revolution in the use of behavioral science that will improve the wellbeing of people in ways that will prove as dramatic as the changes we have seen in medicine, physics and chemistry." – Anthony Biglan PhD

CDC: Lifestyle Changes Can Reduce Death From Top 5 Causes

1 in 3 motor vehicle deaths caused by drinking and driving

HOSPITAL

$28-33 BILLION estimated annual cost of preventable health care expenditures from healthcare-associated infections

480,000 deaths caused by cigarette smoking each year

2.5 MILLION ANNUAL U.S. DEATHS AT LAST REPORT

7 in 10 leading causes of death resulting from chronic diseases

1 in 2 deaths in the U.S. caused by heart disease or cancer

Percent of Deaths from Heart Disease and Stroke that Could Have Been Prevented or Delayed through Changes in Health Habits

HEART DISEASE
34%

STROKE
33%

Missed Opportunities in Cancer Prevention

1 in 3 people at-risk for colon cancer are not getting recommended screening

1 in 5 women at-risk for breast cancer are not getting recommended screening

1 in 6 women at-risk for cervical cancer are not getting recommended screening

2 in 3 teen girls have not received full HPV vaccine series

Medical Complications of Obesity

Sleep apneas and snoring

Lung disease
Asthma
Pulmonary blood clots

Liver disease
Fatty liver
Cirrhosis

Gallstones

Cancer
Breast
Uterus
Colon
Esophagus
Pancreas
Kidney
Prostate

Stroke

Heart disease
Diabetes
Abnormal lipid profile
High blood pressure

Pancreatitis

Female disorders
Abnormal periods
Infertility

Arthritis

Inflamed veins, often with blood clots

Gout

Vignette

- "A" is a patient of Dr. Z, a family medicine doctor in rural Colorado. A presents to Dr. Z complaining of fatigue and chronic low back pain for the past 6 months. Dr. Z conducts a [complete evaluation and medical history](#), noting no neurologic deficits, fever, or trauma; Dr. Z prescribes ibuprofen, and refers A for an X-ray and a consult with physical therapy.

- Two months later, A returns to see Dr. Z complaining of worsening pain and decreasing mobility. A reports having taken ibuprofen regularly for 2 weeks, but stopped due to stomach pains. A's X-ray shows nothing remarkable. A has not yet scheduled an appointment with physical therapy.

- Dr. Z engages A in a conversation about patient values and barriers to support shared decision making, and upon agreement with the patient, introduces A to the clinic's care manager for assistance with scheduling with physical therapy.

Behavior is everywhere

Patient

Clinician

Professional Organization

Healthcare System

Health Policy

Science of Behavior Change

- Theory development and testing
  - Determinants of behavior (theoretical constructs) and how they relate to each other (mechanisms)
  - Understanding behavioral phenomena in the context of health and health care
- Theory-based interventions
  - Selecting behavior change strategies linked to specific constructs – what you modify, manipulate, or impose to influence the known or suspected behavioral determinants

What is theory?

- Theory: A general explanation of some phenomena - "a set of interrelated concepts, definitions, and propositions that explains or predicts events or situations by specifying relations among variables"

- Theoretical framework: Theory (or theories) as applied to your particular research problem
  - What are the specific determinants of your research problem?
  - What constructs will be targeted by the intervention? How will they be defined, intervened upon, measured, analyzed and interpreted?

How do I apply theory?

- Two interrelated steps:
  - Identify intervention targets: theory-based factors and processes underlying the current state that you wish to change
    - Observational research
  - Design intervention using theory-based behavior change strategies
    - Ontology of Behavior Change Techniques (Abraham & Michie)

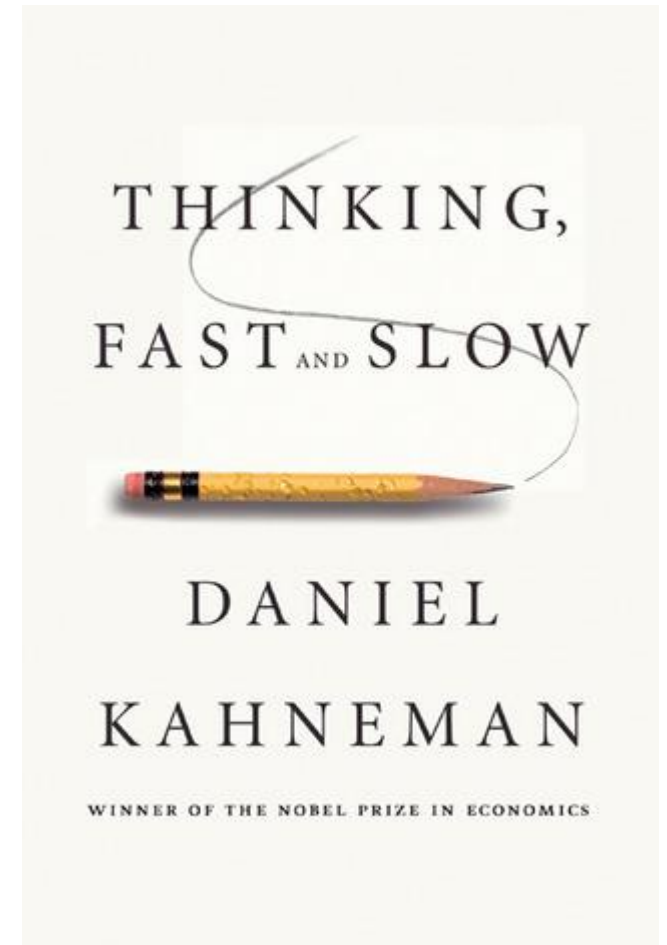# Why do we behave the way we do?

Ability and confidence

What we are told to do

Attitudes and beliefs

What other people do

Knowledge

Habit and automaticity

Environment

Opportunity
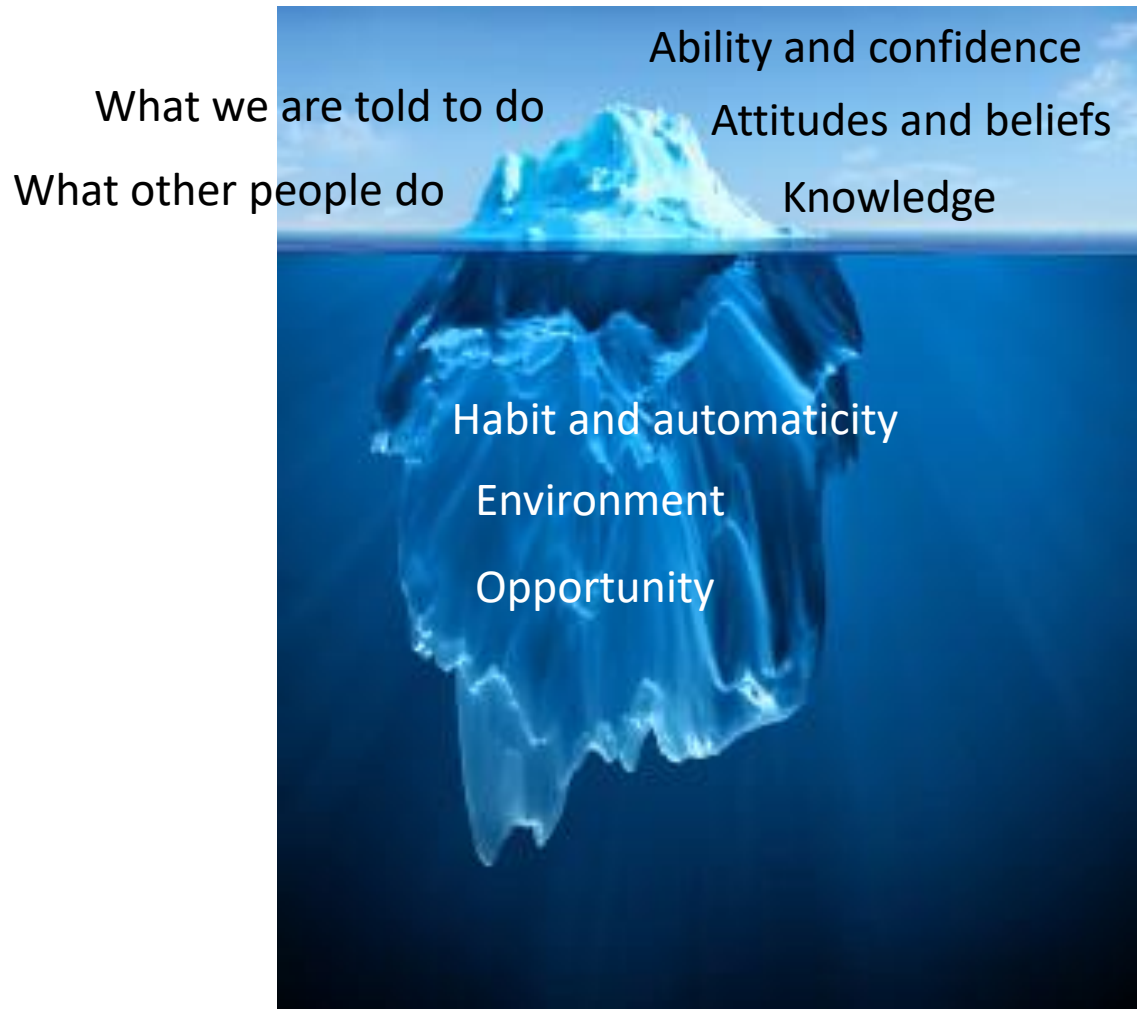
Dual Processes

Conscious, reflective, deliberative, verbalized processes → "Planned Behavior" (Goal-directed, flexible, rational, slow, attention absorbing)

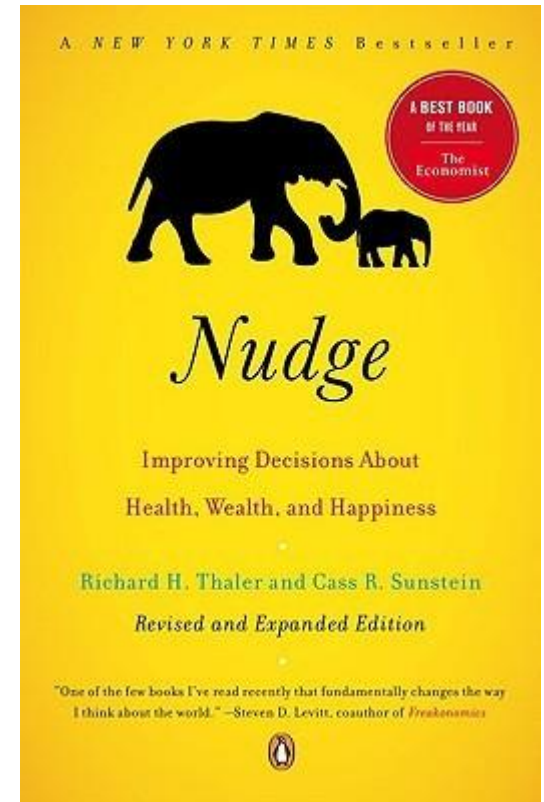Unconscious, automatic processes → "Routine Behavior" (Efficient, low cognitive demands, fast, divorced from conscious desires)

Reflective vs Automatic Processes

- "…the potential for information-based interventions is fundamentally limited, given that it is based on a view of human behavior that is at odds with psychological and neuroscientific evidence that much human behavior is not actually driven by deliberation upon the consequences of actions, but is automatic, cued by stimuli in the environment, resulting in actions unaccompanied by conscious reflection."
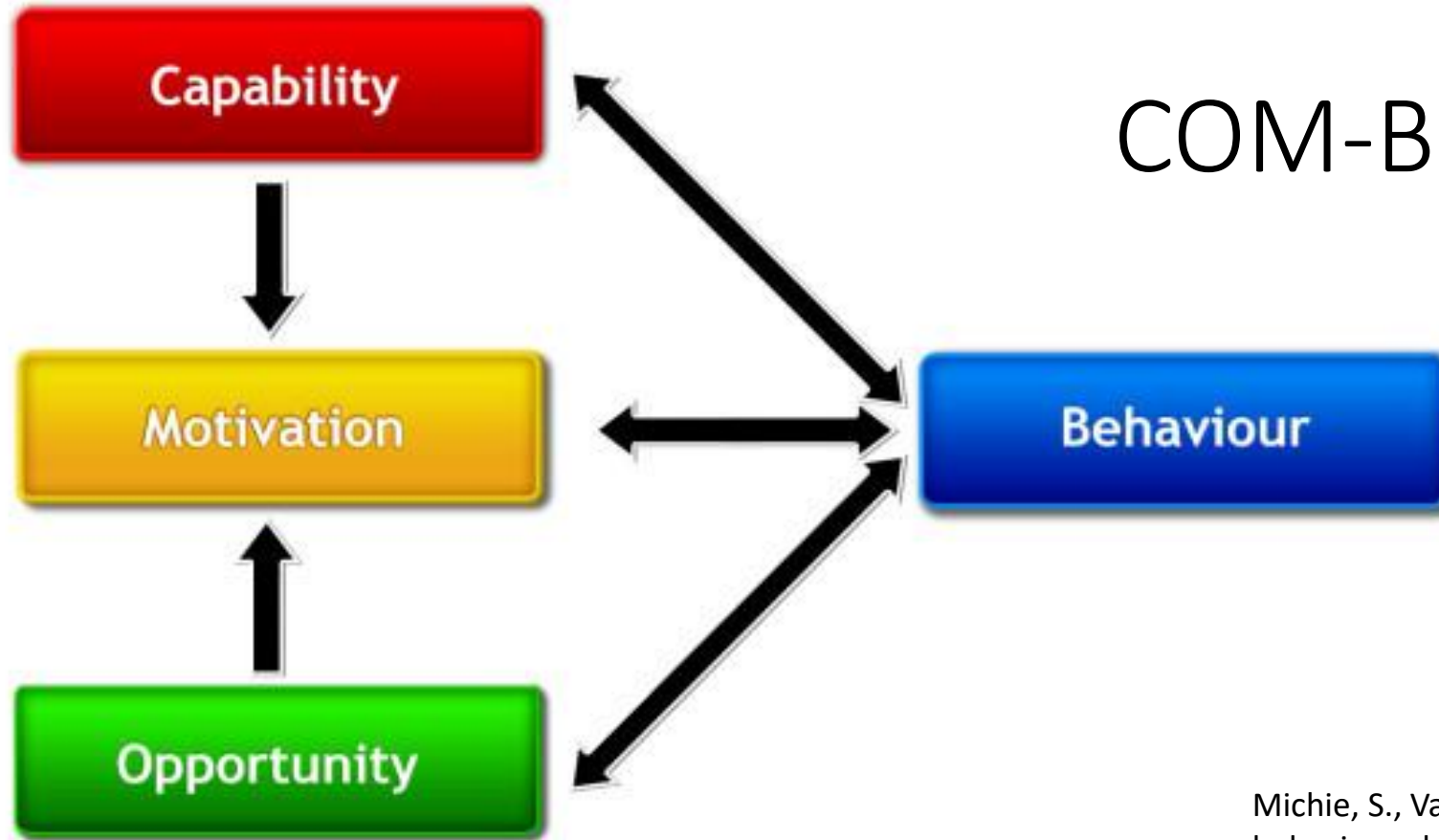
Marteau, T. M., Hollands, G. J., & Fletcher, P. C. (2012). Changing human behavior to prevent disease: the importance of targeting automatic processes. *Science*, *337*(6101), 1492-1495.

Reflective vs Automatic Processes

"…the limited effectiveness that is often observed, particularly for predominantly information-based interventions, should prompt us to explore the potential of an additional approach, one that entails interventions that do not focus on engaging conscious deliberation via explicit communication, but instead target non-conscious processes occurring outside awareness."

Hollands, G. J., Marteau, T. M., & Fletcher, P. C. (2016). Non-conscious processes in changing health-related behaviour: a conceptual analysis and framework. *Health Psychology Review*, *10*(4), 381-394.

How do we change behavior?

COM-B model

Michie, S., Van Stralen, M. M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation science*, *6*(1), 42.]

How do we change behavior?

Where is "increase knowledge" or "explain how someone's lifestyle is putting them at risk" as a behavior change strategy?
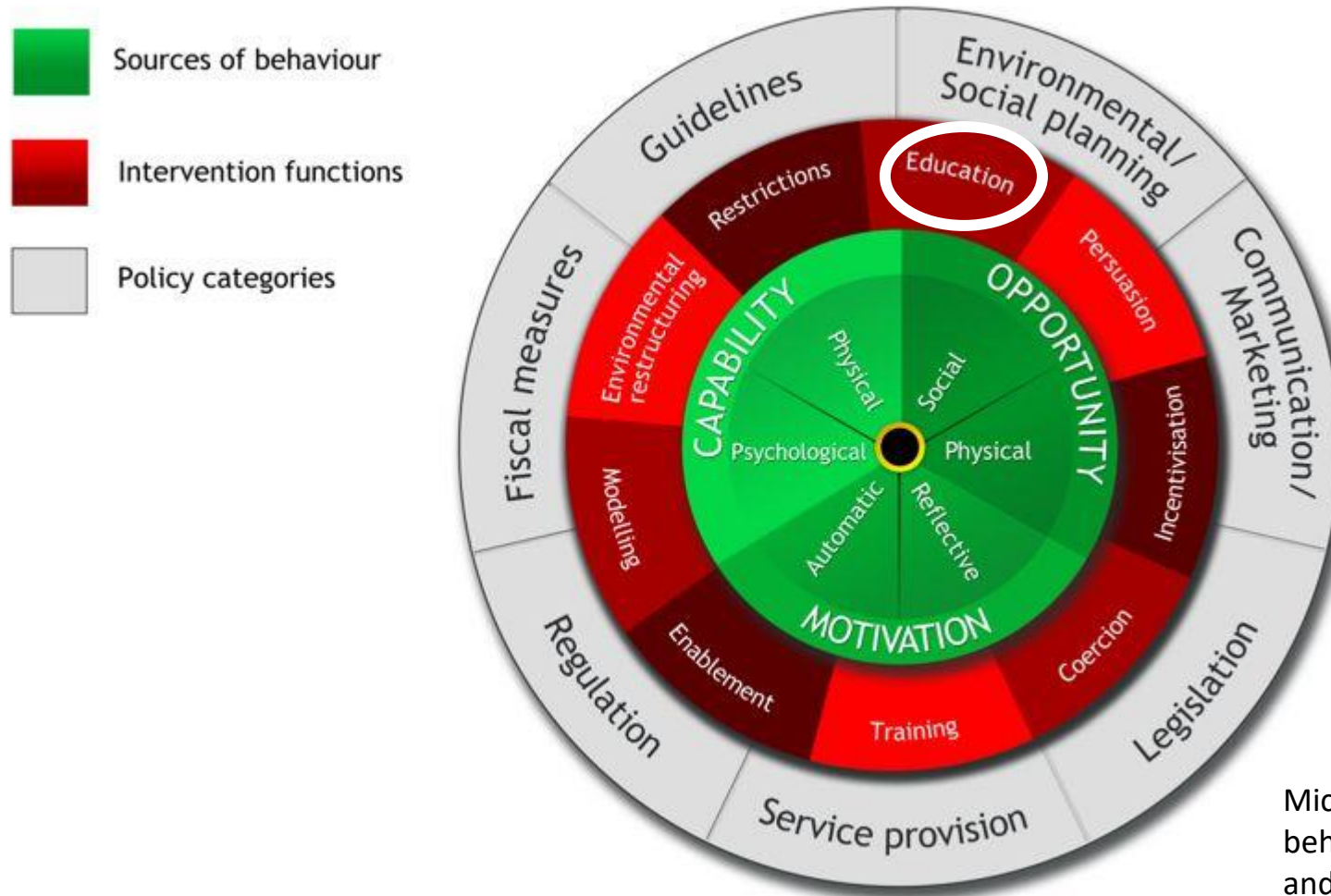
Michie, S., Van Stralen, M. M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation science*, 6(1), 42.]

ORIGINAL ARTICLE

The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions

Susan Michie, DPhil, CPsychol · Michelle Richardson, PhD · Marie Johnston, PhD, CPsychol · Charles Abraham, DPhil, CPsychol · Jill Francis, PhD, CPsychol · Wendy Hardeman, PhD · Martin P. Eccles, MD · James Cane, PhD · Caroline E. Wood, PhD

Cluster label and component BCTs	AU, % (SE)
(10) Social support	100 (.001)
Social support (practical) [3.2]	
Social support (general) [3.1]	
Social support (emotional) [3.3]	
(11) Comparison of behavior	83 (.006)
Modeling of the behavior [6.1]	
Information about others' approval [6.3]	
Social comparison [6.2]	
(12) Self-belief	92 (.005)
Mental rehearsal of successful performance [15.2]	
Self-talk [15.4]	
Focus on past success [15.3]	
Verbal persuasion to boost self-efficacy [15.1]	
(13) Comparison of outcomes	90 (.005)
Persuasive argument [9.1]	
Pros and cons [9.2]	
Comparative imagining of future outcomes [9.3]	
(14) Identity	86 (.006)
Identification of self as role model [13.1]	
Self-affirmation [13.4]	
Identity associated with changed behavior [13.5]	
Reframing [13.2]	
Cognitive dissonance [13.3]	

Table 5 Results of hierarchical cluster analysis of behavior change techniques (step 6): grouping within the 16 cluster solution, approximately unbiased p values (AU), and standard errors

Cluster label and component BCTs	AU, % (SE)
(1) Scheduled consequences	91 (.004)
Punishment [14.2]	
Response cost [14.1]	
Chaining [14.5]	
Extinction [14.3]	
Discrimination training [14.6]	
Shaping [14.4]	
Negative reinforcement [14.10]	
Counter-conditioning [14.7]	
Thinning [14.9]	
Differential reinforcement [14.8]	
(2) Reward and threat	90 (.005)
Social reward [10.4]	
Material reward [10.2]	
Self-reward [10.9]	
Non-specific reward [10.3]	
Threat [10.11]	
Anticipation of future rewards or removal of punishment [14.10]	
Incentive [10.1]	

Table 5 (continued)

Cluster label and component BCTs	AU, % (SE)
Health consequences [5.1]	
Social and environmental consequences [5.3]	
Salience of consequences [5.2]	
Emotional consequences [5.6]	
Self-assessment of affective consequences [5.4]	
Anticipated regret [5.5]	
(8) Feedback and monitoring	97 (.002)
Feedback on behavior [2.2]	
Biofeedback [2.6]	
Other(s) monitoring with awareness [2.1 and 2.5]	
Self-monitoring of outcome of behavior [2.4]	
Self-monitoring of behavior [2.3]	
(9) Goals and planning	90 (.002)
Action planning (including implementation intentions) [1.4]	
Problem solving/coping planning [1.2]	
Commitment [1.9]	
Goal setting (outcome) [1.3]	
Behavioral contract [1.8]	
Discrepancy between current behavior and goal standard [1.6]	
Goal setting (behavior) [1.1]	

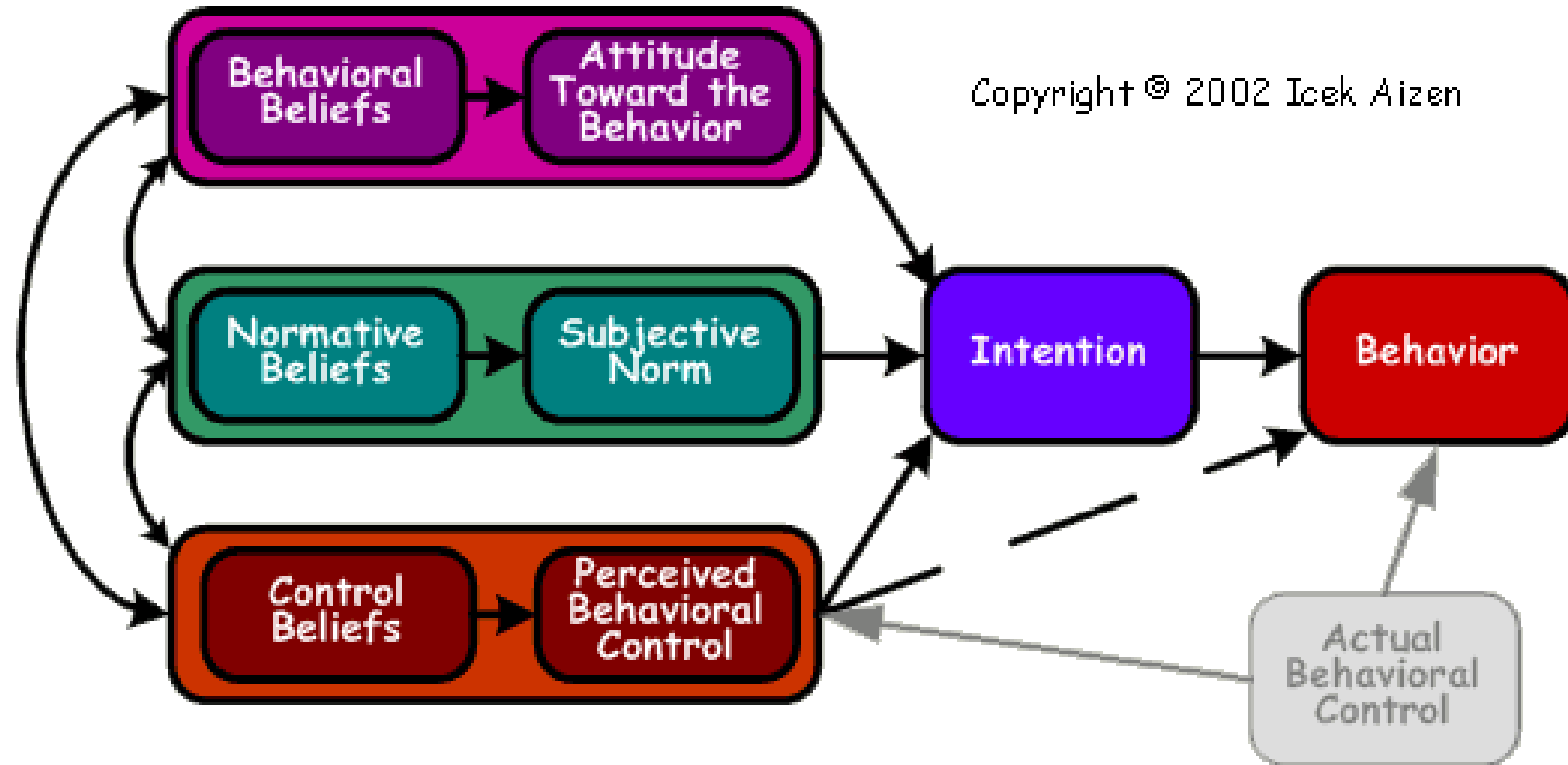# Behavior Change Strategies for the Unconscious

- Environmental cues

(3) Repetition and substitution	97 (.002)
Behavior substitution [8.2]	
Habit reversal [8.4]	
Habit formation [8.3]	
Graded tasks [8.7]	
Overcorrection [8.5]	
Behavioral rehearsal/practice [8.1]	
Generalization of a target behavior [8.6]	
(4) Antecedents	96 (.002)
Restructuring the physical environment [12.1]	
Restructuring the social environment [12.2]	
Avoidance/changing exposure to cues for the behavior [12.3]	
Distraction [12.4]	
(5) Associations	97 (.002)
Discriminative (learned) cue [7.2]	
Time out [7.4]	
Escape learning [7.5]	
Satiation [7.6]	
Exposure [7.7]	
Classical conditioning [7.8]	
Fading [7.3]	
Prompts/cues [7.1]	
(6) Covert learning	73 (.008)
Vicarious reinforcement [16.3]	
Covert sensitization [16.1]	
Covert conditioning [16.2]	
(16) Regulation	98 (.001)
Regulate negative emotions [11.2]	
Conserving mental resources [11.3]	
Pharmacological support [11.1]	
Paradoxical instructions [11.4]	

Marteau, T. M., Hollands, G. J., & Fletcher, P. C. (2012). Changing human behavior to prevent disease: the importance of targeting automatic processes. *Science*, *337*(6101), 1492-1495.
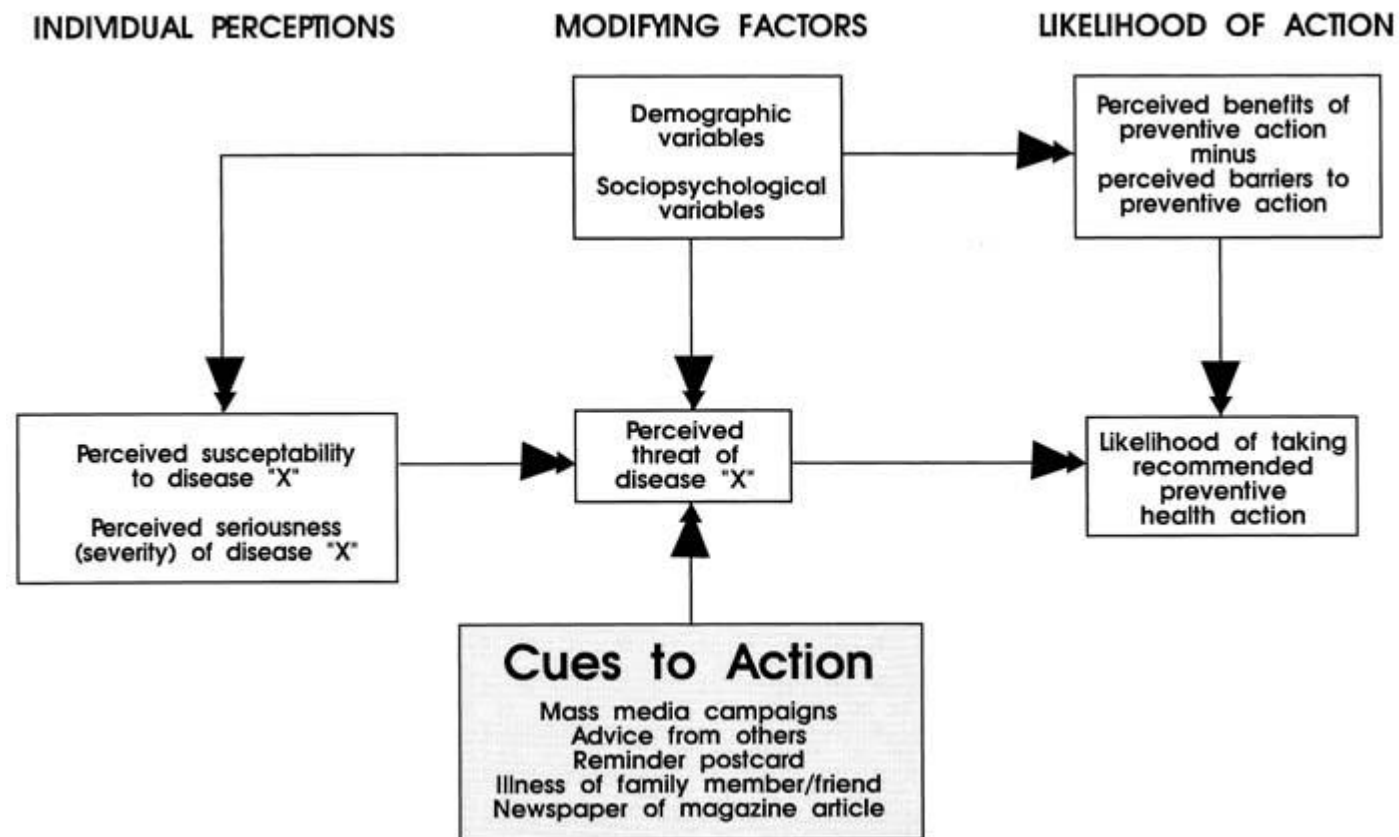
Behavior Change Theories
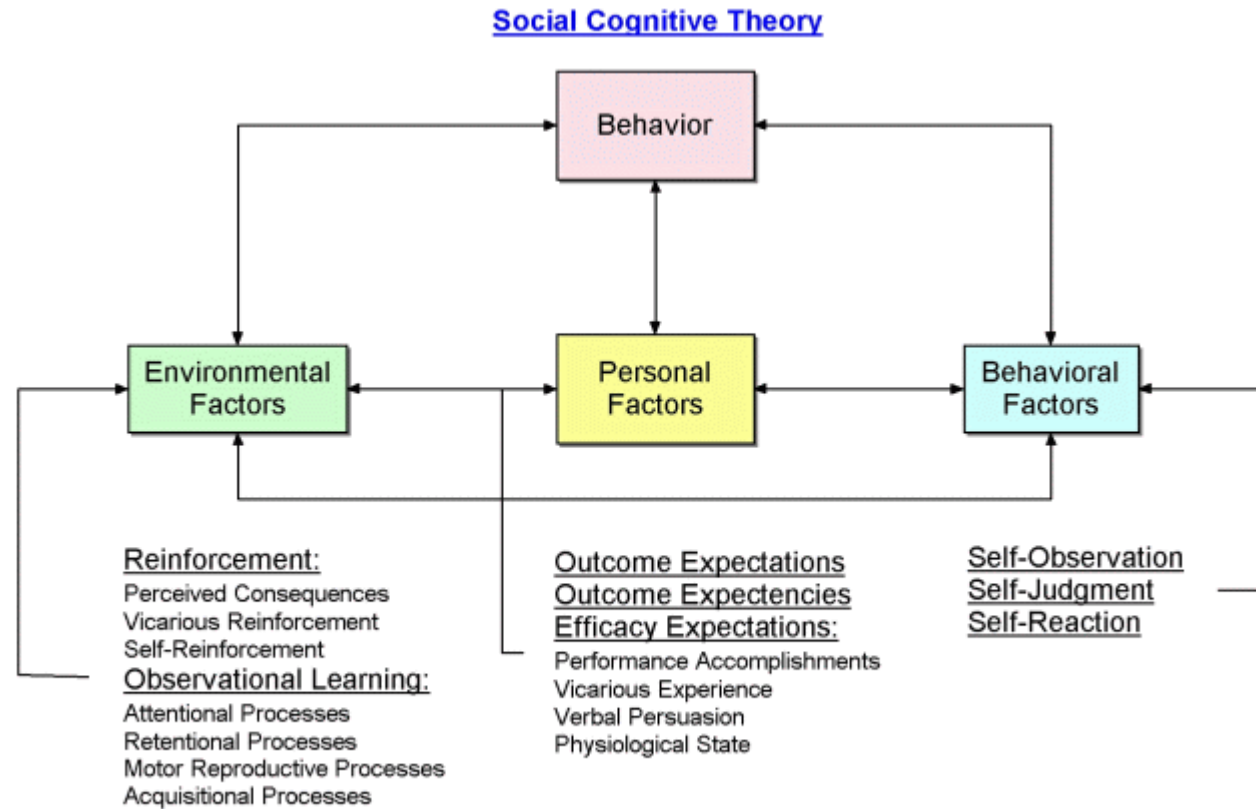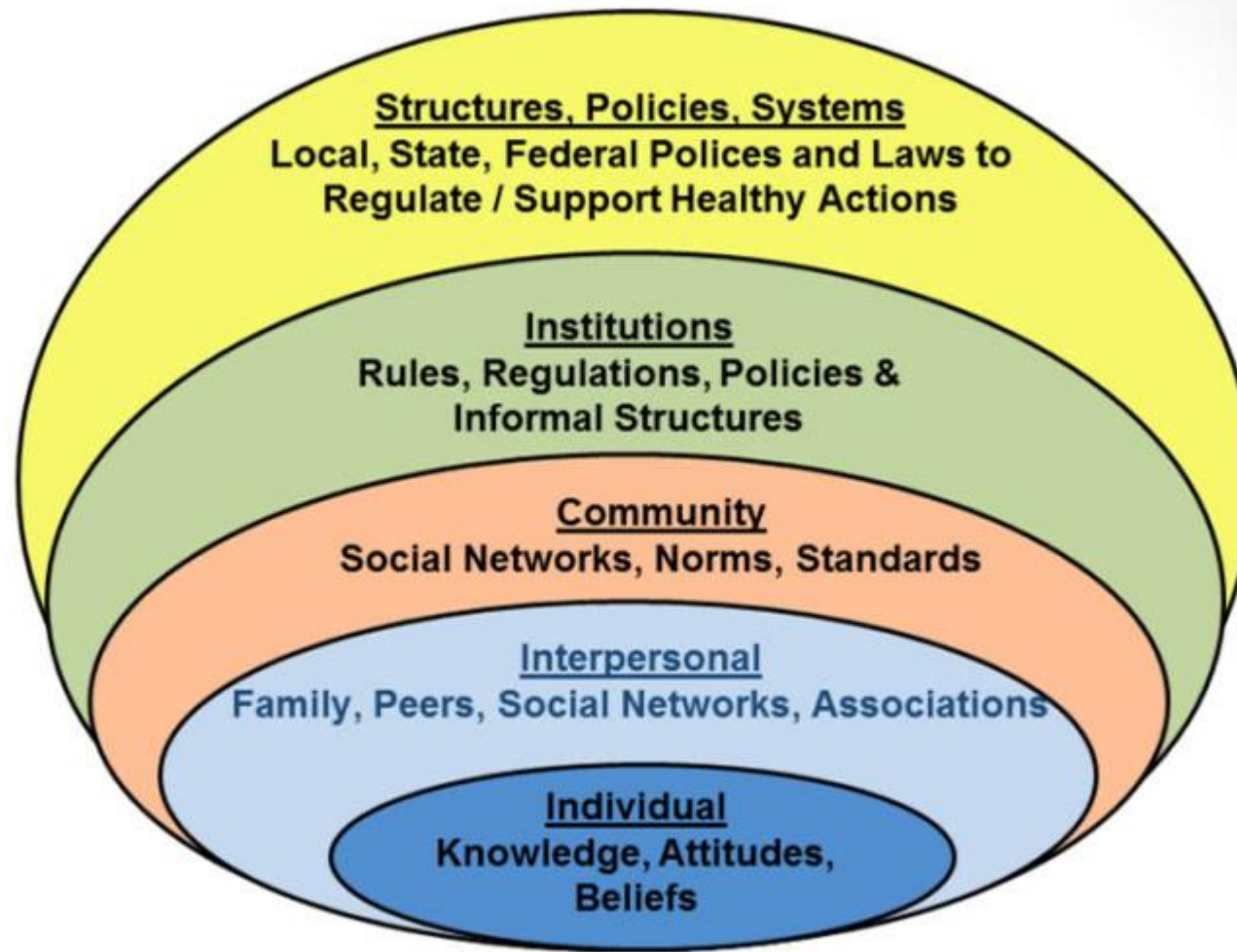
A brief summary

Theory of Planned Behavior (Ajzen & Fishbein)

# Health Belief Model (Rosenstock)

Social Cognitive Theory (Bandura)

# Social Ecological Model (Bronfenbrenner)

Structures, Policies, Systems
Local, State, Federal Polices and Laws to
Regulate / Support Healthy Actions

Institutions
Rules, Regulations, Policies &
Informal Structures

Community
Social Networks, Norms, Standards

Interpersonal
Family, Peers, Social Networks, Associations

Individual
Knowledge, Attitudes,
Beliefs

Levels of Influence in the Social Ecological Model

Transtheoretical Model/Stages of Change (Prochaska)
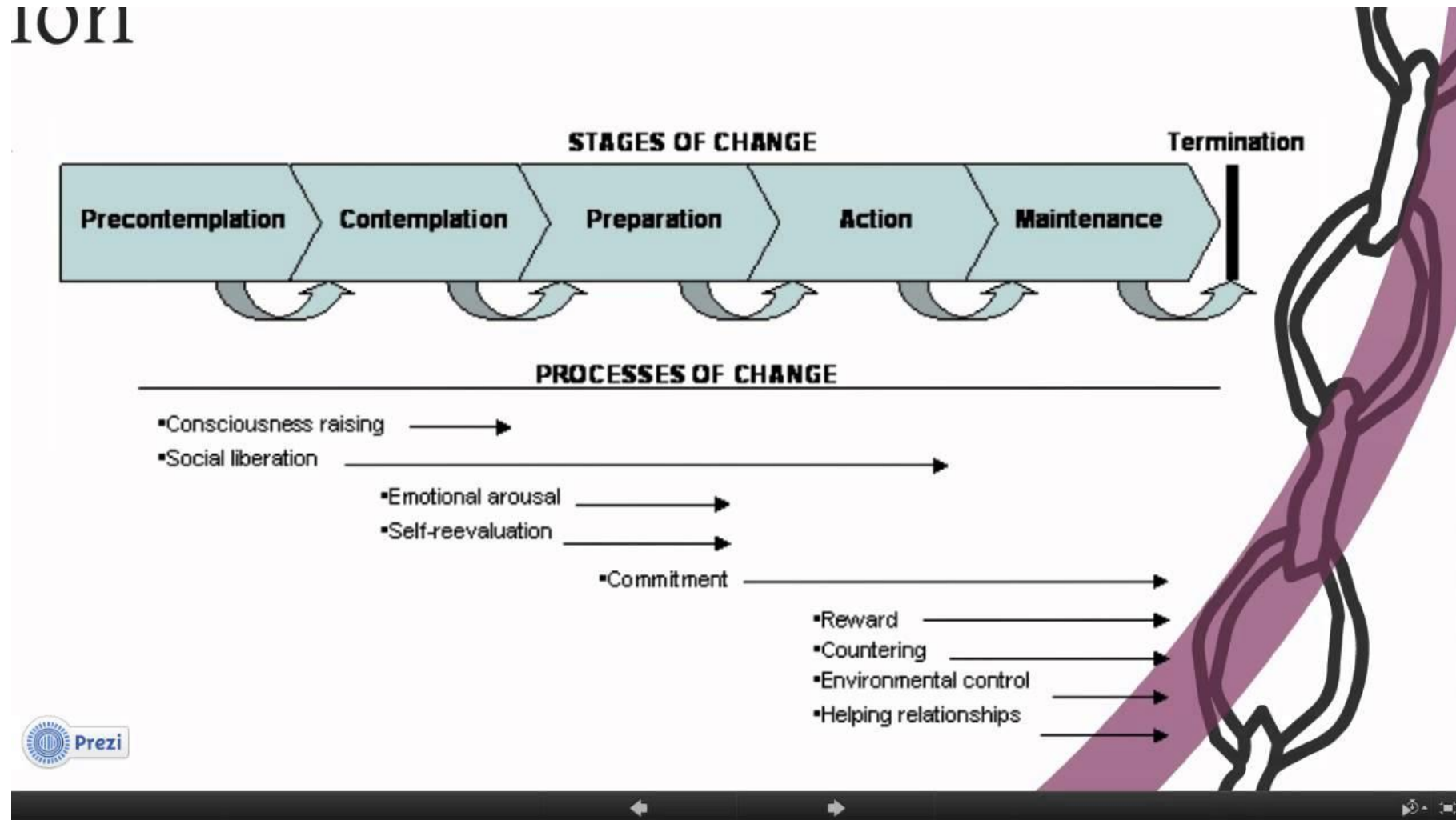
Self-Determination Theory (Deci & Ryan)
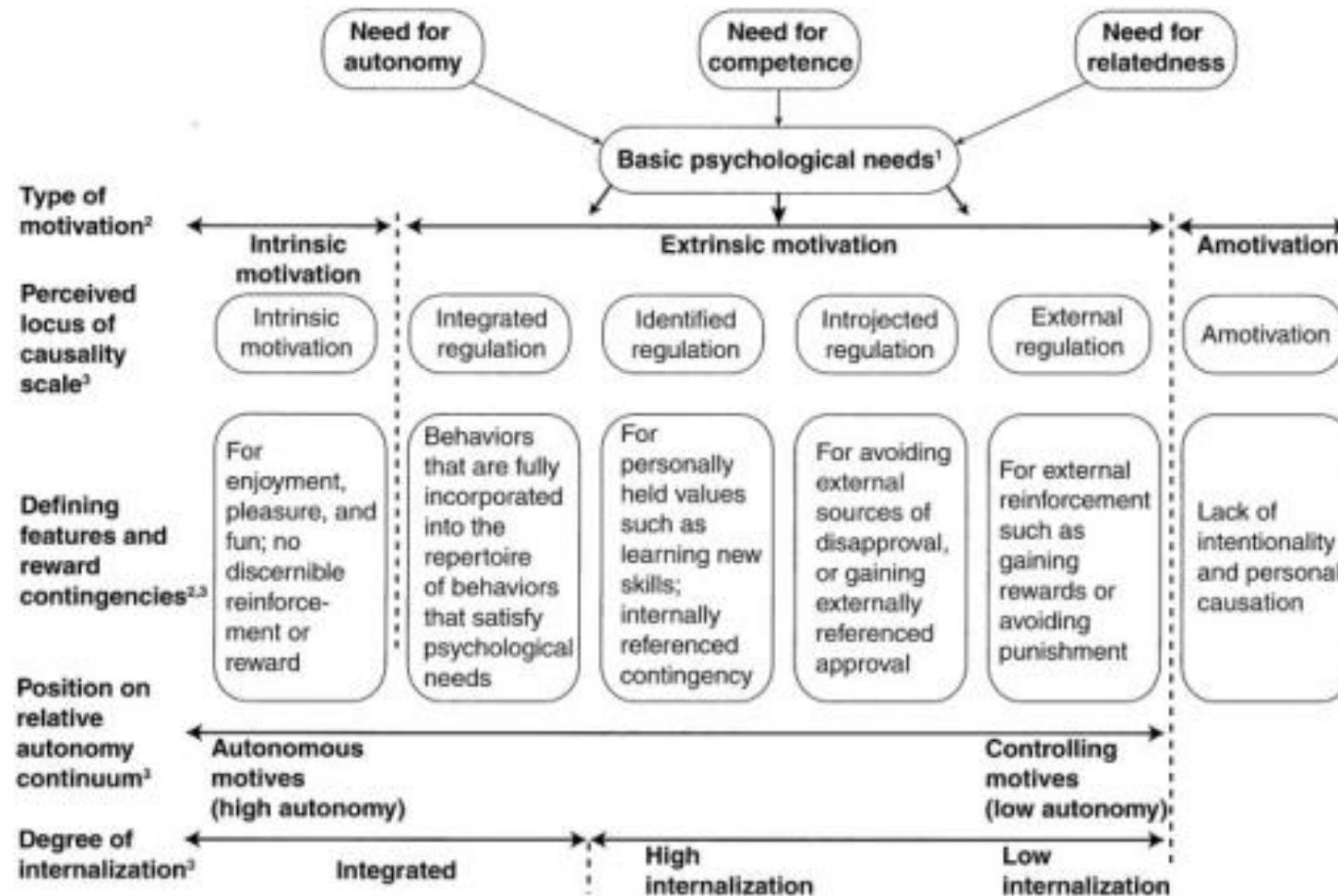
# Health Action Process Approach (Schwarzer)
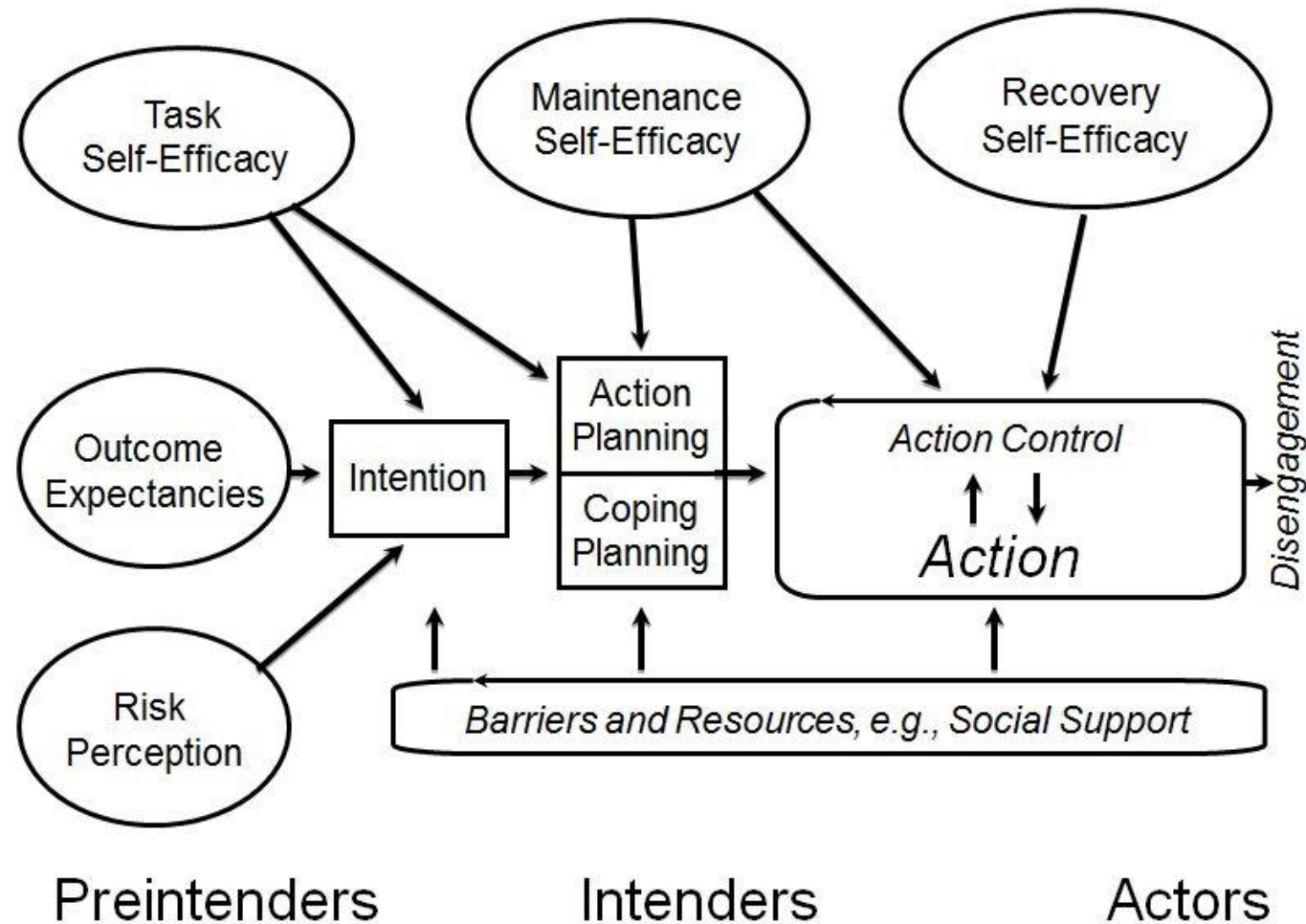
How do I find the right theory?

- Literature search: What are the determinants (and levels of determinants) of my research problem?
    - Within the domain of your research problem: What are known explanatory factors?
    - Outside the domain of your research problem: What are more comprehensive explanations of your problem?
- Other ways to identify determinants?
    - Community and stakeholder engagement
    - Qualitative research
    - Ask an expert
- Align determinants with theory
    - Concept approach: Link determinants with potentially useful theoretical constructs and theories (may yield a "hybrid" theoretical framework)
    - General theories approach: Select a theory most applicable to the research problem

Example: Redivac
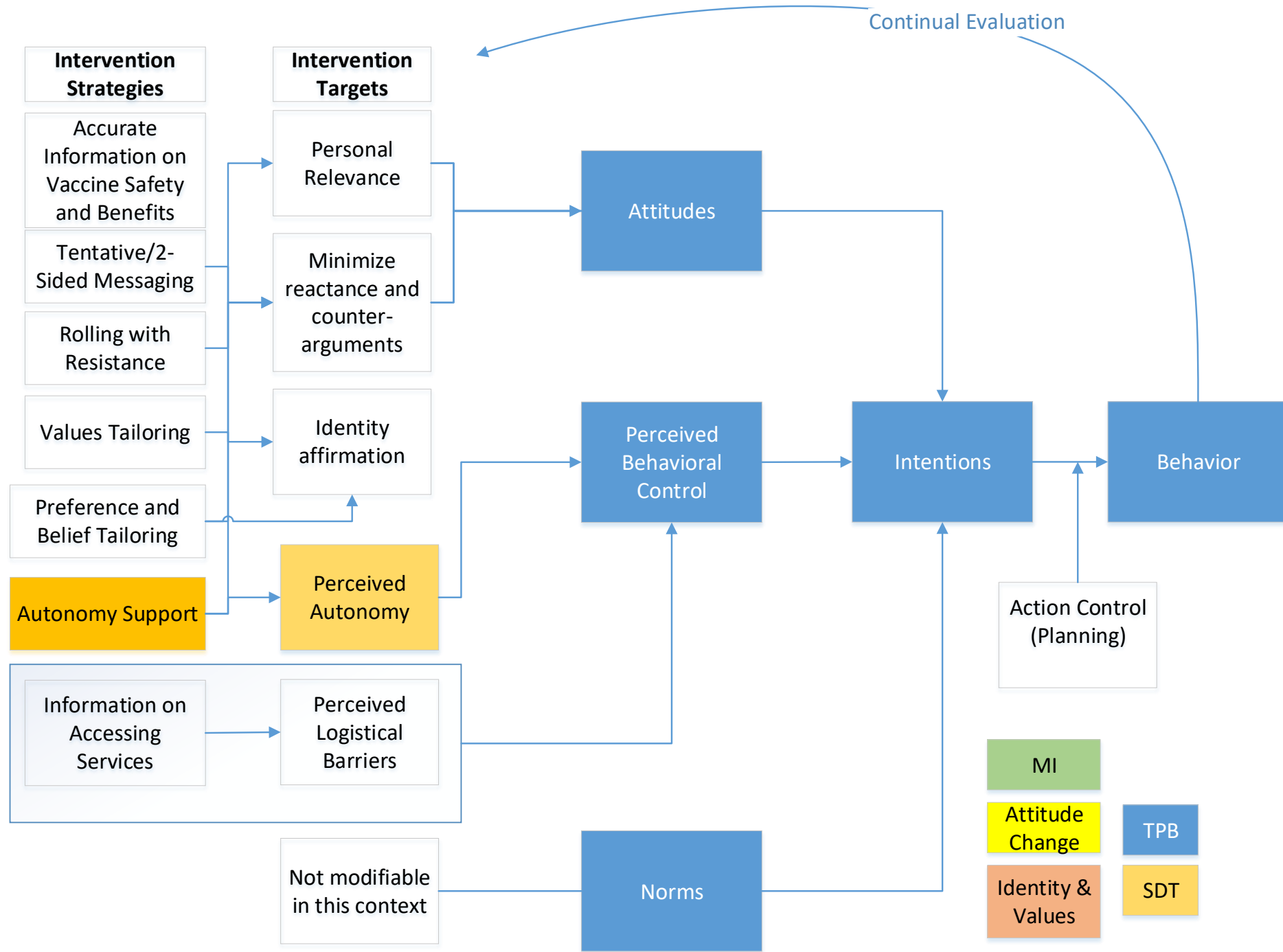
Activity

- Identify a clinical or public health problem
- Identify *behaviors* associated with this problem
- Select a theory from those presented today or another you are familiar with
- Identify behavioral determinants and associated behavior change strategies

Health problem

Measuring Behavior and Theoretical Constructs

- Construct validity and psychometrics

- Objective measures

- Implicit vs explicit measures

- Resources for existing measures:
    - GEMS: https://www.gem-beta.org/Public/Home.aspx
    - Physical Activity: http://sallis.ucsd.edu/measures.html
    - NIH toolbox: http://www.healthmeasures.net/explore-measurement-systems/nih-toolbox
    - PROMIS® (Patient-Reported Outcomes Measurement Information System): http://www.healthmeasures.net/explore-measurement-systems/promis
    - Self-determination theory: http://selfdeterminationtheory.org/questionnaires/
    - HAPA: http://www.gesundheitsrisiko.de/docs/RACKEnglish.pdf
    - Implicit measures: https://implicit.harvard.edu/implicit/ ; https://implicitmeasures.com/
    - Implementation measures (Intervention Acceptability, Appropriateness, Feasibility): https://implementationscience.biomedcentral.com/articles/10.1186/s13012-017-0635-3

GEM Grid-Enabled Measures Database

Search

| Home | Constructs | Measures | Datasets | Workspaces | About | My GEM | Glossary |

Home

Content Areas

- Anthropometrics
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- Cardiovascular
- Diabetes
- Education, Training, and or Career Development
- Environment
- HIV/AIDS
- Mental Health
- Methods
- Nutrition
- Obesity
- Occupational Health
- Pain
- Physical Activity
- Pregnancy
- Risk and Decision Making
- Sexual Behaviors
- Sleep
- Smoking/Tobacco
- Spirituality
- Stress
- Substance Abuse
- Transplant

Welcome to GEM, a web-based collaborative tool containing behavioral, social science, and other relevant scientific measures.

The goal of GEM is to support and encourage a community of users to drive consensus on best measures and share the resulting data from use of those measures.

GEM enables users to:

- Add constructs or measures to the database
- Contribute to and update existing information (metadata) about constructs and measures
- Rate and comment on measures to drive consensus on best measures
- Access and share harmonized data
- Search for and download measures

Learn more about GEM

▼Community News | ▲ Recent Additions

Check out the Team Science Toolkit blog about GEM

See a recent blog by Richard Moser and Kisha Coa about how GEM can be used to facilitate team science on the Team Science Toolkit website (https://www.teamsciencetoolkit.cancer.gov). Make sure to explore this helpful site that has information and... *More*

Click here to read the blog

Inaugural GEM-inar! GEM Care Planning: Advancing Survivorship Care Planning

In case you missed it, click the link below to watch the first GEM-inar that highlights real-world application and use of GEM. NCI's Carly Perry, PhD, MA, MSW and University of Pittsburgh's Ellen Beckjord, PhD, MPH presented on the GEM-Care... *More*
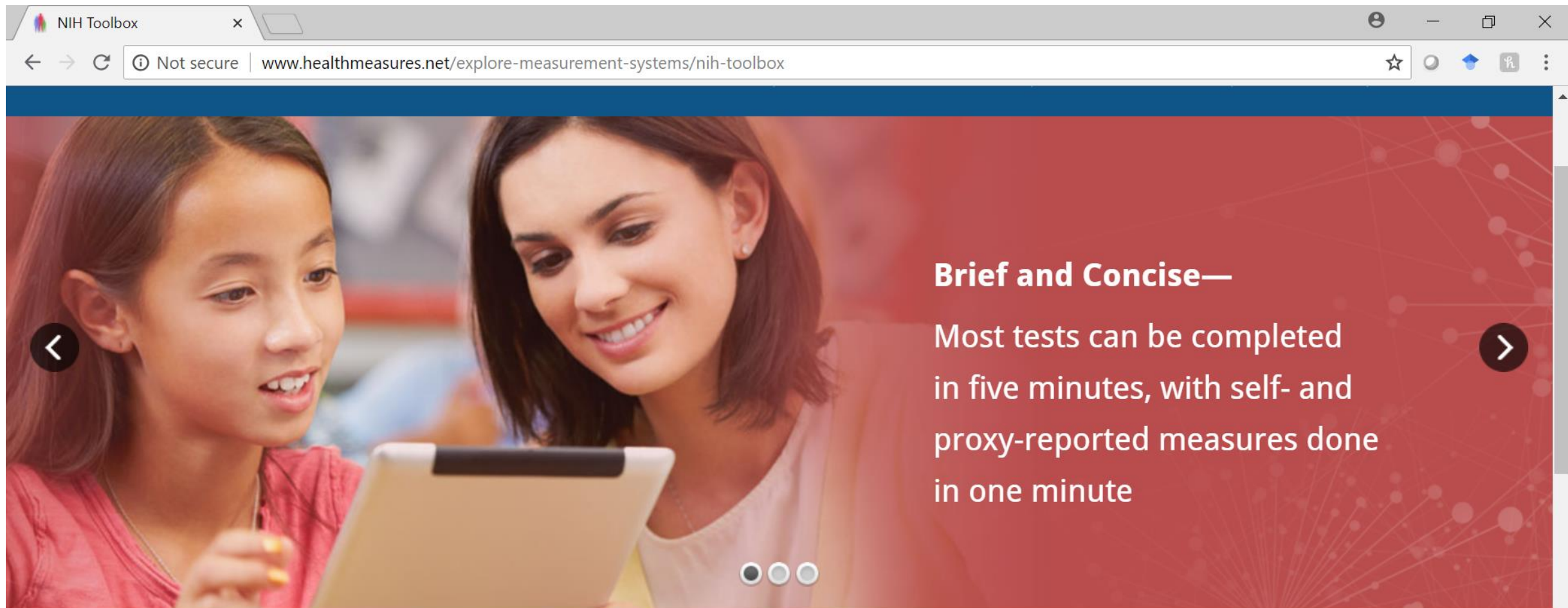
Click here to watch the Gem-inar

More Community News

Recent Workspaces

Customizable virtual areas to collaborate on a specific project

- **Smoking Cessation at Lung Examination (SCALE) Collaboration Special Collection**
  The Smoking Cessation at Lung Examination (SCALE)... *More*

- **Assessment of Cancer Patient Symptoms and Needs**
  The primary aim of the Assessment of Cancer Patient... *More*

- **ACRM Cancer Rehabilitation Research Outcomes Project**
  The primary aim of the ACRM Cancer Rehabilitation Research... *More*

- CoRTC AC2 MADCaP Consortia

My Subscriptions

Login to receive updates on constructs, measures, data, and workspaces.

Brief and Concise—

Most tests can be completed
in five minutes, with self- and
proxy-reported measures done
in one minute

The NIH Toolbox® is a comprehensive set of neuro-behavioral measurements that quickly assess cognitive, emotional, sensory, and motor functions from the convenience of an iPad.

Application of behavioral science to health and health care

- October: What levels of change are important to consider?
  - Dr. Jeni Cross, Colorado State University, Sociology – The Social Ecological Model
- November: How do I design theory-based interventions?
  - Dr. Jennifer Leiferman, Colorado School of Public Health, Community and Behavioral Health – Behavior change interventions
- December: How do I test that my intervention works as expected?
  - Dr. Kevin Masters, University of Colorado Denver, Psychology – Testing mechanisms of behavior change

Application of behavioral science to health and health care

- January – How do I target automatic processes to influence health behavior?
  - Dr. Gretchen Chapman, Carnegie Mellon University Social and Decision Sciences - Emotion, Automaticity, and Decision Making in Health Care
- February – How do I change behavior of health care providers?
  - Drs. Danielle Loeb and Amy Huebschmann, University of Colorado Division of General Internal Medicine – Implementation Theories and Strategies
- March – How do I change organizational behavior?
  - TBD
- April – How do I change policy?
  - Dr. Jim Sallis, University of California San Diego, Family Medicine & Public Health Distinguished Professor – The intersection of behavioral science, health policy, and advocacy

Upcoming Activities

- Designing for Dissemination Workshop – October 2-3
  - At capacity – plenaries will be streamed via Zoom
    - Visit our ACCORDS Education website for Zoom information
    - Will be archived here following the event

- Patient Centered Decisions: An ACCORDS Seminar Series – Oct-Apr
  - Next seminar: 10/25 Dan Matlock, MD – "An Overview of Shared Decision Making"
  - 12:00-1:00pm | Education 2 North room 1206

- Behavioral Science in Health and Health Care: An ACCORDS Seminar Series – Sept-Mar
  - Next Seminar: 10/17 Jeni Cross, PhD (CSU) – "Systems Level Change: The Social Ecological Model"
  - 12:00-1:00pm | Education 2 South room 1307

Please **sign in** and be sure to **fill out an evaluation** before you leave.

Recorded seminars can be found on our website https://goo.gl/1q9nUx
Request a Planning or Support Consultation with the Education Program
Thank you!