KNOWLEDGE AND BEHAVIORAL CHANGE

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Healthy People. Environments. Economies.

Learning Objectives

- Discuss factors of knowledge, attitude and behavioral change
- Discuss some behavioral change models
- How to validate survey tool
- Present ways to measure knowledge and behavioral change

Definitions

- Knowledge: the understanding of a given topic
- Attitude: feelings towards this subject, as well as any preconceived ideas that they may have towards it
- Practice: the ways in which they demonstrate their knowledge and attitude through their actions

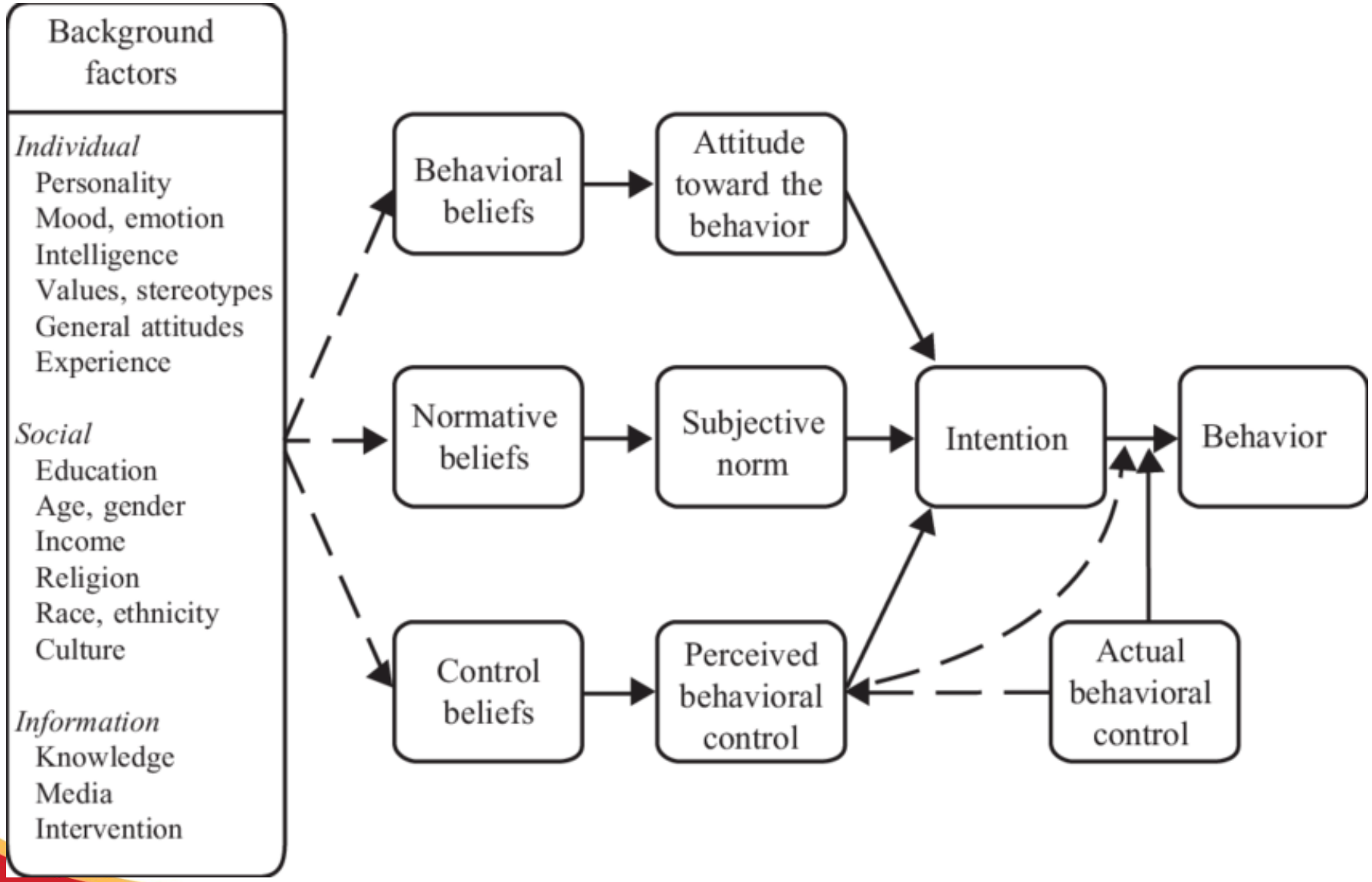
Knowledge is NOT enough to change Behavior

COMMON BEHAVIORAL CHANGE MODELS

Theory of Planned Behavior

- Theory of Reasoned Action in 1980
- Behavioral achievement depends on both motivation (intention) and ability (behavioral control)
- Three types of beliefs - behavioral, normative, and control

http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories_print.html



https://www.researchgate.net/figure/The-theories-of-reasoned-action-and-planned-behavior_fig3_264000974

Six Constructs

1. Attitudes - This refers to the degree to which a person has a favorable or unfavorable evaluation of the behavior of interest.
2. Behavioral intention - This refers to the motivational factors that influence a given behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed.
3. Subjective norms - This refers to the belief about whether most people approve or disapprove of the behavior. It relates to a person's beliefs about whether peers and people of importance to the person think he or she should engage in the behavior.

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Six Constructs, continue

4. Social norms - This refers to the customary codes of behavior in a group or people or larger cultural context. Social norms are considered normative, or standard, in a group of people.
5. Perceived power - This refers to the perceived presence of factors that may facilitate or impede performance of a behavior. Perceived power contributes to a person's perceived behavioral control over each of those factors.
6. Perceived behavioral control - This refers to a person's perception of the ease or difficulty of performing the behavior of interest. Perceived behavioral control varies across situations and actions, which results in a person having varying perceptions of behavioral control depending on the situation.

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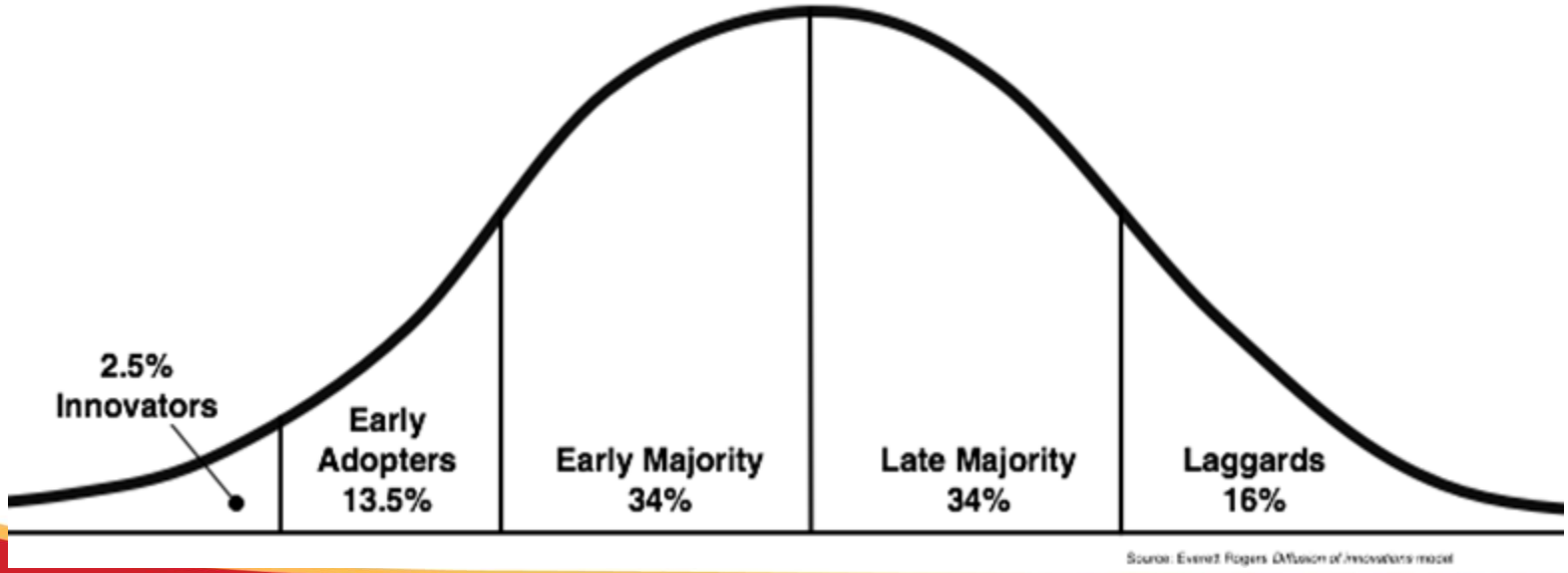
Diffusion of Innovation Theory

- Adoption of a new idea, behavior, or product does not happen simultaneously in a social system



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5 Main Influencers

1. Relative Advantage - The degree to which an innovation is seen as better than the idea, program, or product it replaces.
2. Compatibility - How consistent the innovation is with the values, experiences, and needs of the potential adopters.
3. Complexity - How difficult the innovation is to understand and/or use.
4. Triability - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.
5. Observability - The extent to which the innovation provides tangible results.

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Social Cognitive Theory

- The theory takes into account a person's past experiences
- Past experiences influences reinforcements, expectations, and expectancies, all of which shape whether a person will engage in a specific behavior and the reasons why a person engages in that behavior

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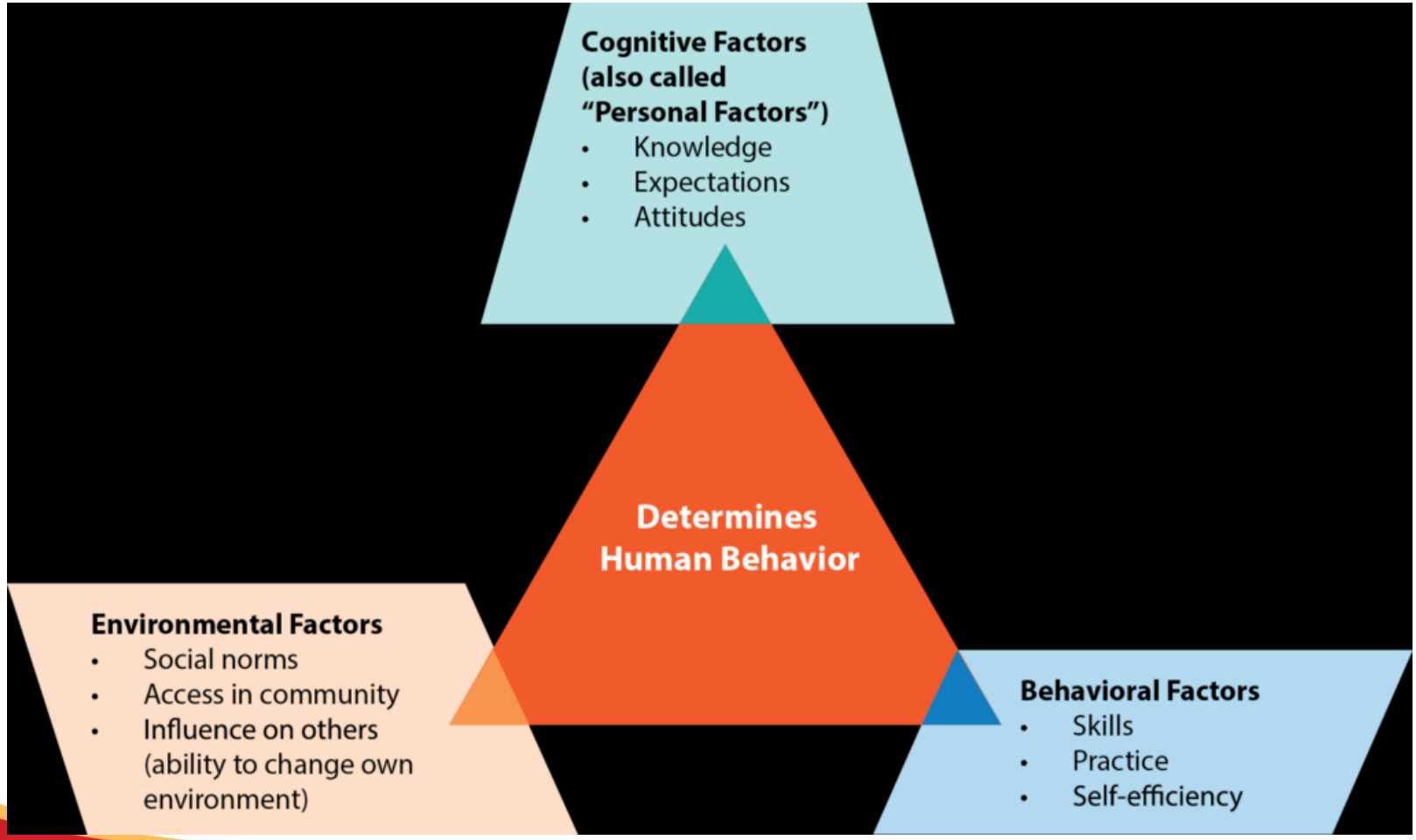
Social Cognitive Theory



Five Constructs

1. Reciprocal Determinism - individual with a set of learned experiences, environment (external social context), and behavior (responses to stimuli to achieve goals)
2. Behavioral Capability - person's actual ability to perform a behavior through essential knowledge and skills. A person must know what to do and how to do it. People learn from the consequences of their behavior

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Five Constructs

3. Observational Learning – If individuals see successful demonstration of a behavior, they can also complete the behavior successfully.
4. Reinforcements - This refers to the internal or external responses to a person's behavior that affect the likelihood of continuing or discontinuing the behavior. Reinforcements can be self-initiated or in the environment, and reinforcements can be positive or negative.

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Five Constructs

5. Expectations - People anticipate the consequences of their actions before engaging in the behavior, and these anticipated consequences can influence successful completion of the behavior.

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Self-efficacy

- Self-efficacy is influenced by a person's specific capabilities and other individual factors, as well as by environmental factors (barriers and facilitators)

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Benefits of Self Efficacy Studies

- High levels of self-efficacy enhance one's accomplishments and feelings of personal well being (Pajares, 1996).
- Self-efficacy helps one to remain calm when approaching challenging tasks (Pajares, 1996).
- Building self-efficacy in multiple areas increases one's confidence in mastering new domains (Ormrod, 2008).

http://sbluman2.blogspot.com/p/advantages-and-disadvantages-of-self.html

Benefits of Self Efficacy Studies, continue

- High self-efficacy increases one's willingness to experiment with new ideas (Ormrod, 2008).
- Self-efficacy encourages one to set higher expectations for future performances (Ormrod, 2008).
- High self-efficacy increases one's persistance and focus on a given task beyond previous levels (Ormrod, 2008).

http://sbluman2.blogspot.com/p/advantages-and-disadvantages-of-self.html

Disadvantages of Self-efficacy

- High self-efficacy beliefs do not always guarantee positive outcome expectations (Pajares, 1996).
- Self-efficacy beliefs vary greatly between individuals, which makes them very difficult for researchers to assess (Pajares, 1996).
- People with high self-efficacy and high skills may lack the resources and equipment to perform. According to Bandura (1986, p. 396),"When performances are impeded by disincentives, inadequate resources, or external constraints, self-judged efficacy will exceed the actual performance."

http://sbluman2.blogspot.com/p/advantages-and-disadvantages-of-self.html

Disadvantages of Self-efficacy, continue

- Basing one's self-efficacy for a new task on results of previous tasks may be misleading (Bandura, 1986).
- Personal factors and distorted memories of previous performance can distort one's self-efficacy (Bandura, 1986).
- Rather than high self-efficacy, one might have low self-efficacy following failure or setbacks that causes them to lose faith in their capabilities and to develop increased stress and depression (Bandura, 1984).

http://sbluman2.blogspot.com/p/advantages-and-disadvantages-of-self.html

The Transtheoretical Model (Stages of Change)

- Prochaska and DiClemente in the late 1970s
- Focuses on the decision-making of the individual and is a model of intentional change
- Assumption that people do not change behaviors quickly and decisively
- Habitual behavior, occurs continuously through a cyclical process

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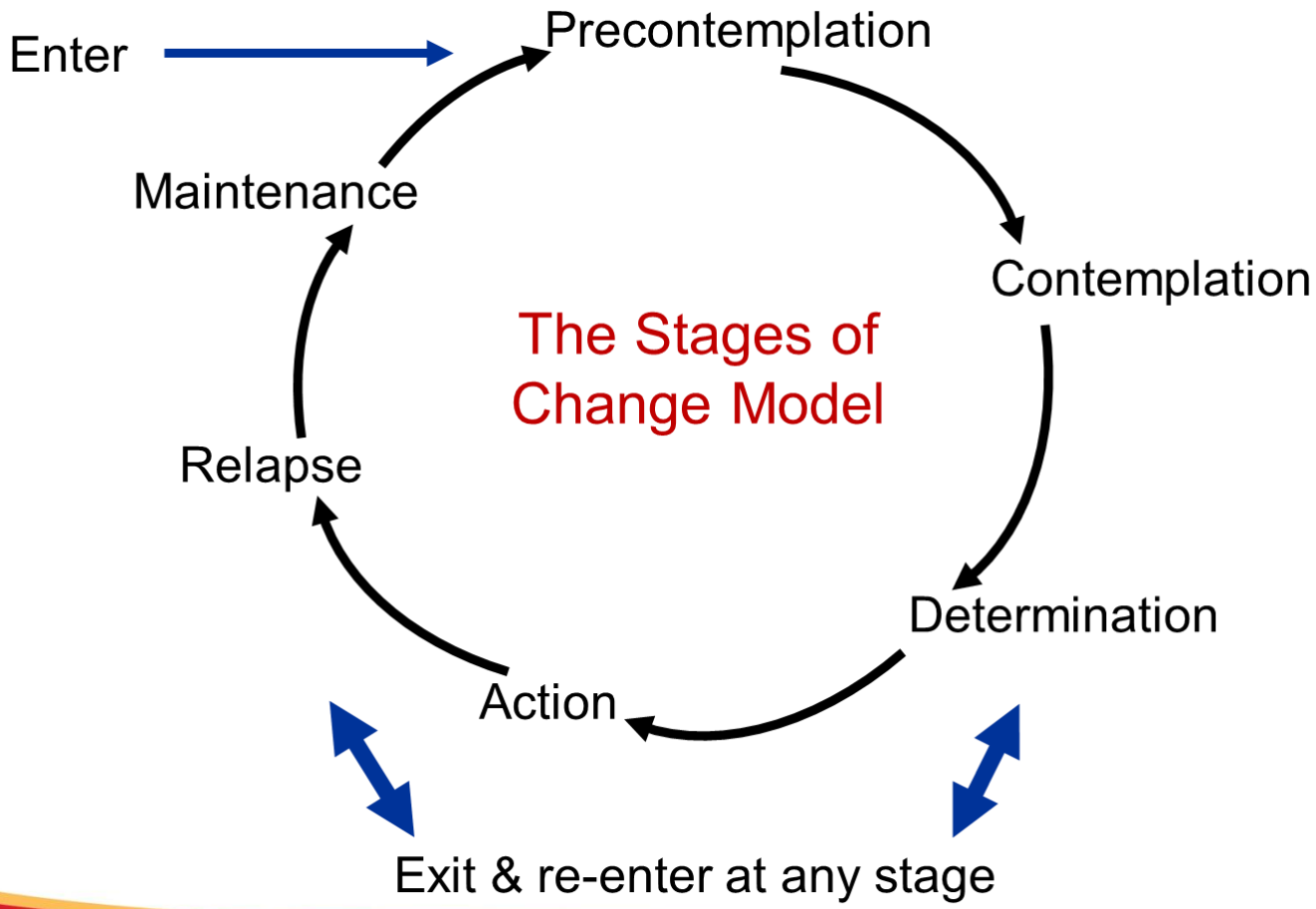
Stages of Change



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Six Stages in Model

1. Precontemplation - In this stage, people do not intend to take action in the foreseeable future (defined as within the next 6 months). People are often unaware that their behavior is problematic or produces negative consequences. People in this stage often underestimate the pros of changing behavior and place too much emphasis on the cons of changing behavior.
2. Contemplation - In this stage, people are intending to start the healthy behavior in the foreseeable future (defined as within the next 6 months). People recognize that their behavior may be problematic, and a more thoughtful and practical consideration of the pros and cons of changing the behavior takes place, with equal emphasis placed on both. Even with this recognition, people may still feel ambivalent toward changing their behavior.

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Six Stages in Model

3. Preparation (Determination) - In this stage, people are ready to take action within the next 30 days. People start to take small steps toward the behavior change, and they believe changing their behavior can lead to a healthier life.
4. Action - In this stage, people have recently changed their behavior (defined as within the last 6 months) and intend to keep moving forward with that behavior change. People may exhibit this by modifying their problem behavior or acquiring new healthy behaviors.

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Six Stages in Model

5. Maintenance - In this stage, people have sustained their behavior change for a while (defined as more than 6 months) and intend to maintain the behavior change going forward. People in this stage work to prevent relapse to earlier stages.
6. Termination - In this stage, people have no desire to return to their unhealthy behaviors and are sure they will not relapse. Most people tend to stay in the maintenance stage.

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Strategies for make change

1. Consciousness Raising - Increasing awareness about the healthy behavior.
2. Dramatic Relief - Emotional arousal about the health behavior, whether positive or negative arousal.
3. Self-Reevaluation - Self reappraisal to realize the healthy behavior is part of who they want to be.
4. Environmental Reevaluation - Social reappraisal to realize how their unhealthy behavior affects others.

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Strategies for make change

5. Social Liberation - Environmental opportunities that exist to show society is supportive of the healthy behavior.
6. Self-Liberation - Commitment to change behavior based on the belief that achievement of the healthy behavior is possible.
7. Helping Relationships - Finding supportive relationships that encourage the desired change.

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Strategies for make change

8. Counter-Conditioning - Substituting healthy behaviors and thoughts for unhealthy behaviors and thoughts.
9. Reinforcement Management - Rewarding the positive behavior and reducing the rewards that come from negative behavior.
10. Stimulus Control - Re-engineering the environment to have reminders and cues that support and encourage the healthy behavior and remove those that encourage the unhealthy behavior.

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Social Norms Theory

- Behavior is influenced by misperceptions of how our peers think and act
- *Perceived norms*: what we view as typical or standard in a group
- *Actual norm*: the real beliefs and actions of the group)
- The gap between perceived and actual is a *misperception*, and this forms the foundation for the social norms approach.

http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories_print.html

Media Campaigns

1. Assessment or collection of data to inform the message
2. Selection of the normative message that will be distributed
3. Testing the message with the target group to ensure it is well-received
4. Selection of the mode in which the message will be delivered
5. Amount, or dosage, of the message that will be delivered
6. Evaluation of the effectiveness of the message

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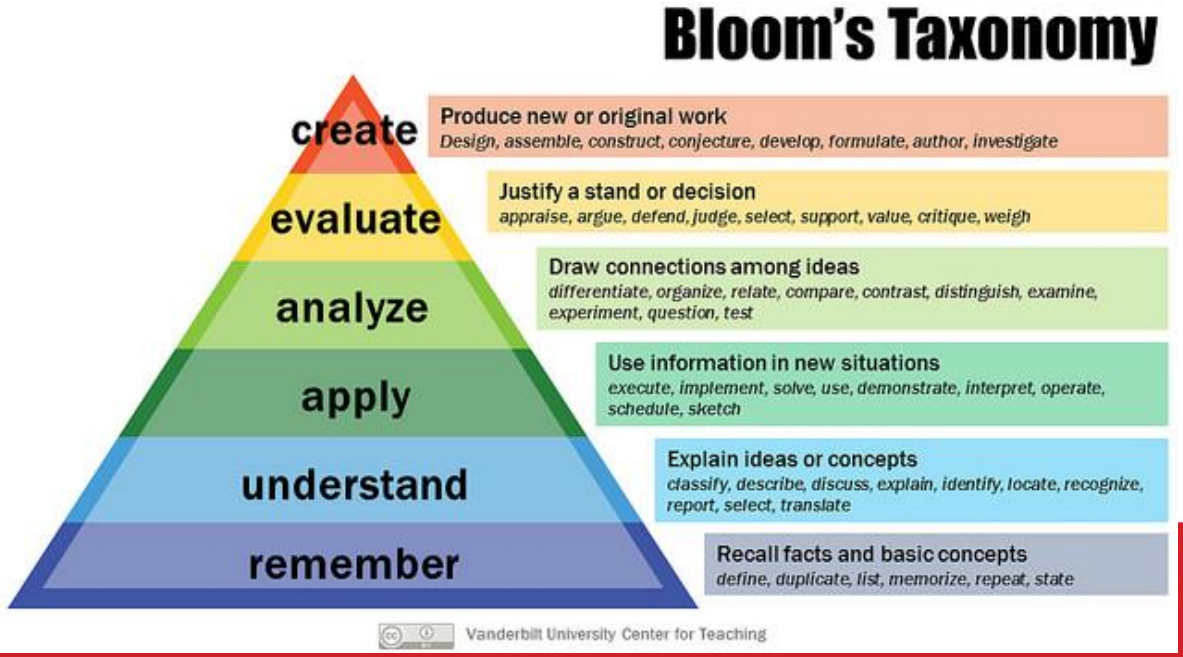
TOOLS TO MEASURE

Learning objectives

- Statements that define the expected goal of a curriculum, course, lesson or activity in terms of demonstrable skills or knowledge that will be acquired by a student as a result of instruction.



Resources

- A.B. Shetty Memorial Institute of Dental Science; http://www.idjar.net/eJournals/_ejournals/39_REVIEW%20ARTICLE.pdf
- Artino AR et al. Developing questionnaires for educational research. Med Teach. 2014. 36(6):463-74. http://www.ncbi.nlm.nih.gov/pubmed/24661014.
- Construct measurement and validation procedures in MIS and behavioral research: https://www.jstor.org/stable/23044045?seq=1#metadata_info_tab_contents
- Oppenheim, A. N. (1966/2004). Questionnaire design, interviewing and attitude measurement. New York: Continuum.
- Cronbach's Alpha. https://www.joe.org/joe/1999april/tt3.php

Definitions

- **Reliability** – The extent to which the scores produced by a particular measurement procedure or instrument (e.g. a survey) are consistent and reproducible. Reliability is a necessary but insufficient condition for validity.
- **Validity** – The degree to which evidence and theory support the proposed interpretations of an instrument's scores.

Evaluator: to conduct these measures

- Internal Consistency Reliability: you want to show elicit consistent and reliable response even if questions were replaced with other similar questions
  - Cronbach's alpha
  - Composite reliability
- Convergent Validity: you need to show that measures that should be related are in reality related (theory vs observation)
  - Factor outer loading
  - Average variance extracted
- Discriminant Validity: show that measures that should *not* be related are in reality *not* related
  - Cross-factor loading
  - Fornell–Larcker criterion

How to Validate a Tool (6 Steps)

- **Step 1: Establish Face Validity (2 step process)**
  - The first is a group familiar with your topic who can evaluate if your questions successfully capture your topic.
  - The second review should come from someone who is an expert on question construction, ensuring that your survey does not contain common errors such as leading, confusing or double-barreled questions.

How to Validate a Tool (6 Steps)

- **Step 2: Run a Pilot Test**
  - Select a subset of your intended survey participants and run a pilot test of the survey.
  - ~10%of your total population is a solid number of participants.
  - The more participants you can round up, the better, although even a smaller sample can help you weed out irrelevant or weak questions.

How to Validate a Tool (6 Steps)

- **Step 3: Clean Collected Data**
  - Enter your collected responses into a spreadsheet.
  - Reverse code negatively phrased questions.
  - Also double-check minimum and maximum values for your overall dataset (5 Point scale; enter 6 in spreadsheet)

How to Validate a Tool (6 Steps)

- **Step 4: Use Principal Components Analysis (PCA)**
  - Allows you to identify underlying components that are being measured by your survey questions.
  - These are known as factor loadings, and questions point back to the same elements should load into the same factors.
  - A factor loading scale runs between -1.0 and 1.0. Solid values to look for are factor loadings of 0.6 or above.
  - Your overall goal at this stage is to determine what the factors represent by seeking out common themes in questions that load onto the same factors.

How to Validate a Tool (6 Steps)

Step 5: Check Internal Consistency

- internal consistency of questions that load onto the same factors
- Checking the correlation between questions that load on the same factor measures question reliability by ensuring the survey answers are consistent.
- Standard test known as Cronbach's Alpha (CA). Test values range from 0 to 1.0, and values should generally be at least 0.6 to 0.7 or higher to indicate internal consistency. If you have a value lower than 0.6, let you delete a question from the test to see if it improves consistency.

How to Validate a Tool (6 Steps)

- **Step 6: Revise Your Survey**
  - revise your survey based on the information you gathered from your PCA and Cronbach's Alpha.
  - If only minor changes were made to your survey, it's likely to be ready to go after its final revisions. If major changes were made, especially if you removed a substantial amount of questions, another pilot test and round of PCA and CA is probably in order

PROGRAMMING MODEL

Bennett's Hierarchy Extension Program Evaluation Model

Examples of "hard" and "soft" evidence in a hierarchy for program evaluation		
Levels of Bennett's Hierarchy	**Examples of "hard" evidence**	**Examples of "soft" evidence**
7. End Results	• Profit and loss statements • Life expectancies • Pollution Indexes	Casual perceptions of quality of health, economy and environment
6. Practice Change	Direct observation of use of recommended farm practice over several years	Retrospective reports by farmers of their use of recommended farm practices
5. KASA Change	Changes in scores on validated measures of knowledge, attitudes, skills and aspirations	Opinions on extent of change in participants' knowledge, attitudes, skills and aspirations
4. Reactions	Extent to which a random sample of viewers can be distracted from watching a demonstration	Recording the views of only those who volunteer to express feelings about the demonstration
3. People Involvement	Use of social participation scales based on recorded observations of attendance, holding of leadership positions, etc	Casual observation of attendance and leadership by participants
2. Activities	Pre-structured observation of activities and social processes through participant observations, use of video and audio tapes, etc	Staff recall of how activities were conducted and the extent to which they were completed
1. Inputs	Special observations of staff time expenditures, as in time and motion study	Staff's subjective reports about time allocation

Bennett's Hierarchy Extension Program Evaluation Model

- **Step 1.** Document the Extension Program's objectives and proposed outcomes. Where possible use the S.M.A.R.T. principle; are they specific, measurable, achievable, realistic and time bound
- **Step 2.** Identify who the project stakeholders are
- **Step 3.** Be clear on who is the audience for the evaluation report
- **Step 4.** Develop a problem statement for the evaluation that clearly articulates what the evaluation is hoping to achieve

Bennett's Hierarchy Extension Program Evaluation Model

- **Step 5.** Write the scope for the evaluation. This describes what the evaluation will be covering and how it will be delivered
- **Step 6.** Select the levels of Bennett's Hierarchy to be assessed and the quality of the evidence that is required
  - Document the information needs (evidence) for the evaluation for each level that is required to be covered in order to assess whether the program has met it's objectives.
  - Quantitative ("hard") data and Qualitative ("soft") data will both be required.
  - Evidence of "end results" is the strongest evidence for the extension program having met it's objectives.

Question Selection

- Knowledge Questions: Linked to learning objectives
- Attitude Questions (Evaluative component)
  - How strongly do you agree or disagree: Strongly agree, agree, neither agree…etc.
  - Example: People in my neighborhood generally get along with each other
- Behavioral intention (Behavioral component)
  - In the next 6 months, how likely is it that you will buy a car?
- Belief Questions (Cognitive component)
  - Example: How healthy is pizza on the following dimensions? A, B, C

Cautions

- Watch out for context effects due to
  - Question wording
  - Prior/ later questions
  - Self administrative questions
  - Interviewers characteristics, behaviors, introduction of the survey
  - External factors such as weather and mood

Other Cautions

- Cultural or global bias
- Agree-disagree scales
- Hypothetical questions

Knowledge Assessments

- Immediate after the training
- 6 months after the training
- 1 year after the training

- 21 days or 66 days to make behavioral change

Pre-Test and Post-Test

- Advantages
  - Current knowledge of the group
  - Able to compare to after the training
- Disadvantages
  - Due to learning in classroom or natural maturation
  - Argue that absorb knowledge just from the pre-test
  - Tendency to teach to the test
  - Response shift bias

Pre-Post Test

- Knowledge or attitude they had toward a particular subject
- Advantages
  - Own baseline comparison
  - taking part in the program may show participants that they actually knew much less than they originally reported on the pretest
- Disadvantages
  - Overestimate of knowledge and skills

Tips

- Pre- and Post-Testing with more impact
  - I know the answer
  - No I am guessing
  - https://www.joe.org/joe/2007december/iw1.php
  - Asking if they did the behavior before the training

Observational Assessments

- Bias based on who is conducting the assessment
  - Voice tone, body language, attitude or perceived attitude, time allowed, all ISMS
- Word choice

- Story about Kitchen Observational work

Conclusion

- Discuss factors of knowledge, attitude and behavioral change
- Discuss some behavioral change models
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- Present ways to measure knowledge and behavioral change

Questions

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