NCI Big D.A.T.A. Workshop
Health Behavior Theory:
Challenges & Opportunities

Jasmin A. Tiro, PhD
Department of Clinical Sciences, UT Southwestern
NCI- Designated Simmons Cancer Center
September 18, 2013
Theories Are Useful...

Explain Health Behaviors

- Health Belief Model
- Theory of Reasoned Action/Planned Behavior
- Precaution Adoption Process Model

Change Health Behaviors

- Social Cognitive Theory
- Transtheoretical (Stages of Change) Model

All theories describe a set of concepts/constructs & make assertions about how constructs are related to each other and to health behavior.
Challenges to Measuring Latent (Unobservable) Constructs

- Reliable & Valid
- Conceptually equivalent across languages & cultures
### Measurement Challenge:
**Same Concept across Language & Culture**

### Attitudes about liver cancer treatment

<table>
<thead>
<tr>
<th>English</th>
<th>Spanish version 1:</th>
</tr>
</thead>
<tbody>
<tr>
<td>People with liver cancer always die if they are not treated.</td>
<td>Las personas que padecen de cáncer de hígado mueren de no recibir tratamiento.</td>
</tr>
<tr>
<td></td>
<td><strong>People who suffer from liver cancer die of not receiving treatment.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spanish version 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Las personas que tienen cáncer de hígado siempre mueren si no reciben tratamiento.</td>
</tr>
</tbody>
</table>
Challenges to Measuring Latent (Unobservable) Constructs

- Reliable & Valid
- Conceptually equivalent across languages & cultures
- Conceptually equivalent across administration modes (interviewer vs. self; mail vs. mobile)
Challenges Because of Overlap in Constructs Across Theories

- Similar conceptual and operational definitions
- Acknowledge similar origins
- Focus on identifying unique constructs and unique hypotheses of how constructs are linked
### Measurement Challenge: Same Concept but Different Label & Scale

<table>
<thead>
<tr>
<th>Outcome Expectations</th>
<th>Having yearly mammograms will increase my chances of surviving if I get breast cancer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Benefits / Pros</td>
<td>Having a regular mammogram gives me peace of mind about my health.</td>
</tr>
<tr>
<td>Perceived Barriers / Cons</td>
<td>Mammograms have high chance of leading to breast surgery that is not needed.</td>
</tr>
<tr>
<td>Attitudes toward the Behavior</td>
<td></td>
</tr>
</tbody>
</table>

Competitive Hypothesis Testing

Hypothesis 1:
Do benefits and barriers directly influence mammography screening behavior (HBM: $p_1$ and $p_2$) or indirectly influence behavior via intention (TRA: $a_1 \times b_1$ and $a_2 \times b_1$)?

---

Opportunity to Use Multiple Data Sources

Use surveys to measure cognitions and perceptions that are unknowable from any other source.

What is ideal timing and frequency of measurement?

Link with other data sources to measure behavior:
- Sensors
- Area-based measures
- Electronic medical records and other clinical information systems