Understanding and Choosing Self-Report (Survey) Measures: Part One

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Measurement Issues in Health Disparities Research

- Measurement principles apply to all research
  - Conceptual clarity, readability, reliability, validity, sensitivity to change
- In disparities populations: many additional considerations
  - To accommodate cultural, language, and educational differences from mainstream

Concerns in Disparities Research

- Most self-reported measures developed and tested in mainstream, well-educated groups
- Lack of information on how well they work in disparity groups
  - Conceptual adequacy/equivalence
  - Psychometric adequacy
  - Clarity/readability

..although this is changing

Content of Measurement Lectures

- Importance of concepts
- Process of selecting measures
- Reviewing measures

Part 1

  - Get to know the measure
  - Appropriateness
  - Conceptual and psychometric adequacy
  - Practicality

Part 2

Concept/Construct/Latent Variable

- A variable that is relatively abstract
  - e.g. stress, depression, mindfulness
- Latent - present but not visible, unobservable
- Latent trait - unobservable set of characteristics that can be empirically inferred and estimated through answers to a set of questions

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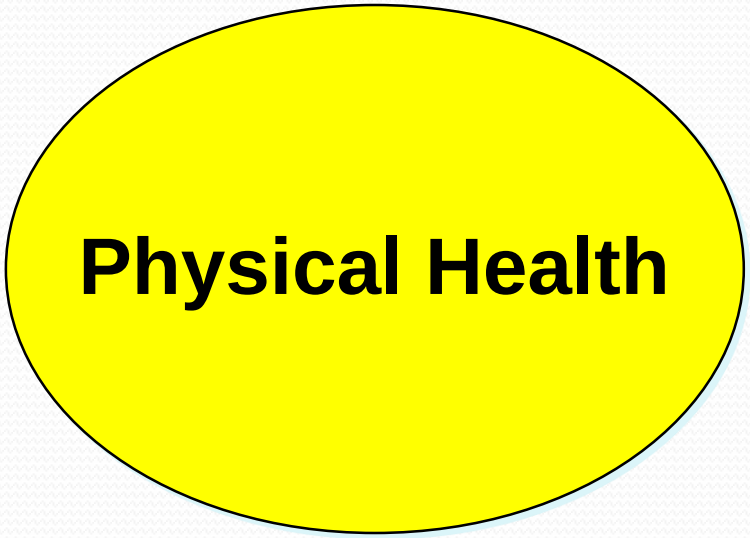
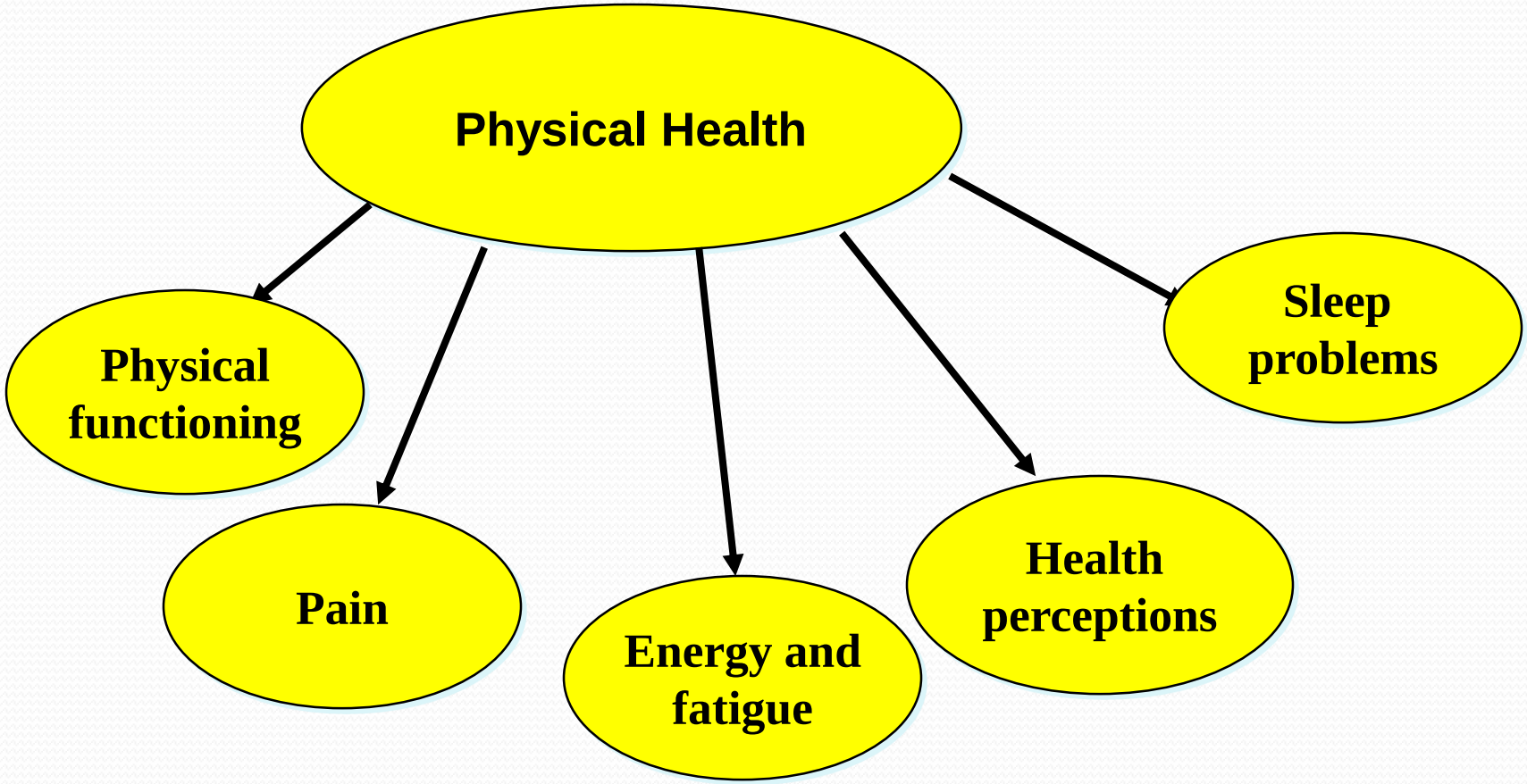
Depicting Concepts as Latent Variables



Concepts/Latent Variables Are Usually Multidimensional

- Due to abstract nature, most are complex
  - Hard to define
- Multidimensional
  - Concepts within concepts
- Especially true for health concepts

Concept of Physical Health: Multidimensional



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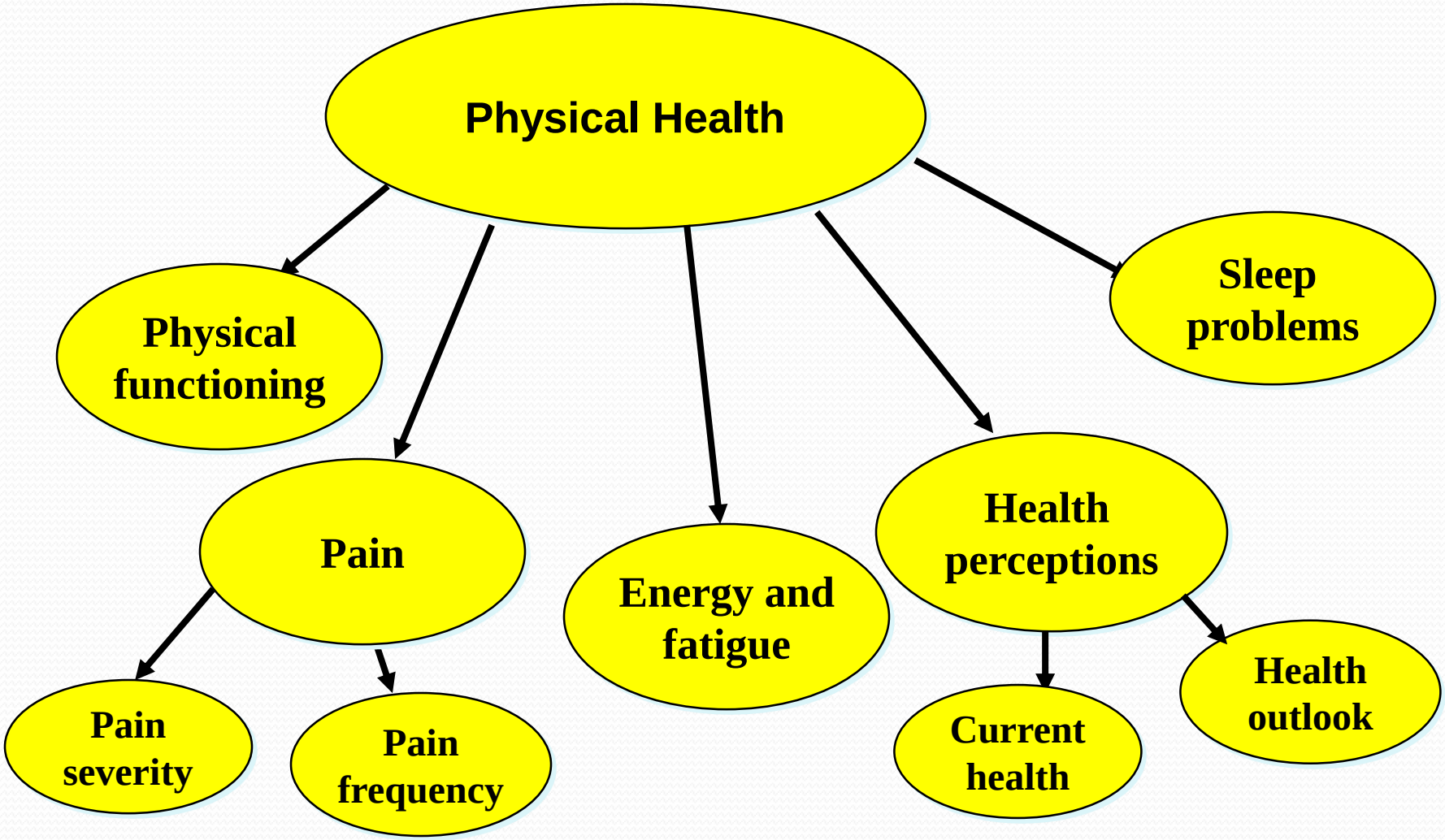
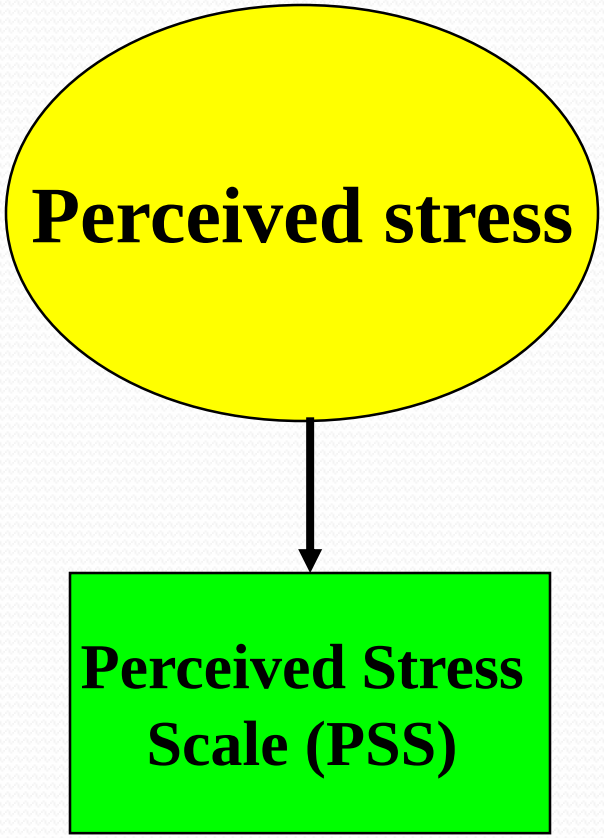


Measures of Concepts

- Concepts are defined and operationalized in terms of observed indicators or measures
- Measures are “proxies” for the latent variables we cannot directly observe

Depicting How Latent Variables are Measured



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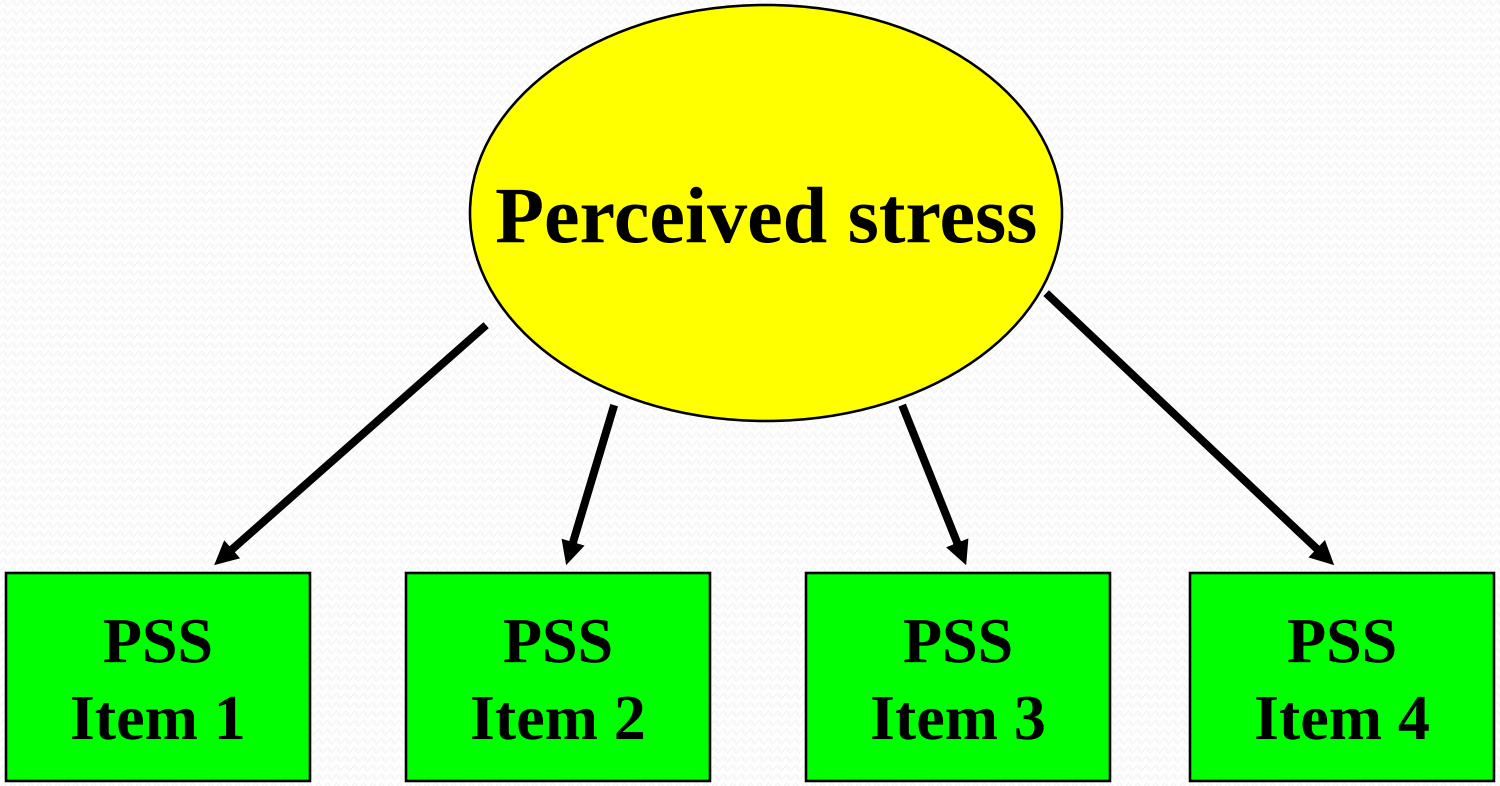
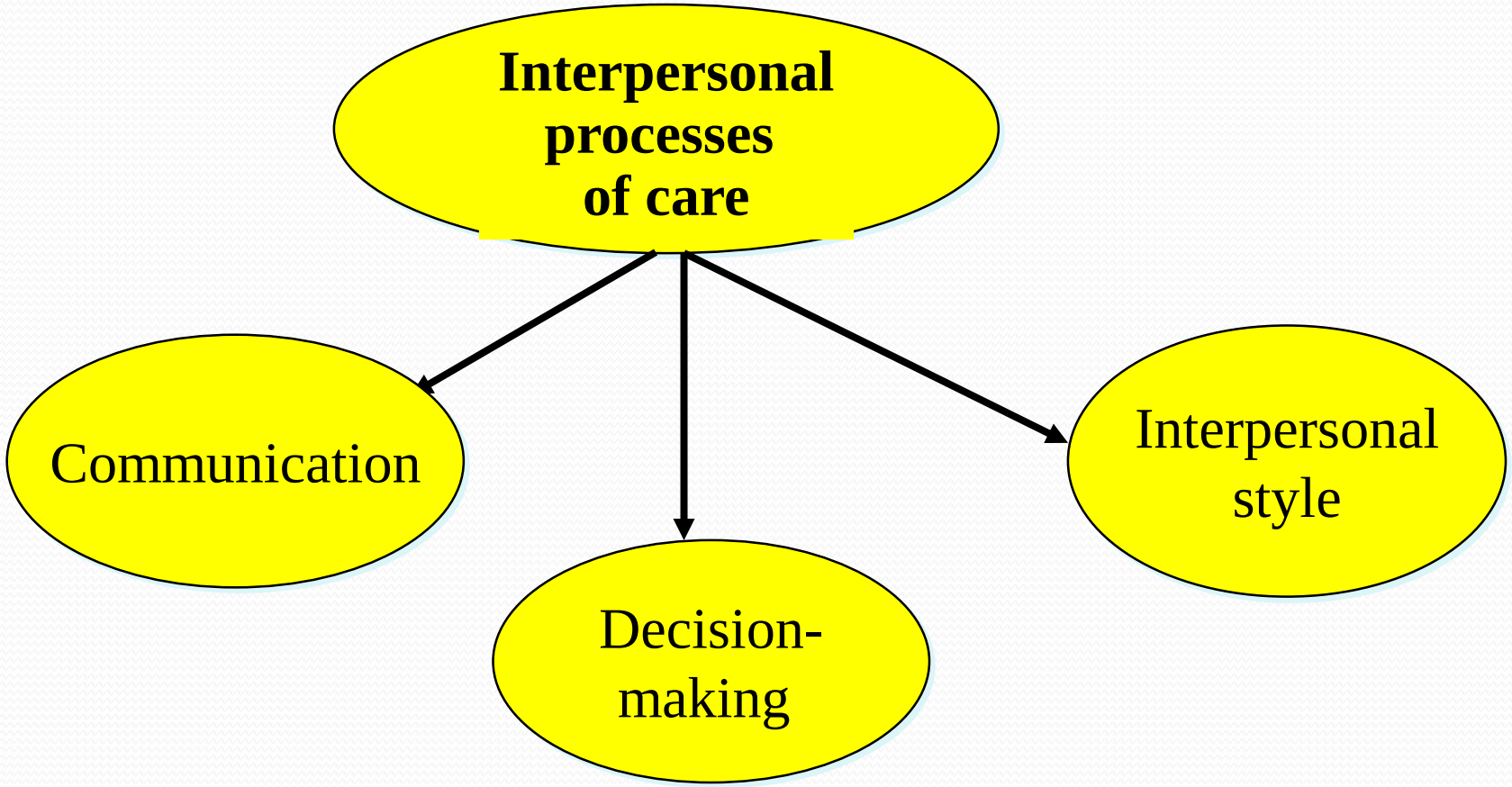


Concept of Interpersonal Processes of Care



AL Stewart et al., *Health Serv Res*, 2007:42:1235-56.

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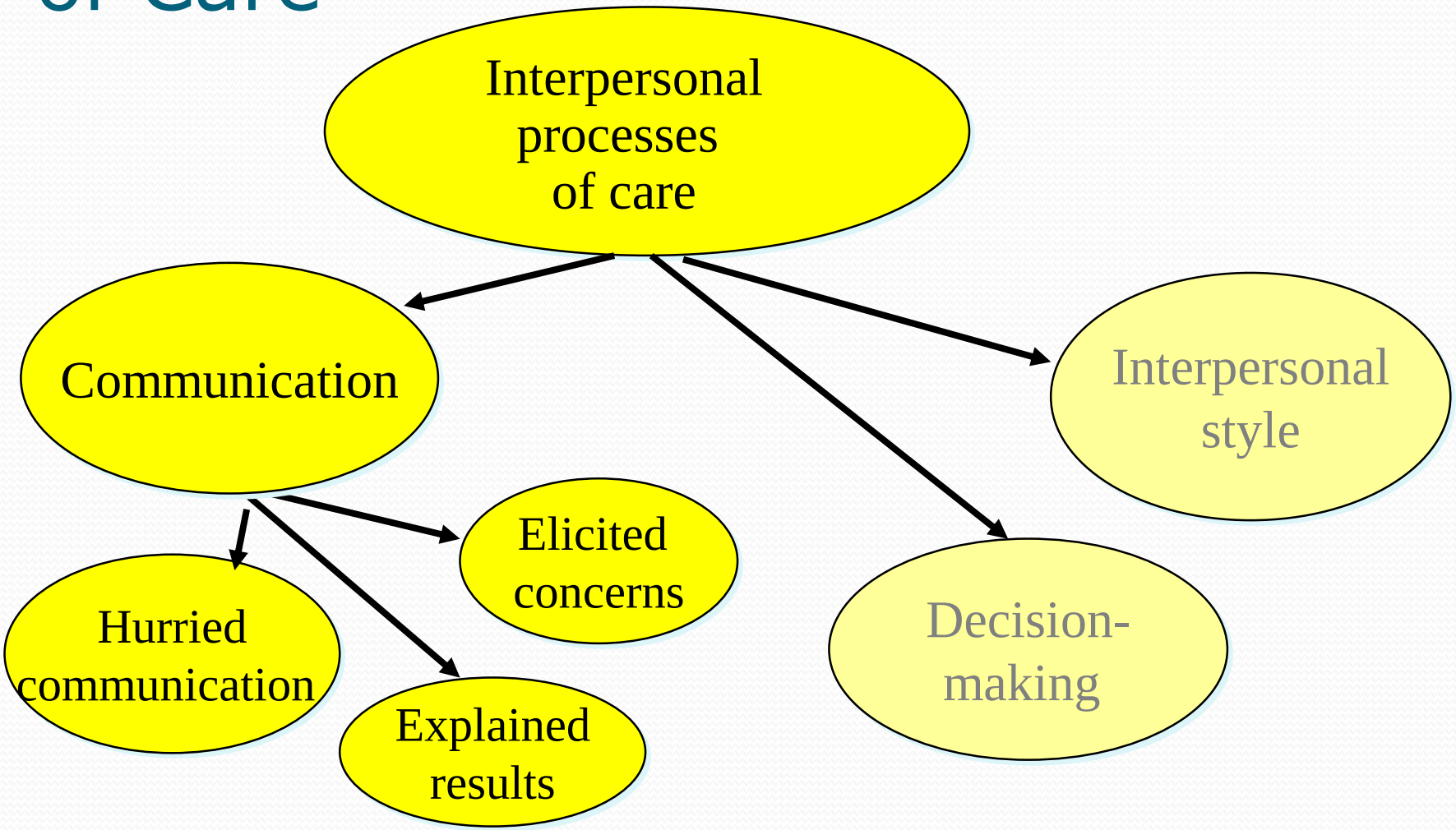
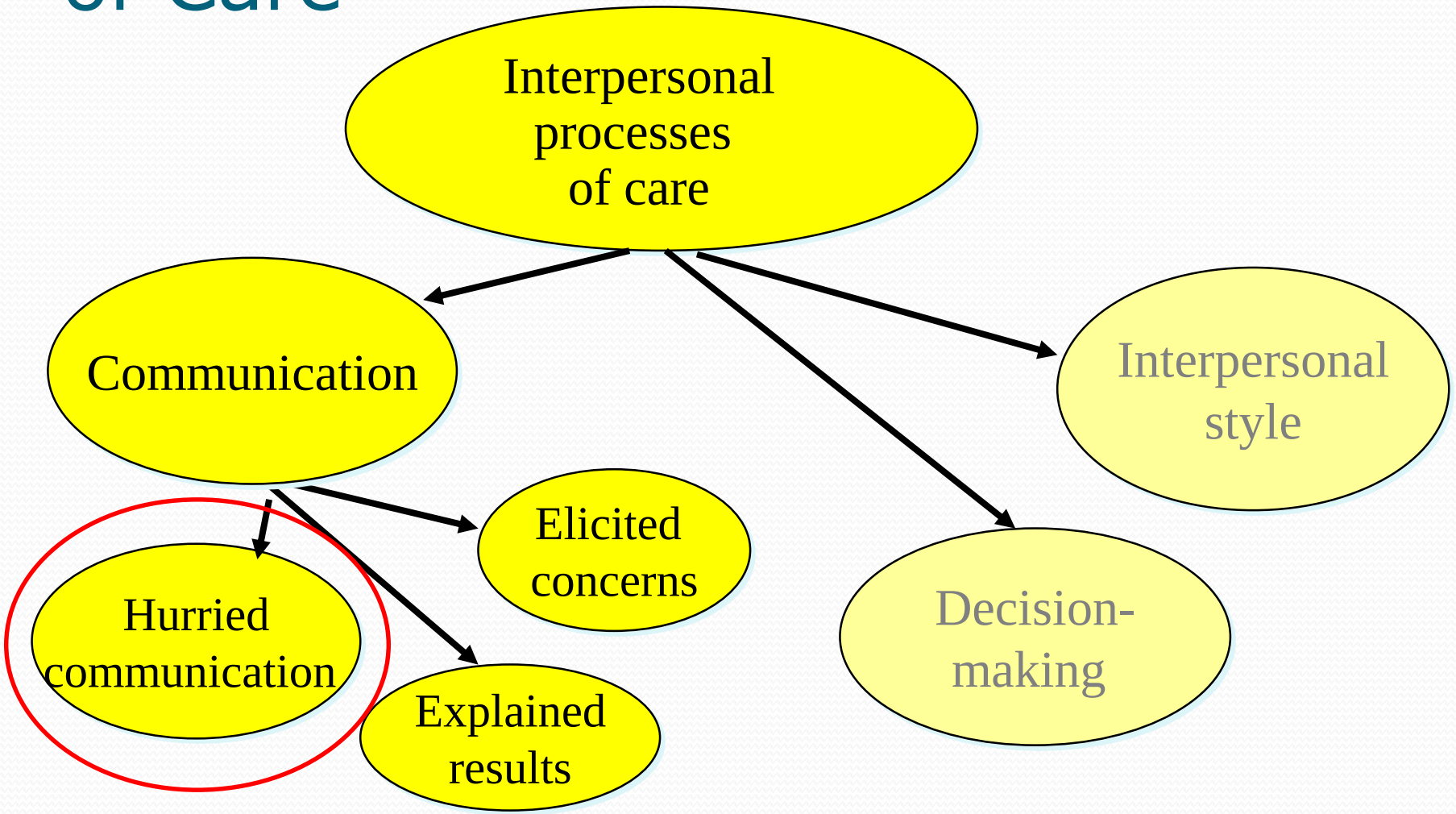
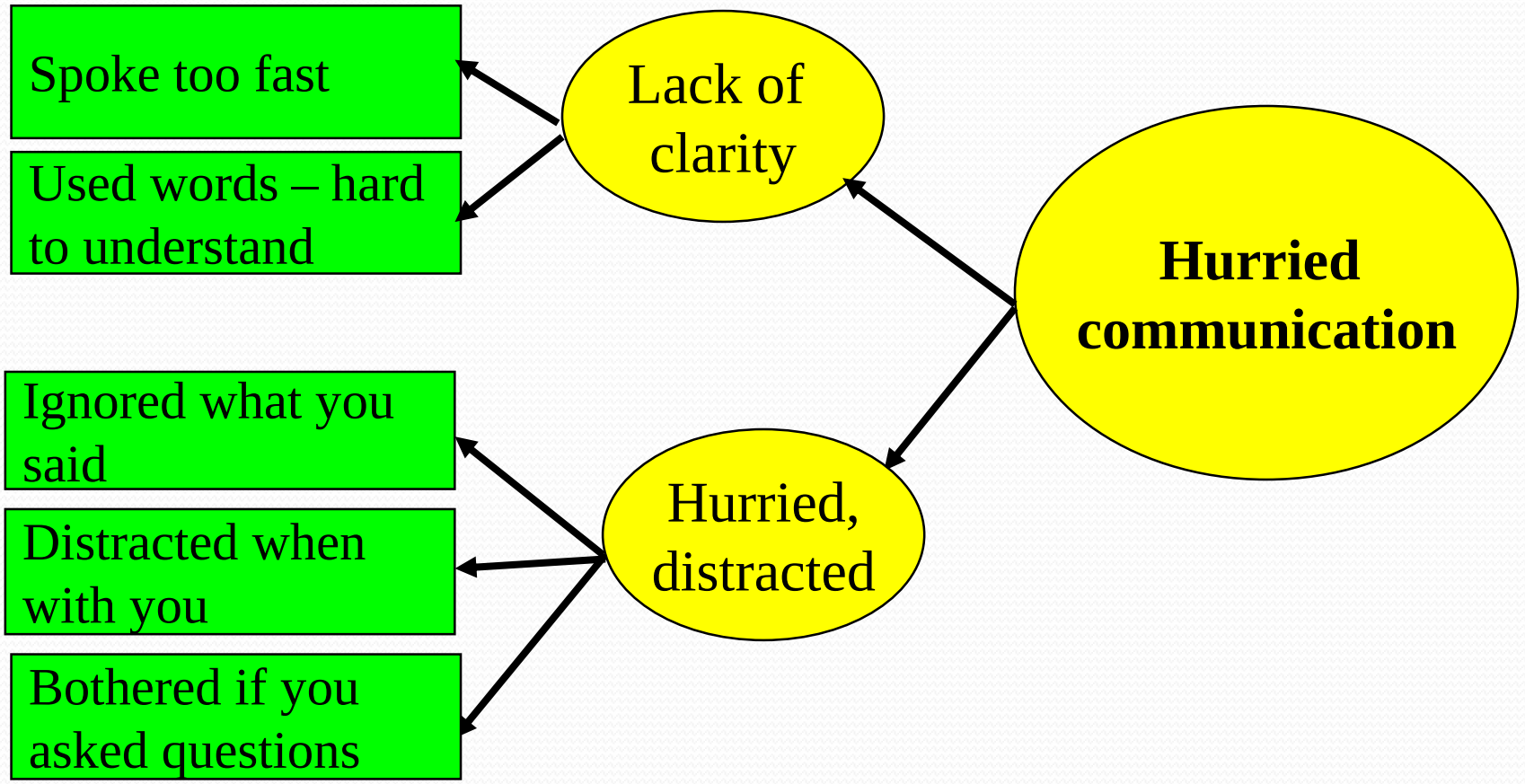


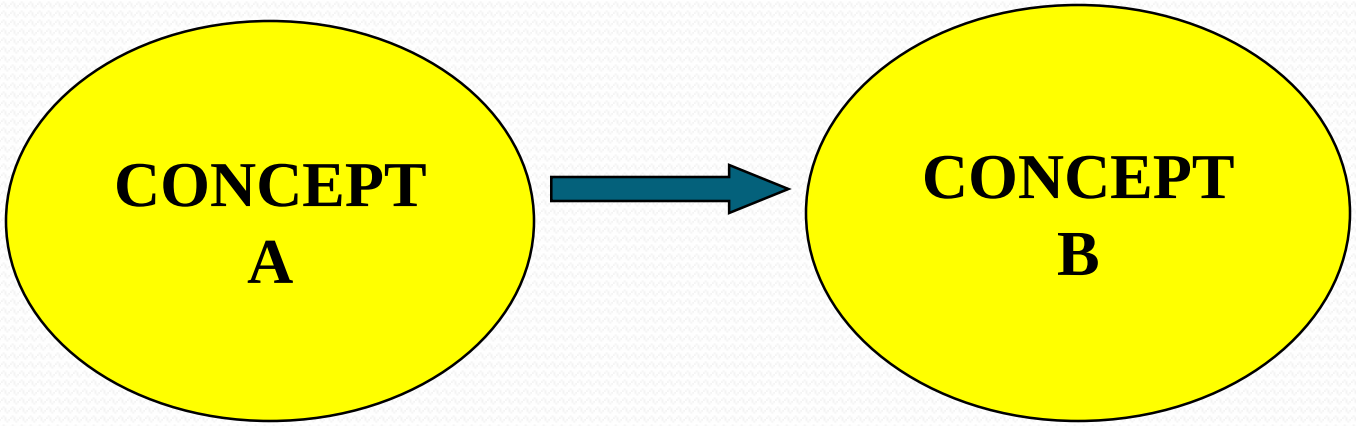
Concept of Interpersonal Processes of Care



Second Order Latent Variables: Hurried Communication (IPC)



Depicting Research Questions as Latent Variables (Concepts)



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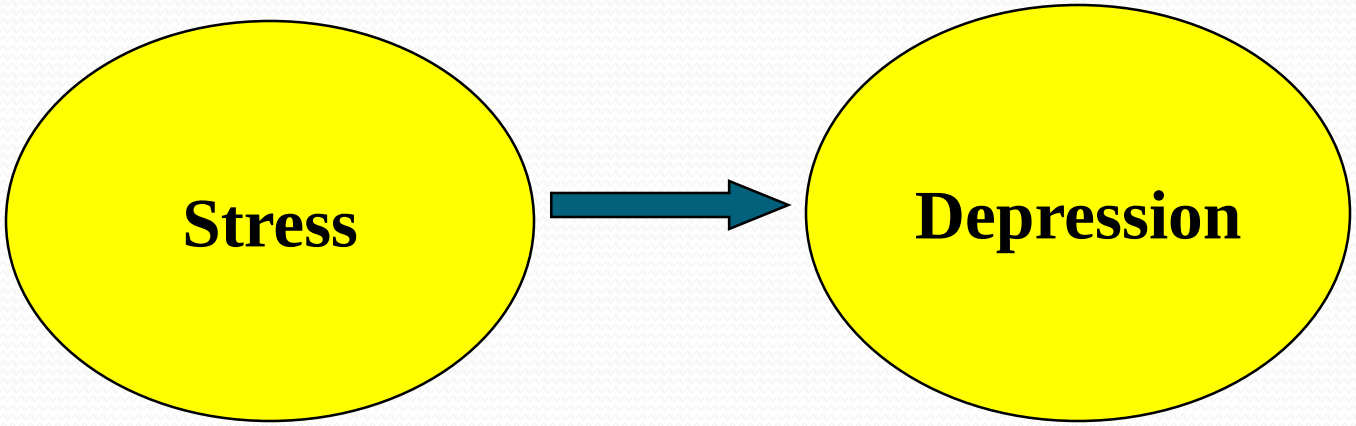
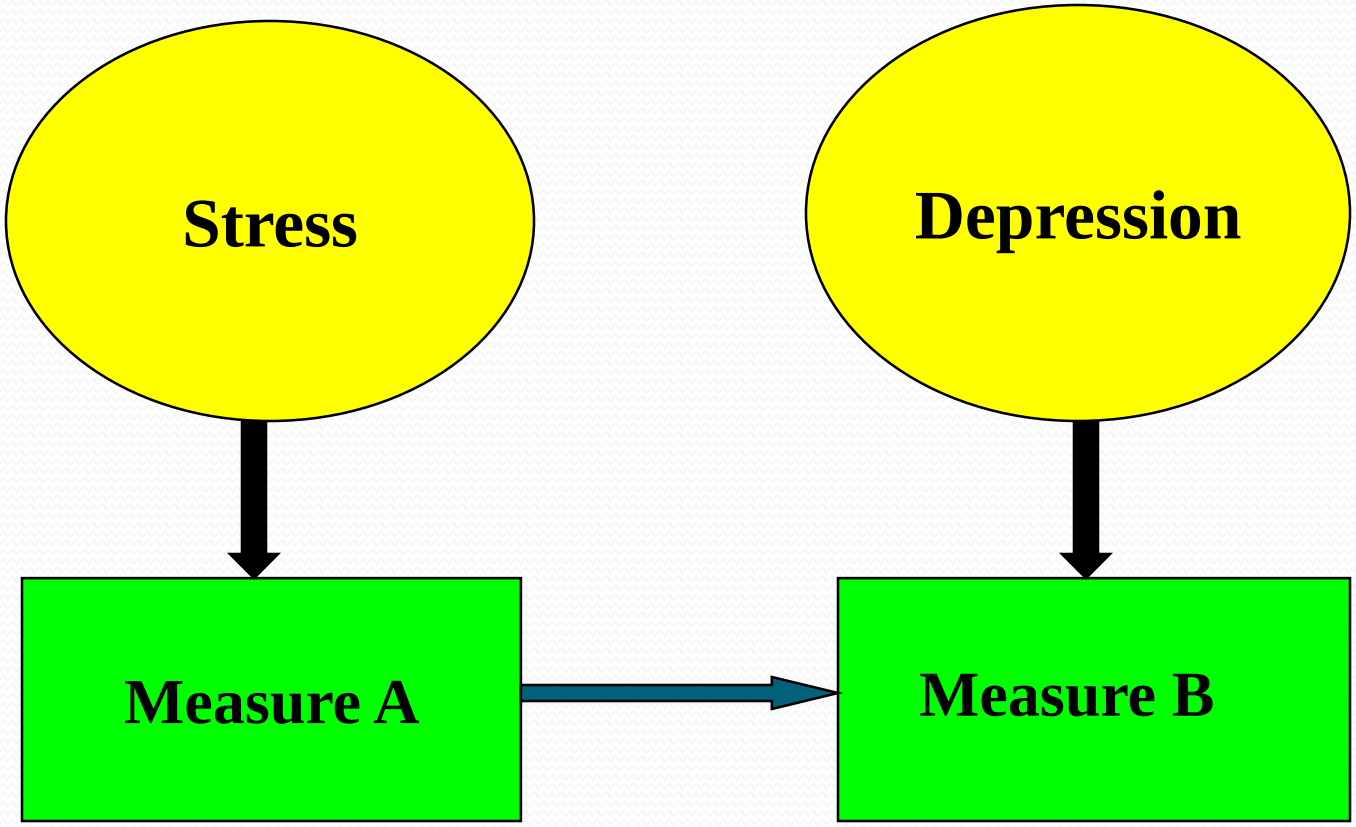


We Infer Associations of Concepts Through Associations of Measures



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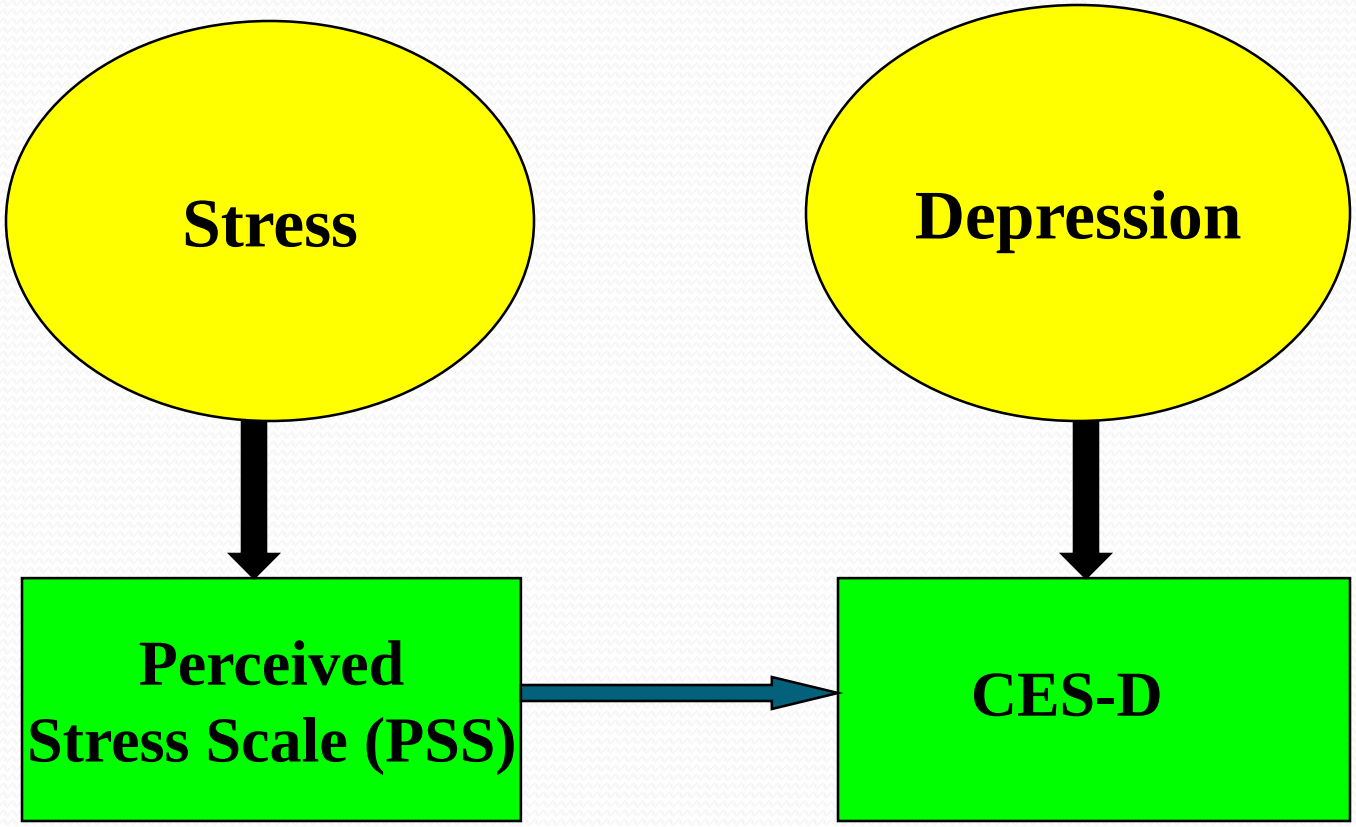

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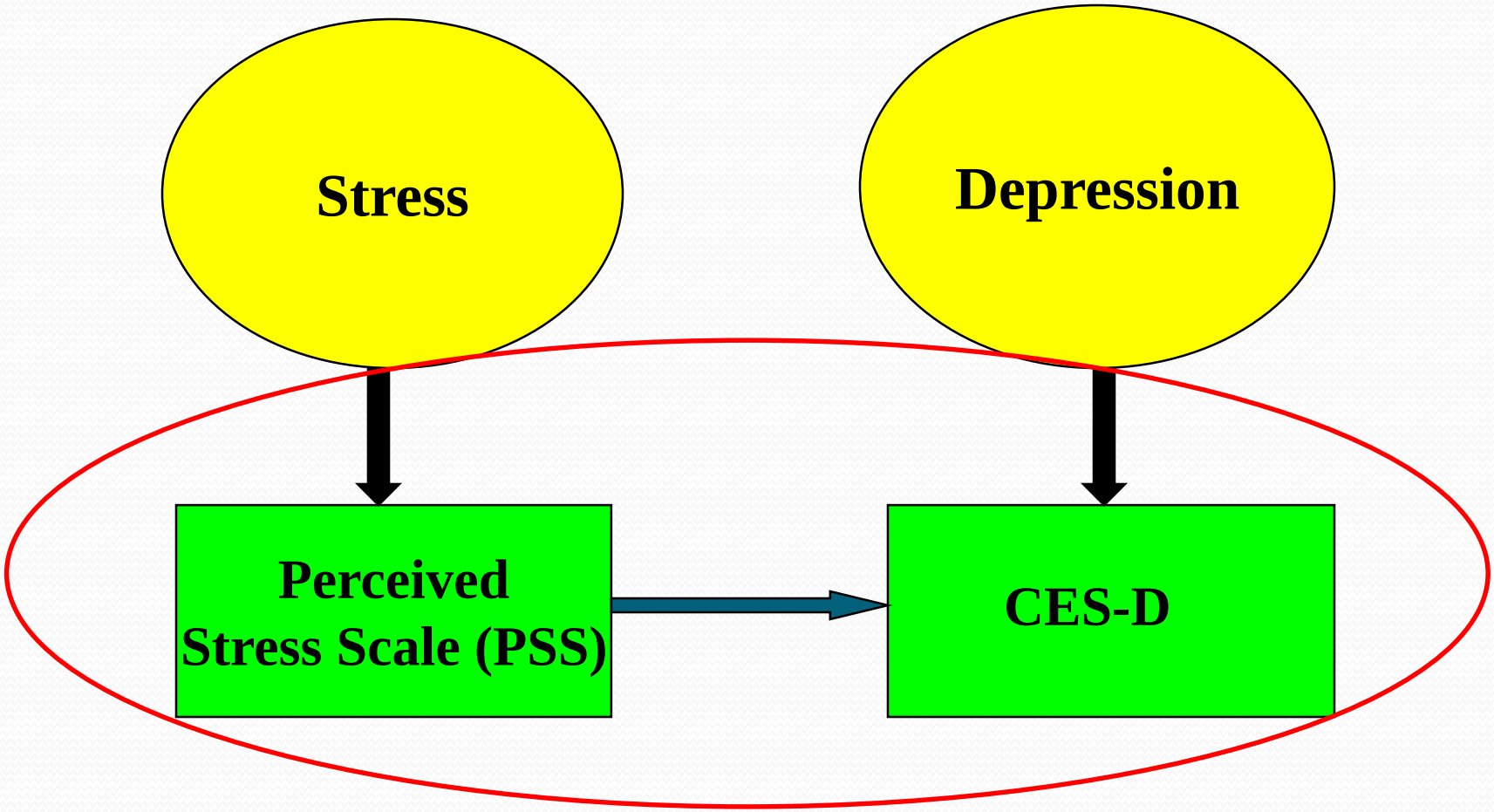
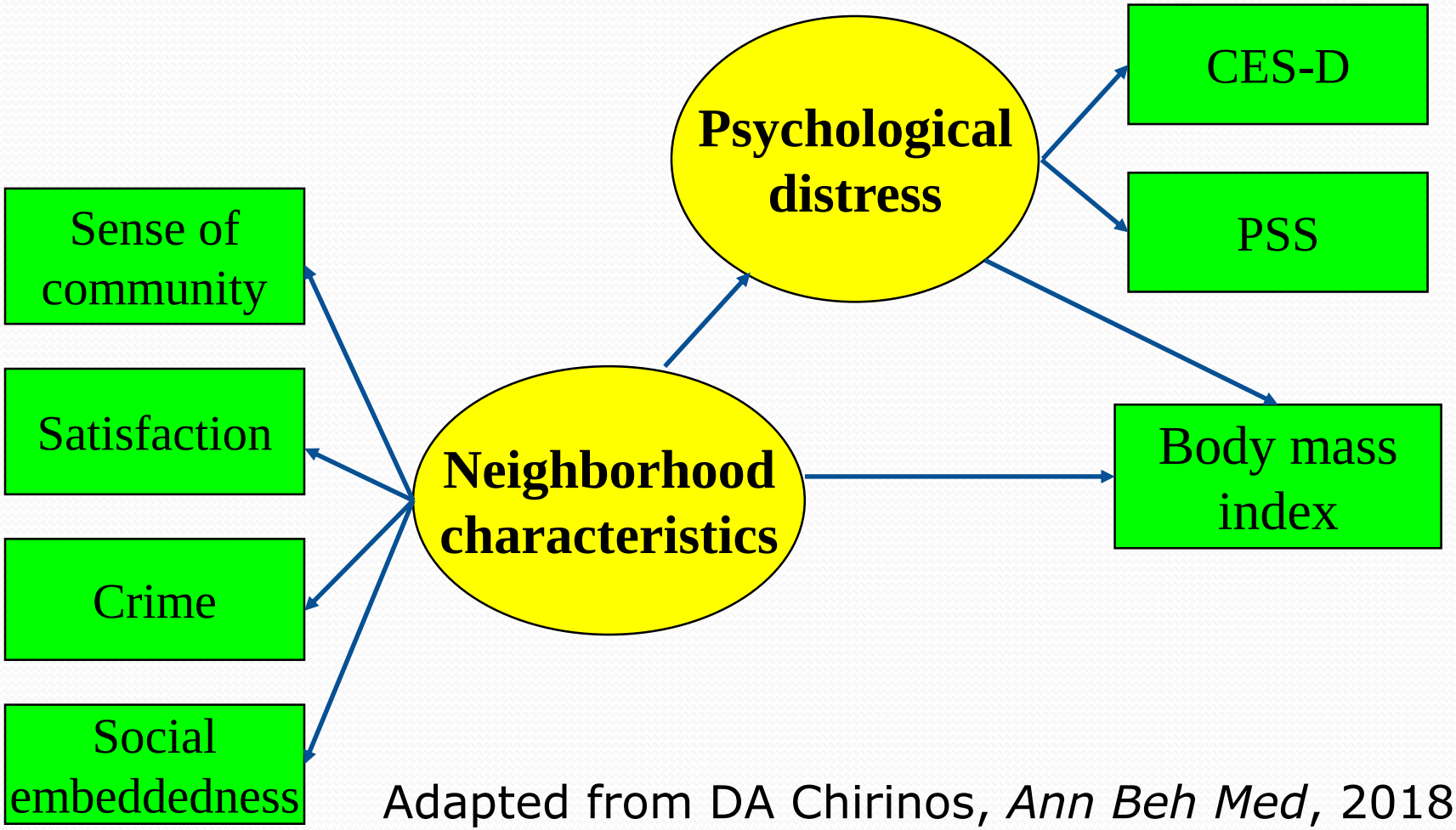
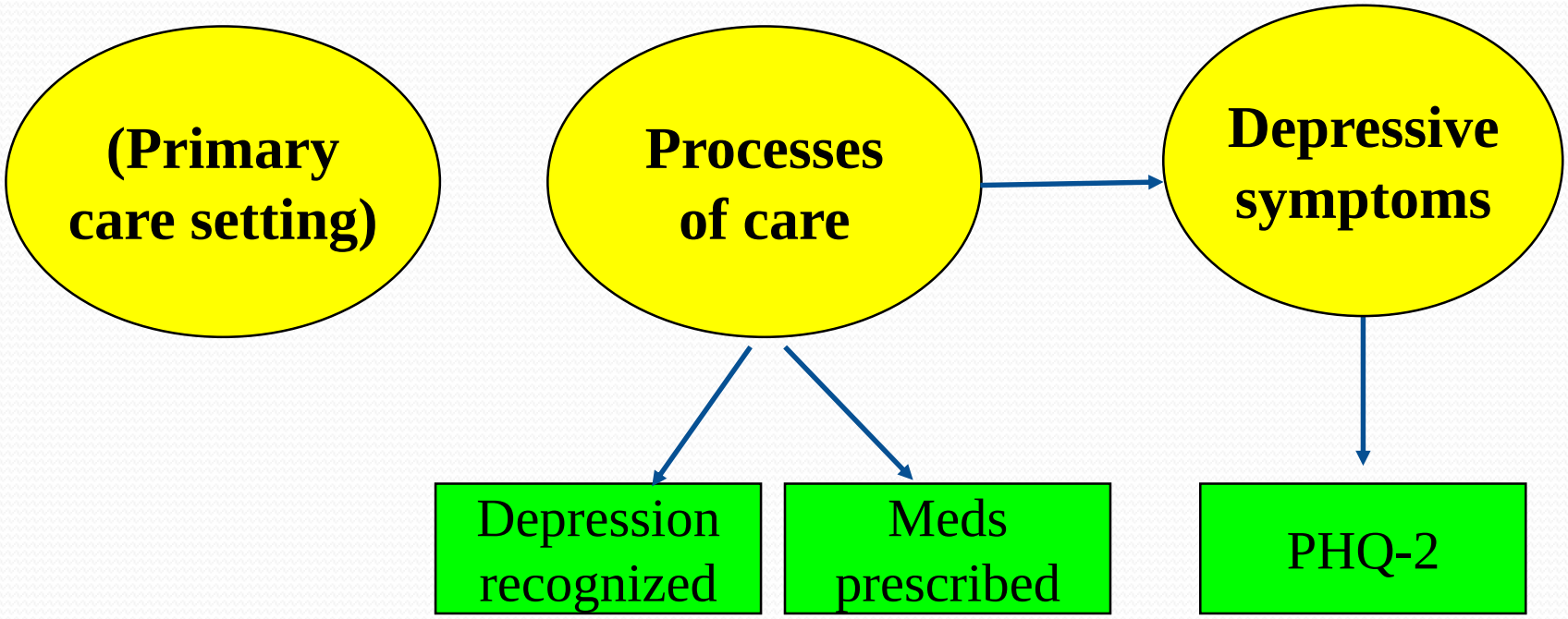


A More Realistic Example

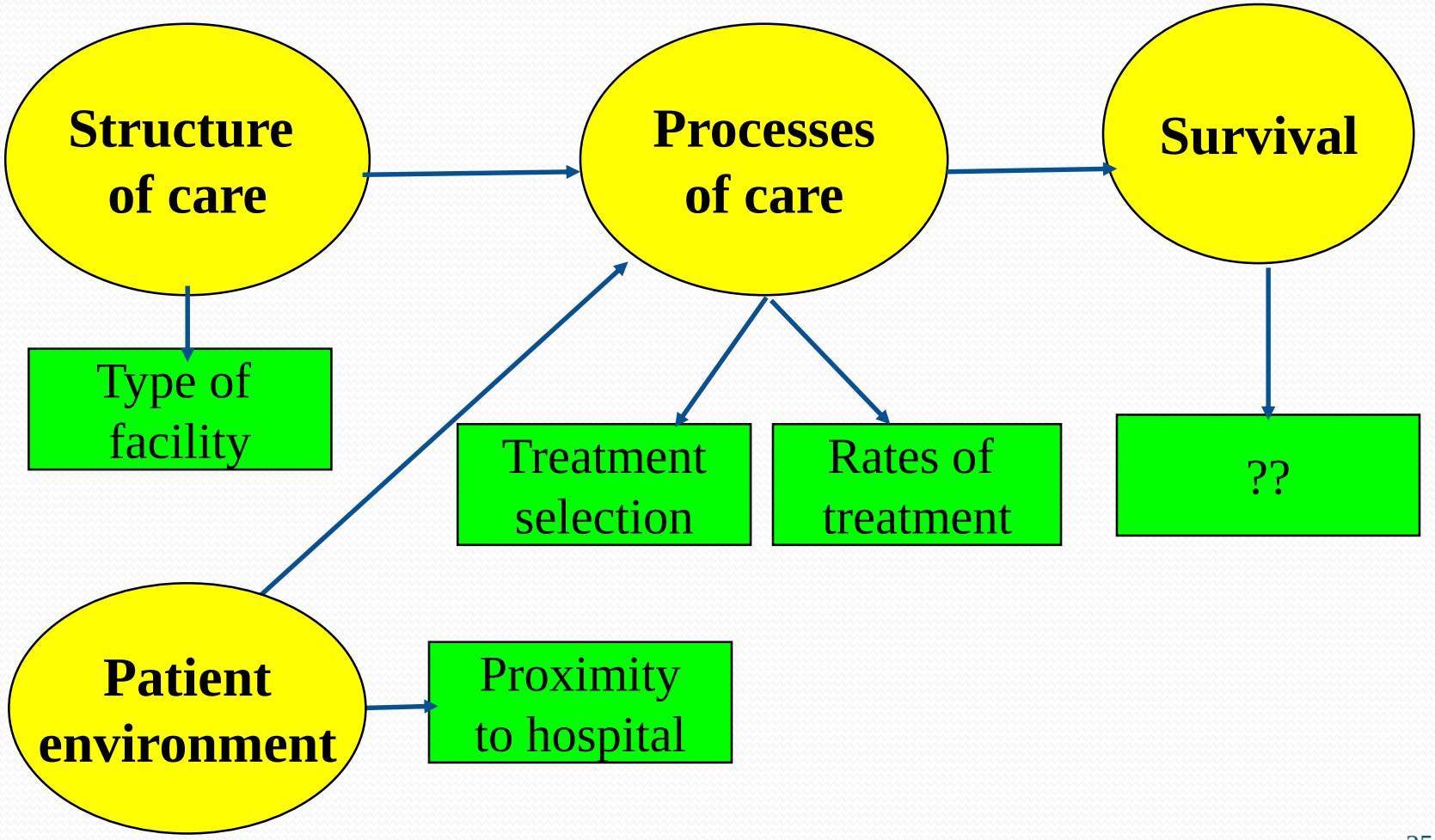


Adapted from DA Chirinos, *Ann Beh Med*, 2018 published online

Adapted from Maria Garcia's Framework



Adapted from Sam Washington's Framework



Bottom Line for Concepts

- Research questions stated in terms of concepts (latent variables)
- Ability to answer research questions depends on how well the measures reflect the concepts
- Defining concepts before selecting measures increases chance of observing true associations

Content of Measurement Lectures

- Importance of concepts
- Process of selecting measures
- Reviewing measures
  - Get to know the measure
  - Appropriateness
  - Conceptual and psychometric adequacy
  - Practicality

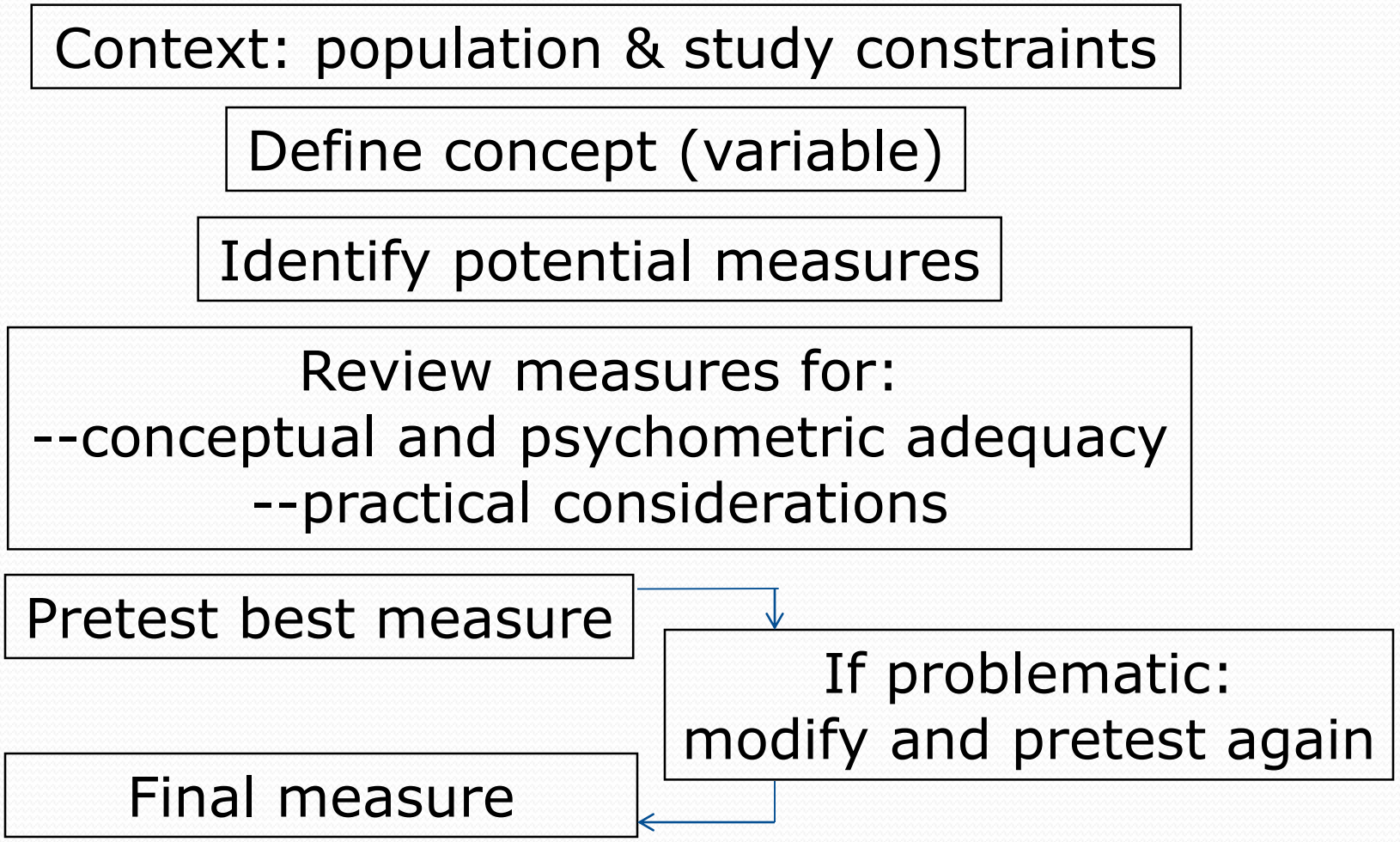
Part 1

Part 2

Content of Measurement Lectures

- Importance of concepts
  - Concepts vs. measures
- Process of selecting measures
- Reviewing measures
  - Scale names misleading
  - Conceptual adequacy
  - Psychometric adequacy

PROCESS of Selecting Measures for Your Studies



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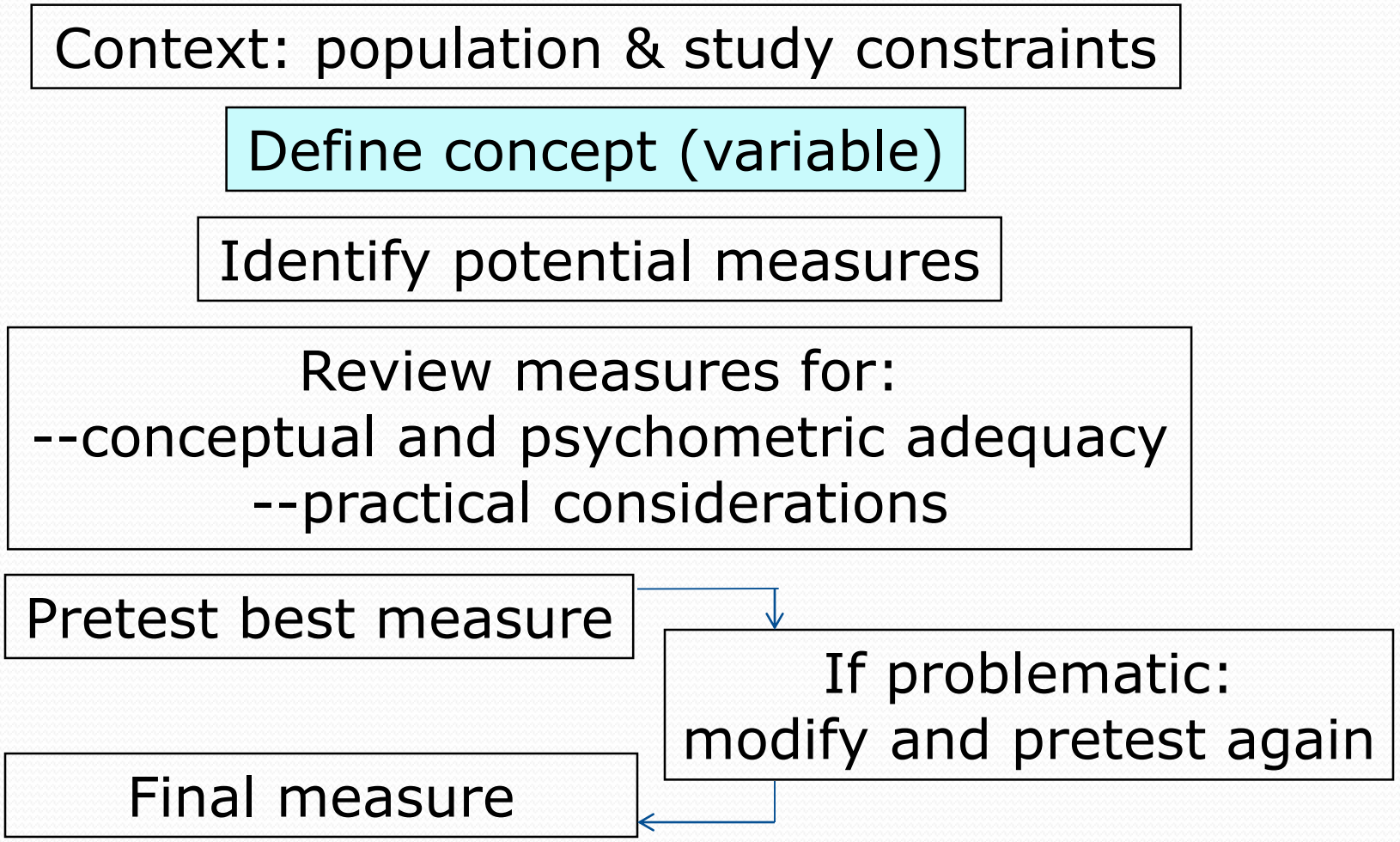
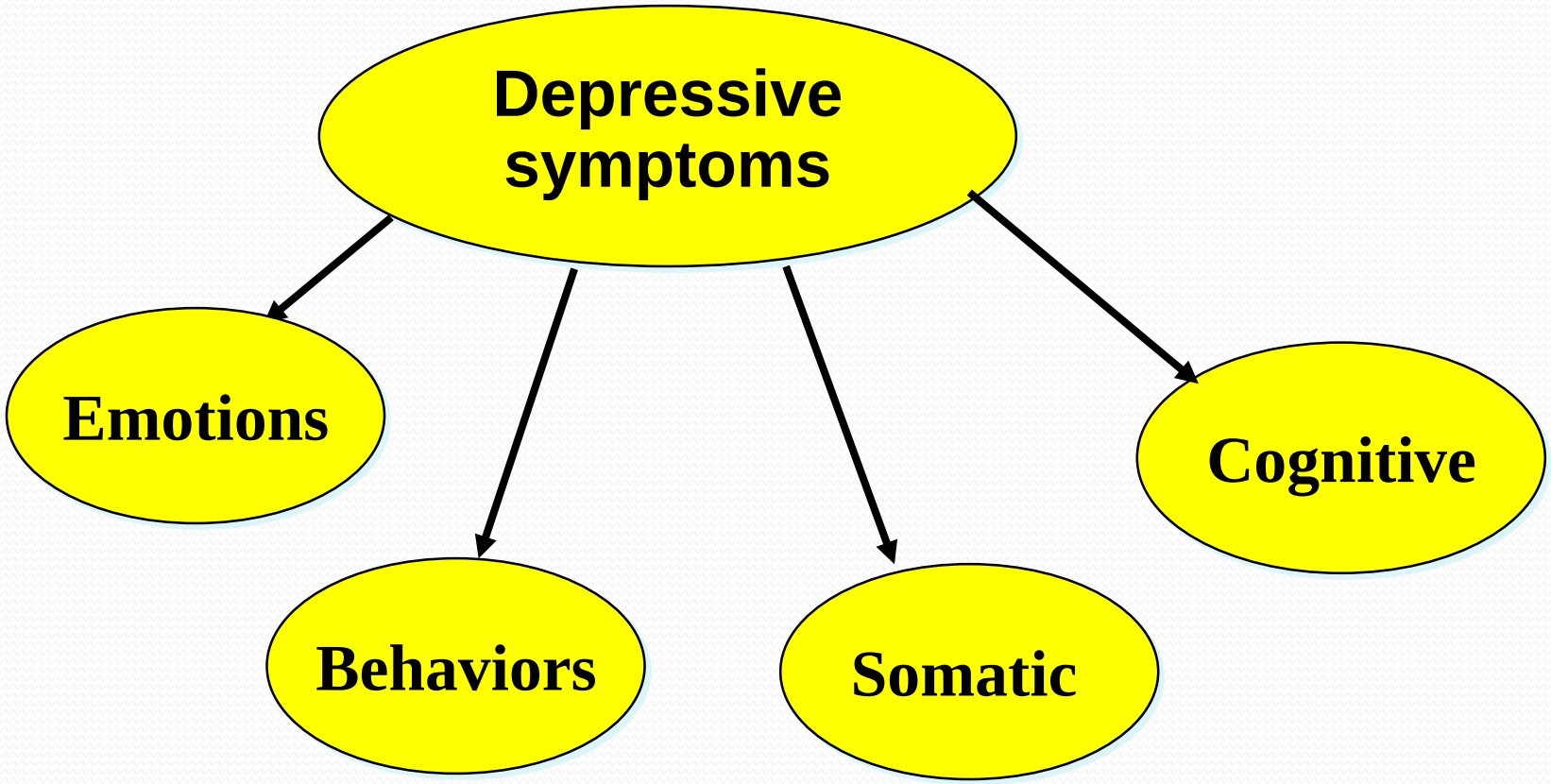


Defining Concept of Depression

- General (vs. clinical) depression
- Syndrome/collection of feelings, perceptions, somatic or bodily manifestations, and behaviors
  - Emotions: sadness, feeling blue, depressed
  - Somatic: insomnia, fatigue, loss of appetite
  - Behaviors: social withdrawal
  - Cognitive: sense of failure, little interest

Concept of Depression or Depressive Symptoms



Concept Well Defined…

- Once you are satisfied with a concept definition for your study…
- Proceed through process to identify and review measures of that concept
- Result: the best measure for your study

What if you Cannot Choose Your Measure?

- Secondary datasets: measures already included
- Task is reversed: identify concept being measured by measures
  - Review items for content
  - Review factor structure (from literature)

Depression Concept Reflected by Items in Four Measures

	CES-D 20	Hamilton 21	Beck 21	PHQ-9 9
Personal behavior -sleep problems, substance abuse	3	3	4	1
Social behavior -cut down work, withdraw	1	1	0	1
Somatic symptoms -fatigue, low libido, poor appetite	2	8	5	3
Emotions/affect -depressed mood, lonely, hopeless	9	3	4	1
Cognitions/perceptions -sense of failure, little interest in things	5	6	8	3

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PROCESS of Selecting Measures for Your Studies

Describe context: population & study constraints

Define concept (variable)

Identify potential measures

Review measures for:
--conceptual and psychometric adequacy
--practical considerations

Pretest best measure

If problematic:
modify and pretest again

Final measure

Identify Potential Measures

- Identify candidate measures
- Multi-item measures with known psychometric properties
- Most good measures published
  - Original publication
  - Numerous applications
- DO NOT develop your own questions unless absolutely necessary

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A Word about Multi-Item Measures

- Multi-item measures created by combining two or more items into a scale score
- Most survey measures are multi-item
- Advantages:
  - Increase richness of concept
  - More scale values (improves distribution)
  - Improves reliability

Multidimensional and Unidimensional "Multi-item" Measures

- Unidimensional "multi-item" measure
  - Combines items into one score

Example of Unidimensional Multi-item Measure

- Perceived Stress Scale (PSS) (14 items)
- Frequency of stressful experiences, e.g.,
  - Felt confident could handle life's problems
  - Able to control irritations in your life
  - Difficulties piling up so high, could not overcome them
- Single score combining all items

Cohen S et al., *J Health Soc Behav* 24:385-396, 1983

2nd Example of Unidimensional Multi-item Measure

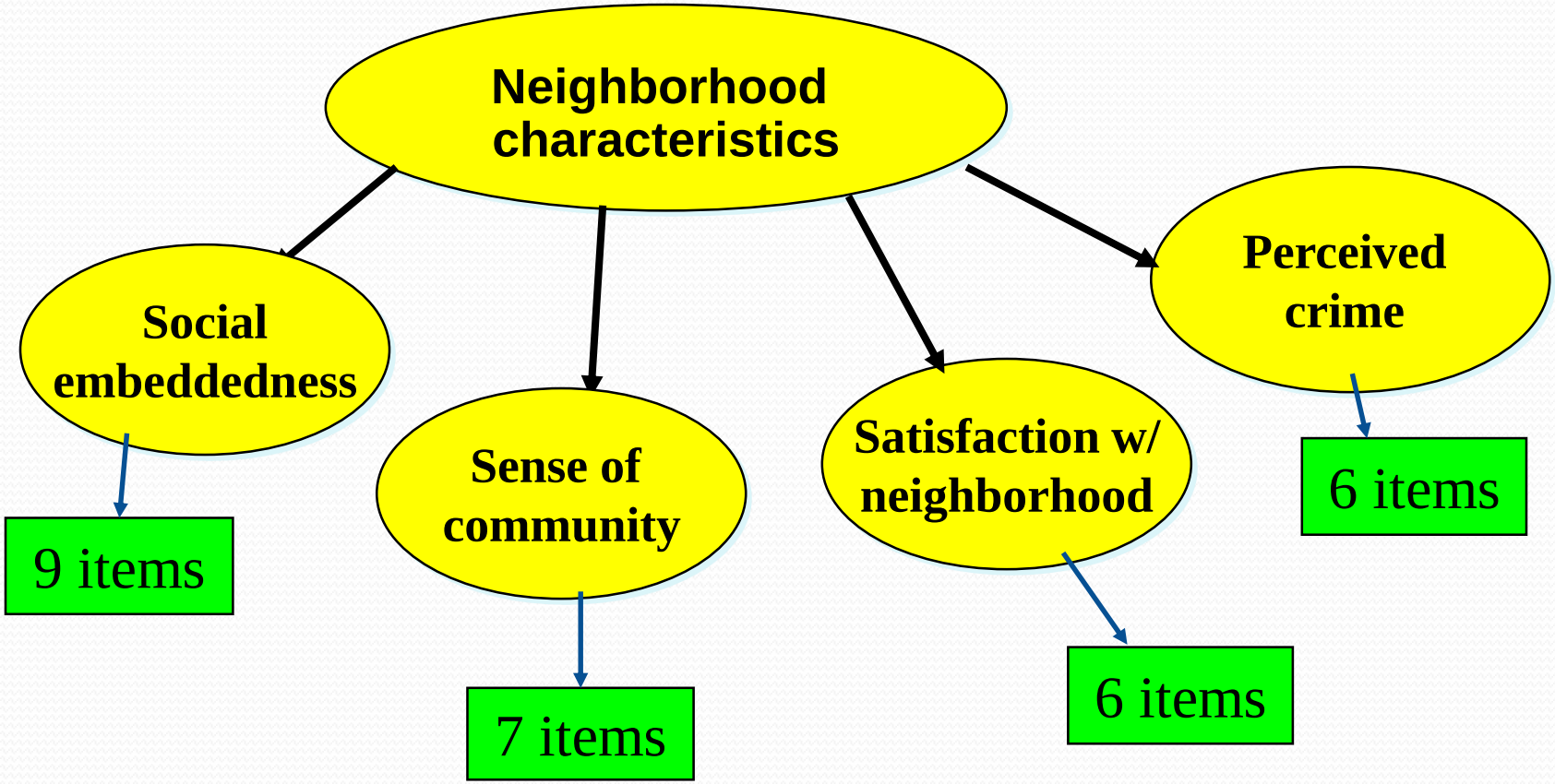
- Center for Epidemiological Studies Depression Scale (CES-D) (20 items)
- Frequency of symptoms, e.g.,
  - Felt depressed, felt lonely
  - Enjoyed life, happy
  - Could not get going
- Single score combining all items

LS Radloff, *Appl Psychol Meas*, 1977;1:388

Multidimensional and Unidimensional "Multi-item" Measures

- Unidimensional "multi-item" measure
  - Combine items into one score
- Multidimensional "multi-item" measure
  - Items combined into several domains or subscales
  - May or may not be an overall score

Example of Multi-dimensional Multi-item Measure



Martinez et al., Factorial structure of the perceived neighborhood scale (PNS) *J Commun Psychol*. 2002;30:23-43

Scale Construction Methods

- Dimensionality must be empirically tested
- To create a multi-item scale requires applying a scale construction approach
  - Multitrait scaling, factor analysis help identify dimensions

Sources of Potential Measures

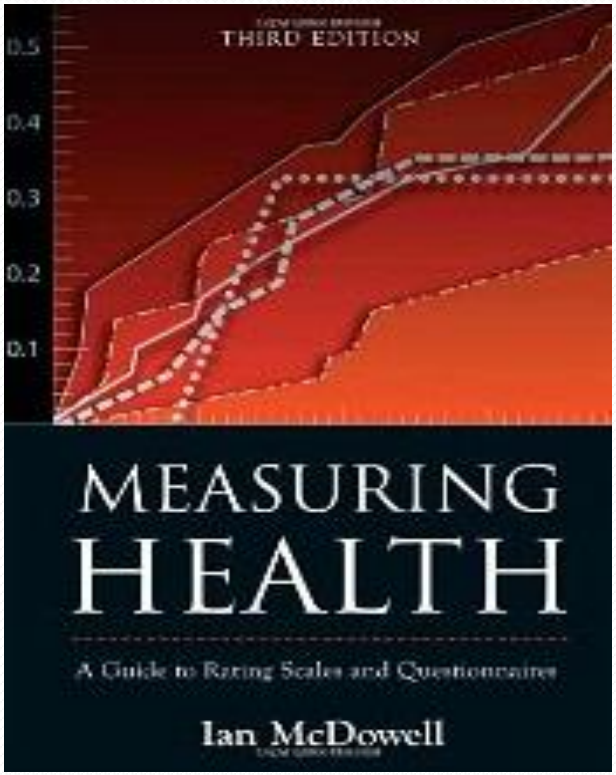
- Reviews of measures
  - Compendia
  - Literature reviews
- Web, various databases
- Organizations and research centers
- Government agencies
  - National and state surveys
  - NIH
- Universities and individual researchers

CADC Website – Analysis Core Section

- Summarizes these and other sources of measures
- Includes descriptions and weblinks

https://cadc.ucsf.edu/locating-measures

Best Compendium: Reviews Measures of Various Domains



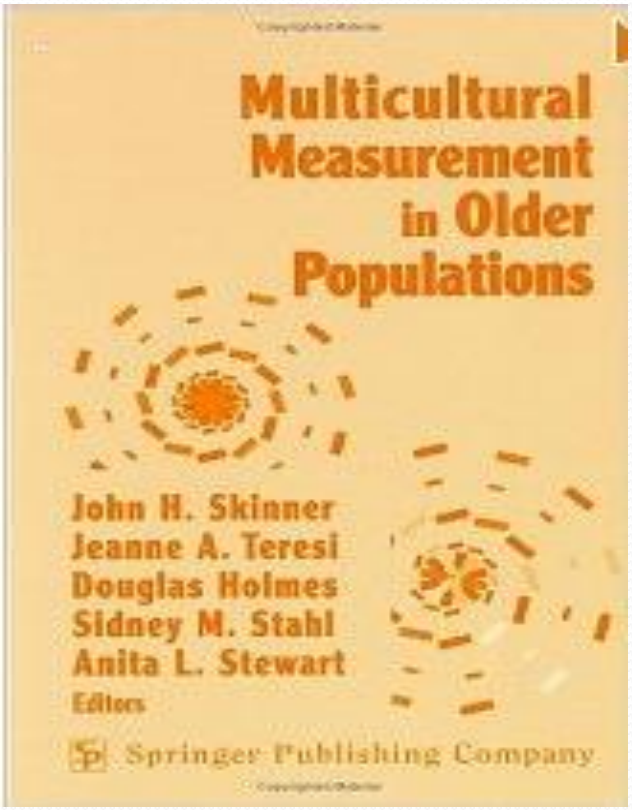
- Physical disability
- Social health
- Psychological well-being
- Anxiety, depression
- Mental status
- Pain
- General health status
- Quality of life

McDowell I, 2006, Third Edition, New York: Oxford University Press, 2006.

Resource: Reviews Measures for Diverse Populations (2002)

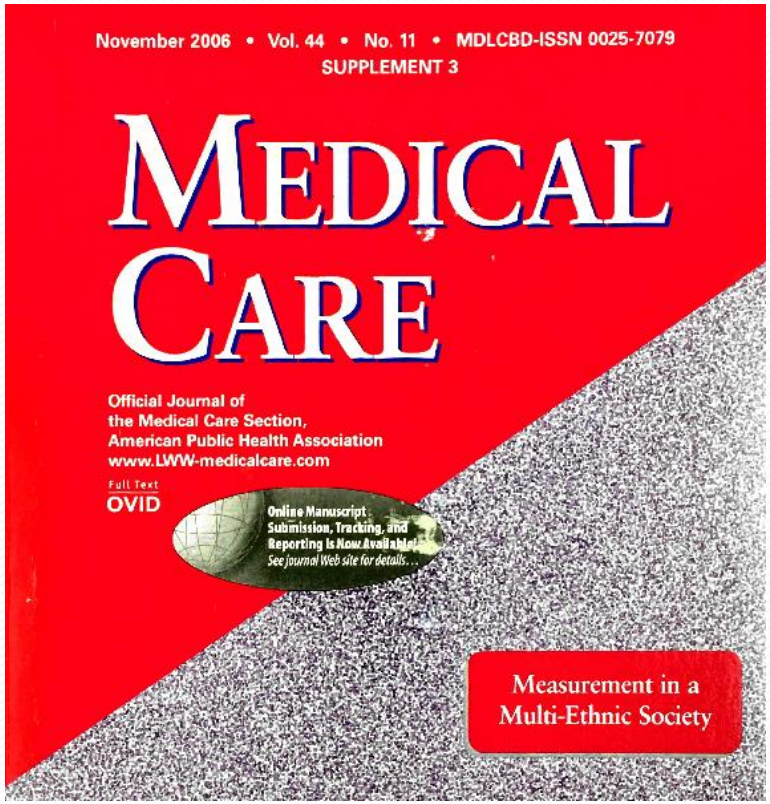
Measures that have been used cross-culturally:

- Acculturation
- Socioeconomic status
- Social support
- Cognition
- Health
- Depression
- Religiosity



Skinner JH et al. (eds), New York: Springer Publishing Company, 2002.

Special Issue on Measurement in Health Disparities Research (2006)



- Product of RCMARs
- Result of CADC-sponsored workshop in 2001
- Qualitative and quantitative methods
- Classical test theory and item response theory (IRT)
- Item banking and Computer Adapted Testing (CAT)

NIH Assessment Center℠

- An online data collection tool that enables researchers to create study-specific websites for capturing participant data securely online
- Access to measures such as:
  - PROMIS, Neuro-QOL, NIH Toolbox
  - Various profiles and short forms
  - Computer Adapted Testing (CAT)

https://www.assessmentcenter.net/

To Find Measures…

- Obtain a copy of the questionnaire or instrument
- Be sure you have original from author

CONTINUE WITH PART TWO

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- Process of selecting measures

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