

Toward common ground in the measurement of individual and population health

**Ethical Issues in the Measurement of Health
and the Global Burden of Disease**

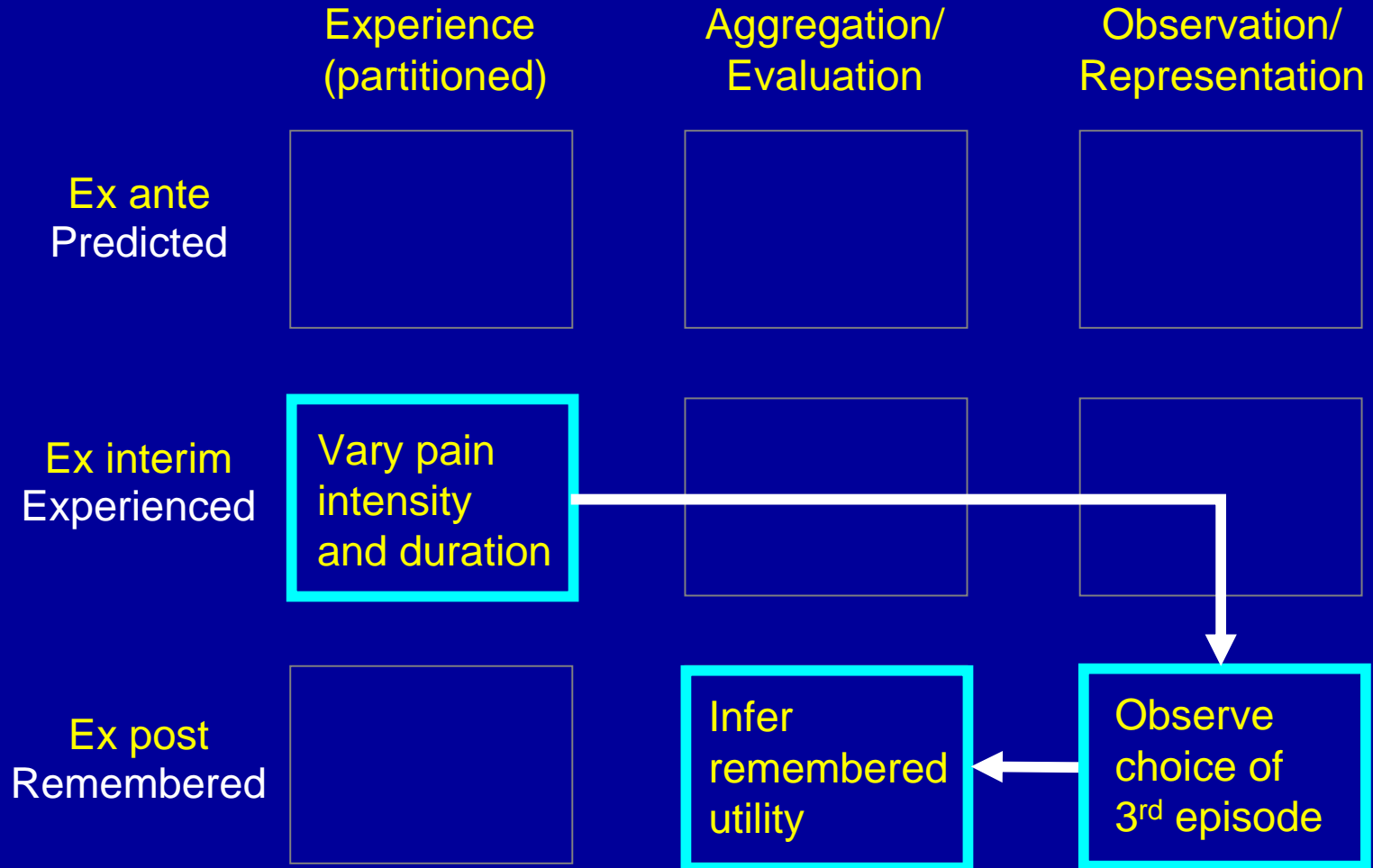
April 25, 2008

Joshua A Salomon

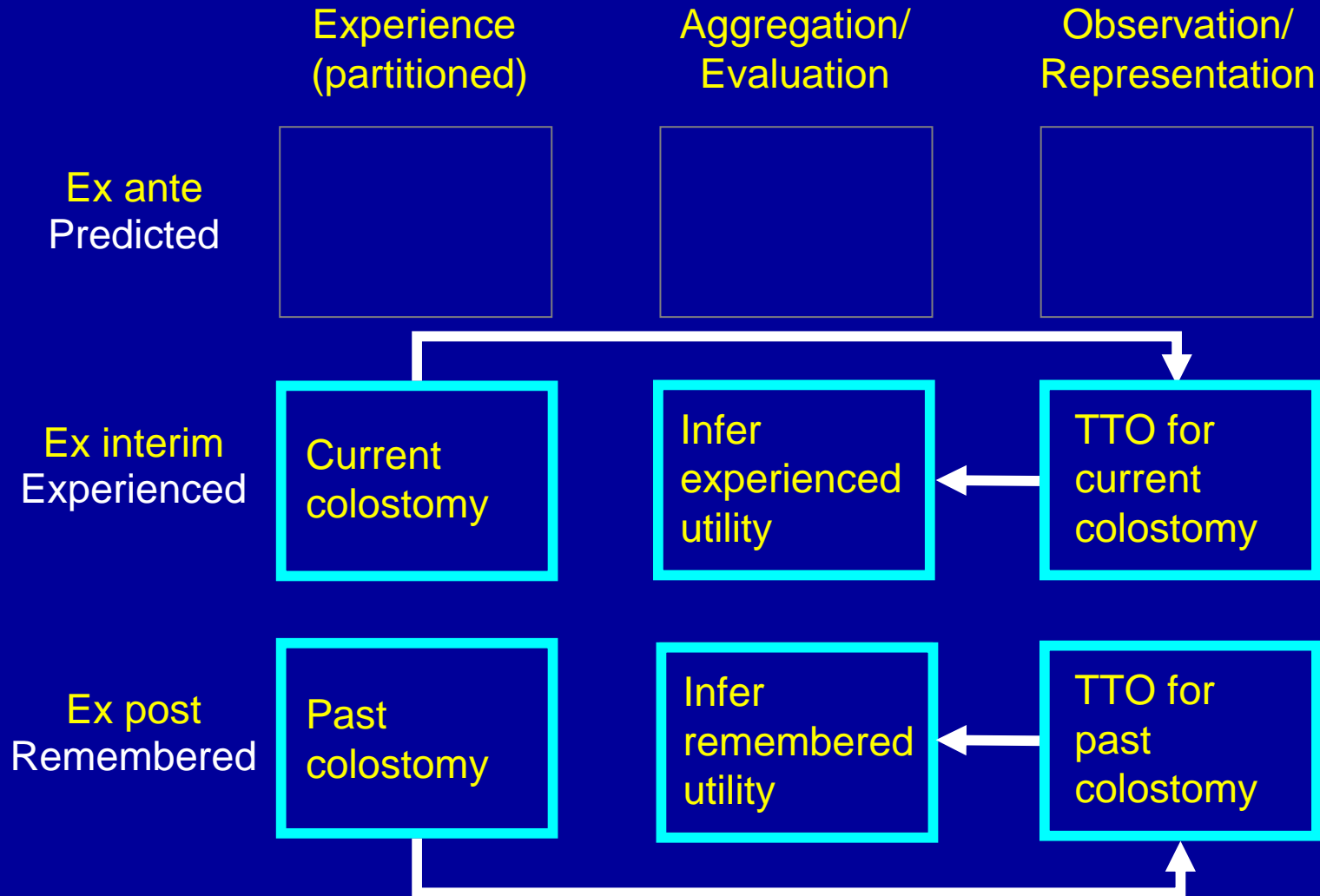


	Experience (partitioned)	Aggregation/ Evaluation	Observation/ Representation
Ex ante Predicted			
Ex interim Experienced			
Ex post Remembered			

Cold water experiment



Memories of colostomy



- Daniel Kahneman's theme:
Multidimensionality of well-being and utility
- Proposition:
Measurement of the global burden of disease concerns health rather than well-being or utility
- Questions:
Is it possible to quantify health?
Does a focus on health rather than well-being ameliorate any of the dilemmas of multidimensionality?

- Well-being and health
- Dilemmas in health measurement
 - Whose perspective?
 - How to elicit overall aggregate measures?
 - Possibility of generalization or standardization?

Well-being and health

- Dilemmas in health measurement
 - Whose perspective?
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Burden of disease as a measure of health

- “Is healthier than...” – incomplete ordering? (Hausman)
 - Health comprises levels on various domains

Domains of health and well-being

Motor function

Dexterity

Affect (mood, emotion)

Cognition

Vision

Hearing

Pain

Breathing

Sexual functioning

Speaking

Sleep

Accomplishment

Enjoyment

Spirituality

Deep personal relationships

Understanding of the world

Human dignity

Living conditions

Command over resources

Health \equiv well-being (?)

- “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”
 - WHO constitution (1947)

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Health \equiv naked physiology (?)

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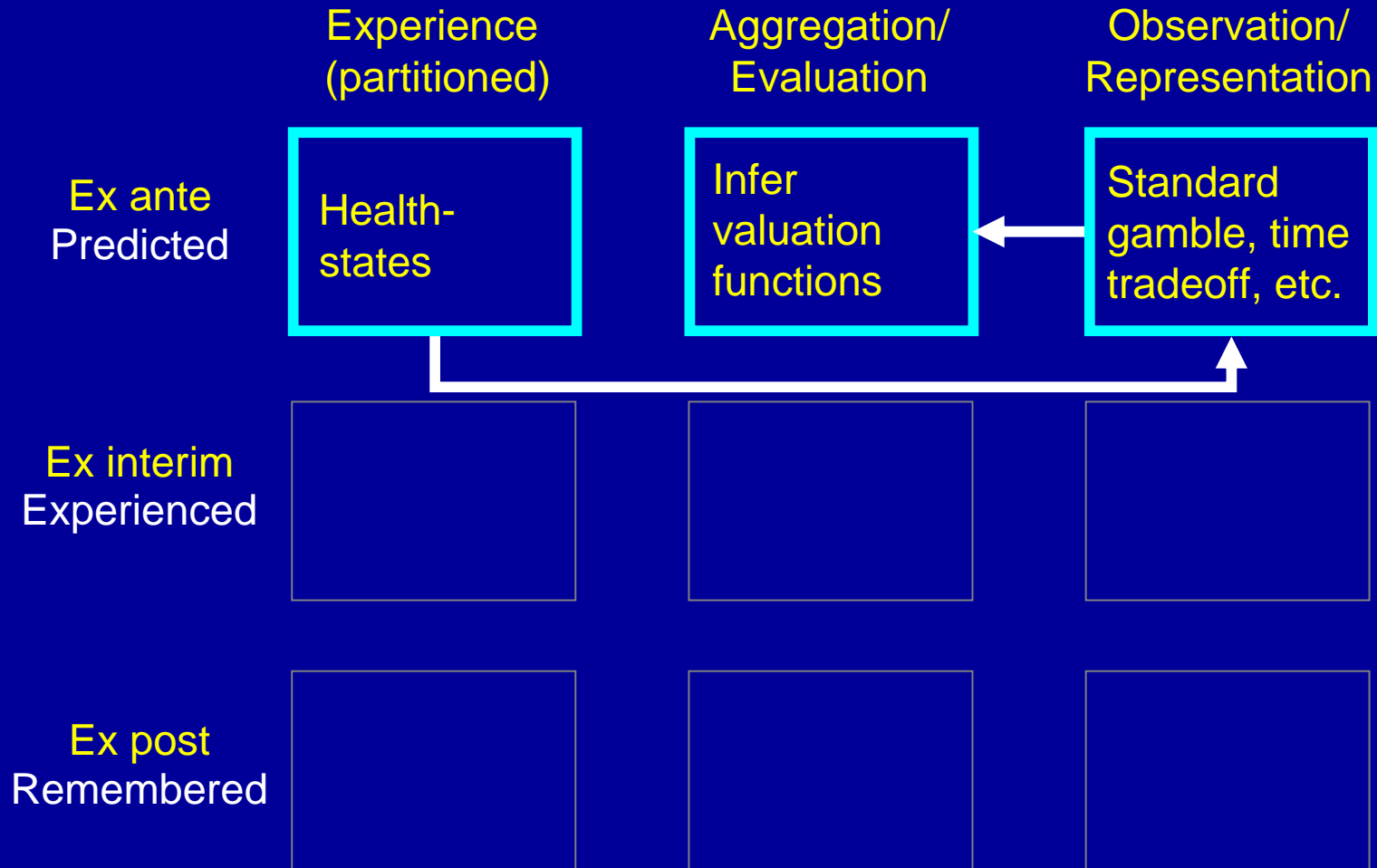
Many measurement strategies include subset of domains at different levels

Burden of disease as a measure of health

- “Is healthier than...” – incomplete ordering? (Hausman)
 - Health comprises levels on various domains
 - An improvement in any domain, *all else equal*, cannot make a person less healthy (weak monotonicity)
 - Dead represents an absolute zero on the health scale
- Additivity over time
 - Has pragmatic appeal for combining premature mortality with non-fatal health decrements
 - May be more intuitively plausible for health than for well-being?
 - Remains the default for computing DALYs (or QALYs) as the integral of ‘snapshot’ valuations of health states

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Multi-attribute health valuation



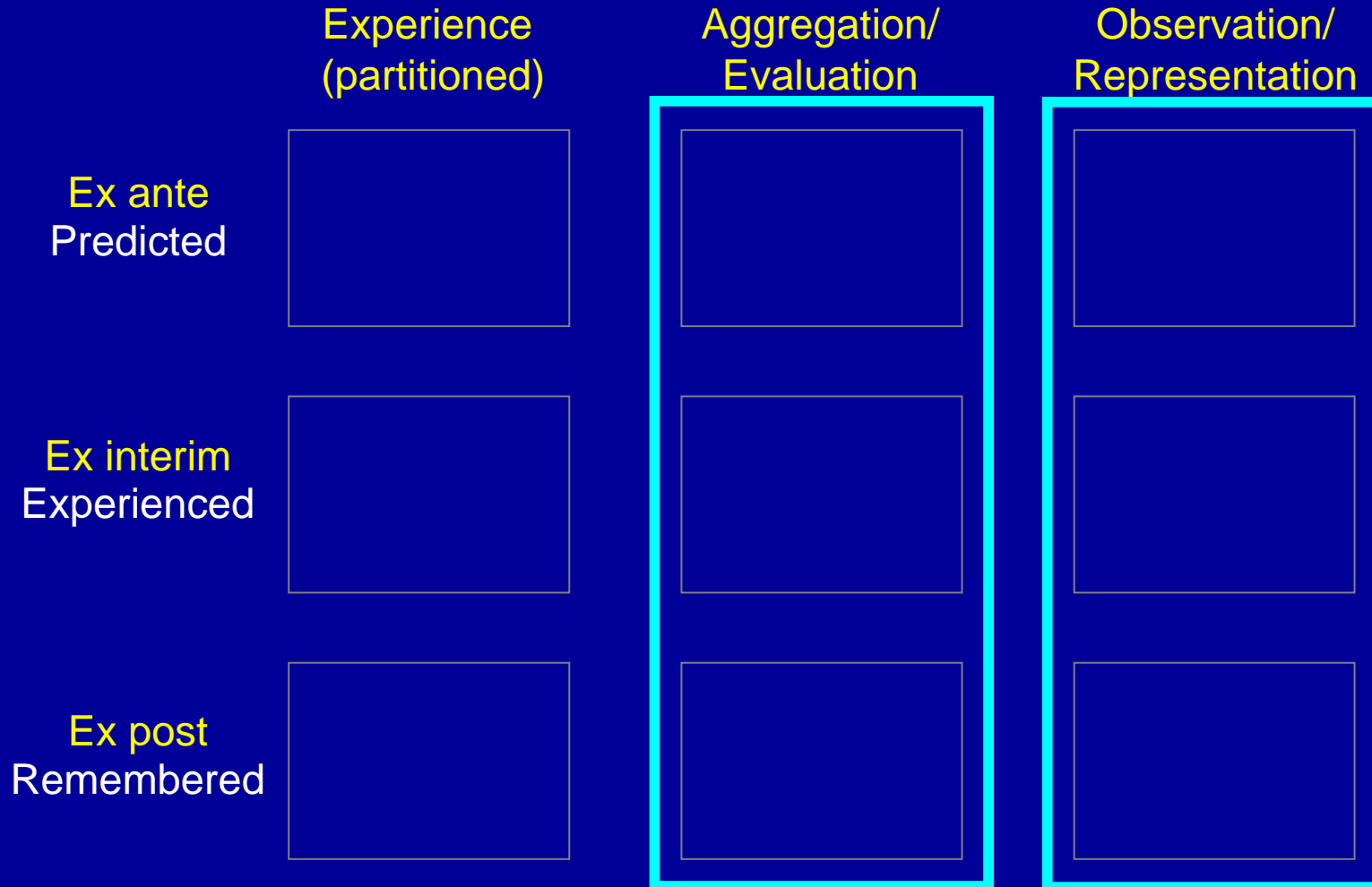
Dilemmas in health measurement:

1. Whose perspective?

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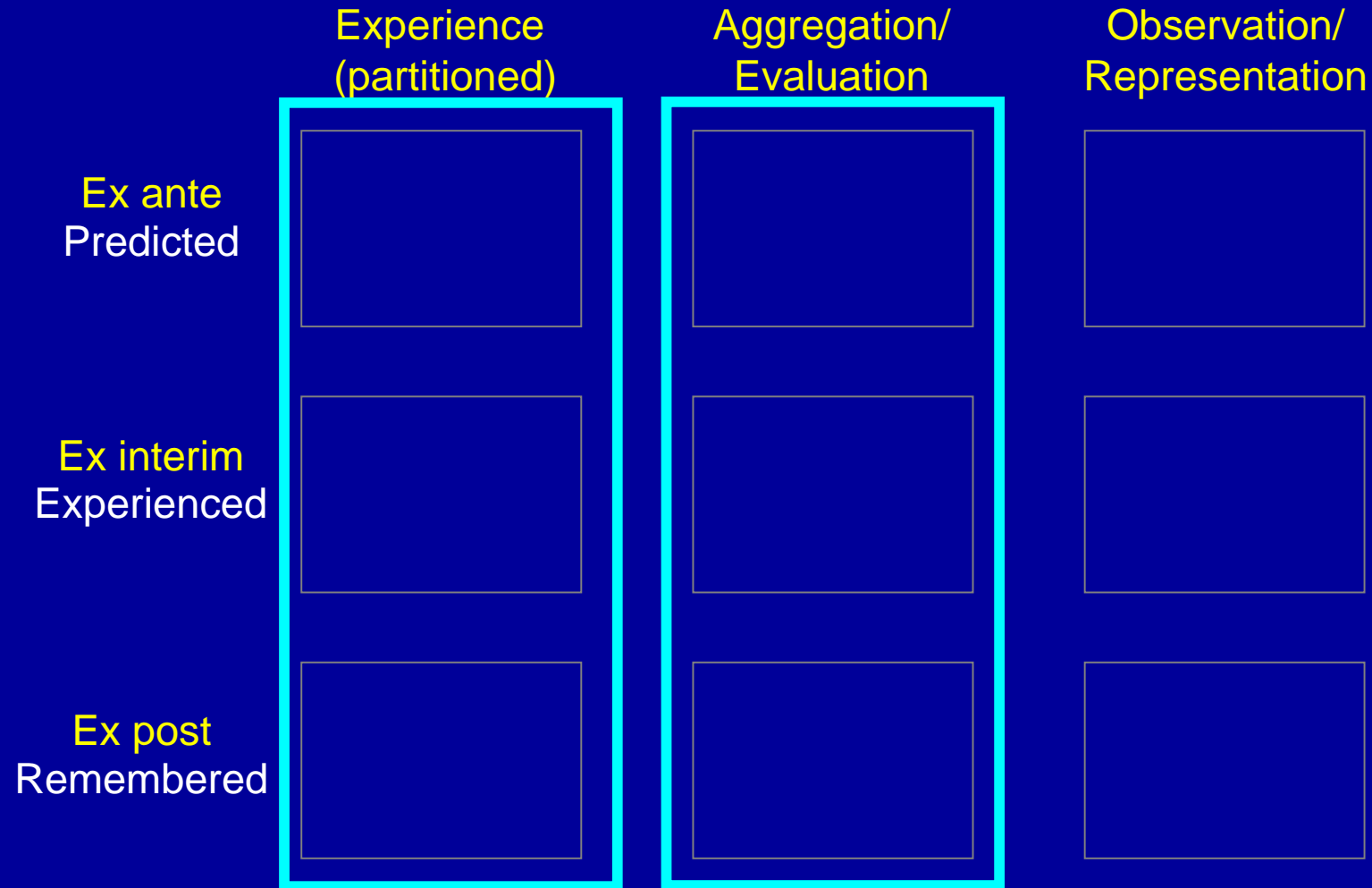
Dilemmas in health measurement:

2. How to elicit overall aggregate measures?



Dilemmas in health measurement:

3. Possibility of generalization or standardization?



- Well-being and health
- Dilemmas in health measurement
 - ➔ Whose perspective?
 - How to elicit overall aggregate measures?
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Elements of adaptation

(Menzel et al 2002)

	Include?
Cognitive denial	X
Suppressed recognition of full health	X
Lowered expectations	X
Heightened stoicism	?
Skill enhancement	✓
Activity adjustment	✓
Substantive goal adjustment	✓
Altered conceptions of health	✓

Elements of adaptation

(Menzel et al 2002)

	Include?	
Cognitive denial	X	Changes evaluation of levels on specific domains
Suppressed recognition of full health	X	
Lowered expectations	X	
Heightened stoicism	?	
Skill enhancement	✓	
Activity adjustment	✓	
Substantive goal adjustment	✓	
Altered conceptions of health	✓	

Elements of adaptation

(Menzel et al 2002)

	Include?	
Cognitive denial	X	
Suppressed recognition of full health	X	
Lowered expectations	X	
Heightened stoicism	?	
Skill enhancement	✓	Changes health state
Activity adjustment	✓	
Substantive goal adjustment	✓	
Altered conceptions of health	✓	

Elements of adaptation

(Menzel et al 2002)

	Include?	
Cognitive denial	X	
Suppressed recognition of full health	X	
Lowered expectations	X	
Heightened stoicism	?	
Skill enhancement	✓	
Activity adjustment	✓	
Substantive goal adjustment	✓	Changes aggregation function
Altered conceptions of health	✓	

Elements of adaptation

(Menzel et al 2002)

	Include?
Cognitive denial	X
Suppressed recognition of full health	X
Lowered expectations	X
Heightened stoicism	?
Skill enhancement	✓ ✓ ✓
Activity adjustment	✓
Substantive goal adjustment	✓
Altered conceptions of health	✓

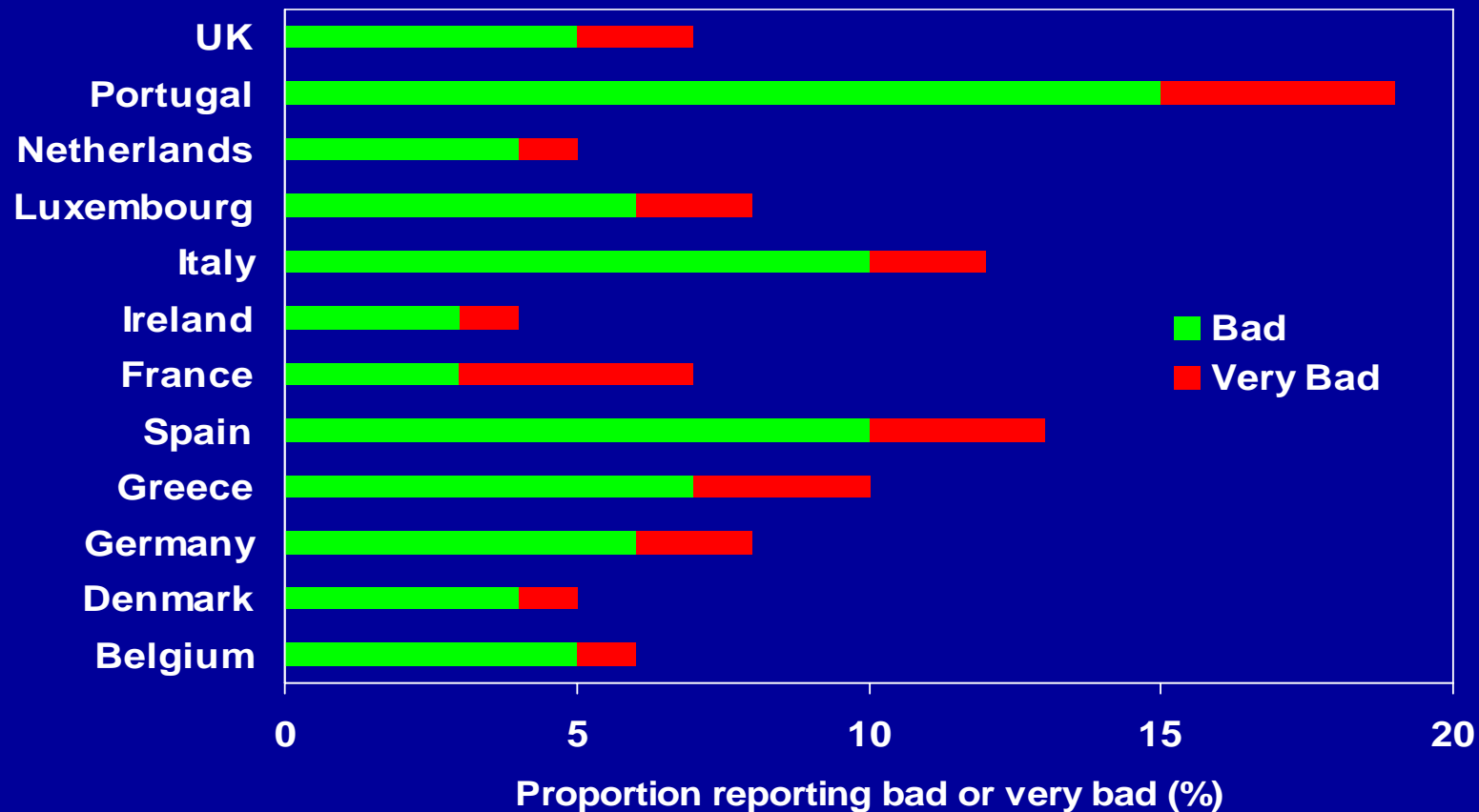
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Measurement challenge

- No gold standard instrument or natural physical units for quantifying overall health
- Everyday language for describing health lacks cardinality
- Cardinal elicitation techniques introduce other considerations and biases apart from overall assessments about health

Self-reported health in 12 OECD countries

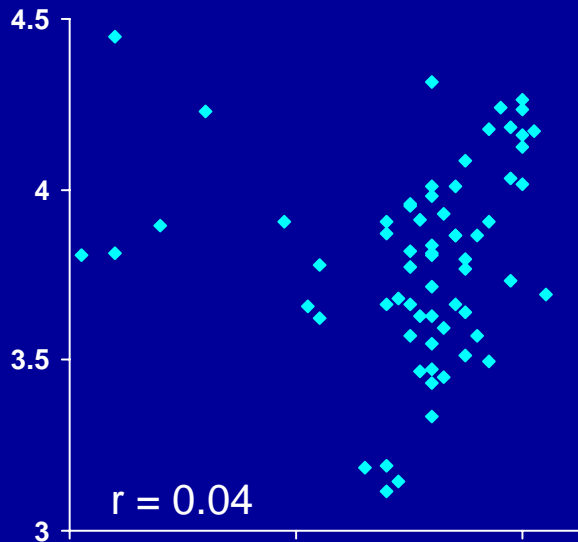
European Community Household Panel Surveys 1994



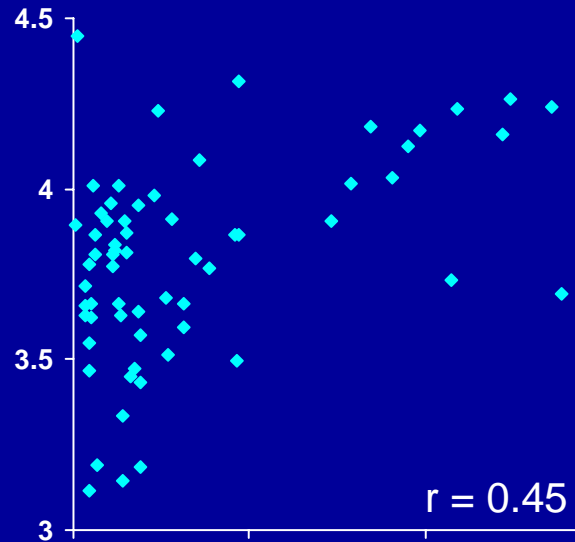
Correlates of SR health

World Values Surveys

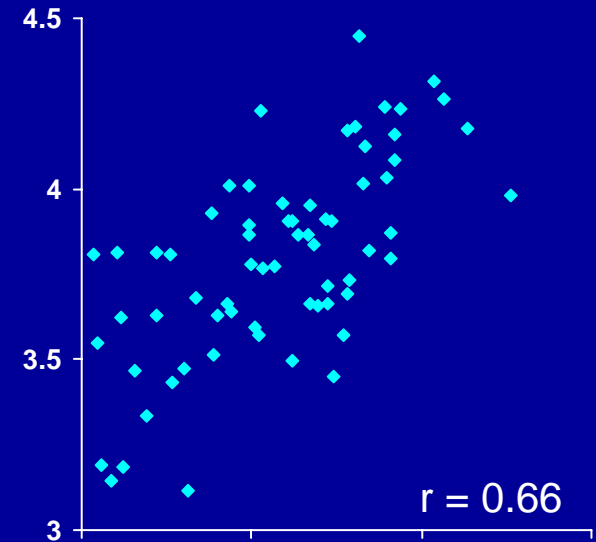
A



B



C



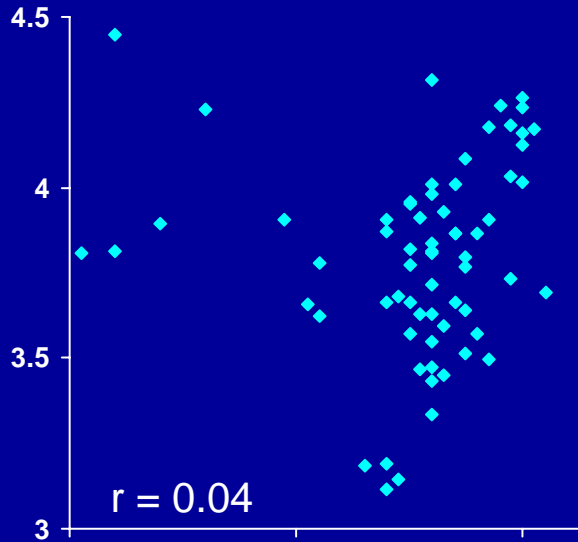
Which figure describes the association between SR health and

- (1) Life expectancy
- (2) Income per capita
- (3) Satisfaction with financial status

Correlates of SR health

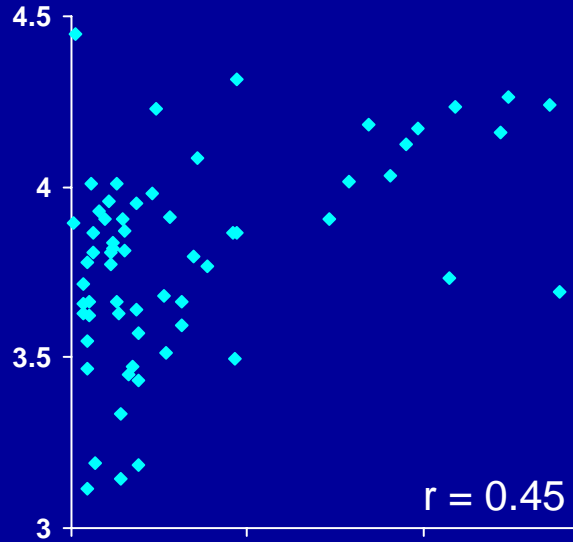
World Values Surveys

A



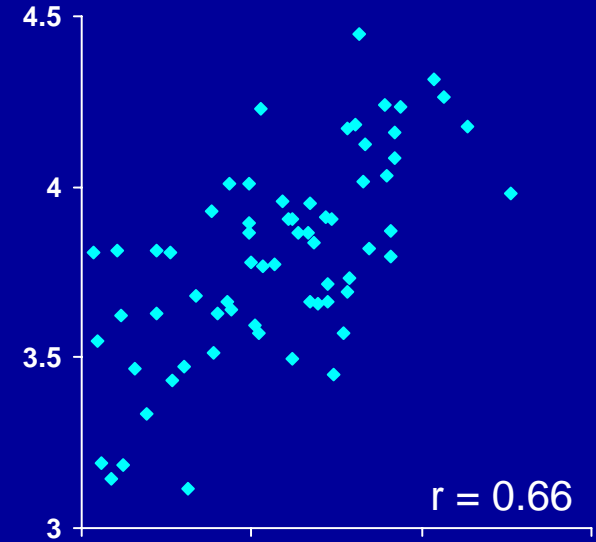
Life expectancy

B



Per capita GDP

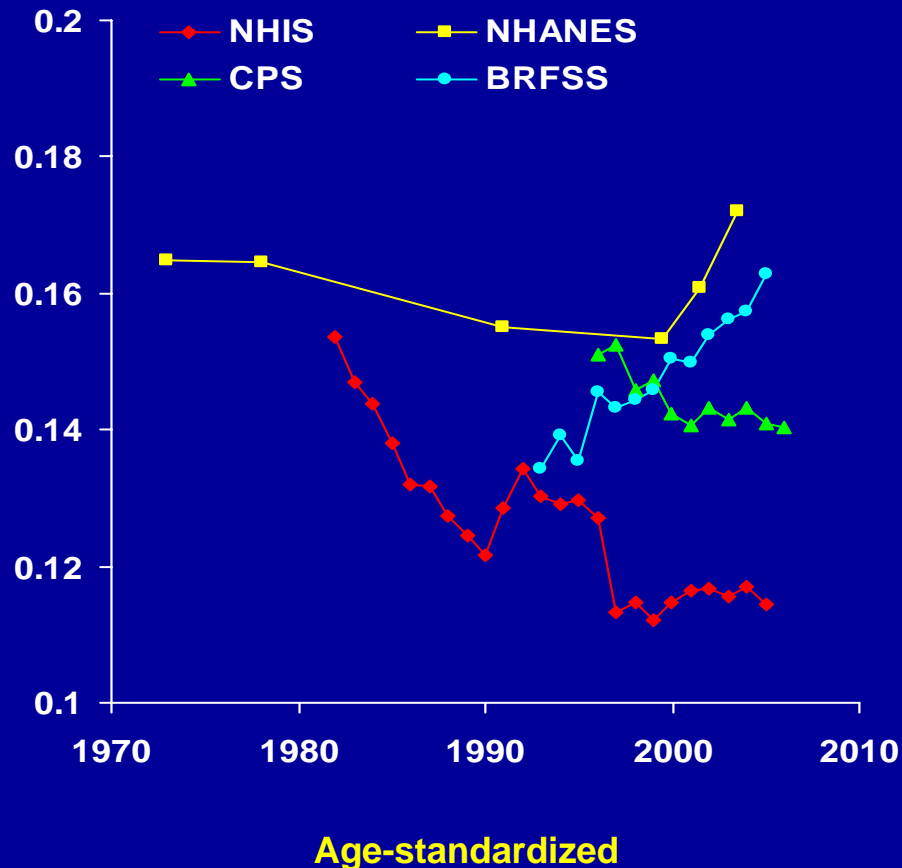
C



Financial satisfaction

Results: US trends in SRGH

Proportion rating fair or poor, males



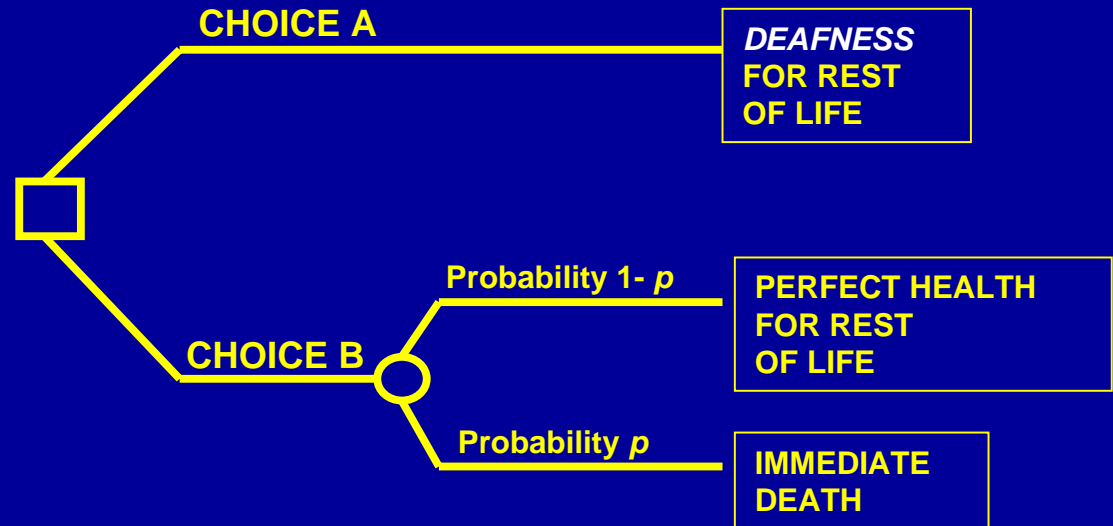
- Location of question within survey structure can change results (NHIS changed survey in 1997)
- Responses on the exact same question vary widely across different nationally representative sample surveys of the US population

Valuation methods

- Standard gamble
- Time tradeoff
- Person tradeoff
- Visual analog

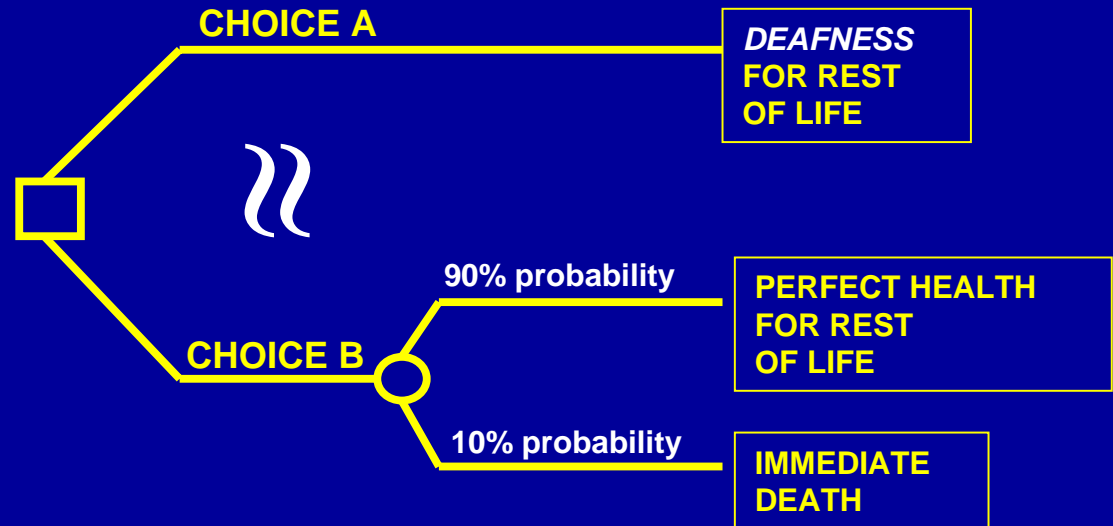
Valuation methods

- **Standard gamble**
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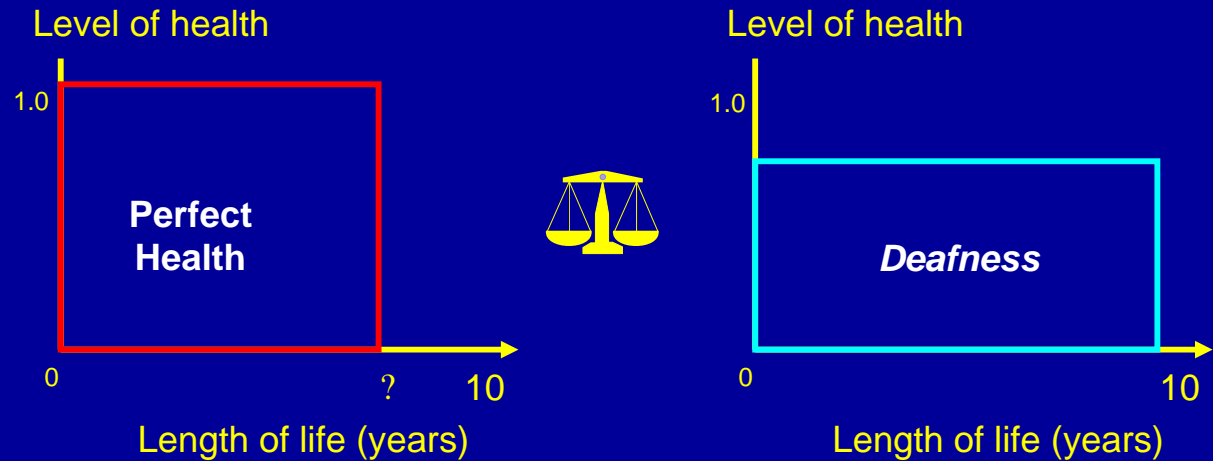
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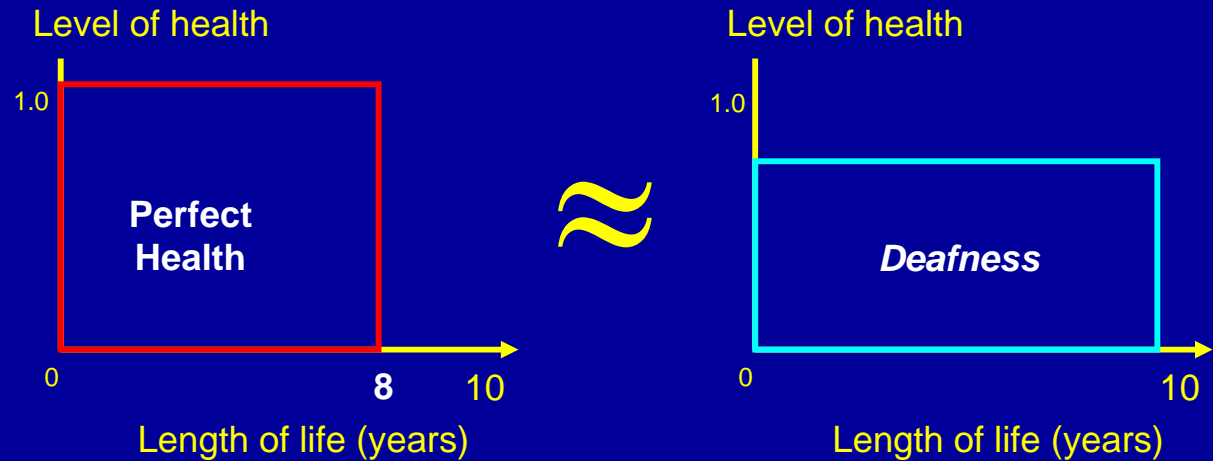
Valuation methods

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Valuation methods

- Standard gamble
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Valuation methods

- Standard gamble
- Time tradeoff
- **Person tradeoff**
- Visual analog

Intervention 1:
Prevent deaths in
100
healthy individuals



Intervention 2:
Prevent *deafness* in
?
healthy individuals

Valuation methods

- Standard gamble
- Time tradeoff
- **Person tradeoff**
- Visual analog

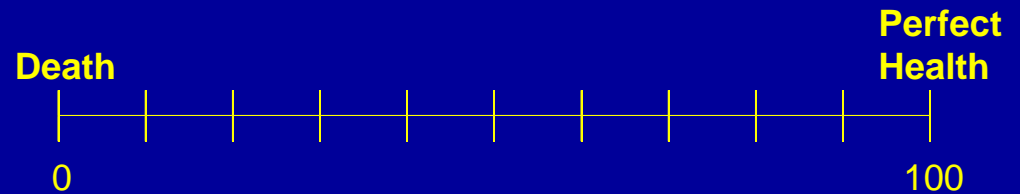
Intervention 1:
Prevent deaths in
100
healthy individuals



Intervention 2:
Prevent *deafness* in
2000
healthy individuals

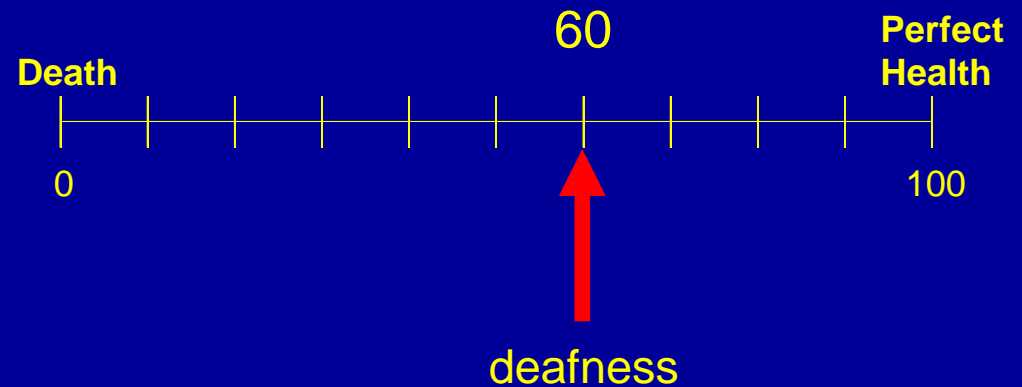
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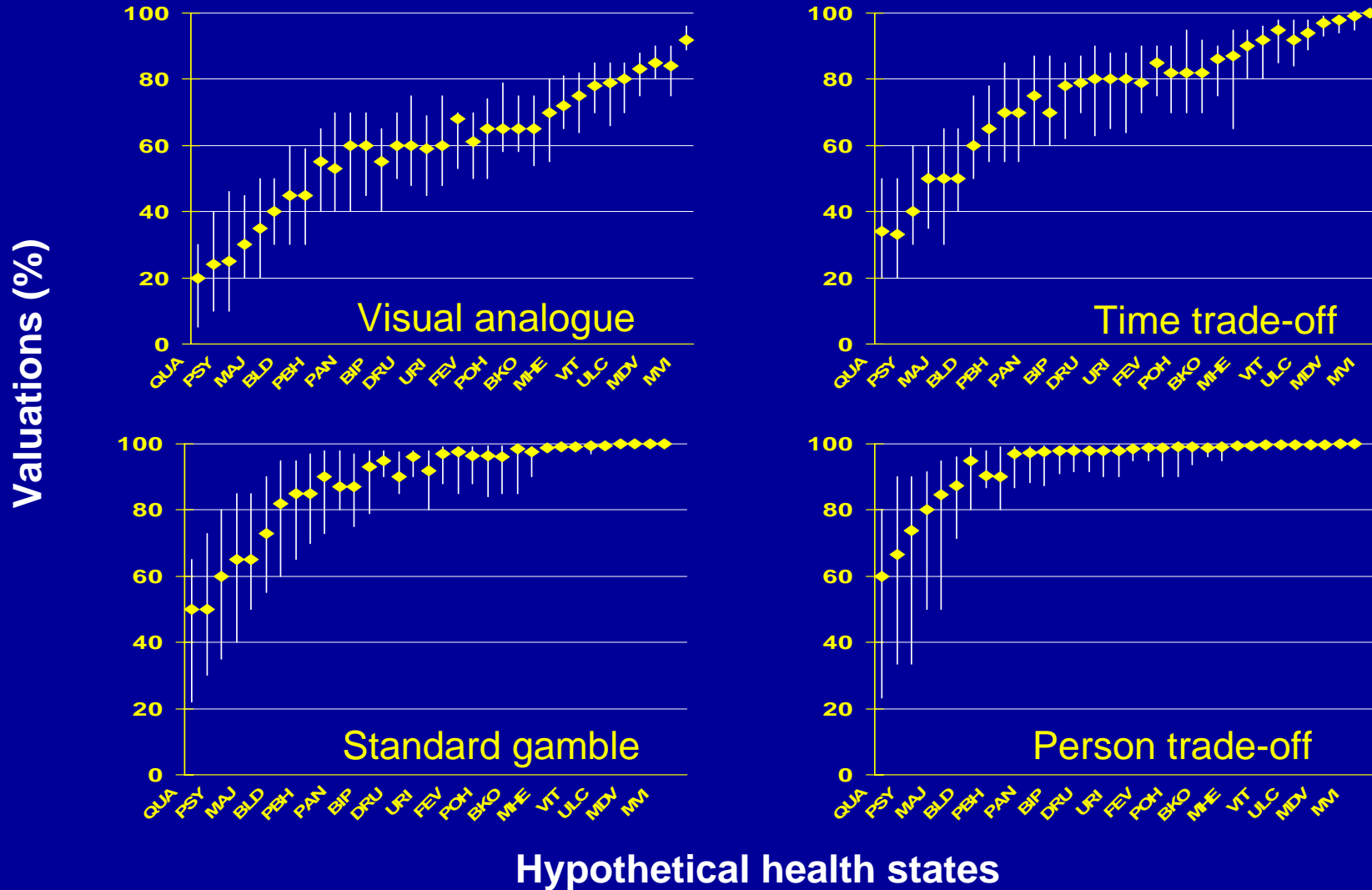


Valuation methods

- Standard gamble
- Time tradeoff
- Person tradeoff
- **Visual analog**



Comparison of methods, China



- Rank ordering highly consistent across methods
- Methods produce systematic cardinal differences

Proposition:

- All methods relate to common underlying construct (assessment of health)
- Systematic differences relate to differences in other values and biases invoked by each method:
 - SG – risk aversion
 - TTO – time preference and threshold effects
 - PTO – distributional concerns
 - VAS – scale distortions

Is it possible to elicit meaningful cardinal assessments of health without reference to probability, time, etc.?

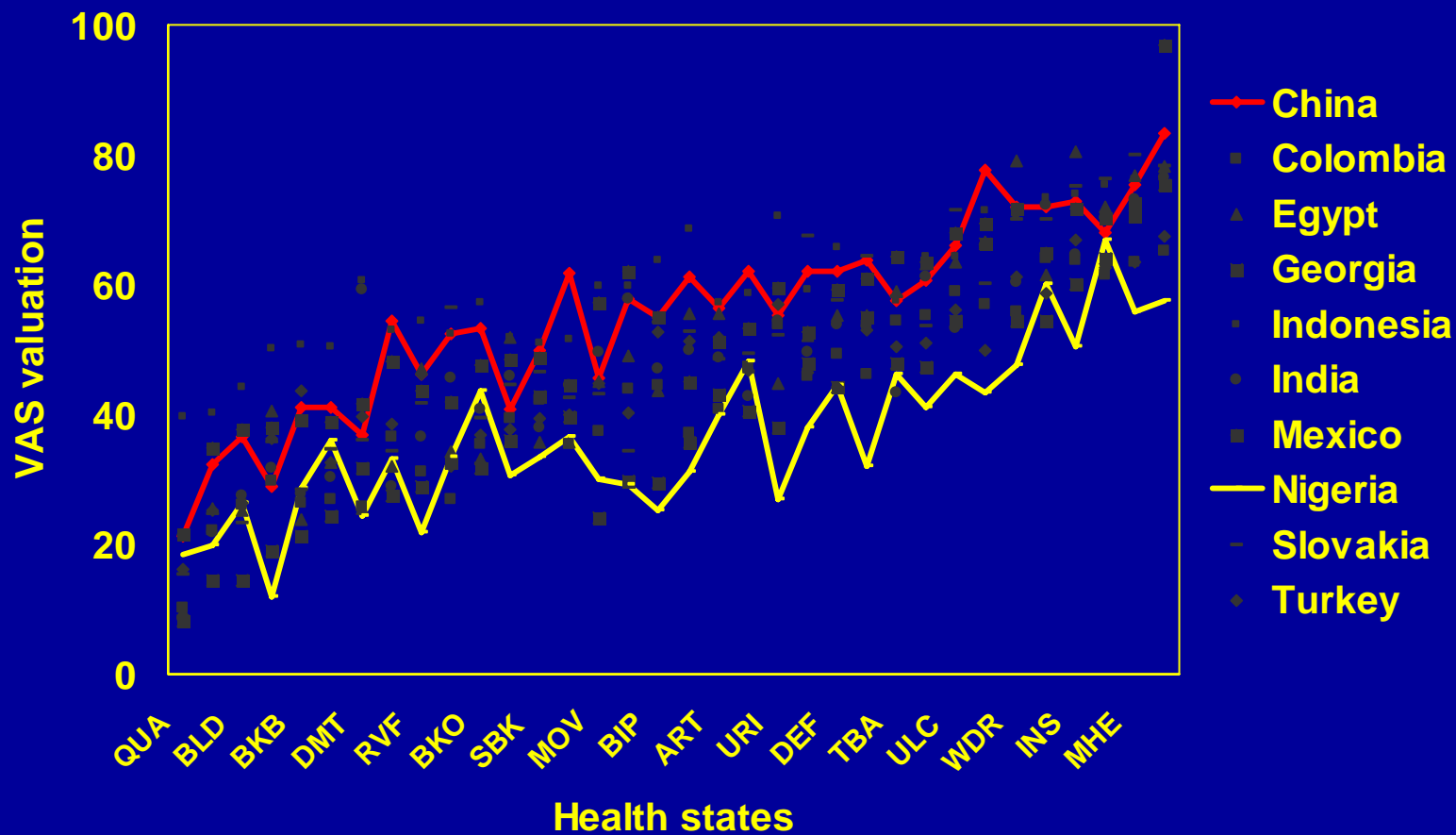
- Nord et al. argue that:
 - Raw judgments of health states are strictly ordinal
 - Forcing concrete choices raises scaling level of raw judgments from ordinal to cardinal
 - Tradeoff methods are calibrated using metrics of probability, time, persons that are “meaningful vehicles for making cardinal judgments”
- But...
 - Comparisons about health are within reach of everyday intuition
 - These comparisons extend beyond ordinal level

What is the source of these cardinal intuitions?

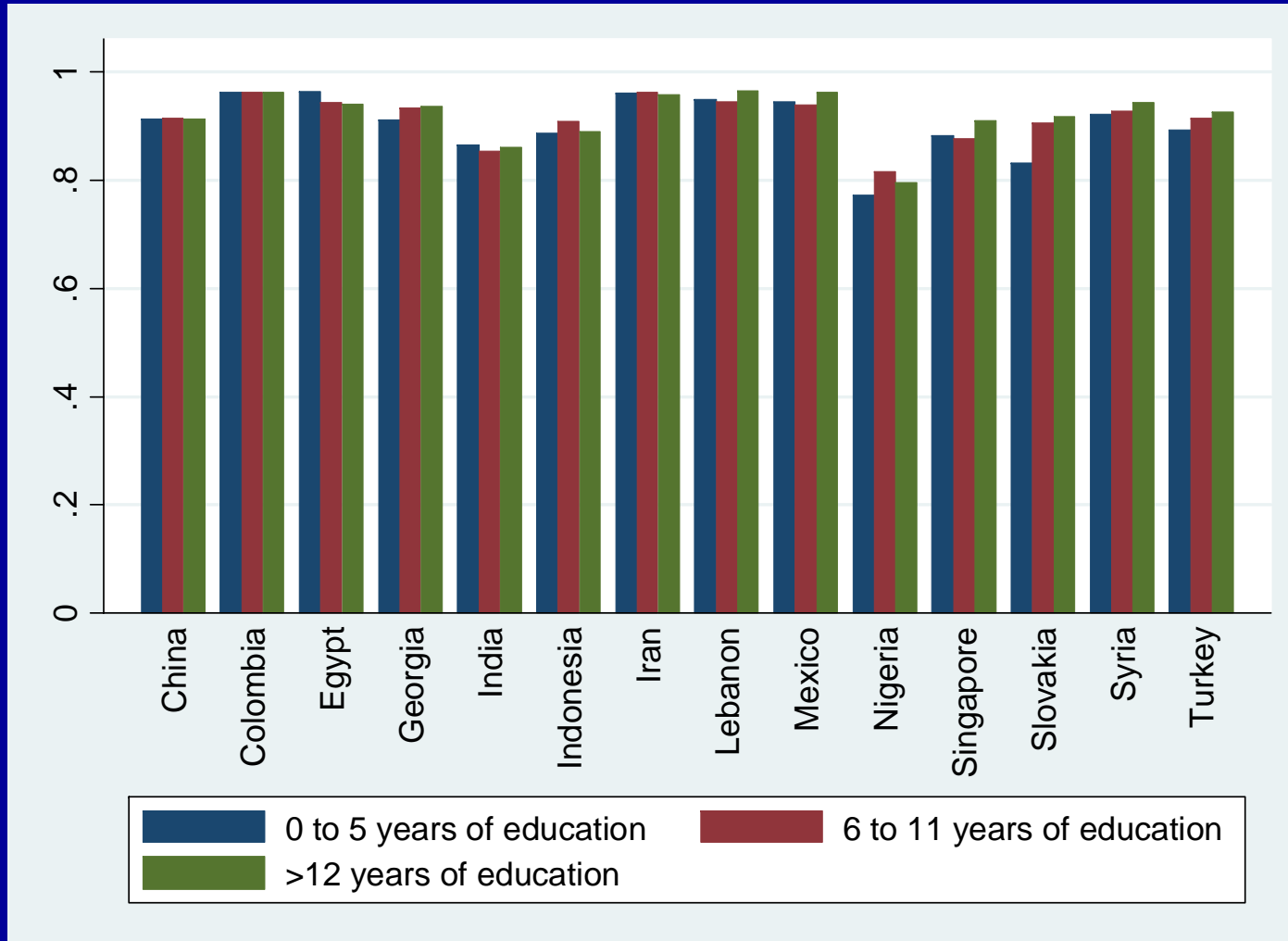
- Health as contributor to overall well-being?
- Health as it determines the ability to pursue individual life plans?
- Health as it determines ‘capabilities’ or sets of functionings?

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Average VAS values in 10 countries

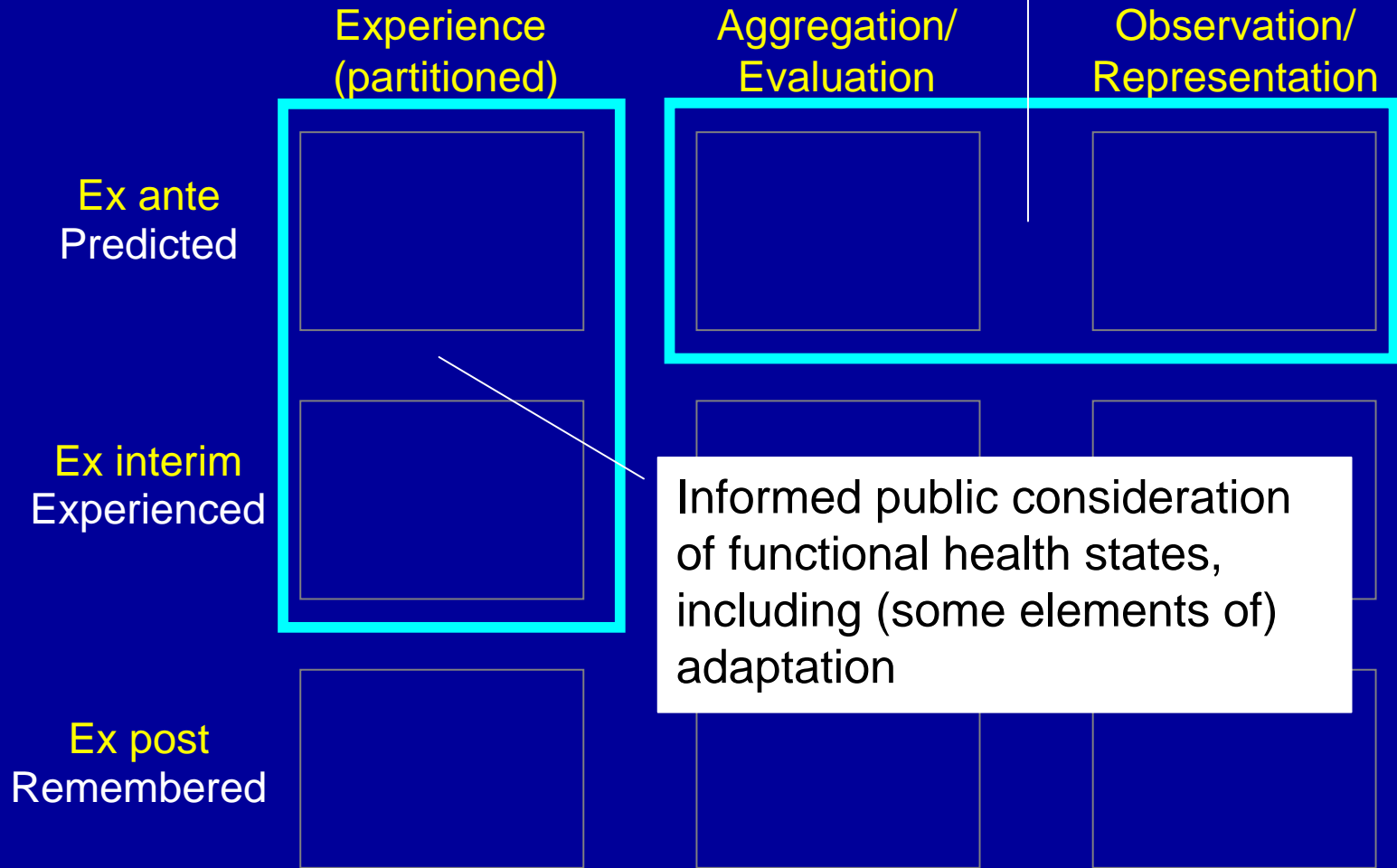


Consistency in rankings across countries



Toward common ground...

Reorientation of measurement tasks to health comparisons rather than individual preferences



Directions for health measurement in GBD

- Address criticisms of 1996 disability weights:
 - Reliance on expert raters
 - Use of person tradeoff technique
 - No examination of cross-population variability
- Movement toward approach based on standardized measurement of functional health in various domains rather than direct valuation of disease states and sequelae
 - Will require massive empirical effort to elicit functional health measures in populations representing each disabling sequela, in different world regions
 - Will require resolution of persistent methodological challenges relating to comparability of functional health measures and aggregation issues

