Measurement- What you've always wanted to know...*

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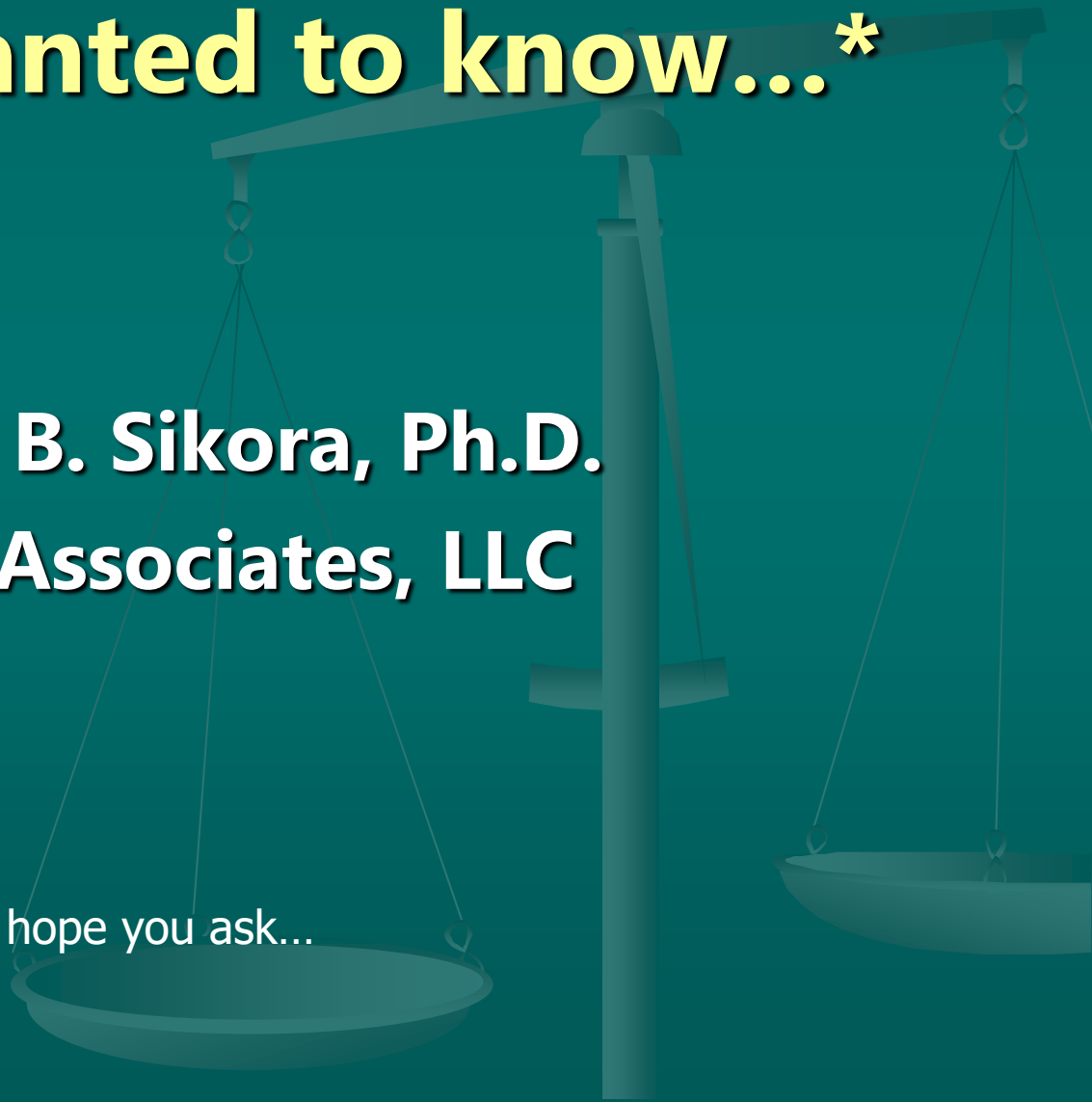
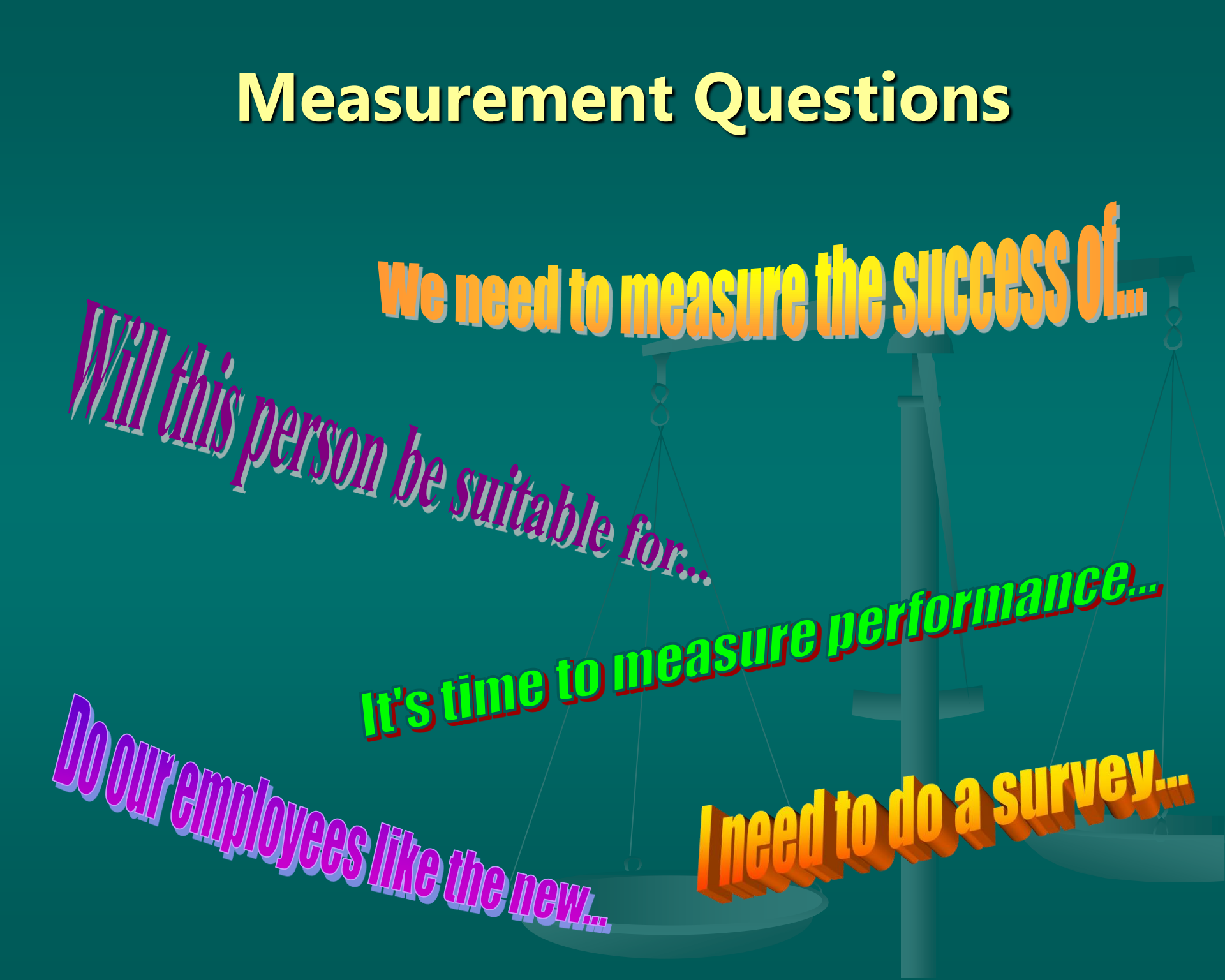


* and your internal clients hope you ask...

Measurement Questions



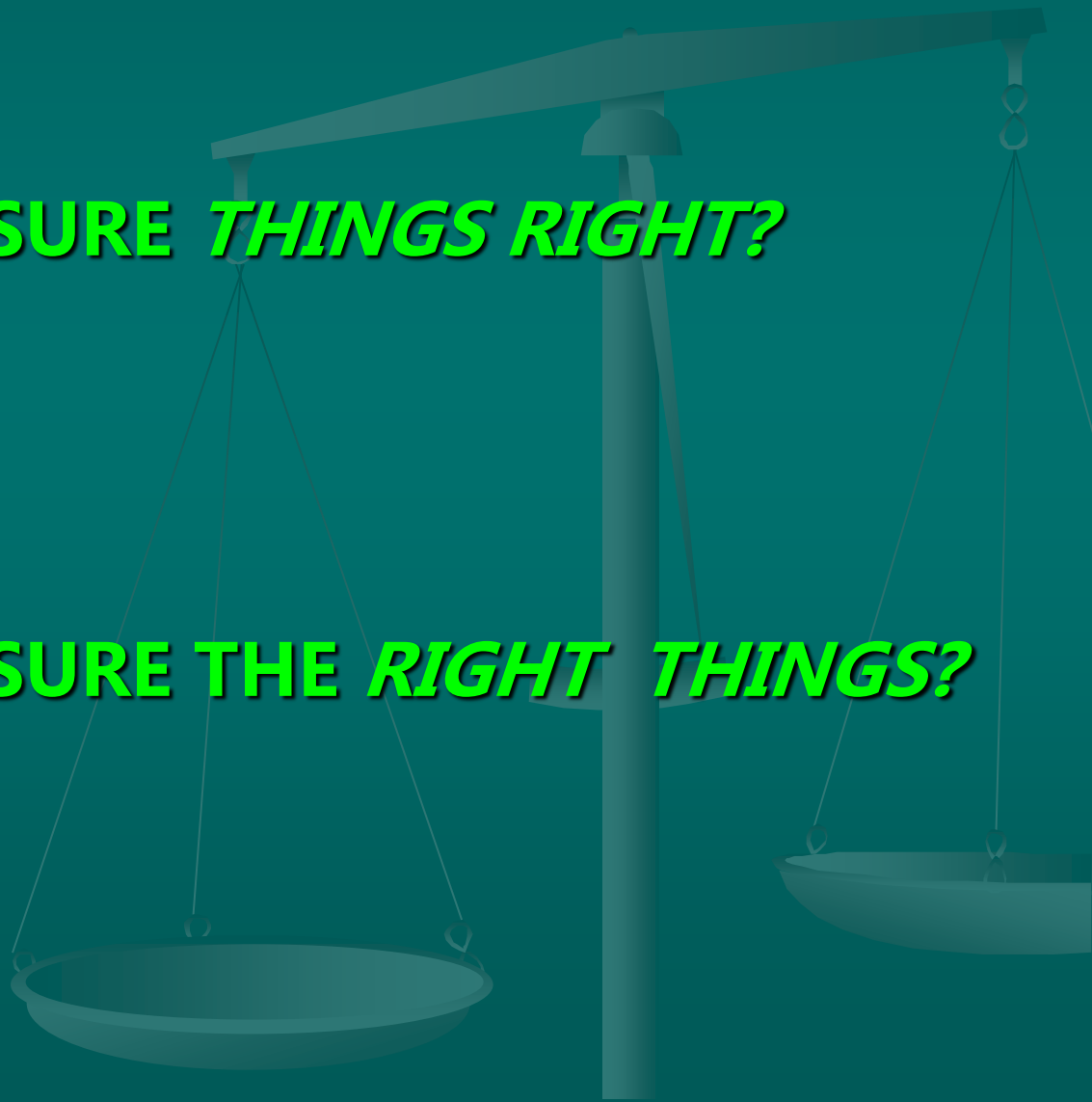
Theory and Practice of Measurement

- **THEORY**

  HOW DO I MEASURE *THINGS RIGHT?*

- **PRACTICE**

  HOW DO I MEASURE THE *RIGHT THINGS?*



Key Questions for Measurement

- **Measuring the Right Things**
  - WHY
  - WHAT
  - WHO
  - WHEN
  - WHERE

Sets the stage for:

- **Measuring Things Right**
  - HOW

WHY?

- Business Needs First
  - What decisions will be made based on this data?
  - Visualize a presentation – why are you there?
  - Is a scale or number the best source of information?

Not everything that counts can be counted, and not everything that can be counted counts.

EINSTEIN

WHO?

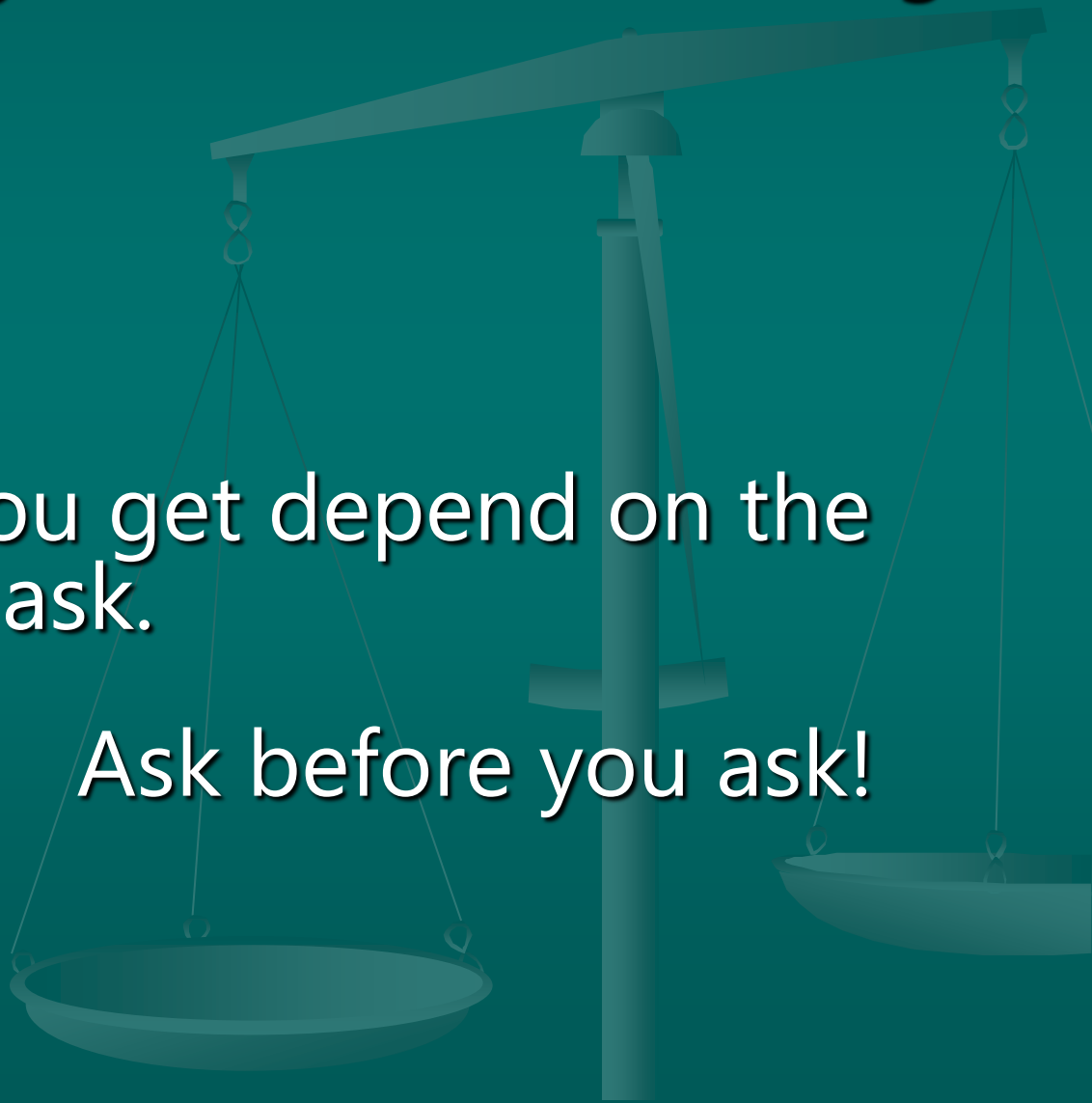
- Internal Stakeholders
  - Decision-makers – who authorizes change
  - Budget managers – who pays for it
  - End-users – who needs to apply it
  - Impacted groups – who will feel the impact
- External audiences
  - Regulatory groups
  - Professional associations
  - Press implications

WHAT's

- Concept Clarity *AND* Shared Meaning
  - Fair = ?
  - Quality = ?
  - Excellence = ?

- The answers you get depend on the questions you ask.

Ask before you ask!



WHERE's and WHEN's

- Tests are only helpful relative to:
  - the **purpose** of the test
  - the **people** being tested (and compared)
  - the **circumstances** of the test.

Different circumstances (time and place) imply different tests and interpretations.

FYI: Measurement properties are also impacted by circumstances.

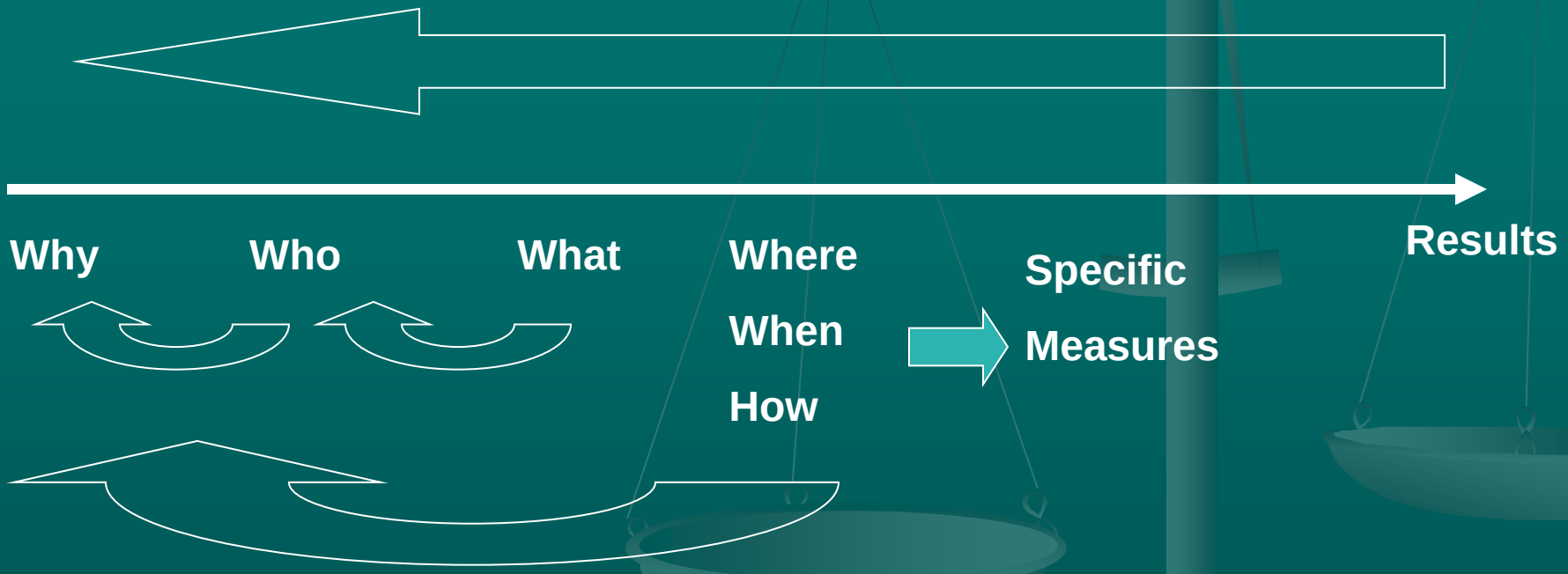
HOW'S

- DEPEND ON
  - WHYs
  - WHATs
  - WHENs

WHOs

WHEREs

The Process goes backwards!

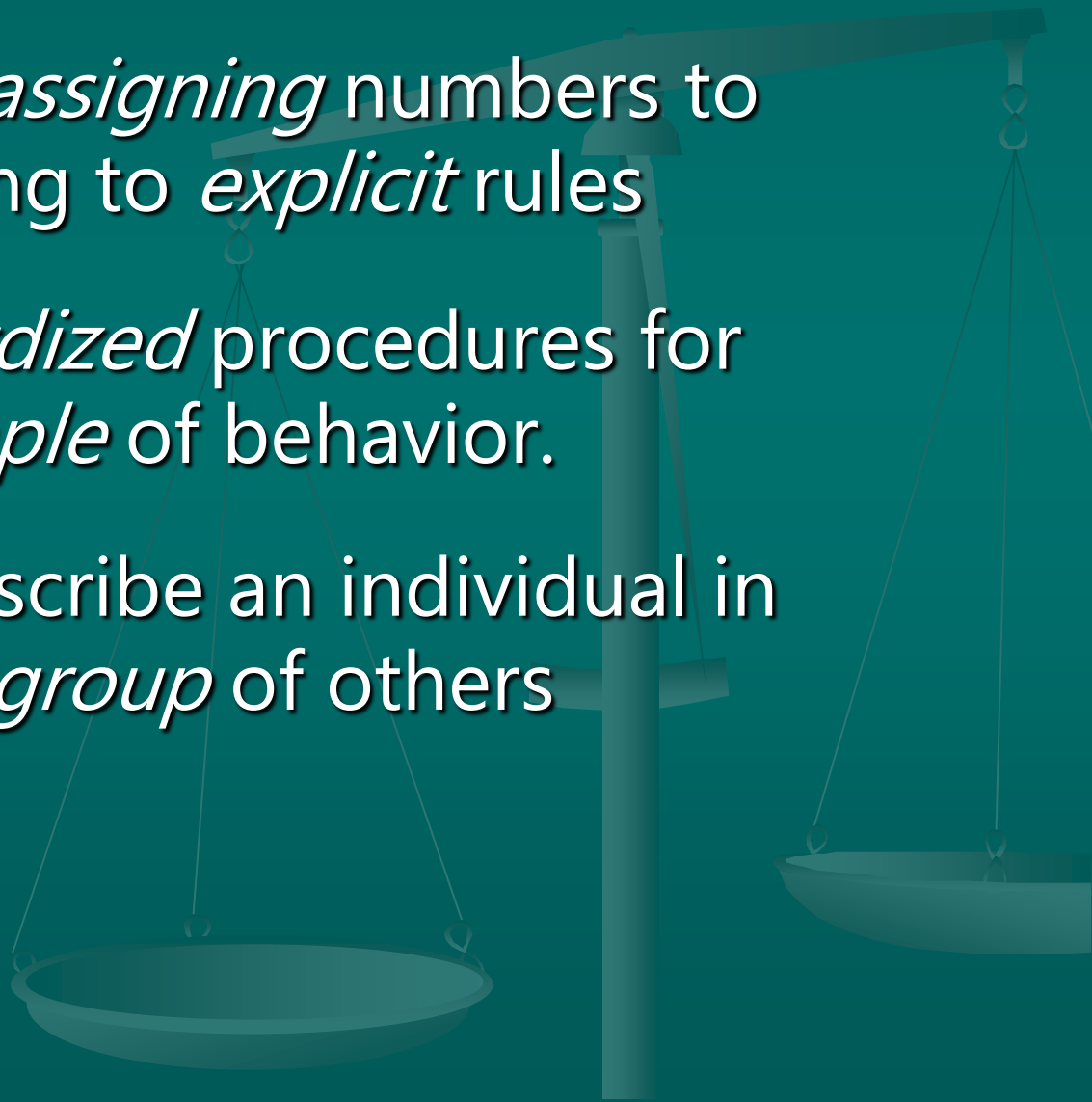


HOW DO I MEASURE THINGS RIGHT?

- Hows
  - Item/Scale Development
  - Measurement Properties
  - Sampling
  - Analysis
  - Reporting

What do we mean by "Measurement" or "Tests"?

- Measurement = *assigning* numbers to behavior according to *explicit* rules
- Tests are *standardized* procedures for measuring a *sample* of behavior.
- Tests typically describe an individual in *comparison* to a *group* of others



Measurement Properties:

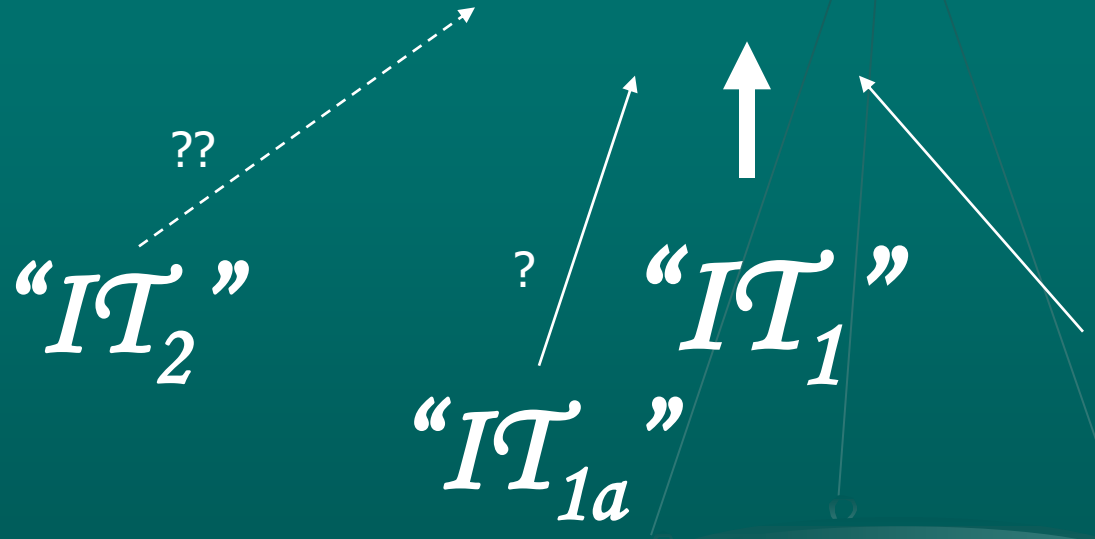
- Error – how much and where from?
- Reliability – will this happen again?
- Homogeneity – is this one thing?
- Validity – is this really my "what"?
- Norms – is the comparison group helpful?

HOW'S

Test Theory in 10 minutes or less…

O = T + E

Observed **"True" Score** **Error:** Random "Noise"



Measurement Tools
Communication
Lighting

Systematic

Measurement Properties - RELIABILITY

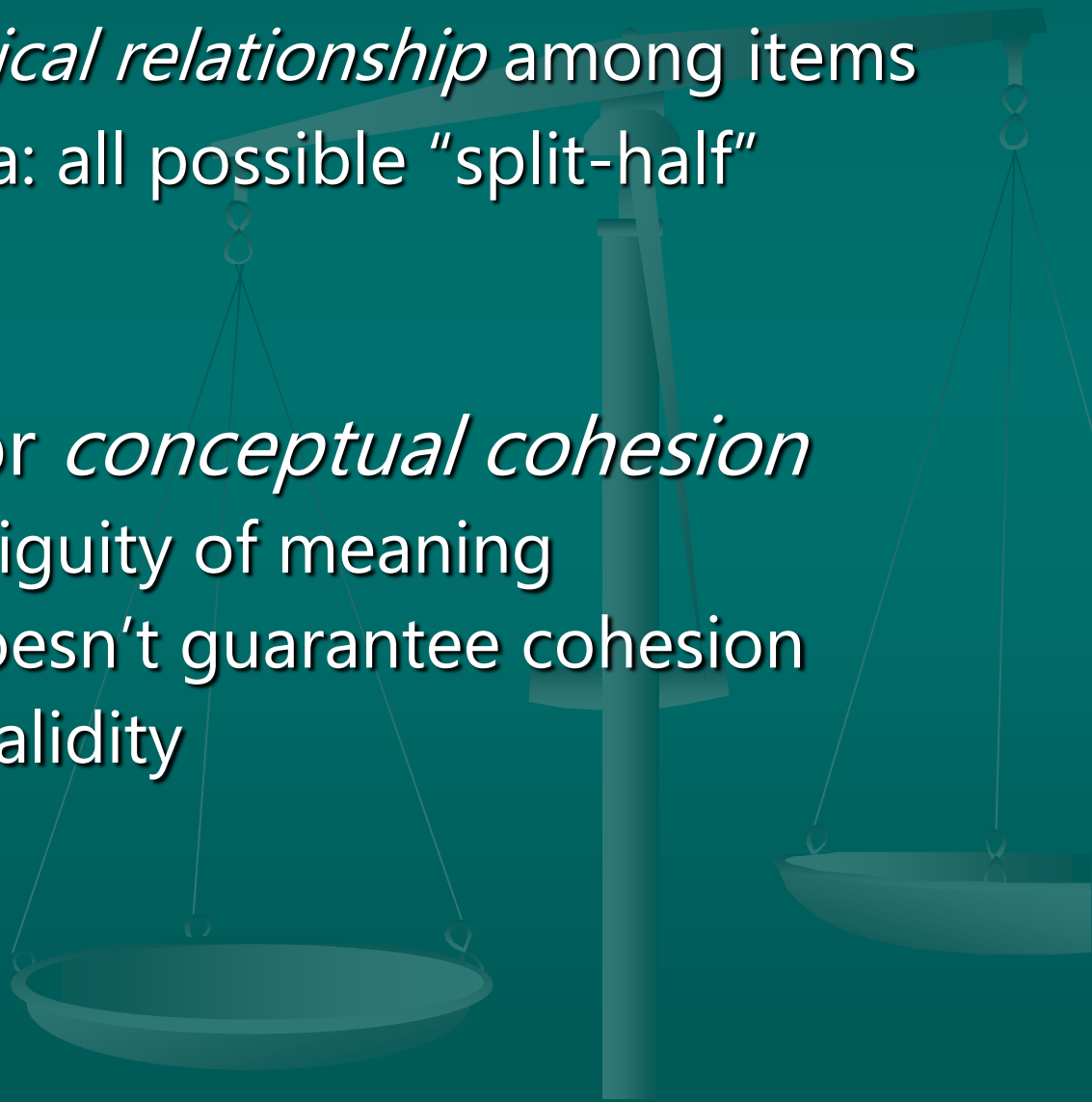
- Replicability or **Consistency**
  - How much of "O" is "T" vs. "E"? OR
  - What is proportion of "O" that is "T"?

$$R = T/(T+E)$$

- "Flavors" of Consistency
  - Inter-rater: across observers
  - Test-retest: across time
  - Parallel forms: across equivalent forms

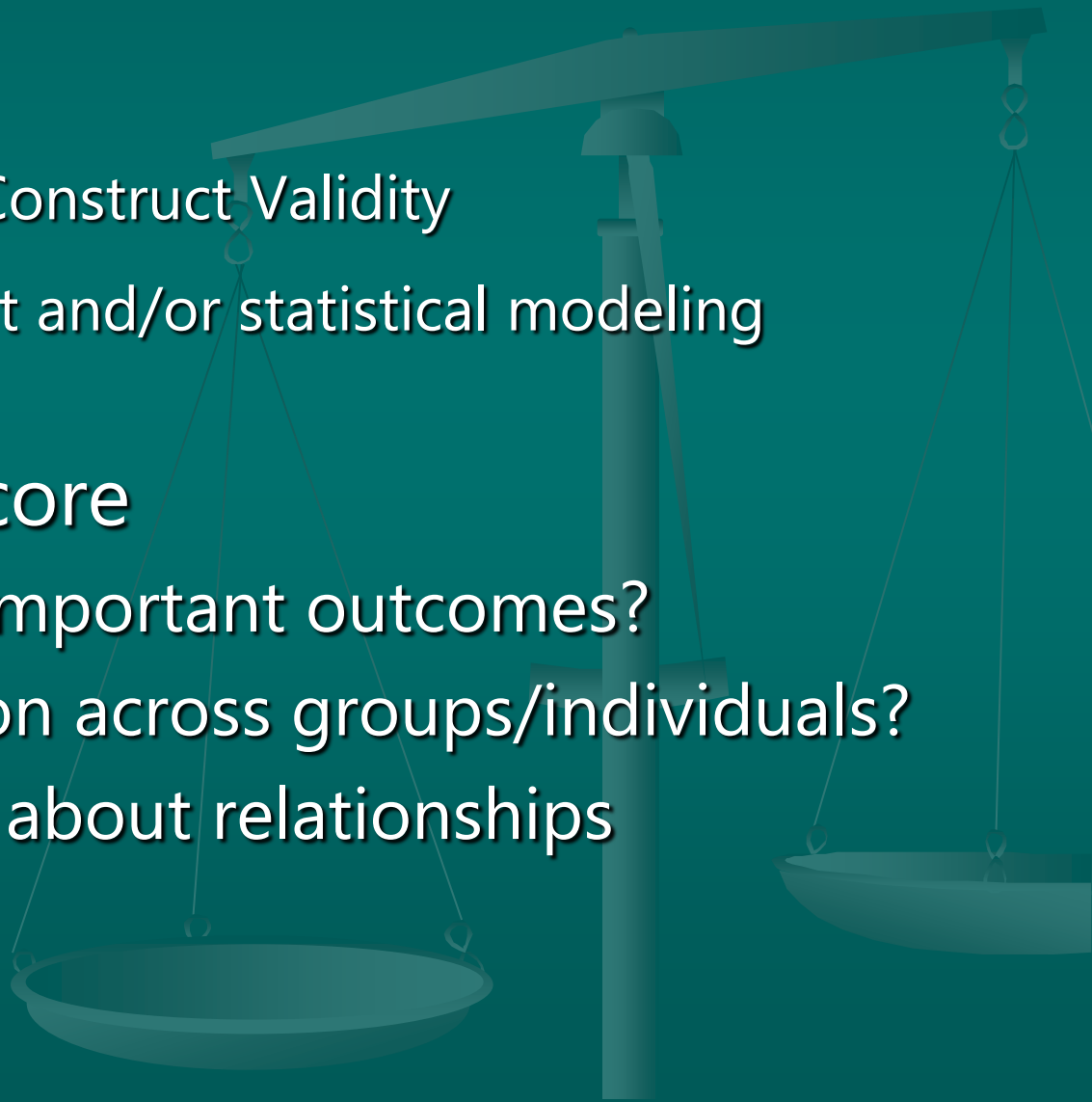
Measurement Properties - RELIABILITY

- **Internal Consistency**
  - Is there a *statistical relationship* among items
  - Coefficient alpha: all possible "split-half" correlations
- **Homogeneity** or *conceptual cohesion*
  - One "it" vs. ambiguity of meaning
  - High C-alpha doesn't guarantee cohesion
  - A transition to validity



Measurement Properties: VALIDITY

- **Meaningfulness** of score
  - The right "it"?
    - Face, Content, Construct Validity
    - Expert judgment and/or statistical modeling
- **Usefulness** of score
  - Does it predict important outcomes?
  - Allow comparison across groups/individuals?
  - Requires theory about relationships



THOME THUMB THTUFF

EXERCISE MEASURING THUMBS AS EXAMPLES

- RELIABILITY and ERROR
  - Tomorrow? Right vs. Left? Your table mate?
  - Random error – distractions, where start, angle
  - Systematic error – lighting, scale, reading glasses
- VALIDITY
  - What is a thumb? nail? which joint? out/inside?
  - What does it predict? IQ? dexterity? flexibility?
- NORMS
  - Are we comparing "apples to apples"?
    Europeans? NBA players? males? females?

What your clients hope you ask:

- Who, What, Why questions first
- Where's and When's impact implementation and interpretation
- O = T + E
- Know what type of reliability matters
- Look for meaning as well as statistics
- Confirm normative group relevance

Specific Measurement Questions

Let's Talk:

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