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Construct Measurement Using Factor Analysis: Creating & Validating Survey Protocols

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Construct Measurement Using Factor Analysis: Creating & Validating Survey Protocols

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Assistant Professor, Leadership, Technology & Human Development
Food World Member, 2014-present
Keep it Brief Richard...

- Research Interests  [NOTE: not an exhaustive listing]
- Validating Protocols for “New” Populations
- Considering Assumptions
Helping Students Flourish

- Resiliency
  - Positive Psychology (Lopez et al., 2009)

- Spirituality
  - Professional Recognition (ACA, ASCA, CACREP)
  - Conceptualizing Spirituality
    - Internal & Possibly Secular (Noddings, 2006)
    - Religious (Fowler, 1981)
    - Constructivist (Phillips, 1995)

- Spirituality & General Well-Being
  - Developmental/Psychological (Kim & Esquivel, 2011)
Holder, Coleman & Wallace (2010)

• Correlations between Spirituality, Religiosity & Happiness in Children
  ▫ 3 Happiness (FACES, OHQ-SF, SHS)
  ▫ 1 Spirituality (SWBQ)
  ▫ 1 Religiosity (PBS)
  ▫ 1 Temperament (EAS)
So What Did Richard Do?

- “New” Populations
  - Instruments Created/Administered with Adult Samples (*spirituality, subjective well-being, temperament, etc.*)
  - Instruments Created/Administered with English Samples (*mindfulness, e.g., CAMM-K*)

- “New” Latent Variables
  - School Counselor PK-12 CGCP Implementation
Assumptions Richard Made

1. EFA versus CFA
2. PAF versus PCA
3. Skewness & Kurtosis Parameters
4. Parallel Analysis
EFA versus CFA

- Confirmatory Factor Analysis (CFA) investigates hypotheses about identified factors and their relationships with each other.
- *Exploring* a construct (e.g., latent variable) and the contributing factor(s) within requires EFA.

(Field, 2009; Nunnally & Bernstein, 1994; Pedhazur & Schmelkin, 1991; Pett et al., 2003)
**PAF vs. PCA**

- **Underlying Mathematics** (Fabrigar & Wegener, 2012; Field, 2009; Tabachnick & Fidell, 2007)
  - PAF **correlations among variables**
  - PCA **reducing variables to a smaller set**

- **Variance** (Fabrigar & Wegener, 2012; Tabachnick & Fidell, 2007)
  - PAF **analyzing shared variance only**
  - PCA **no distinction between common/unique variance**

- **Theory** (Fabrigar & Wegener, 2012; Gall, Gall & Borg, 2007)
  - PAF **parameter estimates generalized beyond sample**
  - PCA **parameters fit to sampling at core level**
Skewness & Kurtosis

- **EFA Parameters**
  - Skewness $< |2|$
  - Kurtosis $< |7|$

  (Fabrigar & Wegener, 2012)
Parallel Analysis

- Determining the appropriate number of factors
  - Random data generated in a parallel (similar) model
  - Non trivial components in the model influence both raw & random data
  - Eigenvalues: Raw > Random
  - SPSS Syntax O’Connor (2000)

(Fabrigar & Wegener, 2012; Fabrigar, Wegener, MacCallum, & Strahan, 1999; Hayton, Allen, & Scarpello, 2004; O’Connor, 2000)
Thank You

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