

Strategies for selecting measures to assess psychosocial constructs in primary data collection

Briana Mezuk (<u>bmezuk@umich.edu</u>) May 19, 2021

Outline

- **Brief review**: Core elements of measurement
- Defining the challenge: Conceptual and psychometric non-equivalence of psychosocial measures
 - Example: Centers for Epidemiologic Studies Depression (CESD) Scale
- Important resources for finding existing psychosocial measures
- Strategies and considerations for adapting measures to, or creating new measures for, specific populations

Things to consider when selecting a measure

- Purpose: Why are you assessing this construct in your study anyway?
- Population being studied: General population vs. clinic sample, etc.
- Method of assessment: mail vs. telephone vs. web vs. in-person
- Copyright/costs
- Psychometric properties: Reliability & Validity

Core elements of measurement: Reliability

Reliability: Consistency in measurement - across items, across raters, across time, across context

Reliability is Quantified. Examples-

- Cronbach's alpha: "internal consistency" (that is, are items that are measuring the same construct positively correlated?)
- **Kappa coefficient:** Agreement in case/non-case status between raters that accounts for chance agreement.

Reliability is a prerequisite for validity.

Core elements of measurement: Validity

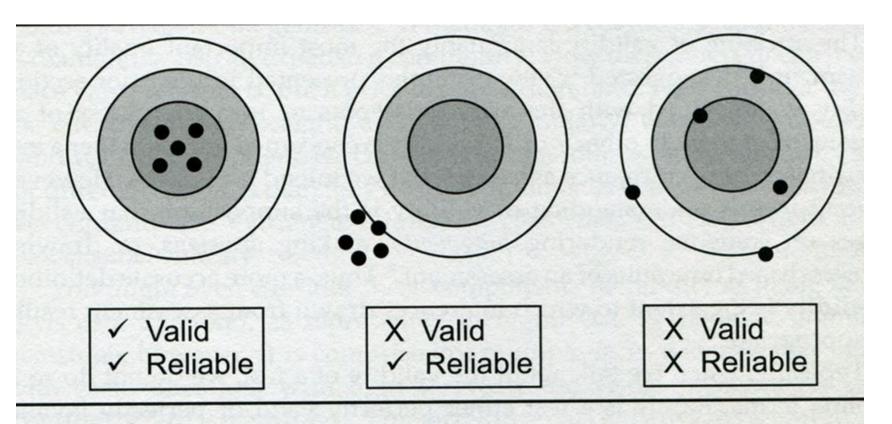
Validity: The degree to which a measure assesses the "true status" of the construct it is intended to assess. **Generally NOT quantified.**

- Face validity: The degree to which a scale "appears" to measure what it is intended to measure
- Construct validity: The degree to which a scale captures all elements of the concept it is intended to measure.
- Criterion validity: The degree to which a scale agrees with/predicts the outcomes
 of another measure (sensitivity/specificity, positive predictive value/negative
 predictive value).
- Convergent & divergent validity: The degree to which a scale is positively correlates with related constructs and negatively/uncorrelated with opposing/unrelated constructs.

Core elements of measurement

Valid Sensitivity and Specificity are only the c meaningful relative to a known status that is a categorical determination that a state/trait is either present or absent based on a "gold standard" - such standards generally do not exist for most psychosocial constructs.

Relationship between Reliability and Validity

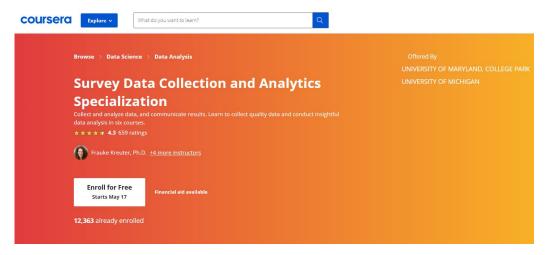


Additional resources for brushing up on core elements of measurement and survey research

Lumen Learning Course

Open textbook: Practical strategies for psychological measurement

Coursera Survey Research Courses



Why does measurement matter in minority health research?

Social/behavioral health research largely depends on self-report/survey assessments.

In order to make valid statements of differences (whether between racial/ethnic groups, or within racial/ethnic groups by age, gender, education, over time, etc.) the measures must have minimal bias.

Two types of bias to consider

Non-differential ("random" error that is similar across groups being compared)

Differential (more error in one group)

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Advancing Health Disparities Research Can We Afford to Ignore Measurement Issues?

ANITA L. STEWART, PhD,* AND ANNA M. NAPOLES-SPRINGER, PhD*

BACKGROUND. Research on racial and ethnic health disparities in the United States requires that self-report measures, developed primarily in mainstream samples, are appropriate when applied in diverse groups. To compare groups, mean scores must reflect true scores and have minimal bias, assumptions that have not been tested for many self-report measures used in this research.

OBJECTIVE. To identify conceptual and psychometric issues that need to be addressed to assure the quality of self-report measures being used in health disparities research.

METHODS. We present 2 broad conceptual frameworks for health disparities research and describe the main research questions and measurement issues for 4 key concepts hypothesized as potential mechanisms of health disparities: socioeconomic status, discrimination, acculturation, and quality of care. This article is based on a small conference convened by 6 Resource Centers for Minority Aging Research (RCMAR) measurement cores. We integrate written materials prepared for the conference

by quantitative and qualitative measurement specialists and cross-cultural researchers, conference discussions, and current literature.

RESULTS. Problems in the quality of the conceptualizations and measures were found for all 4 concepts, and little is known about the extent to which measures of these concepts can be interpreted similarly across diverse groups. Many problems also apply to other concepts relevant to health disparities. We propose an agenda for accomplishing this challenging measurement research.

CONCLUSIONS. The current national commitment to reduce health disparities may be compromised without more research on measurement quality. Integrated, systematic efforts are needed to move this work forward, including collaborative efforts and special initiatives.

Key words: Measurement; health disparities; patient-physician communication; discrimination; minority health; socioeconomic status; acculturation (Med Care 2003;41: 1207-1220)

Conceptual framework of psychometric "adequacy" and "equivalence" across groups

	Conc	eptual	
Adequacy in One Group	Concept is meaningful within one group	Concept is equivalent across groups	Equivalence Across Groups
	Psychometric properties meet minimal standards within one group	Psychometric properties invariant (equivalent) across groups	
	Psycho	ometric	

Fig. 1. Conceptual and psychometric adequacy and equivalence within one group and across groups.*

^{*}Group(s) can refer to any sociodemographic strata being compared

Conceptual framework of psychometric "adequacy" and "aguivalones" across groups

"equivalence" across groups

What causes conceptual non-equivalence? Culturally mediated differences in perceptions of the meaning of items and health constructs or because a concept is missing an important dimension in one group.

Conceptual

Adequacy in One Group

Psychometric properties meet minimal standards within one group

Adequacy in One Group

Psychometric properties invariant (equivalent) across groups

Psychometric properties invariant (equivalent) across groups

Psychometric

What causes psychometric non-equivalence?

Response bias resulting from cultural or group differences in the cognitive processes of answering, using response scales, or differences introduced by inadequate translations and failure to address varying literacy levels.

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rithin one group and across groups.*

Why is it that existing measures may be affected by conceptual and/or psychometric non-equivalence?

- 1. Limited inclusion of concepts relevant to the quality of care of minority populations in the creation of "universal" scales (e.g., stress, quality of life) such as cultural competence and discrimination.
- 2. Lack of information on the psychometric invariance of measures across diverse groups (e.g., insufficient sample size or limited variability),
- 3. Traditional survey methods (mail, telephone) fail to reach many minority groups, resulting in small/select samples of these groups;
- 4. Measures may need to be translated into other languages and written at reading levels appropriate for people with limited English proficiency.

Goal: to quantify the agreement between the CIDI and CESD measurement of "depression syndrome" and examine variation by age, sex, and race/ethnicity among older adults

CESD (Radloff 1977) is the most widely-used depression scale in population surveys.

Why? Brief, can be self-administered and has thresholds to indicate "clinically significant" depression.

How was its reliability and validity as a measure of "clinically significant" depression assessed?



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Measurement Article

Shades of Blue and Gray: A Comparison of the Center for Epidemiologic Studies Depression Scale and the Composite International Diagnostic Interview for Assessment of Depression Syndrome in Later Life

Linh Dang, MPH,1 Liming Dong, PhD,12 and Briana Mezuk, PhD123,*

¹Department of Epidemiology and ²Center for Social Epidemiology and Population Health, University of Michigan School of Public Health, Ann Arbor. ²Research Center for Group Dynamics, Institute for Social Research, University of Michigan, Ann Arbor.

*Address correspondence to: Briana Mezuk, PhD, Center for Social Epidemiology and Population Health, Department of Epidemiology, University of Michigan School of Public Health, Suite 2649B, 1415 Washington Heights, Ann Arbor, MI 48109. E-mail: bmezuk@umich.edu

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Decision Editor: Suzanne Meeks. PhD

Abstract

Background and Objectives: Psychiatric research lacks the equivalent of a thermometer, that is, a tool that accurately measures mental disorder regardless of context. Instead, the psychometric properties of scales that purport to assess psychopathology must be continuously evaluated. To that end, this study evaluated the diagnostic agreement between the eight-tiem Center for Epidemiologic Studies Depression Scale (CESD-8) and the Composite International Diagnostic Interview—short form (CIDI-SF) in the Health and Retirement Study (HRS).

Research Design and Methods: Data come from 17,613 respondents aged >50 from the 2014 wave of the HRS. Kappa coefficients were used to assess the agreement between the 2 instruments on depression classification across a range of thresholds for identifying case status, including variation across subgroups defined by age, race/ethnicity, and gender.

Results: The point prevalence of depression syndrome estimated by the CESD was higher than that estimated by the CIDI-SF (CESD: 9.9%–19.5% depending on the cutoff applied to the CESD vs CIDI-SF: 7.7%). Assuming CIDI-SF as the gold standard, the CESD yielded a sensitivity of 56.2%–70.2% and specificity of 84.7%–94.0% across the range of cutoffs. The agreement on depression classification was weak (x = 0.32–0.44).

Discussion and Implications: Depression cases identified by the CESD have poor agreement with those identified by the CIDI-SF. Conceptually, psychological distress as measured by the CESD is not interchangeable with depression syndrome as measured by the CIDI-SF. Population estimates of depression among older adults based on the CESD should be interpreted with caution.

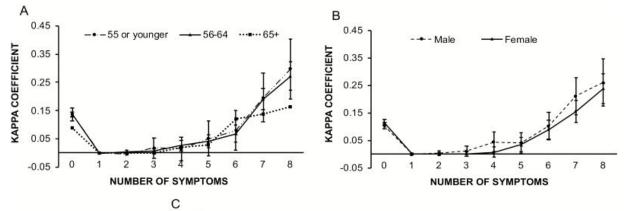
Keywords: CES-D, Depression classification, Validity, Reliability

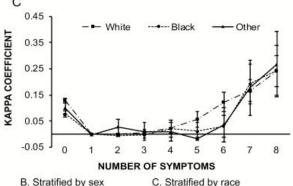
Strategy and sample used to quantify the psychometric properties of the CESD in Radloff (1977)

Recall, the Diagnostic and Statistical Manual of Mental Disorders (DSM) - underwent a major revision in 1980, creating the atheoretical criteria we are familiar with today. **So, where did the CESD even come from?**

- **Study**: Community Mental Health Epidemiology Program (JHU)
 - Two sites: Washington County, MD (very rural) and Kansas City, MO
 - Total sample size: 3845
 - Number of Black participants: 295, <u>all of whom were from Kansas City, MO</u>
 - Reliability: While they don't report the exact numbers, Radloff (1977) says: "Test-retest correlations were moderate (.40 or above) in all but three groups (*Blacks*, age under 25, and "need help" [for mental distress])"
 - Validity: CESD was given to "true" cases of depression (n=70 in MD, n=35 in CT) and scores were higher than people given in the general population.
 - Racial/ethnic composition of the "true" cases are never reported, nor is there any text stating whether the validity of the CESD varied by race.

Chance-corrected (Kappa coefficient) agreement between CIDI and CESD as a function of symptom count





A. Stratified by age

Why this matters: The CESD is the ONLY measure of depression that consistently estimates that the prevalence of depression is higher among Blacks vs. whites.

- CESD consistently generates higher point prevalence of depression syndrome: 9.9 19.5% depending on threshold used, vs. 7.7% for the CIDI.
 - Assuming CIDI as the gold standard, the CESD has a sensitivity of 56.2%–70.2% (CESD produces many more false-positives) and specificity of 84.7%–94.0% across the range of cutoffs.
 - Higher symptom counts=higher agreement between the two measures.

Take-away - Measure twice, cut once

We were only able to do this study because the HRS included multiple measures of the same "concept" - depression.



Resources to find existing psychosocial measures

Existing studies - **ICPSR**



- Using the same measures that have been included in large, existing studies allows you to compare your (likely small) study's findings to larger/representative samples.
 - Can even pool your datasets!
- Running cross-tabs of potential measures fielded in ICPSR datasets allows you to see the observed variation in them within and across groups to get a sense of whether they are appropriate for your population of interest.

PhenX: Phenotypes for eXposures



Recommended standard data collection protocols for conducting biomedical research.

Tools selected by expert consensus.

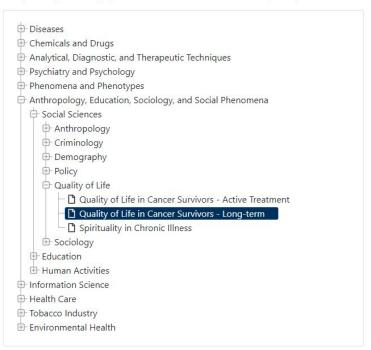
Includes both measures and data collection protocols.

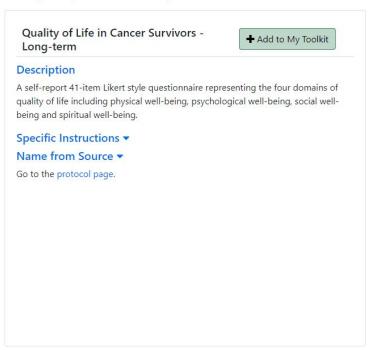
Focus on genetically-informed studies.

PhenX: Example

Cross-Domain Concept Tree Browser

The PhenX Cross-Domain Concept Tree Browser allows users to intuitively browse protocols by scientific concept, organized by the National Library of Medicine (NLM)'s Medical Subject Headings (MeSH), the most widely used vocabulary in medical research. Users can identify conceptually related protocols across research domains and access protocols from multiple entry points, e.g. cystic fibrosis (CF) is under both the "Respiratory Tract Diseases" and the "Digestive System Diseases" headings.





PROMIS: Patient Reported Outcome Measurement Information System





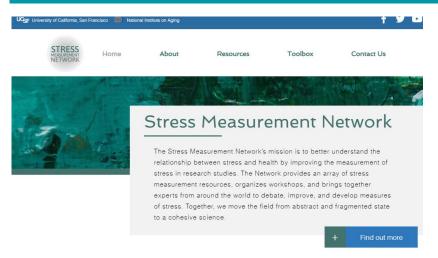
A spart of COVID-19 guidelines and social distancing, the HealthMeasures and PROMIS team acknowledge that recommended administration practices may not be possible. In cases where modifications are required to continue data collection (e.g., administration with a phone interview), this is allowable at this time. We recommend that the required modification be documented and that each assessment that was done using a modified administration is "flagged" for subsequent analysis. When shared devices are used, disinfection protocols must be followed.



PROMIS® (Patient-Reported Outcomes Measurement Information System) is a set of person-centered measures that evaluates and monitors physical, mental, and social health in adults and children. It can be used with the general population and with individuals living with chronic conditions.

- Focus on clinical care/settings/living with specific health conditions.
- Includes development of new measures.
- Designed to enhance communication between clinicians and patients in diverse research and clinical settings.
- Available in multiple formats and easily integrated into diverse administration platforms.
- Translations available in Spanish and many other languages

Stress Measurement Network



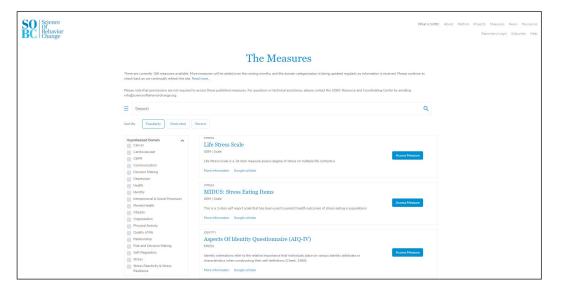






- Detailed explanations of the rationale for each stress measure
- Psychological measures of "stress" and related constructs.
 - Acute stress, early-life stress, stigma, discrimination, relationships, neighborhood safety, work stress, resilience
- Physiologic measures of "stress" exposure and stress response systems
 - Epigenetic clocks/biological aging/telomeres, cortisol, inflammation, skin conductance.
 - Includes some protocols of biological sample collection (ex. <u>Hair cortisol</u>)

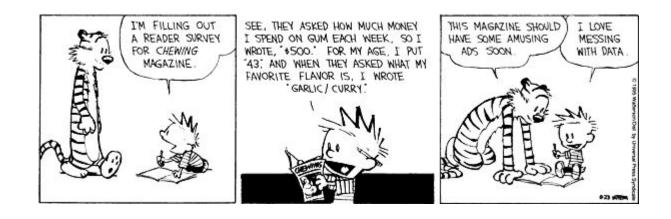
Science of Behavior Change



- NIH-wide initiative to understand the underlying mechanisms of behavior change by promoting basic research on the initiation, personalization, and maintenance of behavior change.
 - Goal is to inform more effective behavioral interventions using core ideas from behavioral economics.

Focus on three domains

- Self-regulation
- Stress reactivity/resilience
- Interpersonal and Social Processes
- Experimental approach: Identity potential mechanisms, Measure those mechanisms, and Develop interventions that influence those mechanisms.
 - <u>Measures</u> are organized as self-report, task, or observational



Still didn't find what you are looking for? Strategies for making a new psychosocial assessment

Multi-step, multi-modal process (from PROMIS)

- 1. Begin with a **Comprehensive literature search** of existing measures to ensure content validity (i.e., the assurance that each measure represents all facets of a domain)
- 2. Qualitative data collection and analysis to generate items
 - a. To ensure comprehensive coverage of the conceptual area, you should conduct **focus groups** with relevant participants and thematic analyses are performed of the topics discussed.
 - After the focus groups, conduct an initial item-review screening process to eliminate items that are redundant, confusing, or poorly written.
 - b. **Cognitive interviews** are performed so that each candidate item is reviewed by multiple individuals with diverse characteristics for feedback on the language and clarity of items and the relevance of the content.
- 3. Quantitative data collection and psychometric analysis to determine reliability
 - a. Responses to candidate items are collected from relevant participants, usually via computer administration to both community and clinical samples. Data from large samples confirm the factor structure of the domains and allow for analyses at the item and bank level. Involves both classical test theory (Reeve et al and Hansen et al) and item response theory (IRT).

Multi-step, multi-modal process (from PROMIS)

4. Validation studies

- a. **Validity studies** are conducted to determine the degree to which an instrument measures what it is intended to measure.
- b. Involves evaluating content validity, correlation with related measures, responsiveness to change, relationship with clinical indicators, etc.

5. Translation into other languages

Process of forward and back-translation, multiple expert reviews, harmonization across languages, and cognitive debriefing with a sample of native speakers of the target language (linguistic validation). A universal approach to translation ensures that, whenever possible, one language version is created for multiple countries instead of country-specific versions of the same language.

An example of creating a new scale...

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cite as: Innovation in Aging, 2017, Vol. 00, No. 00, 1-9 doi:10.1093/geroni/igx003 Advance Access publication May 26, 2017

JOURNAL OF ELDER ABUSE & NEGLECT 2017, VOL. 29, NO. 4, 213-228 https://doi.org/10.1080/08946566.2017.1338170





The Lichtenberg Financial Decision Screening Scale (LFDSS): A new tool for assessing financial decision making and preventing financial exploitation

Peter A. Lichtenberg, PhD, ABPPa,b, Lisa Ficker, PhDa, Analise Rahman-Filipiak, MAa,b, Ron Tatro, BAc, Cynthia Farrell, MSWd, James J. Speir, MSWe, Sanford J. Mall, JDf, Patrick Simasko, JD9, Howard H. Collens, JDh, and John Daniel Jackman Jr., MD1

alnstitute of Gerontology, Wayne State University, Detroit, Michigan, USA; bDepartment of Psychology, Wayne State University, Detroit, Michigan, USA; 'Center for Elder Rights Advocacy, Elder Law of Michigan, Lansing, Michigan, USA: dAging and Adult Services, Adult Protective Services, State of Michigan Department of Health and Human Services, Lansing, Michigan, USA; "Speir Financial Services, Southfield, Michigan, USA: Mall, Malisow and Cooney, PC, Farmington Hills, Michigan, USA: Simasko and Simasko Law Firm, Mount Clemens, Michigan, USA; hGalloway and Collens, PLLC, Huntington Woods, Michigan, USA: Private Practice Cardiologist (Ret.), Tyler, Texas, USA

ABSTRACT

One of the challenges in preventing the financial exploitation of older adults is that neither criminal justice nor noncriminal justice professionals are equipped to detect capacity deficits. Because decision-making capacity is a cornerstone assessment in cases of financial exploitation, effective instruments for measuring this capacity are essential. We introduce a new screening scale for financial decision making that can be administered to older adults. To explore the scale's implementation and assess construct validity, we conducted a pilot study of 29 older adults seen by APS (Adult Protective Services) workers and 79 seen by other professionals. Case examples are included.

KEYWORDS

Financial decision making; financial exploitation: financial judgment: protective services

Reliability and Validity of the Lichtenberg Financial **Decision Screening Scale**

Peter A. Lichtenberg, PhD, ABPP,1.* Jeanne A. EdD. PhD²⁻⁴ Katia Ocepek-Welikson, MPhil3, Joseph P. Eimicke, MS34

¹Institute of Gerontology, Wayne State University, Detroit, Michigan. ²Columbia University Stroud Center at New York State Psychiatric Institute. 3Research Division, Hebrew Home at Riverdale, RiverSpring Health, New York. 4Department of Geriatrics and Palliative Medicine, Weill Cornell Medical Center, New York.

*Address correspondence to Peter A. Lichtenberg, PhD, ABPP, Institute of Gerontology, Wayne State University, 87 E. Ferry Street, Detroit, MI 48202. E-mail: p.lichtenberg@wayne.edu

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Decision Editor Laura P Sands PhD

Original Research Article

Abstract

The scarcity of empirically validated assessment instruments continues to impede the work of professionals in a number of fields, including medicine, finance, and estate planning; adult protective services; and criminal justice-and, more importantly, it impedes their ability to effectively assist and, in some case, protect their clients. Other professionals (e.g., legal, financial, medical, mental health services) are in a position to prevent financial exploitation and would benefit from access to new instruments. The Lichtenberg Financial Decision Screening Scale (LFDSS) was introduced in 2016, along with evidence for its convergent validity (Lichtenberg, P. A., Fickern, L., Rahman-Filipiak, A., Tatro, R., Farrell, C., Speir, J. J., ... Jackman, I. D. (2016b), The Lichtenberg Financial Decision Screening Scale: A new tool for assessing financial decision making and preventing financial exploitation (2016). Journal of Elder Abuse and Neglect, 28, 134-151. doi:10.1080/08946566.2016.1 168333). Using a sample of 213 participants, this study investigated the internal consistency of the LFDSS and its criterion validity based on ratings by professionals using the scale. Results demonstrate that the LFDSS has excellent internal consistency and clinical utility properties. This paper provides support for use of the LFDSS as a reliable and valid instrument. The LFDSS and instructions for its use are included in the article, along with information about online tools and support.

Translational Significance: The screening scale presented in this article can be used in a variety of settings to help assess decisional capacity and prevent financial exploitation (e.g., Adult Protective Services, Medical offices, legal services, financial services). Few empirically validated, efficient scales are available for these professionals to assess the older adult's decision making capacity around specific financial transactions. This scale is offered to help fill that void.

Keywords: Financial decision making, Financial capacity, Financial exploitation

Item response theory analysis of the Lichtenberg Financial **Decision Screening Scale**

Jeanne A. Teresi, EdD. PhDa,b,c, Katia Ocepek-Welikson, MPhila, and Peter A. Lichtenberg, PhD, ABPPa

"Institute of Gerontology and Merrill Palmer Skillman Institute, Wayne State University, Detroit, Michigan, USA: bResearch Division, Hebrew Home at Riverdale, River Spring Health, Riverdale, New York, USA; 'Division of Geriatrics and Palliative Medicine, Weill Cornell Medical College, Cornell University, New York, New York, USA

The focus of these analyses was to examine the psychometric properties of the Lichtenberg Financial Decision Screening Scale (LFDSS). The purpose of the screen was to evaluate the decisional abilities and vulnerability to exploitation of older adults. Adults aged 60 and over were interviewed by social, legal, financial, or health services professionals who underwent in-person training on the administration and scoring of the scale. Professionals provided a rating of the decision-making abilities of the older adult. The analytic sample included 213 individuals with an average age of 76.9 (SD = 10.1). The majority (57%) were female. Data were analyzed using item response theory (IRT) methodology. The results supported the unidimensionality of the item set. Several IRT models were tested. Ten ordinal and binary items evidenced a slightly higher reliability estimate (0.85) than other versions and better coverage in terms of the range of reliable measurement across the continuum of financial incapacity.

KEYWORDS

Competency screening; financial abuse; financial decision screening; information: item response theory; reliability

RCMAR Resources: Focus groups & cognitive interviews



QUALITATIVE METHODS

qualitative research methods resources
Focus Group Protocol
Focus Group PowerPoint Presentation
Focus Group Write-up Example
Cognitive Interview Protocol
Cognitive Interview PowerPoint Presentation
Cognitive Interview Guide
Cognitive Interview demonstration. Below is a 15 minute video demonstrating a cognitive interview.



Summary

- Social/behavioral health research lacks the equivalent of a *thermometer*, that is, a tool that accurately measures psychosocial factors regardless of context - whether that context is gender, race/ethnicity, age, SES, etc.
- Instead, the psychometric properties of scales that purport to assess psychosocial factors must be continuously evaluated, within and across populations, across language, across place and across time.
- Doing so is a multi-step, multi-modal process.