

Psychometrics



When undertaking new research, your first task will likely be developing the methodology and selecting the instruments for measurement. Reliable and valid measurements are needed for meaningful research findings and form the foundation of a successful research program. RTI International's psychometricians are ready to apply measurement tools and solutions to help put your research study on solid footing.

Measurement trends on large surveys are moving away from simply conducting basic enumerative tasks toward the addition of analytic tasks that often include scales or multiple item measures. Such additional tasks require complex measurement tools; however, the result can be strong informative research.

Good measurement is vital to sound methodology. RTI psychometricians have worked in a wide variety of areas—from education and child development to healthcare, from assessing job satisfaction in the corporate workplace to evaluating the climate in the U.S. Navy—with data from the United States and around the world. Our psychometricians will combine the depth of their training with the breadth of their experience to meet your measurement challenges. Whether the measurement instrument is large or small, RTI offers a solution.

RTI's breadth and depth of knowledge—from Rasch measurement to IRT models—ensures that we have an extensive set of approaches and solutions to suit your measurement needs.

Areas of Expertise

- Classical measurement theory—Be assured that your research findings will be based on a solid foundation through validity and reliability assessments of existing measures.
- Scale development—Get results from more precise measurement by fine tuning existing measures. Or, open up new areas of research by letting RTI design measures in substantive areas that lack appropriate or effective measures.
- Adaptation to new populations—Guarantee accurate, valid research reports by tailoring measures to new populations or special sub-populations.
- Modern psychometric techniques—Enjoy the confidence that findings will apply beyond your sample when psychometricians employ sample-free scaling expertise through powerful modern scale analysis tools such as item response theory (IRT) or Rasch measurement.
- Incorporation of measurement into analytic models—Obtain optimal statistical modeling results, based on exploring statistically powerful error-free relationships, by utilizing our psychometric expertise through structural equation modeling (SEM), integrating and accounting for measurement error.

Project Highlights

Health

Developing Patient Reported Outcome Measures for Use in Complementary and Alternative Medicine Research. We used classical reliability statistics and factor analysis to develop and evaluate new measures for use in survey and outcomes research related to the experiences of complementary and alternative medicine patients, including perceived provider support, patient-centered care, and empowerment.

Consumer Assessment of Health Plans Study. The Centers for Medicare & Medicaid Services (CMS) recognized that senior consumers needed information about HMO quality of care. CMS worked with RTI to develop, field test, and benchmark measures of consumer satisfaction with Medicare-managed care plans. Both factor analysis and IRT analysis were used extensively for instrument design, development, and refinement. Our reports provided both lay and technical audiences with useful, scientifically rigorous information about the surveys' reliability and validity. This successful tool has been adapted for other settings such as the evaluation of Tricare, nursing homes, and home healthcare providers.

Education

Psychometric Evaluation of Early Grade Reading and Math. RTI psychometricians worked with education-related government agencies in seven developing countries in Africa, Asia, and Central and South America to expand means of assessing multi-grade educational achievement in reading and math. Rasch measurement evaluations were performed on international educational data that spanned countries as well as languages to develop valid, reliable measures of educational attainment.

Employment/Occupations

SIMPACT™. The SIMPACT™ system (focusing on employee satisfaction, impact, and actionable results) is a work/nonwork organizational assessment and decision support tool that identifies life needs most strongly related to employee retention through predictive analytics. Sample-specific factor analytic and structural equation model analyses determined needed modifications to the work/nonwork model.

Occupational Information Network (O*NET) Data Collection.

RTI worked with a multi-state, multi-agency consortium to contribute to the development work based on pre-test data. This included critical evaluations of measurement error across an expansive range of workers' occupational descriptions. Crucial decisions about sample size relied on psychometric analyses—a generalizability study and a data reliability assessment.

Military

Psychometric Evaluation of Navy-wide Personnel Surveys. RTI evaluated the psychometric properties of over 100 items and 18 scales on the 2005 and 2007 Navy-wide Personnel Surveys using IRT and confirmatory factor analysis and classical test theory techniques. To ensure generalizability to the Navy population, we incorporated appropriate survey strata and weights. We provided recommendations to improve scales and measures and used higher-order confirmatory factor analyses to develop the Navy Climate Index. This index provided Navy leadership with a single dashboard metric to monitor quality of work life, as well as subscales (e.g., communication, leadership, autonomy/challenge, fairness, job security, tempo, and work group) that can be used to drill down to specific components affecting the overall Navy climate. We also examined the invariance of the index's factor structure using longitudinal confirmatory factor analysis and assessed the index validity by examining its relationship with key organizational outcomes, including job satisfaction, morale, organizational commitment, and retention intentions.

More Information

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