



*Researcher presenting statistical data trends*

## Measuring What Matters – and Mentoring the Scholars Who Will, Too

UNC methodologist Chia-Lin Tsai advances psychometric research while mentoring doctoral scholars who apply rigorous measurement methods across health, education, and social science



*Dr. Chia-Lin Tsai*

Chia-Lin Tsai, Ph.D., is the kind of methodologist whose work quietly powers progress across disciplines. As a faculty member in the University of Northern Colorado's Applied Statistics and Research Methods program, her research focuses on scale development and validation, psychometric evaluation, and advanced quantitative methods to improve how scholars and practitioners measure complex psychological, educational, and workforce constructs.

Her work spans latent variable modeling, multilevel modeling, and longitudinal analyses – tools that help

researchers better understand how people learn, work, and grow over time.

In recent work featured in *Distance Education*, Dr. Tsai examined how course interactivity shapes college students' learning experiences, with special attention to first-generation college students. The study highlights how thoughtful measurement and analysis can inform more equitable online learning environments.

## Training Scholars to Ask and Answer the Hard Questions

If you skim the headlines of applied research today, you'll notice a recurring theme: our conclusions are only as sound as our measures. That is where Dr. Tsai's program of research delivers value.

Her work emphasizes three interconnected goals:

### **Better instruments, better decisions.**

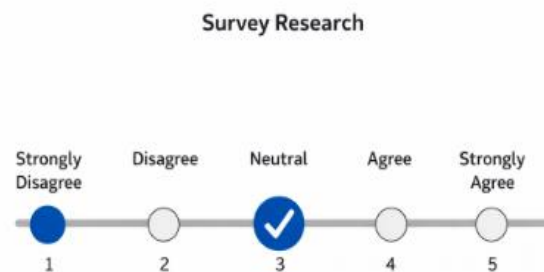
By advancing rigorous scale development and validation, Dr. Tsai helps researchers select and refine instruments that capture the constructs they intend to study – minimizing construct underrepresentation and construct-irrelevant variance.

### **Methodological clarity for complex data.**

Through latent variable modeling, multilevel modeling, and longitudinal analyses, her work equips investigators to model growth and context – exactly where policy and practice decisions often live.

### **Translation across contexts.**

Dr. Tsai collaborates with scholars in healthcare, education, and psychology to demonstrate how psychometric rigor improves real-world programs – from nurse residency transitions to classroom-based social-emotional learning initiatives.



*Example of a psychometric response scale*

Examples of these collaborations include psychometric evaluations of instruments assessing graduate nurses' transition to practice published in [\*JONA: The Journal of Nursing Administration\*](#), a large-scale evaluation of a social-emotional learning intervention published in [\*AERA Open\*](#), and methodological research on improving rating scale design and interpretation in polytomous item response theory published in [\*Measurement: Interdisciplinary Research and Perspectives\*](#).

## Training the Next Generation

Dr. Tsai's research culture emphasizes co-authorship, methodological transparency, and hands-on mentorship. That collaborative ethos is reflected in her co-authored publications and in the trajectories of the students and collaborators she mentors.

One example is [Carlene Brown](#), Ph.D., a recent graduate of UNC’s Applied Statistics and Research Methods doctoral program. Dr. Brown is now teaching research methods, research ethics, and qualitative software and AI analysis for ASRM. Her dissertation explored innovative applications of artificial intelligence in qualitative analysis, demonstrating the kind of methodological range ASRM graduates bring to complex social research problems.

Another example is [Samantha Estrada](#), Ph.D., now an Assistant Professor of Public Health Sciences at New Mexico State University. Dr. Estrada teaches biostatistics and conducts applied measurement and statistics education research, applying the methodological training she developed at UNC to public health contexts.



*Analyzing survey data and measures*

These outcomes are not incidental. They reflect a training model in which students collaborate on real studies – designing measures, testing measurement invariance, and evaluating rating scale performance – before translating those insights into publishable, field-relevant research.

### Why This Work Resonates Now

Several developments make Dr. Tsai’s work especially timely.

#### **Online and hybrid learning are here to stay.**

Her study in Distance Education examines how interactivity relates to learning experiences for different student populations, including first-generation students who may face structural barriers in higher education.

#### **Demand for measurement expertise is growing.**

Schools, healthcare systems, and community organizations increasingly rely on program evaluation and data dashboards. Without psychometrically sound instruments, those metrics risk producing misleading conclusions.

#### **Career pathways for methodologists are diverse.**

Graduates mentored by Dr. Tsai move into academic and applied roles where rigorous measurement is essential – from university faculty positions like Dr. Estrada’s, to program-embedded teaching and research roles like Dr. Brown’s at UNC.

### Looking Forward

For scholars working with complex human constructs – motivation, readiness, belonging, or professional competence – Dr. Tsai’s work offers a clear message: measurement matters.

By integrating methodological rigor with real-world collaboration, her research demonstrates that careful instrument design can strengthen the conclusions researchers draw and the decisions institutions make.

That philosophy lies at the heart of Dr. Tsai's program: not measuring for measurement's sake, but measuring what matters so the knowledge researchers produce leads to better learning, work, and health outcomes.