



Sam Houston
State University

Assessing Student Critical Thinking, Metacognition, and Intellectual Humility Using a Locally Developed Instrument

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Conference

First, a show of hands...

- ▶ How many of you are from:
 - Public Institution?
 - Private Institution?
 - 2-year College?
 - 4-year University?

About Sam Houston State University

- ▶ 4-year, public university approximately 1-hour north of Houston, TX.
 - ▶ Student enrollment of approximately 20,000
 - ▶ Classified as a “Doctoral University: Moderate Research Activity” by the Carnegie Classification of Institutions of Higher Education
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Partnership Between Philosophy and OAPA

- ▶ Since Fall 2015, the Philosophy Program and OAPA have worked together to assess critical thinking for programmatic and core learning purposes
 - Student pre- and post-test scores are analyzed using a dependent samples t -test.
- ▶ Student ID's collected along with student responses to allow for secondary analysis
 - e.g., breaking down student performance by race, gender, socioeconomic status

Core Learning Objectives

According to the THECB, all public institutions should assess student attainment of six core learning objectives:

- ▶ **Critical Thinking**
 - ▶ **Communication**
 - ▶ **Empirical and Quantitative Reasoning**
 - ▶ **Teamwork**
 - ▶ **Personal Responsibility**
 - ▶ **Social Responsibility**
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THECB's Definition of “Critical Thinking”

“creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information”

Our Working Conception

“Critical thinking is reasonable and reflective thinking focused on deciding what to believe and do.” (Ennis, 2015)

Our Working Conception of Critical Thinking

Critical Thinking involves both:

- Skills / Abilities
- Dispositions / Motivations



Texas Assessment of Critical Thinking Skills (TACTS)

- ▶ Administered Annually in All Critical Thinking Courses Taught by Philosophy Program
 - ▶ Originally Developed to Help Evaluate 2003 AACSB standards
 - Analytic thinking
 - Reflective thinking
 - ▶ Adoption by Philosophy Program in Response to Program Assessment Needs
 - ▶ Revised Version of the Instrument was Implemented Fall 2017
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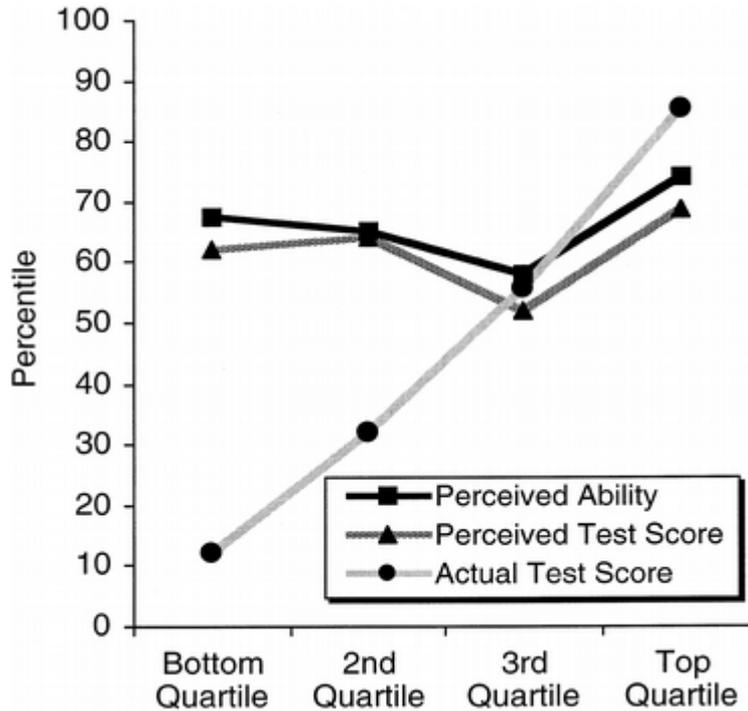
Metacognition: What is It?

- ▶ Metacognition: Commonly defined as “thinking about one’s thinking”
- ▶ Metacognition has many features including:
 - Tracking one’s thinking: (“What was I just thinking about?”)
 - Controlling one’s thinking: (“I need to focus here.”)
 - Evaluating one’s thinking: (“I wasn’t thinking very clearly there”)

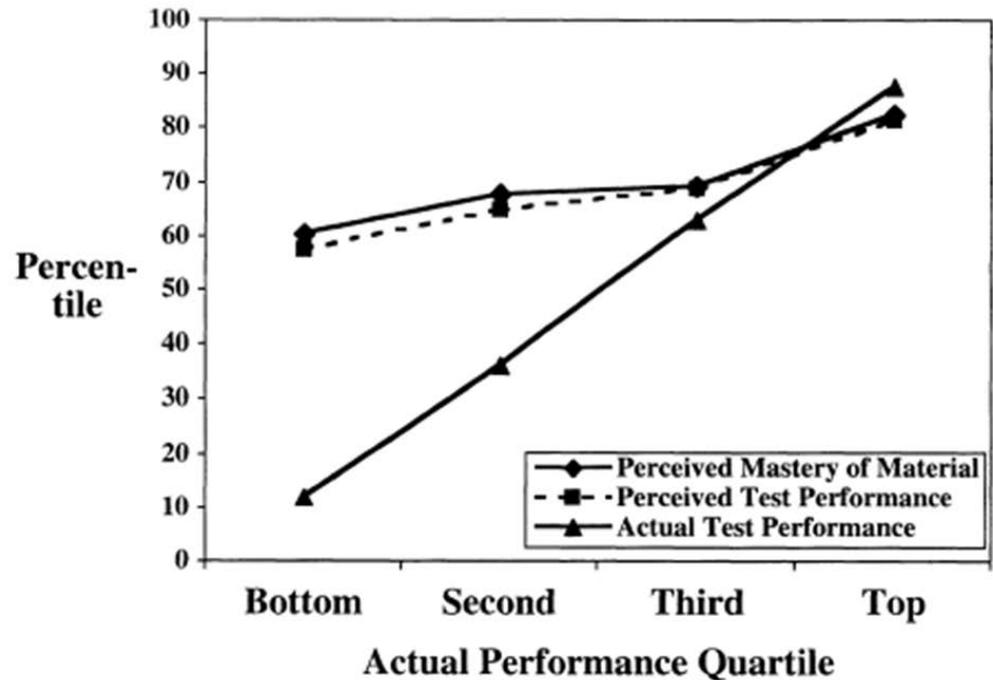
Metacognition: What is It?

- ▶ We use student reports on their critical thinking abilities, BUT:
 - Use these reports in an innovative way
 - Compare those reports to our current critical thinking assessment (TACTS)
- ▶ The Dunning–Kruger effect: put crudely, *the less they know, the less they know it.*
 - The most competent slightly underestimate their abilities
 - Dunning–Kruger holds even when participants are highly motivated (\$100 incentives for accurate self–assessment)

Metacognition: Dunning-Kruger



Logical Reasoning



Psychology Course
Material

Metacognition: Reflecting on TACTS Skills

- ▶ Critical Thinking Ability Questions:
 - “I can consistently determine when a statement or piece of evidence is relevant to a particular conclusion.”
 - “I can consistently identify conclusions that must follow from the information provided to me.”
 - “I can consistently separate required conditions (in other words, necessary conditions) from conditions that guarantee an outcome will occur (in other words, sufficient conditions).”

Intellectual Humility: What Is It?

- ▶ 1) Low self-concern account (Roberts & Wood, 2007)
 - Focus on humility as a contrast to two vices: vanity and arrogance
- ▶ 2) Owning limitations account (Whitcomb, Battaly, Baehr, & Howard-Snyder, 2015)
 - **Cognitive** responses (e.g. response to poor memory)
 - **Behavioral** responses (e.g. verbal response to mistakes in class)
 - **Motivational** responses (e.g. student response to critical thinking deficiency)
 - **Affective** responses (e.g. anger during Q&A)

Intellectual Humility

- ▶ Sample Intellectual Humility Questions:
 - “I often worry about other people finding out what I do not know.”
 - “I tend to be certain that my religious or political beliefs are right and that those who disagree with me are wrong.”
 - “When someone publicly points out that I made an intellectual mistake, I am annoyed at the person who pointed out that mistake.”
 - “It is uncomfortable for me to admit that I do not know something.”

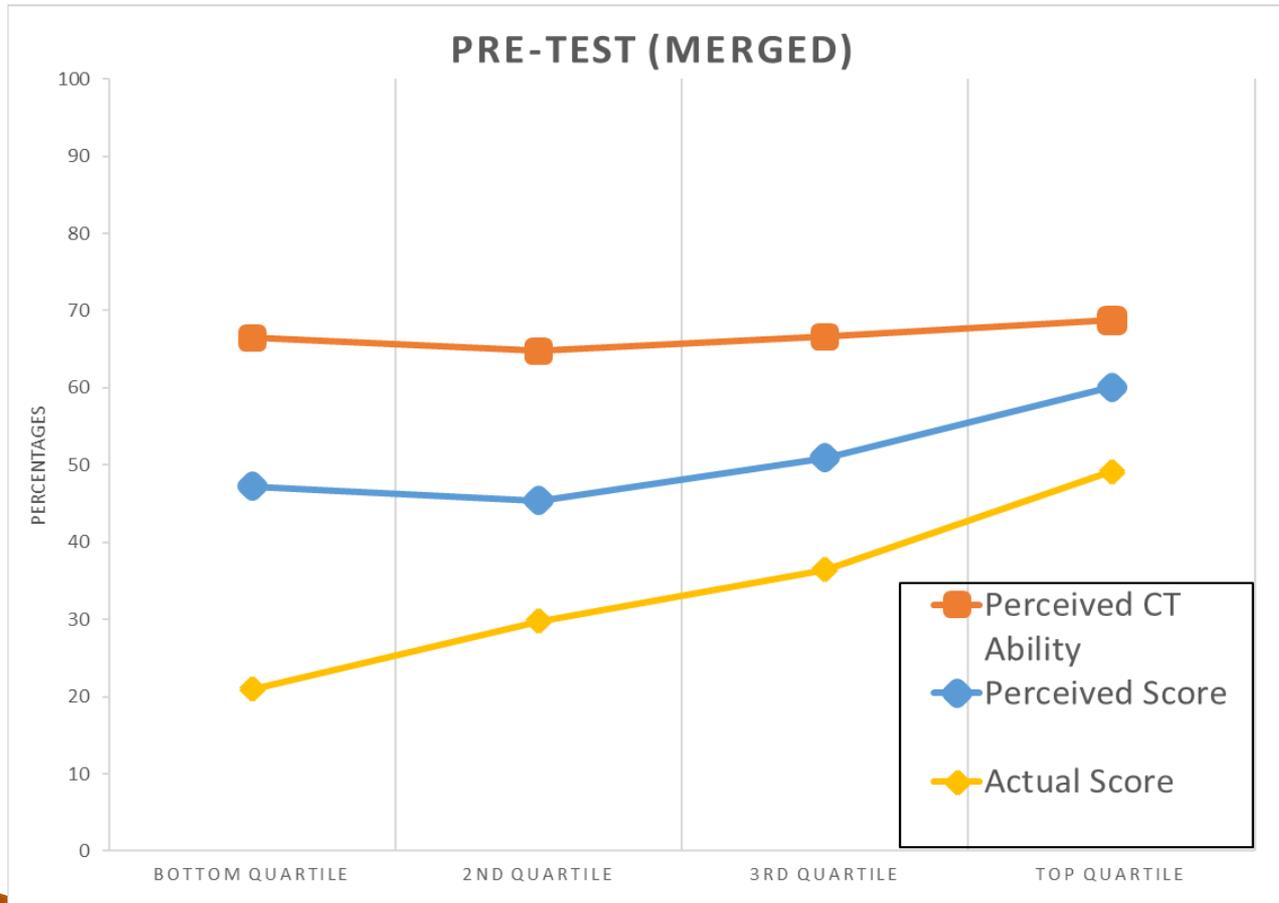
Assessing Critical Thinking, Intellectual Humility, and Metacognition at SHSU

Instrument Reliability and Factor Analysis

- ▶ A restricted factor analysis confirmed the presence of two factors within the instrument (Roberts, Wright, & Sanford, 2017):
 - Student Metacognitive Ability Related to Critical Thinking
 - Cronbach's coefficient alpha of .95
 - Student Intellectual Humility
 - Cronbach's coefficient alpha of .83
- ▶ Question 14, "It would not bother me very much if I found out I was very poor at critical thinking" did not meet the required correlational cutoff of .3 (Lambert & Durand, 1975) for inclusion within either factor.

Does the Dunning–Kruger Effect Apply to Critical Thinking Skills?

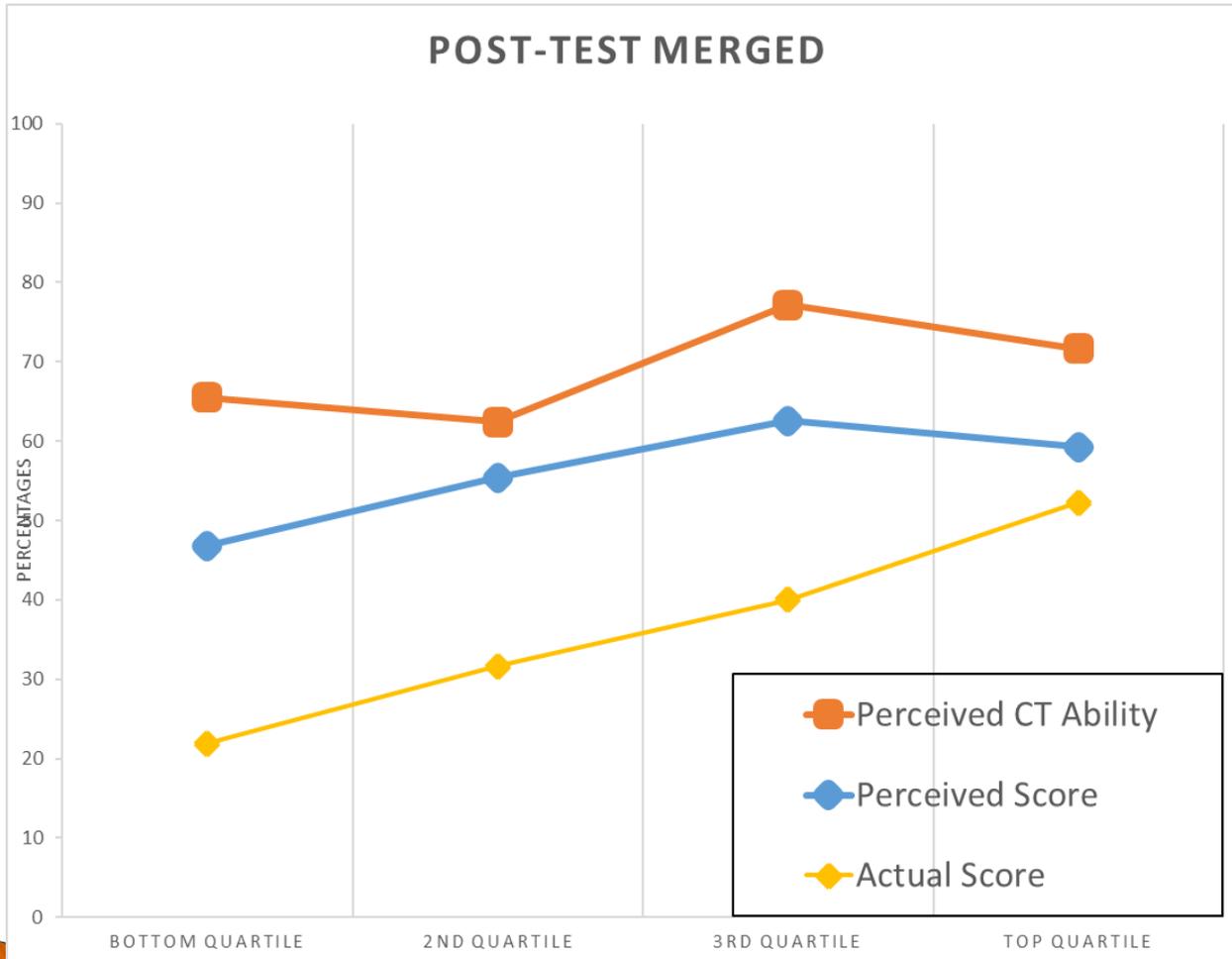
Dunning-Kruger and the TACTS



1) General overestimation of performance

2) All four groups overestimate performance (contra to Dunning-Kruger effect expectations)

Dunning-Kruger and the TACTS



Again, all four groups proved overconfident in evaluating their CT test performance, even at the close of the critical thinking course

**Did We Make Critical
Thinking Students More
Intellectually Humble?**



Intellectual Humility Results

	Pre-Test IH	Post-Test IH	Difference in IH
Bottom Quartile	64.22	63.72	-0.5
2nd Quartile	67.07	62.76	-4.31
3rd Quartile	68.57	72.65	4.08
Top Quartile	66.43	63.33	-3.1

What this means: For most students, taking a critical thinking class did not lead them to them reporting increased intellectual humility.

**How are these data being
used?**



Questions?

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