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The Ethics of Scientific Thinking: Assessment, Intervention, and Decision-Making

Learner Objectives

- Be able to identify salient ethical and legal issues in assessment, intervention, and decision-making practices (especially in context of "RTI");

- Learn about common myths relevant to school-based assessment and intervention;

- Be able to identify cognitive errors and biases that influence school psychologists' and team's decisions.

Rank order the following in terms of their impact on student achievement:

A. Characteristics of principals and school leaders.

B. Teachers' knowledge of subject matter.

C. Teachers' use of formative evaluation.

D. Students' socioeconomic status.

E. Students' use of self-instruction strategies.

F. Teachers' expectations for student performance.

G. Class size.

If a card below has a vowel on one side, then it has an even number on the other side.
Which of the cards should you turn over to determine if this is a true statement?

E   T   2   5

Schools as Host Environments for Commonly-Accepted Myths

- **A profile of characteristics can be used to identify potentially violent students.**
  - No single set of characteristics exists to describe risk with sufficient specificity to be of practical value, and profiling leads to unfair and inaccurate labeling of students (Borum, Cornell, Modezeleski & Jimerson, 2010).

- **Discovery learning results in deeper and more enduring knowledge than direct instruction.**
  - Discovery learning (uncover underlying principles) is best used as adjunct , once knowledge and fluency have been established (Klahr & Nigam, 2004).

- **School-based suicide prevention programs for adolescents can reduce the incidence of suicide.**
  - Little evidence of efficacy, and some evidence of iatrogenic effect (Mann & Currer, 2011).

Myths (continued)

- **Whole word ("look-say") reading approaches are effective.**
  - Phonics-based instruction is more effective than whole-word approaches (Rayner, Foorman, Perfetti, Pesetsky & Seidenberg, 2001).

- **There is an autism epidemic.**
  - The diagnostic criteria for autism have become less stringent; reported increases in prevalence are not based on population studies using standardized diagnostic criteria, but on school reports of the number of children classified as autistic. In the UK, there was no increase in rates when identical diagnostic criteria were used across a multi-year span (Gernsbacher, Dawson & Goldsmith, 2005).

- **Matching students' learning styles to teachers' teaching styles results in improved learning.**
  - "Modality preference" (among students) does not interact with teaching method; i.e., there is no difference in student outcomes when the teacher uses a method (e.g., visual presentation) designed to match the student's preference/style (e.g., visual learner) (Pashler, McDaniel, Rohrer & Bjork, 2009).

Pick Two and Share:

- How do you know whether every third-grade student in your school is reading at an acceptable level of skill?

- How do you know whether interventionists are actually providing the interventions that were discussed and prescribed by the problem-solving team?

- How long should you wait before deciding whether an intervention is working?

- What "decision rule" do you use to decide if a student is showing an adequate response to a prescribed intervention plan (score level, rate of improvement, slope, data pts. above/below goal line, etc.)?

Decision-Making in RTI/MTSS Context

- **What decisions do we make?**
  - Is Tier 1 instruction/behavior management achieving the agreed-upon standard (what standard)?
  - Which students are at risk for failure (Tier 1 inadequate)?
  - What variable(s) should be addressed by Tier 2 and 3 interventions?
  - What intervention(s) are likely to successfully address these variables?
  - Was the intervention delivered with fidelity?
  - Are students who are receiving interventions making adequate progress?
  - Given data regarding progress, what should be done about the intervention (continue, strengthen, expand/generalize, change, discontinue)?
  - Does the student have a disability? (i.e., is there evidence of an inadequate response to evidence-based interventions of increasingly greater intensity, delivered with fidelity?)

- **Are our *decisions* (not just the tests!) valid?**
  - Is a decision defensible on the basis of the technical adequacy of the methods used to make it (assessment measures, decision rules), the manner in which methods were applied, and the outcome to which the decision will lead?

Some concerns that have been raised about RTI/MTSS decisions and practices

- Technical adequacy of CBM: Equivalence of reading passages for progress monitoring (Christ & Ardoin, 2009)

- Technical adequacy of decision rules applied to R-CBM trend (Ardoin, et. al, 2013) when too few data points

- Validity of disability *diagnosis* from "inadequate response" (Fletcher, 2008)

- Inadequacy and/or inappropriateness of Tier 1 and Tier 2 (as delivered in schools) as a foundation for ruling out "inadequate instruction" (Hunley & McNamara, 2010)

- Poor quality and fidelity of problem-solving activities of school teams (Telzrow, et. al, 2003)

- Inadequate evidence base for standard protocol interventions beyond early reading (Institute for Education Science)

Many of these issues are being addressed and resolved in current and ongoing research, but …

- "Research can generate crucial information on … incidence, effectiveness, and consequences …

- Scientific thinking is an important *personal value* for individuals who practice psychology."

- "The evidence-based practice agenda is not just about adopting and implementing research-supported practices. It is about our way of thinking scientifically to reduce bias and errors in our practice" (Kratochwill, 2012, p. 38).

Why? Widespread Cognitive Errors and Biases

- **Confirmation bias** (seek evidence consistent with our beliefs; deny, distort, dismiss contrary evidence)

  - Premature closure (before adequate evidence is available)
  - Belief perseverance (clinging despite repeated contrary evidence)
  - **The cure**: Consider what conclusions would have been drawn if evidence was the opposite of what it is (e.g., shyness/inhibition around males is consistent with SP's suspicion of sexual abuse; if child were excessively friendly with males, would the same conclusion have been drawn? If yes, "confirmation bias.")

- **Illusory correlation**

  - Between "signs" in drawings and propensity for psychological problems
  - Recalling "hits" – when expectation corroborated – and forgetting "misses" (fallacy of positive instances)
  - **The cure:** Attend to instances that do not corroborate expectations; actively seek disconfirming evidence.

- **Hindsight bias** ("I knew it all along" … perceiving events as more predictable after they've occurred than before they occurred)
  - Contributes to overconfidence, and tendency for "second opinions" to corroborate first opinions
  - Contributes to tendency to assume that an event/condition that precedes a pathological outcome is causally related to the outcome (e.g., knowing a child was adopted is regarded as cause of his disruptive behavior)
  - **The cure:** Generate alternative explanations for the outcome.

- **Over-reliance on heuristics** (mental shortcuts or "rules of thumb")

  - *Recognition heuristic*: "If we've heard of something, it's probably higher in quality" (e.g., Harvard vs. Nowhere Community College, or WISC vs. Obscure Test of Intelligence)

  - *Availability heuristic*: Judge likelihood of an occurrence by ease with which it comes to mind (e.g., escalation in school violence as a result of publicity, despite evidence of decrease over past 2 decades)

  - *Anchoring heuristic*: Tendency to be influenced by initial information (e.g., initial low IQ score, followed by later higher score; lower score "sticks")

- *Affect heuristic* (emotional reasoning): More likely to believe claims arousing positive emotions (e.g., SP attending presentation critical of projective testing; because SP's training and practice emphasize it, SP becomes angry and rejects presenter's assertions)

- *Representativeness heuristic*: "Like goes with like" (Placing undue weight on similarities between current phenomenon and past experiences or prototypes; e.g., some IQ test responses remind SP of responses observed among some children with autism)

Base rate neglect
- Underemphasizing the rate or prevalence of a phenomenon within the population as a whole (e.g., regarding IQ score discrepancies as diagnostically significant, despite their high base rate in the general population)

To make matters worse …

Many of the decisions in which school psychologists are involved (especially those of a high-stakes nature) are actually made by *teams*.

So, group "process" variables influence decisions, including …

- **Groupthink** (preoccupation with group unanimity that impairs critical thinking)
  - Pressure toward conformity ("We really need to reach consensus")
  - Illusion of group's unanimity ("We all agree, right?")
  - Illusion of group's correctness ("We're on the right track")
  - Mindguards, or self-appointed group members who suppress dissent ("Are you sure you know what you're talking about?")
  - Self-censorship, or tendency to keep doubts to oneself ("I must be missing something, so I'll keep quiet")
  - **The cure:** Encourage minority dissent; appoint a devil's advocate to raise questions about group decisions

- **Warning signs:**
  - Lack of falsifiability of hypotheses, and tendency to explain away negative findings that contradict hypothesis ("Well … maybe it didn't work because the intervention wasn't *done* properly")
  - Emphasis on confirmation (overlook evidence demonstrating ineffectiveness or contrary findings)
  - Evasion of peer review (certifying adequacy of scientific method in demonstrating effectiveness)
  - Over-reliance on testimonials and anecdotal evidence
  - Extraordinary claims
  - Absence of connectivity between this claim and "settled science" (truly revolutionary paradigms overthrowing extant knowledge are exceedingly rare)
  - Ad antequitatem fallacy (because this is how we've always done things!)
  - Use of hypertechnical language
  - Lack of self-correction ("science" means bending over backward to prove oneself wrong!)

- **Bias Blind Spot:** "Although others make these cognitive errors, I don't, because I'm not that biased or naïve."
  - The "not me" fallacy
  - It's important for *others* to learn about evidence-based practices!

Ten Prescriptions for School Psychologists
(Lilienfeld, et. al)

- Actively seek out disconfirming evidence (to prove your hunch/hypothesis wrong);

- Don't become overly attached to your hypotheses ("know all theories, love some, wed none");

- Consider rival hypotheses (accept hypothesis only if it beats at least one other rival hypothesis);

- Don't cherry-pick (examine *all* evidence/data);

- Put your intuition to the test (hunches may be a good starting point, but they don't work well for decision-making);

- Be skeptical of clinical judgment and long-standing clinical wisdom ("eminence-based practice");

- Be aware of the existence of blind spots (run ideas past others to detect weaknesses or biases);

- Encourage dissent (reinforce others who offer alternative views);

- Quantify, quantify, quantify (assess "impressions" numerically; measure outcomes);

- Maintain a self-critical attitude (willingness to acknowledge that one might be mistaken), and be willing to change beliefs.

References & Further Reading

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