Different Perspectives on Critical Thinking for Evidence-Based Practice

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Different Perspectives on Critical Thinking for Evidence-Based Practice

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Goals of presentation:

- Similarities & differences among different perspectives of critical thinking
- Different applications of critical thinking to evidence-based practice
- Main features of model of critical thinking for evidence-based practice
Why critical thinking for evidence-based practice
Clinicians need to manage and evaluate expanding and evolving body of complex knowledge
Research on judgment & decision-making demonstrates we’re often biased in our thinking, resulting in false beliefs & poor decisions (e.g., Kahneman, 2011)
Quality of clinicians’ decision making skills is foundation for integrating best evidence, clinician expertise, and client preference (e.g., Dollaghan, 2011)
Evidence our profession is beginning to recognize its relevance to clinical decision making includes:
Core competency for IEP (Interprofessional Education Collaborative Expert Panel, 2011) and IEP is primary objective of ASHA’s current strategic plan (ASHA, 2015a)

- Groupthink occurs when a group makes faulty decisions because group pressures lead to a deterioration of “mental efficiency, reality testing, and moral judgment” (Janis, 1972)
Domain of core curriculum in guidelines for Clinical Doctorate in Speech-Language Pathology…and also included in Accreditation Commission for Audiology Education...

I.A. Depth of knowledge and advanced skill development in select areas of clinical practice

I.B. Critical thinking and clinical problem solving

I.C. Clinical education, teaching, supervision, and mentorship

I.D. Expertise in interpreting and applying clinical research

II.A. Professionalism and ethical decision-making

II.B. Oral and written communication about the clinical enterprise

II.C. Advocacy and leadership

II.D. Interprofessional practice

II.E. Regulatory and reimbursement expertise

II.F. Service delivery in a multicultural society
Recently recommended as general knowledge and skill for undergraduate education in CSD by ASHA Academic Affairs Board (2015)

- Critical thinking, problem solving, logical reasoning skills
- Exposure to the scientific method and opportunities for research experiences
- Exposure to the culture of science (e.g., ethics, interdisciplinary, team science)
Included in recent implementation language by Council for Clinical Certification in Audiology and Speech-Language Pathology (CFCC) to Standard V-B

2016 Revisions

Revision 1: Implementation Language to Standard V-B (new paragraphs 3 and 4) – Expanded definition of supervised clinical experiences:

These experiences should allow students to:

• interpret, integrate, and synthesize core concepts and knowledge;
• demonstrate appropriate professional and clinical skills; and
• incorporate **critical thinking** and decision-making skills while engaged in identification, evaluation, diagnosis, planning, implementation, and/or intervention.
Appears in curriculums of undergraduate/graduate programs in our discipline (e.g., Finn, 2011; Hancock & Brundage, 2010; Scherz et al., 2015)
In view of its relevance of critical thinking to our profession, important to understand what it is and how can it be applied to evidence-based practice

- **BUT**

- **Multiple viewpoints**

- **Different perspectives**

  = Confusion and misunderstanding
Historical influences on development of critical thinking:

- Classical Greek philosophers:
  - Socrates
  - Plato
  - Aristotle
Historical influences on development of critical thinking:

- 16th century
- **Sir Francis Bacon**
- “desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to reconsider, carefulness to dispose and set in order; and as being a man that neither affects what is new nor admires what is old, and that hates every kind of imposture” (Spedding, 1868, p. 85)
Historical influences on development of critical thinking:

- John Dewey (1910):
  - How we think
  - “Reflective thinking”
  - “active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it, and the further conclusions to which it tends”
Historical influences on development of critical thinking:

- Edward Glaser (1941):
  
  An experiment in the development of critical thinking

- Critical thinking:

  “(1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within one’s experiences, (2) knowledge of the methods of logical inquiry and reasoning, and (3) some skill in applying these methods”
Historical influences on development of critical thinking:

- Watson-Glaser Tests of Critical Thinking
- Modified version in wide use today
- Based on Goodwin Watson’s (1925) Test of Fairmindedness
Historical influences on development of critical thinking:

- Post-WWII development of cognitive science:
  - Model “open-minded, creative, flexible, and heuristic thinking processes of human nature” (Cohen-Cole, 2014)

- Herbert Simon (1955):
  - Rationality, scientific reasoning, and development of expertise
Later half 20th century:

- Scholars/academics in N. America and Britain
- Develop concept of critical thinking and application across educational settings
- Three perspectives emerged:
  - Philosophy
  - Education
  - Psychology
General similarities across disciplines (Davies, 2015; Lai, 2011):

**Critical thinking = Two-related elements:**

1. **Cognitive skills:**
   - Based on argument analysis

2. **Thinking dispositions:**
   - Reflectiveness
   - Open-mindedness
   - Fairmindedness
General similarities across disciplines (Davies, 2015; Lai, 2011):

Purpose of critical thinking:
- Making up one’s mind about
- What to believe
- What to do
Differences in disciplinary focus and theoretical emphasis

- Help situate recommendations for applying critical thinking to evidence-based practice
Philosophical perspective of critical thinking:

- Typical account of critical thinking (Davies, 2015)
- Emerged during 30-year period beginning in 1960’s
- Often called “critical thinking movement” (Facione, 1990; Paul & Binker, 1990)
- Informed foundations of other perspectives
Philosophical perspective of critical thinking:

- BUT

- So many viewpoints
  
  = Confusing glut of critical thinking definitions
American Philosophical Association (APA) Committee:

- Consensus statement based on Delphi technique (Facione, 1990)

- We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which judgment is based....The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (Facione, 1990, p. 3)
Two widely used assessments for critical thinking also emerged:

- California Critical Thinking Skills Test (CCTST) (Facione, 1990)
- California Critical Thinking Disposition Inventory (CCTDI) (Facione et al., 1994)
Critique of APA Delphi definition:

- Impractical for education (Davies, 2015)
- Unsuitable for clinical reasoning
- Delphi addresses “what could/should be” rather than “what is” questions (Hsu & Sandford, 2007)
- Based on wide-ranging expert opinion and committee consensus rather than cohesive, well-founded theoretical and empirical foundation (Stanovich et al., 2011)
Critical thinking skills

- Argument analysis based on informal logic
- Informal logic is reasoning based on everyday language (Groarke, 2015)
- Argument consists of:
  - Issue
  - Conclusion
  - Reasons
- (Browne & Keeley, 2015)
Example of an evidence-based practice argument:

- **Issue:** Specific question about best approach for managing communication disorder
- **Conclusion:** A recommended treatment approach
- **Reasons:** Various sources of evidence that support that recommendation
Argument analysis consists of three interactive stages:

- Interpretation
- Evaluation
- Metacognition
1. Interpretation: Goal

- Determine how much one understands about argument that will be focus of one’s thinking
Interpretation: Objectives

- Identify
- Understand
- Clarify
- Issue, Conclusion, and Reasons that support Conclusion
- Example:
  - If colleague recommended a treatment approach as ‘best available’ – Practitioner would want to understand reasons for colleague’s recommendation
2. Evaluation: Goal

- Determine how acceptable conclusion is in view of reasons provided
Evaluation: Three interrelated steps

1. Examine relevancy and plausibility of reasons for supporting credibility of conclusion

- **Example:**
  - Colleague recommends treatment approach because other clinicians she knows use this approach

- **Good reason?**
  
  OR

- **Fallacy?**

- Appeal to common practice
Evaluation: Three interrelated steps

2. Determine kind, quantity, and quality of evidence that supports conclusion

- **Example:**
- Colleague’s reasons for recommending treatment approach might be based on personal experience with treatment, or research findings read in a journal, or information from presenter at workshop featuring commercial product
Evaluation: Three interrelated steps

3. Make judgment of likely acceptability of argument in light of evaluation

- Example:

- Evaluation of research that colleague claimed supported her recommendation might reveal quality of evidence sufficient to support, but accurate only for narrow age range and her client’s age falls outside that range
3. Metacognition: Goal

- Monitor and evaluate quality of one’s own thinking during argument analysis.
Metacognition: Three objectives

1. Monitor level of understanding of argument during stages of interpretation and evaluation

- Example:

- Practitioner might ask her colleague what she means when she characterizes her recommendation as ‘best available’ rather than assuming they both share same meaning
Metacognition: Three objectives

2. Be aware of one’s biases, assumptions, and values relative to argument

- Example:
- Practitioner might disagree with theoretical perspective supporting colleague’s recommendation; thus, need to be aware that this view might unfairly influence her evaluation of argument
Metacognition: Three objectives

3. Deliberate application and monitoring of different thinking dispositions to provide most effective evaluation of argument

- **Example:**

- **Actively open-minded thinking:**

- Willingness to search for info, thorough and in proportion to importance of understanding and evaluating argument; to openly consider new ideas, possibilities, and evidence that might be discovered during that search; and to conduct fair evaluation of that evidence, including evidence that one might not favor (Baron, 2008)
Thinking dispositions

- Thinking dispositions essential to successful implementation of critical thinking (Ennis, 1962)

- Play two important roles:
  - Tendency to act or think in particular way
  - Ability associated with disposition
Tendency has two reciprocal elements: (Perkins, Jay & Tishman, 1993)

- **Sensitivity:** Awareness that specific behavior is appropriate in given situation
- **Inclination:** Motivation to actually engage in that behavior

**Example:**

- Uncertainty in clinical situation should trigger and motivate clinician to engage in evidence-based practice
Ability refers to metacognitive skills that moderate quality and direction of one’s thinking

- Examples:
- Open-mindedness
- Fairmindedness
- Reflectiveness
- Relevant to evidence-based practice
Evidence suggests thinking dispositions are:

- Unique predictors of individual ability to critique arguments (Stanovich & West, 1997, 1998)
- Correlated with critical thinking skills and related to ability to minimize cognitive biases (West et al., 2008)
- Relevant to helping professions (Krupat et al., 2011; Papp et al., 2014)
- Relevant to education of students in our professions (Finn, in preparation; Ng et al., 2013)
Critical thinking and evidence-based practice within a philosophical framework:

- Several examples in health care literature, including professions such as
  - Nursing (Profetto-McGrath, 2005)
  - Social work (Gambrill, 2013)
  - Medicine (Jenicek, 2006)
Example based on Jenicek & Hitchcock (2005):

- **Critical thinking based on argument analysis**

- Identifying the problem, clarifying for meaning, gathering the evidence, assessing the evidence, determining the adequacy of inferences drawn from the evidence including possible fallacies in the reasoning, addressing other considerations such as situational factors and alternative explanations, and arriving at an overall judgment (Jenicek & Hitchcock, 2005, pp. 109-110)
Philosophical perspective evident in CMSD:

- Facione (1990) APA definition
- Broadly based on cognitive skills and dispositions
- Guidelines for Clinical Doctorate in SLP (ASHA, 2015)
- Six elements of critical thinking consistent with argument analysis
- Definition of critical thinking from The Critical Thinking Community (Paul & Binker, 1990)
Strengths of critical thinking from philosophical perspective:

- Cognitive skills and dispositions for critically appraising evidence
- Accountability for decisions to other helping professionals, as in interprofessional practice
Weaknesses of critical thinking from philosophical perspective:

- Focus on skills and dispositions may trivialize as set of procedures to be applied mechanically (Johnston et al., 2011)

- Superficial thinking resulting in failure to ask deep questions such as examining sociocultural assumptions (Riddell, 2007)

- Evaluating logical fallacies may result in rejection of otherwise sound argument (Kaplan, 1991) and overlook influence of cognitive biases (Garb, 1998)
Educational perspective of critical thinking:

- Permeable boundaries between perspectives (Davies & Barnett, 2015)
- Most forceful critics from educational perspective (e.g., Barnett, 1997; Thayer-Bacon, 2000)
- Wide variety of approaches for understanding and educating for critical thinking (Moseley et al., 2005)
Focus on criticality and critical pedagogy:

- Both acknowledge relevance of argument analysis to critical thinking (Burbules & Berk, 1999), but argue it is limiting and incomplete

- Both relate to recommendations for applying critical thinking to evidence-based practice
Criticality (Barnett, 1997; Johnston et al., 2011)

- Motivation and ability to act on world and self via evaluative and reflective understanding of knowledge
- Mediated by experience of how social and physical environment is structured
- Underpinned by moral vision and values
Criticality consists of three levels:

- **Critical reason:** Interpretation and evaluation of formal knowledge
- **Critical self-reflection:** Self-evaluation, given standards and norms
- **Critical action:** Evaluation of social structures in order to improve the world
Critical pedagogy (Burbules & Burk, 1999)

- Similar to criticality

- BUT

- Practitioner must question and challenge one’s systems of beliefs, esp. at sociocultural and political level

- Social justice = common theme
Critical thinking and evidence-based practice within an educational framework:

- Reflective practice (Schön, 1983):  
- Occupational therapy (Kinsella, 2001)  
- Medicine (Nguyen et al., 2014)  
- Speech-language pathology (Caty et al., 2014)  
- Audiology (Ng, 2012)
Example based on Ng (2012)

- Value practical, social, political, economic, and personal knowledge
- Consider context and lives of clients
- Explore assumptions underpinning practice
- Understand practice in reality in comparison to theory of practice
Example based on Ng (2012)

- **Reflection-on-action:**
  - Making sense of past actions and actively learn from experience

- **Reflection-in-action:**
  - Learning to appreciate ‘knowledge-in-doing’ that reveals itself in clinic under uncertainty

- **Reflective writing:**
  - Question assumptions, challenge status quo, advocate for change to best support clients
Strengths of critical thinking from educational perspective

- Encourages:
  - Knowledge based on practical experience
  - Self-examination of beliefs in practice
  - Questioning disadvantages of health care system
Weaknesses of critical thinking from educational perspective

- Fails to consider role of cognitive biases in reflection:
  - Confirmation bias
  - Hindsight bias
  - Wishful thinking
  - Memory distortions
Psychological perspective of critical thinking:

- Argument analysis/thinking dispositions essential to critical thinking (e.g., Halpern, 2014)
- BUT within
- Theoretical and empirical framework of how people actually think (e.g., Stanovich & Stanovich, 2010)
Critical thinking is viewed as applied rationality (Stanovich, 2009):

- **Epistemic rationality** = “What is true”

- **Beliefs map reasonably well to way world really is**

- **Instrumental rationality** = “What to do”

- **Decisions provide best means for moving toward desired goal**
Rationality as framework for critical thinking confers several advantages:

- Critical thinking ≠ intelligence (Stanovich, 2009)
- Dual-process models of thinking
- Judgment and decision-making research (Kahneman, 2011)
- Expert decision-making (Shanteau, 1999)
- Emotions as rational tools (De Sousa, 1987)
Critical thinking in evidence-based practice within psychological perspective

- Examples in:
  - Medicine (Croskerry, 2015)
  - Speech-language pathology (Finn, 2011)
Model of critical thinking for evidence-based practice

- Provide cohesiveness & clarity in context of recent theoretical perspectives
- Framework for supporting evidence-based practice
What is critical thinking? (Wade, Tavris, & Garry, 2014)

- Assess claims
- Make judgments on basis of well-supported reasons & evidence
- Look for flaws in arguments
- Resist claims that have no support
- Be creative and constructive
- Consider alternative explanations for events
- Think of implications of research findings
- Apply new knowledge to social and personal problems
A model of critical thinking for evidence-based practice
Dual Process:
Two dominant modes of thinking (Evans, 2008)

- Type 1: Automatic or Intuitive
- Type 2: Controlled or Deliberate
Type 1 Thinking Characteristics (Dane & Pratt, 2007)

- Nonconscious
  Little or no conscious thought
- Associative
  Over-learned associations
- Rapid
  Minimal attention
- Affective
  Influenced by mood
Type 2 Thinking Characteristics (Evans & Stanovich, 2013)

- Conscious
  - Attention & working memory

- Sequential processing
  - Usually involves focused, single task focus

- Slow and deliberate
  - Requires time and effort

- May enable setting aside bias
  - Separate prior beliefs from evaluative process
Dual-Process Thinking: Evidence

- Extensive literature supports dual-process thinking
  - Kahneman (2011)
  - Stanovich (2009)
  - Evans (2008)

- Brain imaging findings:
  - Bechara (2005)
  - Lieberman (2000, 2007)
  - Kuonios & Beeman (2014)
Type 1 & 2 Thinking: Positive Outcomes

- **Type 1**
  - Strong for holistic judgments & expert judgments (e.g., Kahneman & Klein, 2009)

- **Type 2**
  - Strong for specific task & analytic judgments (e.g., Stanovich, 2013)
Type 1 & 2 Thinking: Negative Outcomes

- **Type 1**
  - Errors more likely when accuracy is essential, uncertainty is high (e.g., Kahneman, 2011)

- **Type 2**
  - Errors more likely when engaged in motivated reasoning (e.g., Stanovich, 2013)
Critical thinking
Three components:
- Interpretation
- Evaluation
- Metacognition
A model of critical thinking for evidence-based practice
Contextual factors include:

- Situational characteristics
- Task requirements
Situational characteristics:

- **Defining conditions:**
- Social/Educational context
- Work setting/culture
- Client & significant others
- Amount of information
- Amount of time
Situational characteristics:

- **Predictive factors include:**
- Uncertainty
- Complex information
- Evaluation of evidence
- High stakes outcome
Task requirements:

- Well-defined vs. Ill-defined
- Organizing questions:
  - What do I need to understand?
  - What are client’s needs?
  - Feedback availability
A model of critical thinking for evidence-based practice

CONTEXTUAL FACTORS
- Situation:
  - Defining Conditions
  - Predictive Factors
- Thinking Task Requirements

TYPE 1
AUTOMATIC PROCESSES

TYPE 2
CONTROLLED PROCESSES
CRITICAL THINKING SKILLS
- Interpretation
- Evaluation

Metacognition

INDIVIDUAL FACTORS
- Thinking Dispositions
- Education
- Expertise
- Affect
- Experiential Consequences
Individual factors:

- Thinking dispositions*
- Education
- Expertise
- Affect
- Experiential consequences
Education includes:

1. Breadth/depth of knowledge
2. Critical thinking skills
3. Cognitive biases
1. Breadth and depth of acquired knowledge

- Knowledge across various domains
  Biological, psychological, social, and cultural features of disorders

- Depth of knowledge
  Viewpoints change – quality of reasons to support it
2. Knowledge of critical thinking skills:

- **Evidence strongly suggests critical thinking skills:**

- Significantly improve under direct vs. indirect instruction (Abrami et al., 2008)

- Best if instruction duration is 12 weeks or more (Niu et al., 2013)

- Significantly better within specific knowledge domain (Abrami et al., 2015)

- Students in our professions benefit & improve (Finn, 2012; Ng et al., 2012)
3. Knowledge of cognitive biases

- Cognitive biases refer to various human thinking errors that play role in making decisions and developing beliefs.
Critical thinking minimizes cognitive biases (Stanovich, 2011)

- Examples:
  - Reduce confirmation bias
  - Minimize hindsight bias
  - Consider alternatives
Expertise:

- Understanding of correct decision-making
- Based on knowledge and experience in given setting
- Relies on correct attitudes and skills
Clinical expertise is “glue” by which best available evidence is integrated in providing optimal patient care (Dollaghan, 2007)
Myth of expertise (Dawes, 1994; Finn, 2004)

- Assume skills improve with experience
- But fail to consider requirements for such learning to occur
Expertise improves over time as result of various factors (Tracey et al., 2014)

- Critical thinking skills
- Accurate feedback
- Deliberate practice
Affect

- Mood or emotion that influences decision-making (Hogarth, 2001)
Emotion and decision-making go hand in hand (Lerner et al., 2015)

- Shape decision making
- If anxious, choose a safer option
- Act as guide
- Passion to know the truth
- Provide “data”
- Why am I feeling this way
- Emotional intelligence
- Understand own emotions and those of others
Experiential consequences

- Cognitive and affective experiences of engaging in critical thinking (Fischer et al., 2000)
Experiential consequences wide-ranging:

- Desired outcome = positive experience (Halpern, 2014)
- Time and effort = physical energy (Masicampo & Baumeister, 2008)
- Challenge to cherished views = cognitive dissonance (Brookfield, 2008)
Take home message

- Critical thinking and evidence-based practice:
  - Is about ways of deciding & conveying well to others what we believe and what we are doing or intend to do
  - Not for our personal satisfaction
  - But for the full benefit of the client & community (Jenicek & Hitchcock, 2005)
  - Maybe it should be a required knowledge & skill for all of our helping professionals!
Contact information for questions

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