The Rigor Gap:
Teachers’ Beliefs about Critical Thinking

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A possible factor in the rigor gap: Teachers’ beliefs about how the mind works and how teaching should proceed

In particular, beliefs about **critical thinking** (CT): “Cognitive skills and strategies that increase the likelihood of a desired outcome...thinking that is purposeful, reasoned, and goal-directed – the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions” (Halpern, 2003, p. 6).

CT is a key element in rigorous instruction
Teachers’ beliefs about critical thinking: Differentiation of instruction according to learners’ SES advantages?

Do teachers favor…

…high-CT activities for high-advantage learners?

…low-CT activities for low-advantage learners?

Teachers may support such CT differentiation (Raudenbush et al., 1993; Zohar et al., 2001)

A source of inequity in schools, especially with new tests?

A self-fulfilling prophecy?
Research Article 1

Validation of the
**Critical Thinking Belief Appraisal**

The **Critical Thinking Belief Appraisal** (CTBA)

Two activity types:
- **high-CT** and **low-CT** activities

Two populations of learners:
- **high-advantage** and **low-advantage** learners

Four factors

1. **High-CT** activities for **high**-advantage learners
2. **High-CT** activities for **low**-advantage learners
3. **Low-CT** activities for **high**-advantage learners
4. **Low-CT** activities for **low**-advantage learners
**Pedagogical Preferences:**
The blend of high-CT and low-CT activities judged to be best for a particular learner population (high-advantage or low-advantage)

**Pedagogical Preference Effects:**
• High-advantage PP effect
• Low-advantage PP effect

Series of 5 studies demonstrated favorable psychometric characteristics
Research Article 2

Inservice Teacher Research


Inservice teachers \((N = 145)\)

Within-participants MANCOVA
Effect Sizes of Pedagogical Preference Effects for Inservice Teachers

High-adv. PP Effect: .24
Low-adv. PP Effect: .09

Effects favor high-CT over low-CT activities
Discussion: Research Article 2

Teachers did not prefer low-CT activities over high-CT ones for low-advantage learners

But teachers did favor:

• High-CT more for high-adv. than low-adv.
• Low-CT more for low-adv. than high-adv.

CT differentiation as such seems likely to result in less rigorous instruction for low-advantage learners

Findings replicated twice
Research Article 3

Expert Teacher Research


Groups:
- Supervisor-nominated **expert** teachers
- Randomly-selected **inservice** teachers

\[ N = 194 \]

MANCOVA and ANCOVA
Effect Sizes of Differences Between Expert and Inservice Teachers

* Experts exceeded inservice teachers in mean ratings
** Inservice teachers exceeded experts in mean ratings
Pedagogical Preference Effect Sizes for Expert and Inservice Teachers

**High-Adv. PP Effect**
- **.65** (Expert)
- **.08** (Inservice)

**Low-Adv. PP Effect**
- **.69** (Expert)
- n.s. (Inservice)

*Effects favor high-CT activities*
Discussion: Research Article 3

Experts:
- more favorable to high-CT activities
- less favorable to low-CT activities
- lower level of CT differentiation

Experts’ beliefs seem less likely to contribute to the rigor gap

Inservice teachers’ beliefs appear partially incompatible with teaching expertise – a finding with implications for teacher education
Research Article 4

Teacher Development Research

Groups:
- Controls (non-teachers)
- Prospective teachers
- Preservice teachers
- Inservice teachers

Examination of differences associated with:
- Self-selection of a teaching career
- Preservice education
- Teaching experience and inservice ed.

$N = 408$

MANCOVA with post hoc tests (Bonferroni)
Effect Sizes of Differences Between Controls and Prospective Teachers

Prospective Teachers Exceeded Controls in Mean Ratings

- High-CT / High-Adv.: 0.11
- High-CT / Low-Adv.: 0.05
- Low-CT / High-Adv.: n.s.
- Low-CT / Low-Adv.: n.s.
Pedagogical Preference Effect Sizes for Controls and Prospective Teachers

* Effect favoring high-CT activities
** Effect favoring low-CT activities
Self Selection

- A powerful influence on teachers’ beliefs about CT – differences for high-CT activities, but not low-CT ones
- Prospective teachers show stronger support for high-CT activities for both populations
- Prospective teachers evinced lower CT differentiation
Effect Sizes of Differences Between Prospective and Preservice Teachers

Prospective Teachers Exceeded Preservice Teachers in Mean Ratings

- High-CT / High-Adv.: .05
- High-CT / Low-Adv.: n.s.
- Low-CT / High-Adv.: .06
- Low-CT / Low-Adv.: .06
Pedagogical Preference Effect Sizes for Prospective and Preservice Teachers

Effects favor high-CT activities
Preservice Education

- A time of change in teachers’ beliefs
  - Decline in support for low-CT activities
  - Small decline in support for high-CT/high-advantage
- Modest decrease in CT differentiation – apparently due to reduction in support for low-CT activities
Effect Sizes of Differences Between Preservice and Inservice Teachers

Preservice Teachers Exceeded Inservice Teachers in Mean Ratings
Teaching Experience and Inservice Education

• Little change in teachers’ beliefs
  – Small reduction in high-CT/low-advantage
• No meaningful change in CT differentiation
Research Article 5

“Issues” Research


Interview protocol with inservice teachers ($N = 20$)

Survey of Inservice teachers ($N = 120$)
Within-participants MANCOVA
Issues not associated with a pedagogical preference (with low-advantage learners):
  • Classroom management
  • Ease of assessment

Issues associated with a preference for high-CT activities (with low-advantage learners):
  • High-stakes tests (partial eta = .12)
  • Influence of administrators (.09)
  • The nature of the subject (.05)
Issues associated with a preference for low-CT activities (with low-advantage learners):

- Learners’ prior knowledge (partial eta = .15)
- Time constraints (.13)
- Influence of parents (.08)
- Influence of colleagues (.08)
- Learners’ level of motivation (.07)
- Learners’ level of ability (.04)
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