

When Knowledge Doesn't Fit: Effects of Cognitive Conflict on Diagnostic Accuracy

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Background / Rationale



When teaching medical students, educators often assume new knowledge is consistent with what students already know (schema-congruent) and will assimilate easily.

When information conflicts with existing knowledge (schema-incongruent), it may be ignored or misapplied, leading to misconceptions or no change in practice.

- ✓ Schema-congruent = consistent with prior knowledge
- ✗ Schema-incongruent = conflicts with prior knowledge

Research Question



How do schema-congruent versus schema-incongruent causal explanations, presented as full or partial explanations, affect diagnostic accuracy and knowledge restructuring?

Methods

- Undergraduate science students (target N = 84)
- Learn 4 fictitious diseases
- 1-week delayed alternate diagnostic test
- Randomized to 1 of 4 conditions
- Immediate diagnostic test
- Recognition memory task

	Congruent	Incongruent
Full Explanation	 Congruent + Full	 Incongruent + Full
Partial Explanation	 Congruent + Partial	 Incongruent + Partial

Full explanations include causal mechanisms linking symptoms to underlying processes; partial explanations present symptoms without causal links.

When new information conflicts with what learners already know, they either update their understanding (restructure knowledge) or form misconceptions.



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Outcomes & Analysis



Primary Outcome:
Diagnostic accuracy measured immediately and after 1 week.



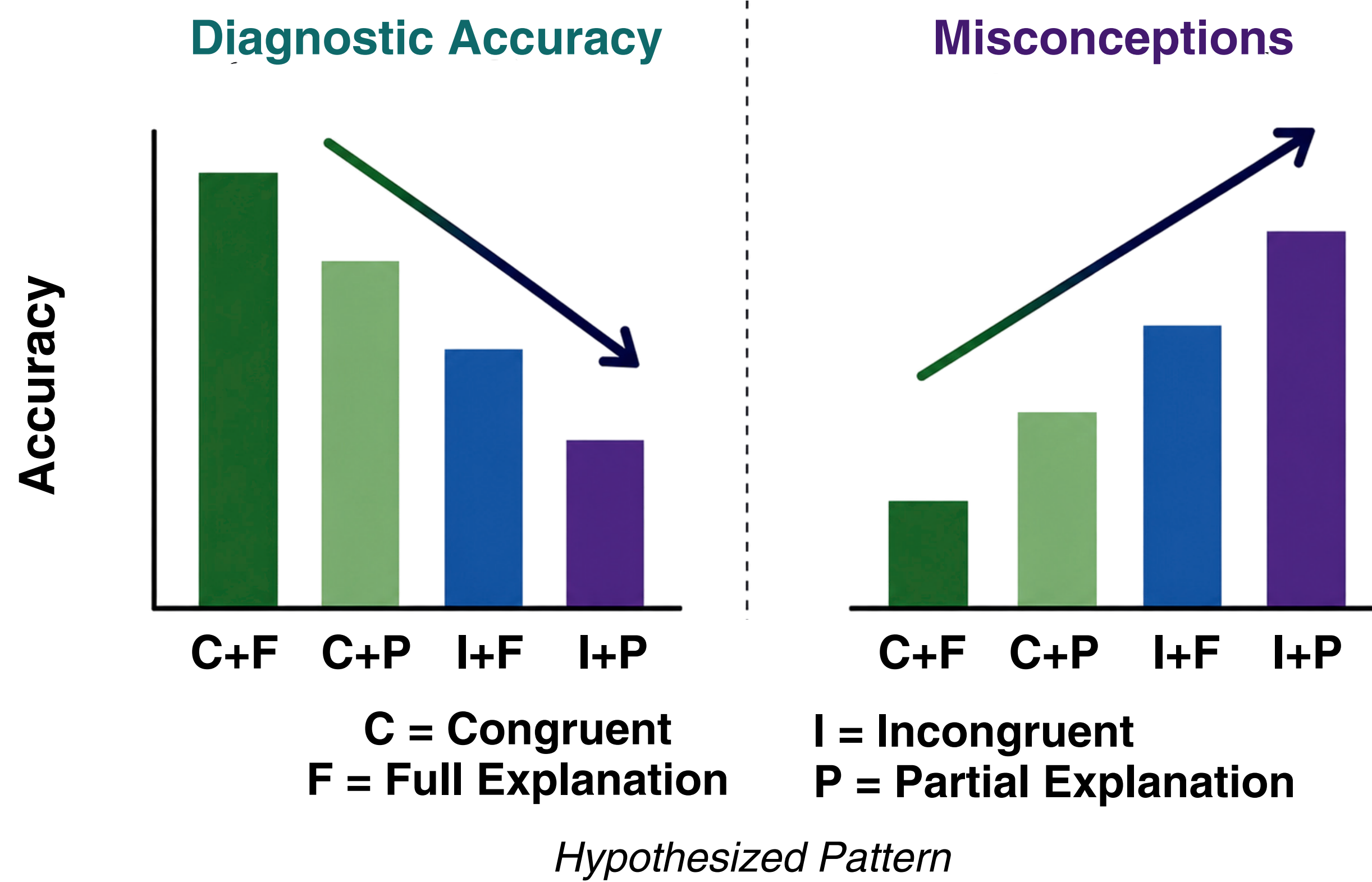
Secondary Outcome:
Knowledge structure / restructuring measured with word recognition.



Analysis:
2 x 2 x 2 mixed ANOVA for diagnostic accuracy (congruence x explanation completeness x timepoint).
2 x 2 factorial ANOVA for recognition scores (congruence x explanation completeness).

Preliminary / Expected Findings

Data collection is ongoing. We expect schema-congruent conditions to outperform schema-incongruent conditions on diagnostic accuracy. We also expect incongruent partial explanations to generate more misconceptions than full explanations.



Significance

Research Gap

It is unclear how causal coherence restructures knowledge when information is schema-incongruent.

Why It Matters

Findings may inform how health professions educators teach atypical presentations to improve diagnostic reasoning.

Relevance to Holland Bloorview

Clinical Training

Teaching medical students and residents often assumes new knowledge fits what learners already know. This research directly informs how educators can better teach schema-incongruent clinical information.

Clients and Families

Most children at Holland Bloorview present with atypical patterns that don't fit standard clinical expectations. Better clinician training supports more accurate diagnostic reasoning for the clients and families we serve.



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