

Preserved Curiosity-Driven Learning in Children with Communication and Behavioural Difficulties

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Background

- Epistemic curiosity (the intrinsic desire to acquire knowledge for its own sake) is fundamental to learning and drives information-seeking behaviour while enhancing memory through dopaminergic reward circuits.
- The PACE framework (Prediction, Attention, Curiosity, Explanation) links surprise to attention, exploration, and memory.
- Research Gap: While curiosity mechanisms have been studied in neurotypical populations, it remains unclear whether these systems are preserved in children with communication and behavioural difficulties.

Aims

- Do children with greater communication/behavioural difficulties show similar curiosity levels?
- Are they equally willing to wait for information they find curious?
- Do they gain similar memory benefits from curiosity?
- Does stimulus type (visual vs verbal) matter?
- Hypothesis: Epistemic curiosity systems would be largely preserved across the developmental spectrum due to their fundamental role in learning and adaptation, with a possible advantage for visual stimuli.

Methods

Participants

- N = 36 children aged 8-12 years (M = 9.98, SD = 0.85)
- Range from neurotypical to diagnosed/suspected neurodevelopmental conditions
- Dimensional Composite: Created using factor analysis of parent questionnaires (SCQ, CCC-2, SDQ)
- Higher scores = greater communication/behavioural difficulties

Curiosity-Driven Learning Task

- **Session 1: Curiosity & Decision-Making**
 - Question Presentation (5s): View trivia question
 - Decision Phase: Choose "Skip," "Wait," or "Know"
 - Wait Period: 10-30 seconds if "Wait" selected
 - Answer Revelation (3s): Correct answer shown
 - Curiosity Rating: 1-7 scale
 - Satisfaction Rating: 1-7 scale
- **Session 2: Memory Assessment (~1 week later)**
 - 4-alternative forced-choice recognition test

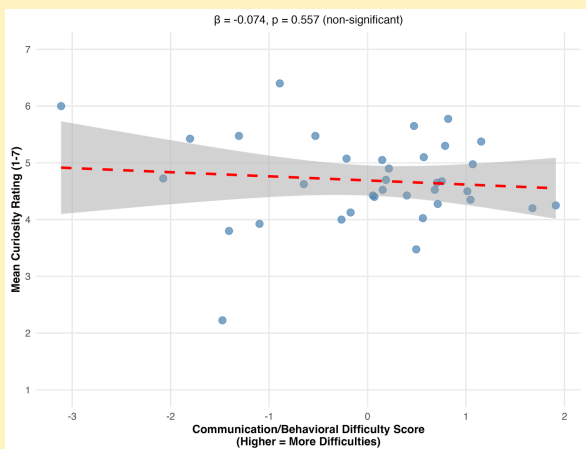
Analysis

- Mixed-effects models accounting for nested data structure
- Random intercepts for participants and items
- Fixed effects: composite difficulty score, stimulus type, age

Key Findings

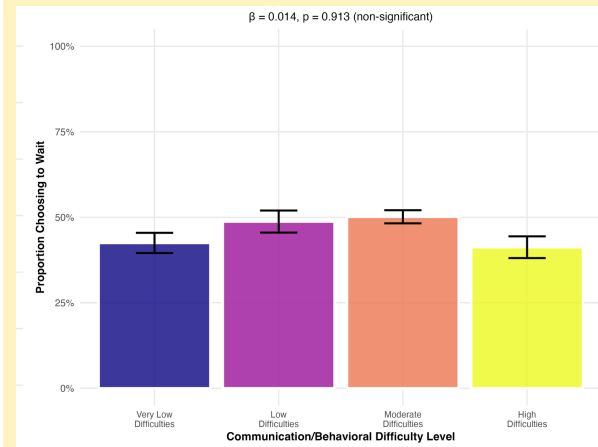
1. Curiosity Expression is Preserved

- **No significant differences** across difficulty levels
- Children with varying communication and behavioural difficulties show equivalent curiosity expression.



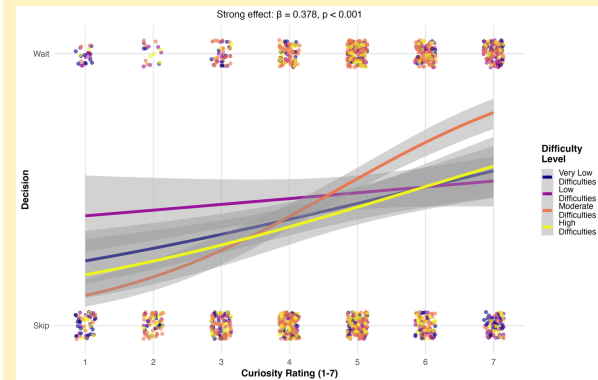
2. Willingness to Wait is Preserved

- **No significant differences** in waiting behavior
- All children equally willing to invest time for curious information.



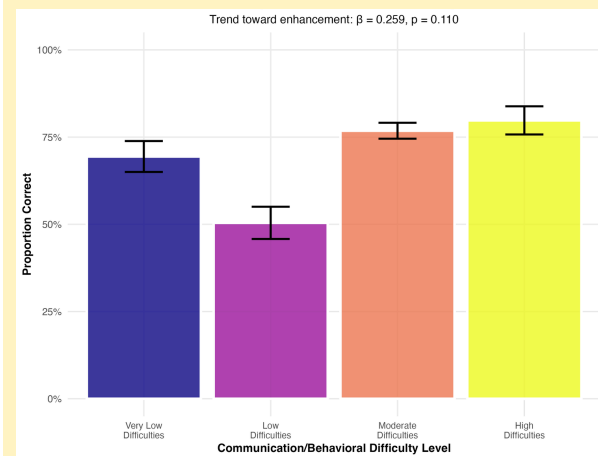
3. Strong Curiosity-Waiting Relationship Across All Groups

- **Robust effect**
- Higher curiosity dramatically increases probability of waiting (OR = 1.46) regardless of difficulty level.



4. Memory Performance Trends

- Unexpected positive trend suggests preserved or potentially enhanced memory mechanisms.



Conclusions

Epistemic curiosity and information-seeking behaviours remain preserved in children with communication and behavioural difficulties.

Clinical Impact: These findings support strength-based, person-centered approaches that capitalize on preserved learning mechanisms rather than focusing on deficits or developing specialized interventions for specific diagnostic categories.

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