



# Effect of Elaborative Conversation Strategies on Parent-Child Science Talk

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## Background

- Children’s early science learning has been positively associated with their development of other domains (e.g., math skills, etc.) and later learning of science (Guo et al., 2015).
- Children need adults to co-construct their knowledge and skills and help them expand and generalize their learning (Alexander et al., 2012; Campbell et al., 2021).
- Parents report lacking confidence when talking about science with their children (Silander et al., 2018).

## Research Questions

- RQ1:** How does training parents on using elaborative conversation strategies influence their use of those strategies when engaging their children in science activities?
- RQ2:** How does training parents in using ECS enhance children’s science knowledge, skills, and interest as well as parents’ attitudes toward supporting children’s science learning?

## Method

### Study Design

Single-case experimental design: Multiple probe design across individuals  
Study phases:

- 1 Pre-assessment: parent survey and child assessments
- 3 Baseline visits: 15- to 30-minute parent-child interactions
- 5 Intervention sessions: 15- to 20-minute training and 15- to 30-minute parent-child interactions
- 5 Probe sessions: 15- to 30-minute parent-child interactions
- 1 Post-assessment: parent survey and interview and child assessments

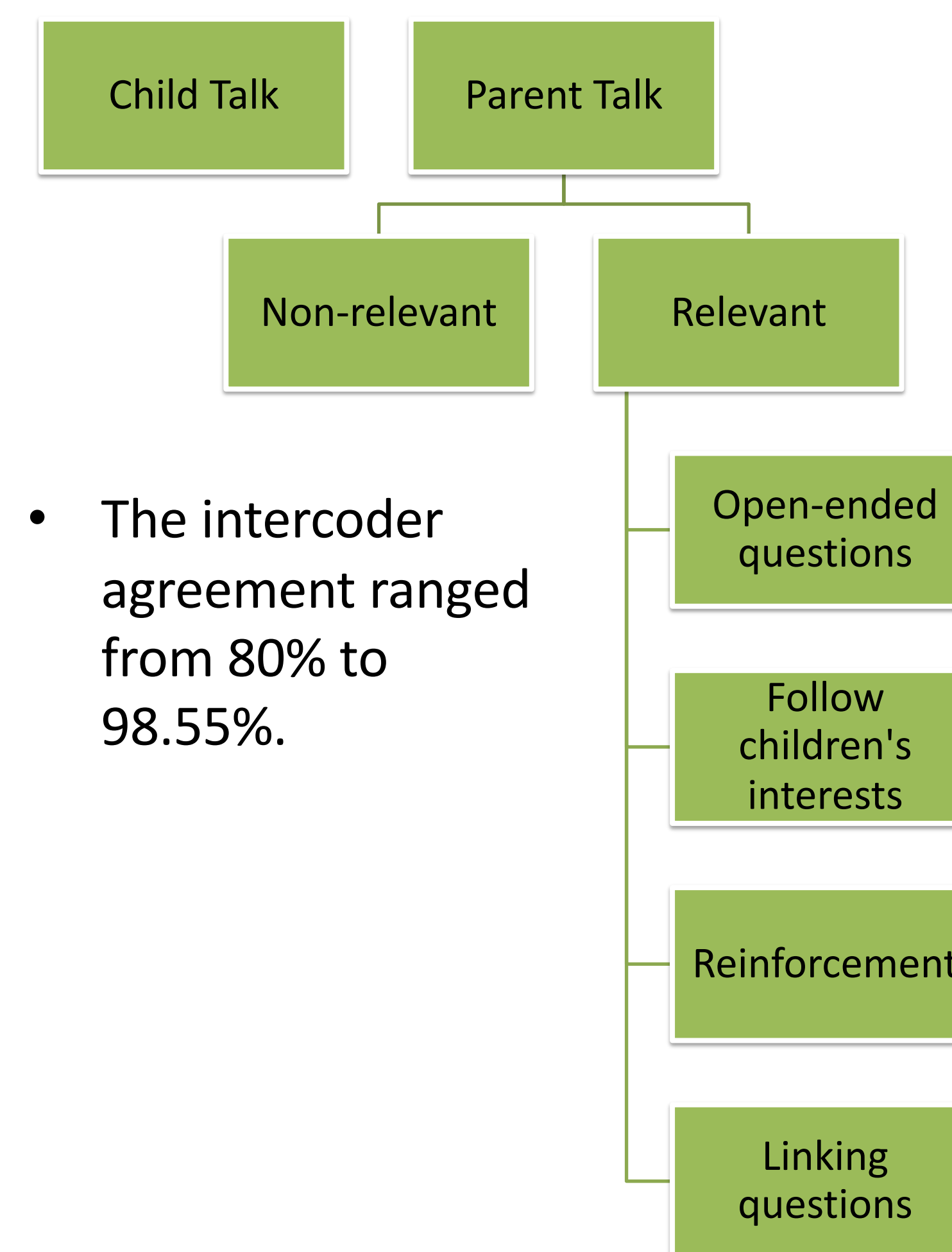
### Participants

- Five typically developing preschool children and their primary caregiver
- 2 boys and 3 girls; 1 father and 4 mothers
- All children attended the Educare Lincoln serving low-income families.
- All five families spoke English as their primary language.

### Measures

- *Direct Science Learning Assessment*: 5 science topics; 15 scenario-based questions created by researcher; score range 0-15.
- *Indirect Science Learning Assessment (CIRCLE Pre-K)* (Zucker, 2016): reliable and valid iPad-adaptive tool; 24 questions; score range 0-24; Cronbach's alpha of 0.81.
- *Children’s Interest in Science Activities* (adapted from Baroody and Diamond, 2012): 5 science topics, each of which contains 1 scenario-based question; total 5 questions created by researcher; score range 5-20.
- *Preschool Parents Dimensions of Science Scale (PP-DAS)* (Adair, 202): 29 items on a five-point Likert scale; self-report measure; score range 29-145, Cronbach's alpha of 0.88.

### Coding System



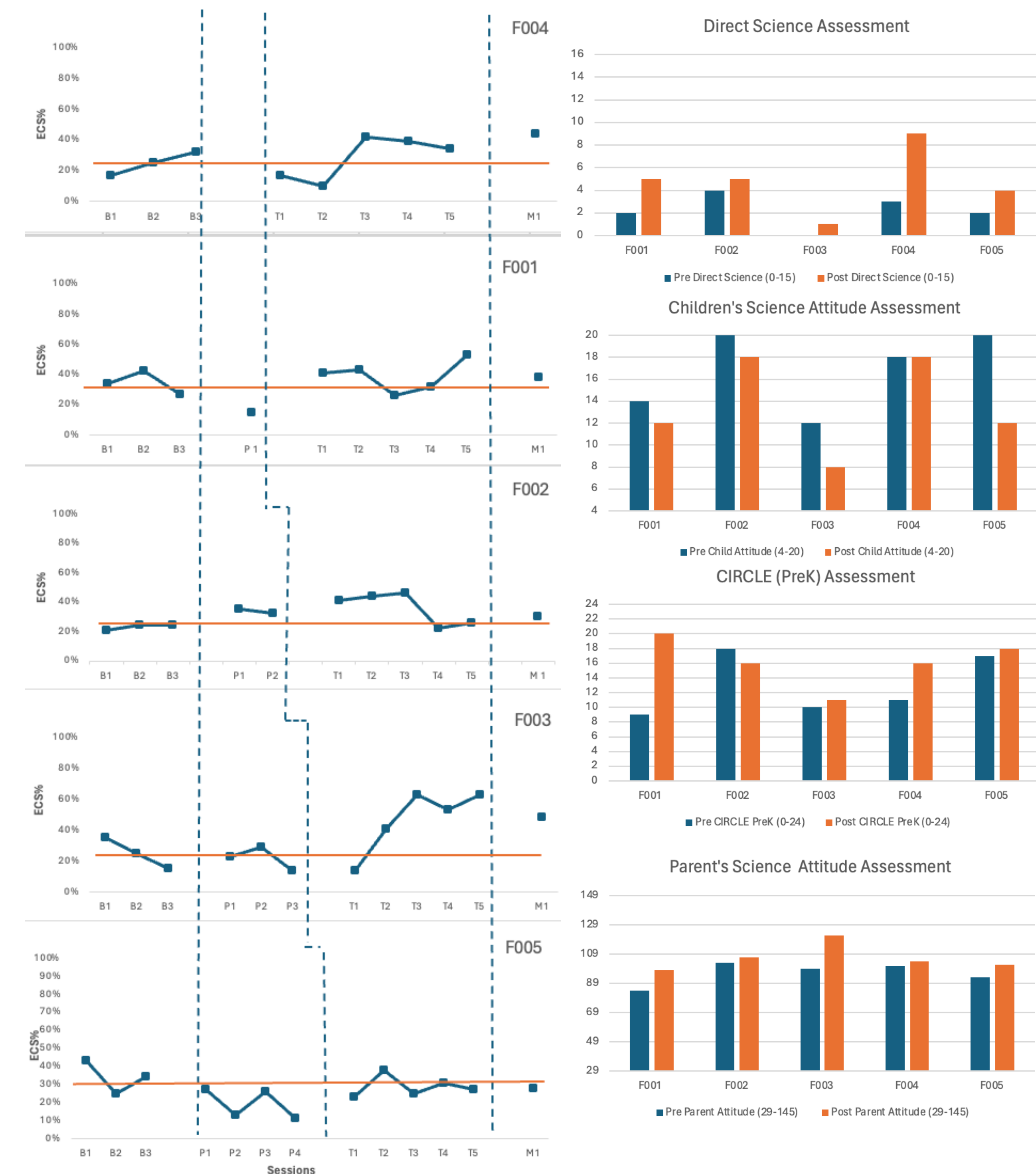
- The intercoder agreement ranged from 80% to 98.55%.

## Data Analysis

- RQ1: Visual analysis, level, trend, and stability, single-case design effect size measures, Percent Exceeding Median (PEM: Pustejovsky, 2019)
- RQ2: Pattern of differences between pre- and post- assessment data

## Results

- The ECS intervention was effective for all families ( PEM = 0.6-0.8)
- There was an increase in direct science knowledge among all five children.
- The majority of children improved on indirect science knowledge, except for F002.
- There was a decline in children's attitudes towards science learning.
- All five parents reported an increase in their attitudes towards science learning.



## Discussion

- The findings may inform that ECS can be used in everyday parent-child interactions to support children's science learning. With ECS, parents can become more confident in talking about science with their children.
- The study findings may also provide an opportunity to address the issue of equitable access to enriching science learning opportunities among low-income families and empower parents to use available materials to engage their children in science-related conversations and interactions.
- Multiple factors may have led to a decrease in children's interest in learning science (e.g., repeated use of the conversation strategies, boring or confusing experience).
- Researchers can explore strategies for equipping parents with the skills to identify and utilize science learning resources efficiently in the future.

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