

Using Picture Books to Support Children's Use and Understanding of the Control-of-Variable Strategy

Background

- > The Control-of-Variable Strategy (CVS) is an experimental strategy in which one isolates a single variable.¹
- Children under age 7 fail to conduct controlled tests even when provided with direct instruction.^{2,3}
- Picture books can scaffold young children's understanding of science concepts.^{4,5}
- > We examine whether children's CVS can be scaffolded with picture books focused on either a science or engineering approach.⁶

Current Study

Research Question: Can narrative picture books facilitate children's use and understanding of CVS?

Participants

72 children age 6 to 8 (target N = 96) were read either a science or engineering picture book.

Procedure

Picture-Book -----> Post-Test ----> Transfer Pre-Test — **Science or Engineering**

Science

"So if I wanted to figure out if the height of my ramp makes my cars go farther, then height is a variable?" said Charlie.

Sample Book Text



Engineering Charlie.

"So if I wanted to figure out the height that I want to build my ramp, I have to measure it?" said

Test Questions



Sample Pre-Test and Post-Test Question: "Can you show me how you would find out if the *height* of the ramp affects how a ball goes down the ramp?

Sample Transfer Question: "Can you show me how you would find out if the *size of the ball* affects how a ball goes down the ramp?

Phase	Variable 1	Variable 2
Pre-test	Height	Surface
Post-test	Height	Surface
Transfer	Size of Ball	Starting Position of Ball

Results

- Generalized Estimated Equations (GEE) analyses were used to investigate whether age, test phase, and condition predicted children's CVS score.
- Children's scores increased from pre-test to post-test in both conditions (p = .008).



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of Cl	0.4		
ion	0.2		
ort	0		
Prop			Scie

- Children showed marginal improvement in both conditions from pre-test to transfer (p=.067).
- Age was a significant predictor of performance (*p* = .001).
- found.
- domains.

- Variables Strategy. Child Development, 70(5), 1098-1120.
- Journal Of Cognition And Development, 19(2), 165-181.

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• No significant main effect or interactions of condition were

Conclusions

> Children as young as 6 years old improved their CVS ability with familiar and novel variables both when they learned about ramps in a science and engineering-focused book.

> Future work will use a control book not focused on ramps, and will extend the research to other concepts and science

References

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