



Children's Emotional Engagement and STEM Talk in a Museum

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INTRODUCTION

- Informal learning environments can promote children's learning and interest for Science, Technology, Engineering, and Mathematics (STEM) from an early age (Alexandre et al., 2022).
- Children's emotions during informal learning may relate to their cognition and learning (Clore & Huntsinger, 2007; Frederickson & Branigan, 2005).
- **Research question: Are age and emotional engagement related to children's STEM talk after tinkering?**

PARTICIPANTS

- 50 parent and child pairs (37 girls, 15 boys) between the ages of 4- to 10- years old ($M = 7.22$, $SD = 1.84$).
- Race/ethnicity: 43.4% Caucasian, 9.4% Hispanic, 9.4% African American, 5.7% Asian, 1.9% Native American, 22.6% Mixed.
- Education: A majority (81%) of parents reported having at least a bachelor's degree.

METHODS

- Recruitment at the Tinkering Lab exhibit of the Chicago Children's Museum.
- Up Up and Away program: build a "flying machine" for the wind tunnels and tables in the exhibit
- After the tinkering activity, children reflected on their experience
- Coding of video/audio recordings

Emotions during Tinkering

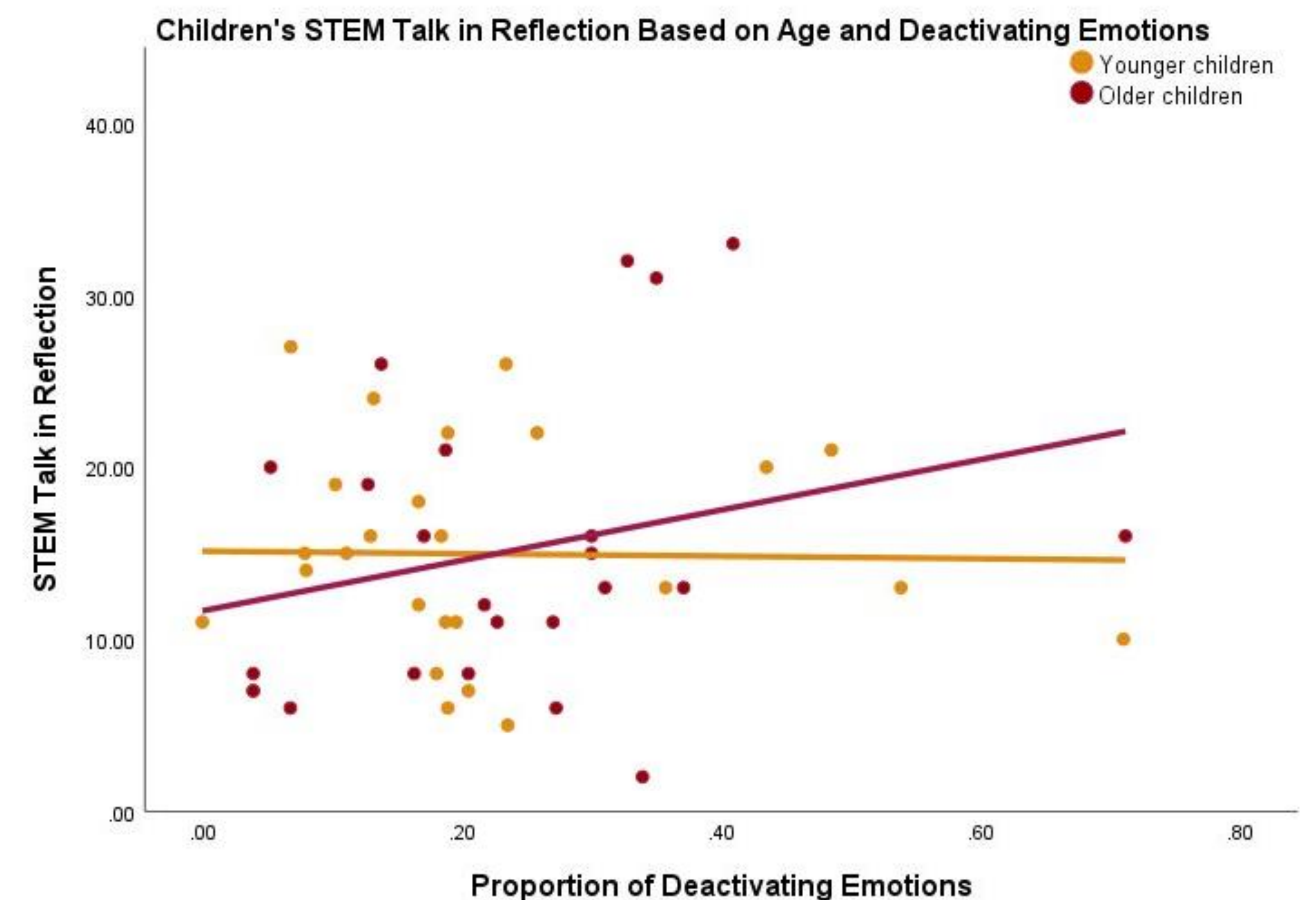
Positive Activating	"Yay!", "It flies!!" laughing, dancing
Positive Deactivating	"I like this" "Good job" Thumbs up
Negative Activating	"No!" "I want to do my own!" Stomping feet, throwing
Negative Deactivating	"It's never going to work", Sighing, heads down

STEM Talk in Reflection

• Project name	• Engineering
• Label tools and materials	• Associations
• Function of tools/materials	• Metacognition

RESULTS

- Children's ages were split on the median ($Mdn = 7$): younger group (4- 7- years old), older group (8- 10- years old).
- There were no differences by age in their emotion expression during tinkering or for STEM talk at reflection.
- Regression analysis showed a significant interaction effect between age group and deactivating emotions on STEM talk, $B = 17.982$, $SE = 8.66$, $p = .044$.
- There were no main effects of age group or emotion in STEM talk during reflection after controlling for children's word count.



CONCLUSION

- Deactivating emotions may promote children's STEM talk during reflection particularly for older children who are more skilled in reflection compared to younger children.
- Deactivating emotions may foster a state of "flow" during the activity that can support reflection and learning (Rowe et al., 2022).
- Future analysis will focus on the role that parents play in facilitating children's emotional engagement and informal learning.

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