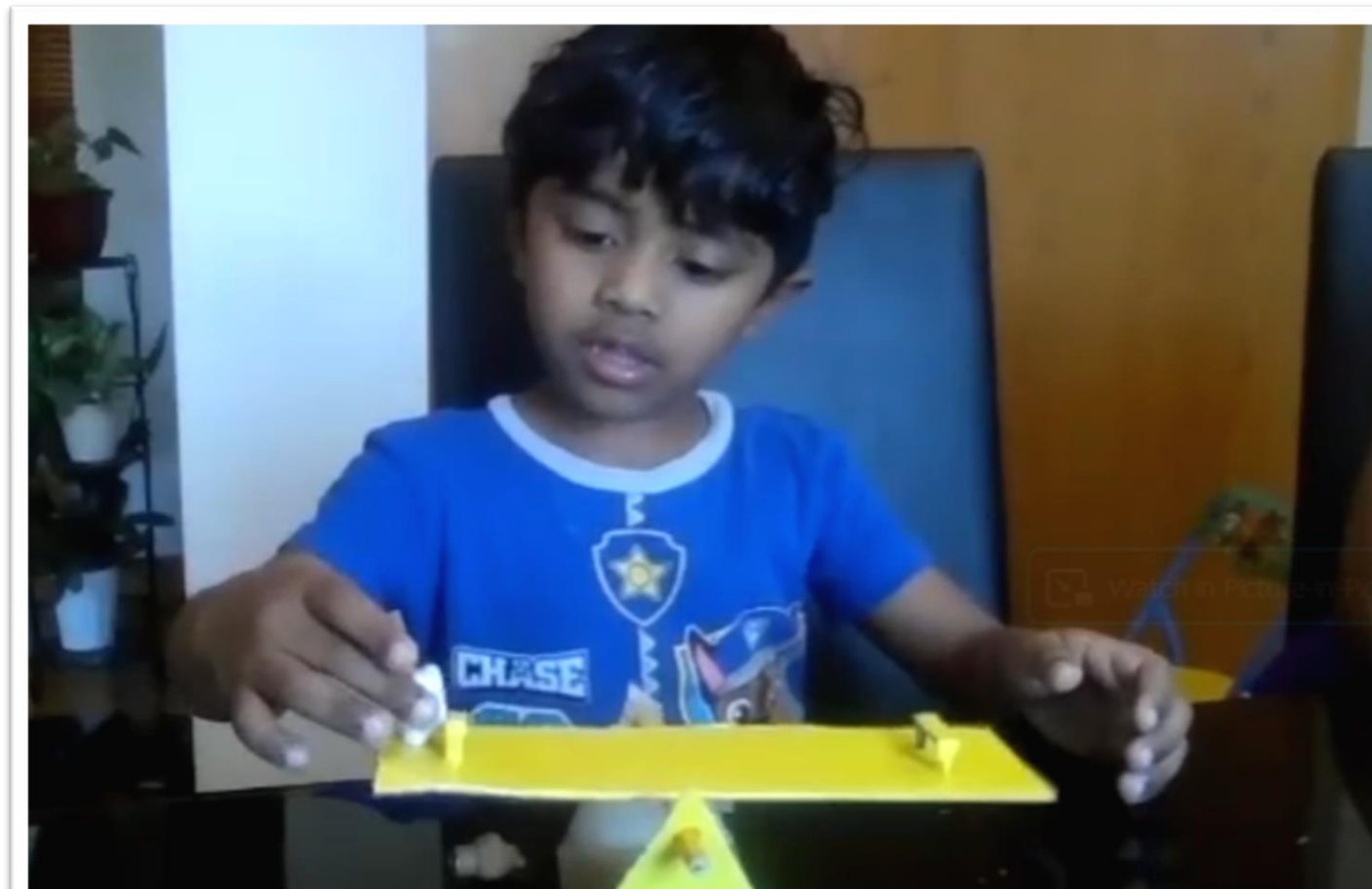
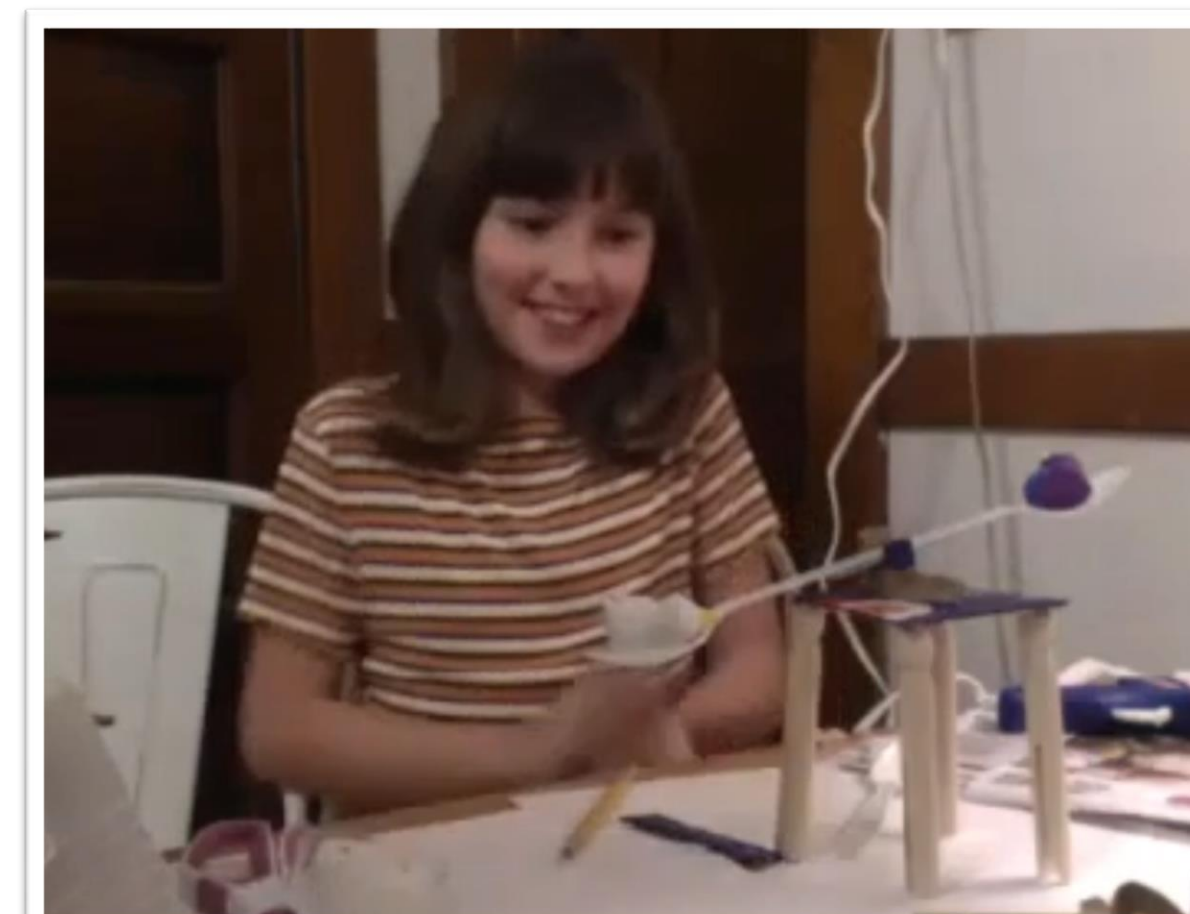
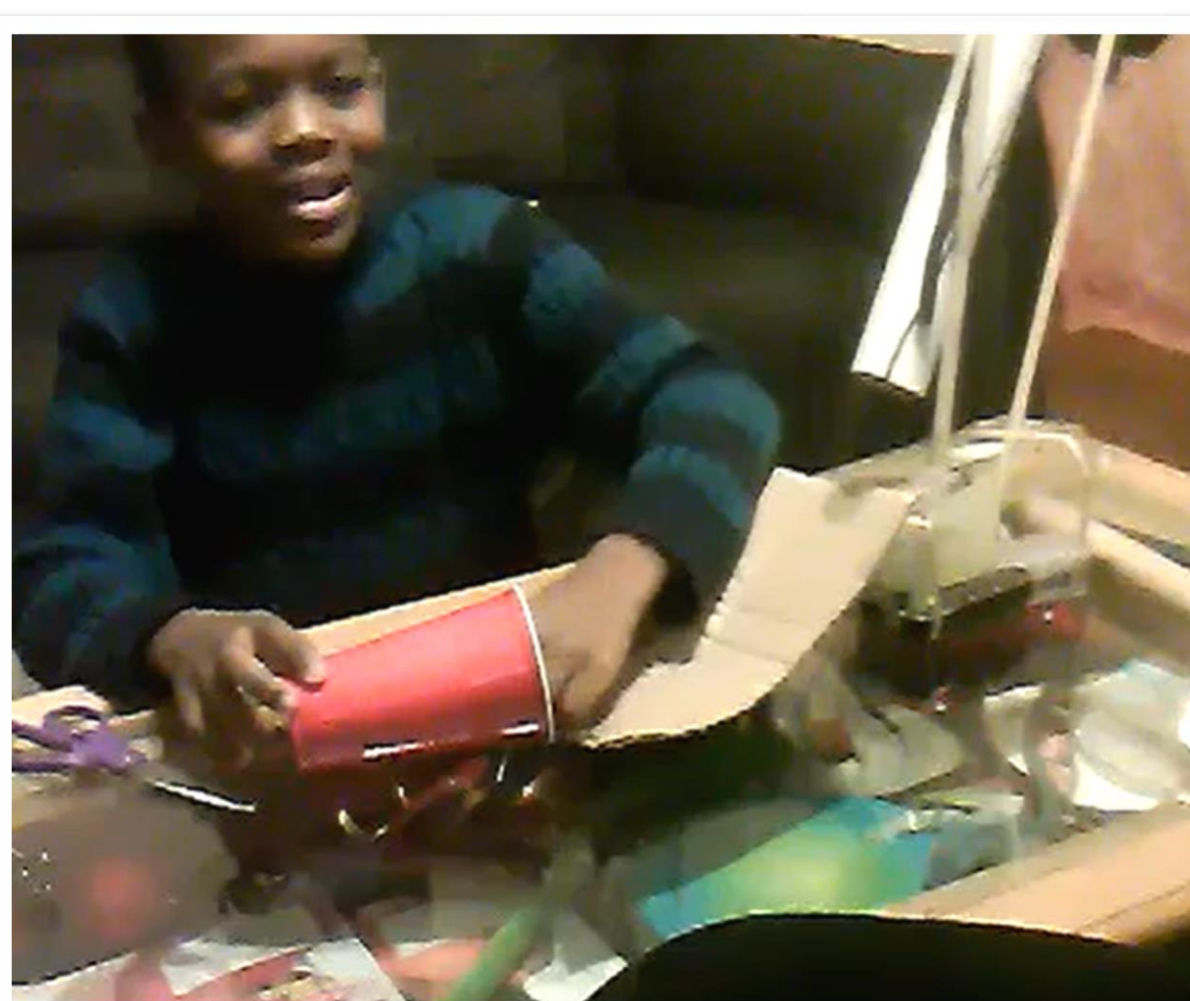


Emotion Mediates Storytelling and STEM Engagement for Girls During Tinkering at Home

Introduction

- Stories can help children organize their experiences adding coherence, understanding, and facilitating learning (Bruner, 1996).
- Stories may also support STEM learning by providing characters with needs, trouble, goals, that elicit emotion and motivate problem solving. Activities designed with the goal of helping a character in need can support girls' engagement in STEM (Letourneau & Bennett, 2020)
- We consider children's emotional investment as a potential mechanism by which oral stories and children's STEM engagement might be related during a tinkering activity

Tinkering Program



Participants and Procedures

Participants:

- 61, 4 – 10-year-olds ($M = 8.10$, $SD = 1.72$)
- Boys = 31, Girls = 30
- 54% White, 15% African-American, 8% Asian, 5% Latino and 16% Mixed, 2% Not reported
- Parental education, $M = 18$ yrs., $SD = 2.60$

Tinkering Activity:

- To build a playground ride for a toy friend and to tell a story about the toy and the ride
- Observations via Zoom

Analysis

- Time sampling method in 5-second intervals

Children's STEM Talk ($M = 0.99$ per minute*, $SE = 0.42$)	
Planning/Goals	Problem Solving
Associations	Function of Materials
Reflection	Explanations/Science talk
Children's Storytelling ($M = 8.20$, $SE = 6.80$)	
Toy's Name	Toy's Wants/Preferences
Toy's Actions	Imaginary Setting
Children's Emotions** ($M = 12.21$, $SE = 10.01$)	
Excitement	Frustration
Pride	Disappointment
Satisfaction	Dislikes

* STEM talk correlated with time spent tinkering; thus, proportion of scores per minute was used

** Children's emotions were mostly positive during this activity

Results

As shown in Figure 1, storytelling was linked to STEM talk via increased emotions (95% CI = 0.002; 0.024). We found an effect of gender (95% CI = 0.0002; 0.029). As shown in Figure 2, storytelling was linked to emotion among girls but not boys

Figure 1

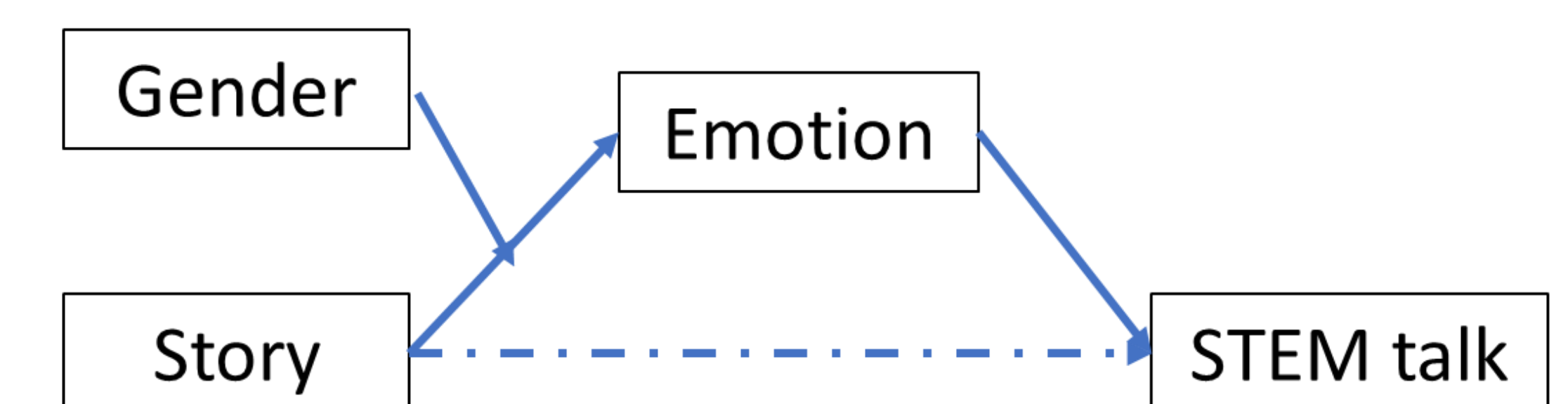
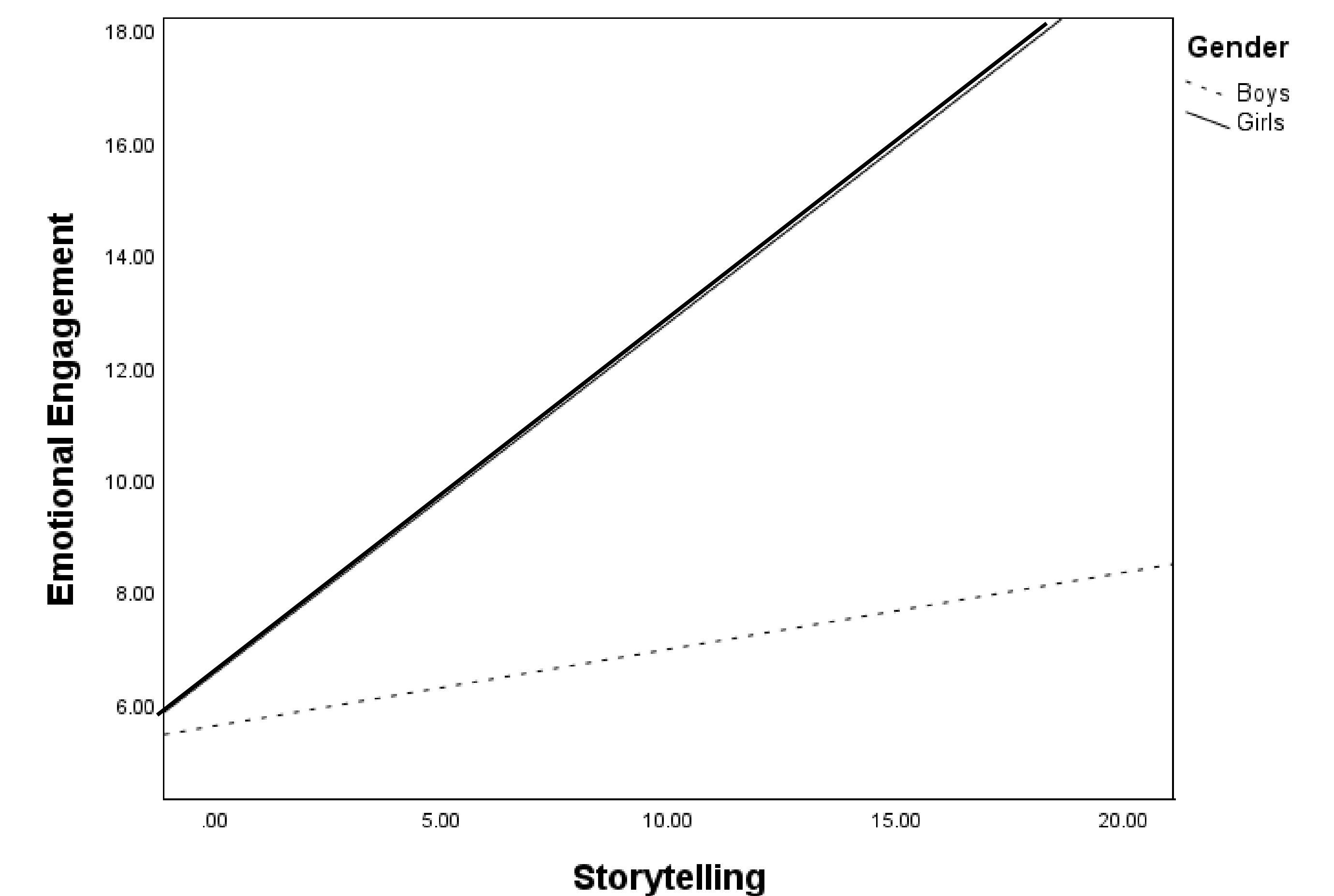


Figure 2



Conclusion

- Our work suggests that incorporating storytelling in engineering activities can support girls' engagement in STEM
- It also indicates that one mechanism by which storytelling can promote greater STEM talk is by increasing children's emotional engagement.