

“Where’s your monster going?”: Children’s story and STEM talk during tinkering and reflections

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Introduction

- There is a long tradition of interest in cognitive development in the connection between storytelling and learning that is further reflected in recent work in STEM education (Bruner, 1990; Haden et al., 2023).
- Storytelling might be especially important in making STEM-related ideas and practices meaningful and memorable.
- Here we asked whether storytelling during a playful problem-solving activity (i.e., tinkering) in informal educational setting (a children's museum) might support children's provision of engineering information in their reflections immediately after tinkering.

Methods

Participants 77 families with 4- to 10-year-old children (*M* age = 6.9 years; 49 girls). 61.5% White, 16.5% Asian, 15.4% Latine, 3.8% African-American, 1.3% Mixed and 1.3% Native American

Tinkering Activity: The museum-based program “Safe Travels” invited families to help a toy monster move across safely through construction of a shadow.

Story Starters: Some families (*N* = 53) elected to use story starters – props designed by museum staff to encourage story development and project creation.

Post-Tinkering Reflections: Shortly after tinkering, a researcher elicited children's reflection about the project they created.

Results

Category	Codes
Story Talk During Tinkering	Frequency of parents' and children's talk about story elements, such as character, settings, goals/conflict and dialogue during tinkering.
Engineering Talk During Tinkering	In each 30-second interval, whether families talked about setting goals, planning, testing, identifying problem, redesigning during tinkering.
Engineering Talk After Tinkering	Frequency of talk about project name, tools, function of tools, planning, testing and redesigning/solution .

Figure 1. More Parent Story Talk with Story Starters During Tinkering

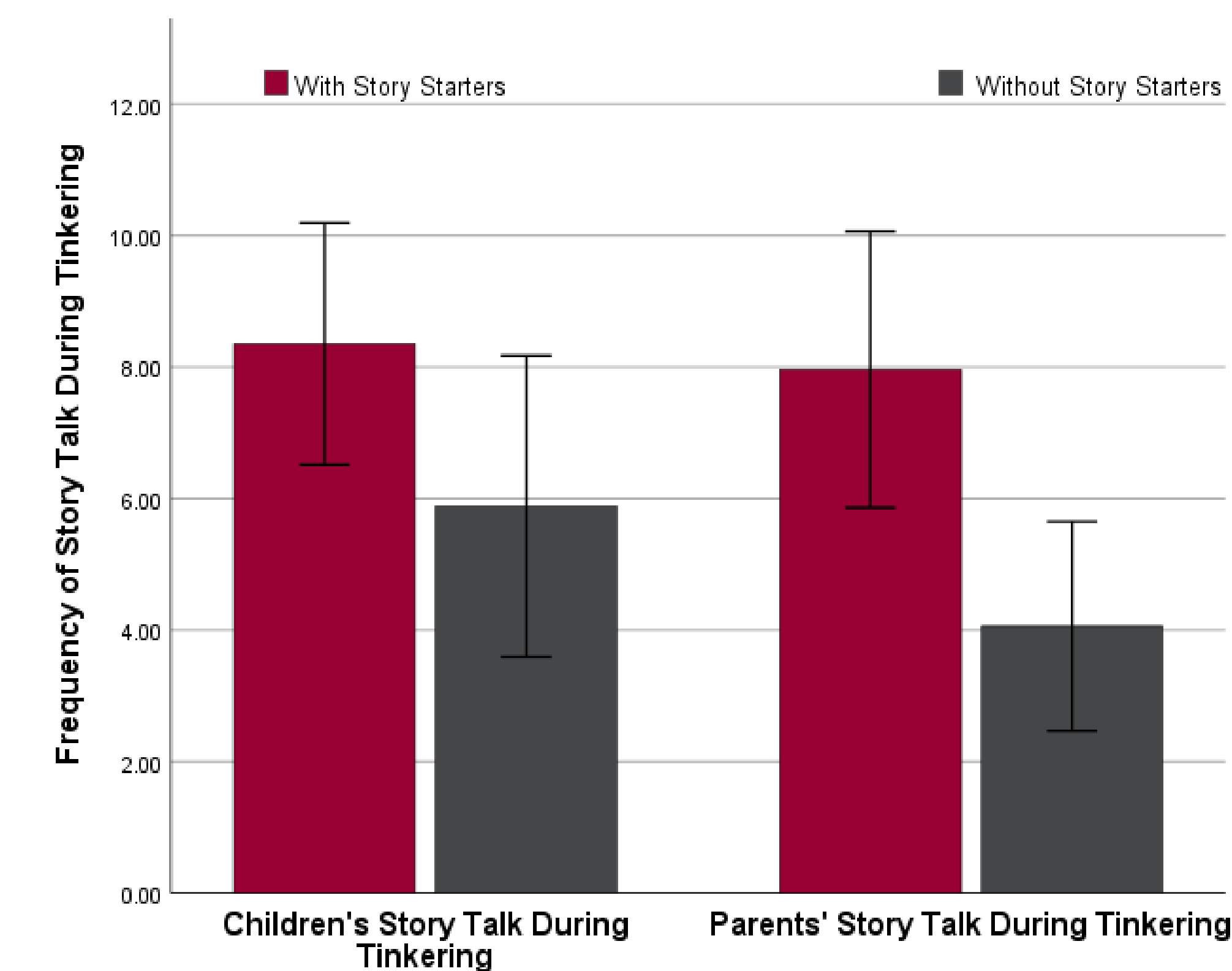
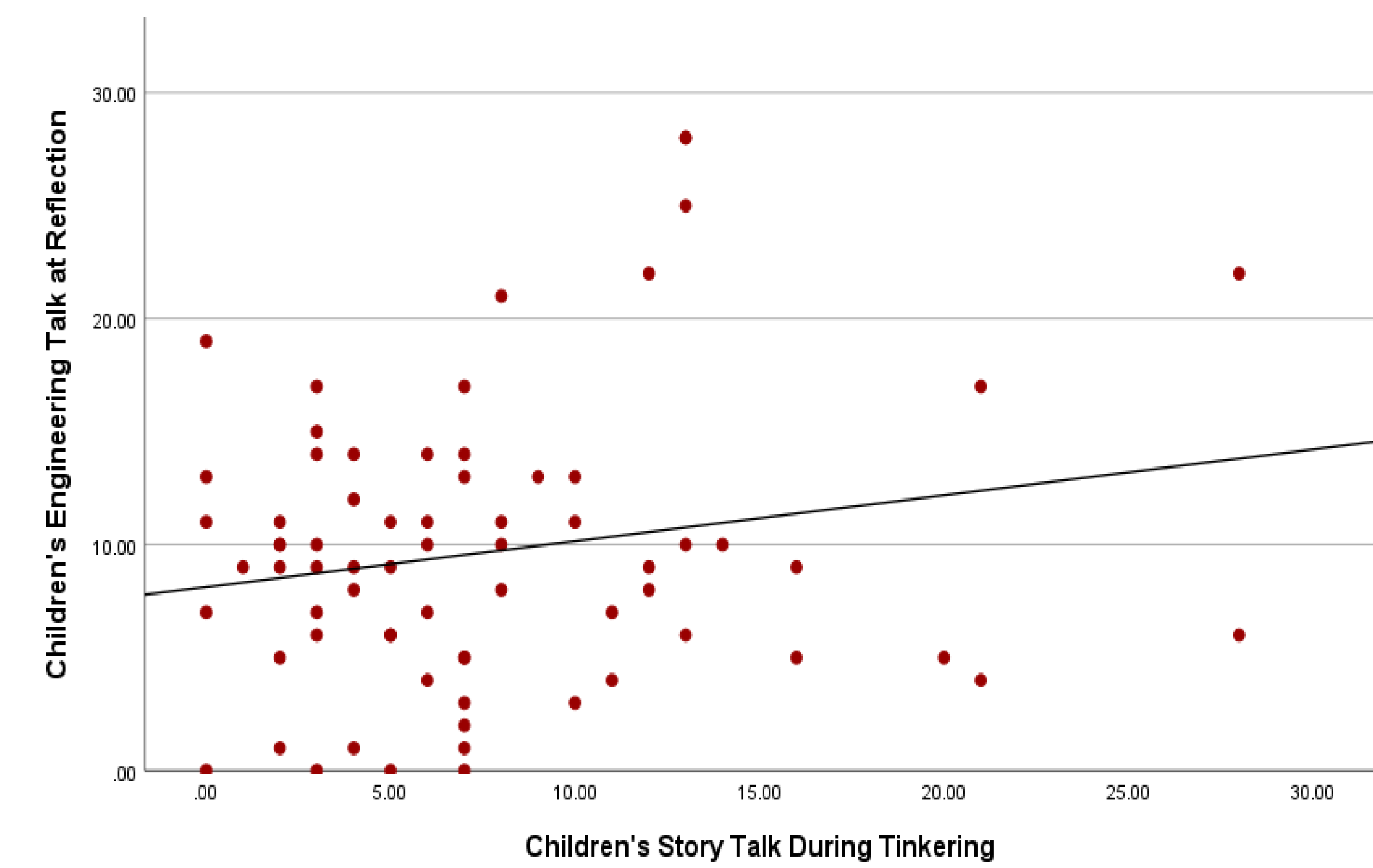


Figure 2. Children's Story Talk During Tinkering Relates to Children's Engineering Talk at Reflection



- Figure 1 shows that parents engaged in more story talk during tinkering if their family used the story starters, compared to families who did not use the story starters, $t(68) = 2.18, p < .01$
- Engineering design process talk during tinkering, which was observed in on average 31% of intervals, did not differ for families who did and didn't use the story starters.
- As shown in Figure 2, a significant multiple regression, $F(3, 63) = 7.66, p < .01$, adjusted $R^2 = .260$, indicated that: Children's story talk during tinkering was a significant predictor, explaining 26% of the variance in the children's engineering talk at reflection. Child age was also significantly positively associated with their engineering talk at reflection. Neither parents' story talk nor families' engineering talk during tinkering significantly related to children’s engineering talk at reflection.

Discussion

- As part of a story-based tinkering program at a children's museum, a number of props (story starters) were made available to families to help inspire their stories. These story starters corresponded to more family story telling during tinkering, perhaps helping them to construct a richer representation of the experience.
- In turn, children who engaged in the most story talk during tinkering afterward reported the most engineering content in their reflections about the experience. Storytelling during tinkering may have made the engineering during tinkering more salient and reportable after the experience.