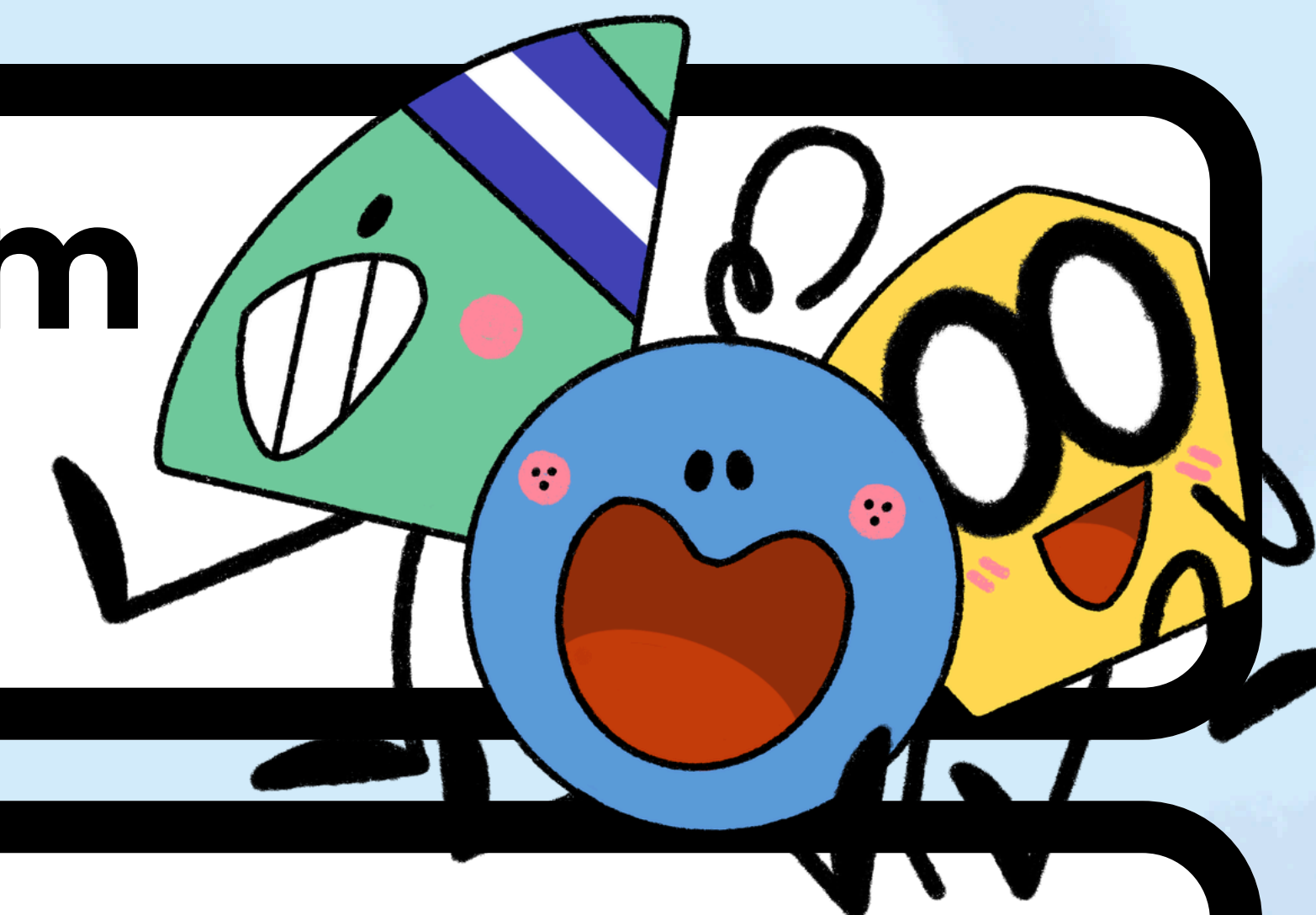




Development of a Reliable Numeracy Coding System

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INTRODUCTION

- **TOYBOX** is a free program, www.TOYBOXManitoba.ca
- Provides playful and evidence based literacy, numeracy and wellness activities for caregivers/educators and their children (age 2-8 years) (Skwarchuk et al., 2024).
- **RESEARCH GOAL:** To determine if the TOYBOX intervention program improves children's numeracy, literacy and wellness knowledge (6 year project so far...).
- Quantitative (pre/post tests) and qualitative (observation notes) approaches. Individual child-focused interventions.
- Promising quantitative findings for numeracy group, but need to know **WHAT is happening/WHY** intervention is working. Start with qualitative numeracy data.

CODING DEVELOPMENT

- Collected qualitative data (notes from each session with each child)
- Transcription of observation notes to a digital format
- Established and defined **25 numeracy codes**: Rote Counting, Number ID, Sequence, Cardinality, Estimation, Addition, Number Symbol Shape...
- Thematic analysis. Up to four codes allowed per session.
 - E.g. Magnitude - Discussion of size of numbers, with comparisons between numbers. Talking about "bigger or smaller," "biggest and smallest," and/or "most and least"

PROGRESS & NEXT STEPS

- Achieved inter-rater agreement rate of **82.44%** between two coders
- Coding disagreements being resolved through discussion
- Calculate the frequency of each code
- Engage critically with findings. No data on adult support/control/goals.
- Relate findings to research (e.g., Wu, Oh, Hyde & Pomerantz, 2024)
- Expand to evaluate literacy and wellness group observation notes
- Expand to evaluate Early Childhood Educator observation notes

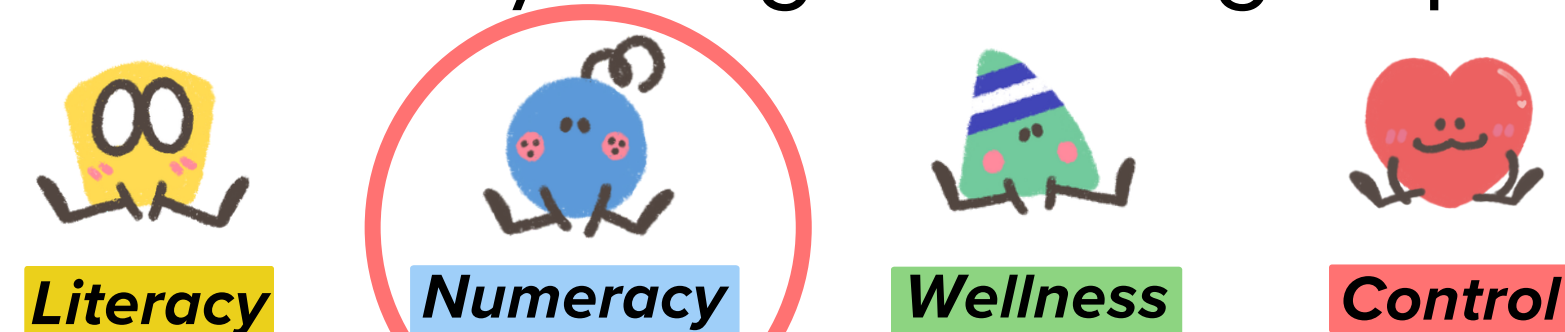
IMPLICATIONS

- Deepen understanding of TOYBOX implementation and engagement
- Insight into strategies deemed important for early numeracy development
- Gain perspective on quantitative v.s. qualitative methods in this context

METHODS

Current Study Design

- Eight Early Childhood Education Centres in Manitoba participated
- 113 Children aged 2-6 years at pre-assessment.
- N = 83 included in quantitative analysis
- Randomly assigned to 4 groups:



5 Weeks of TOYBOX Activities

- Week 1: Bingo
- Week 2: Bowling
- Week 3: Line Jumping
- Week 4: Soup Activity
- Week 5: Find and Hunt Activity



n = 22 included in numeracy qualitative analysis

Observation Notes:

- **RAs** took notes after each session, with the only direction of: "record what you did and you think is important"
- Two coders reviewed each session transcript and a maximum of 4 codes were chosen for each 10 minute session.

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