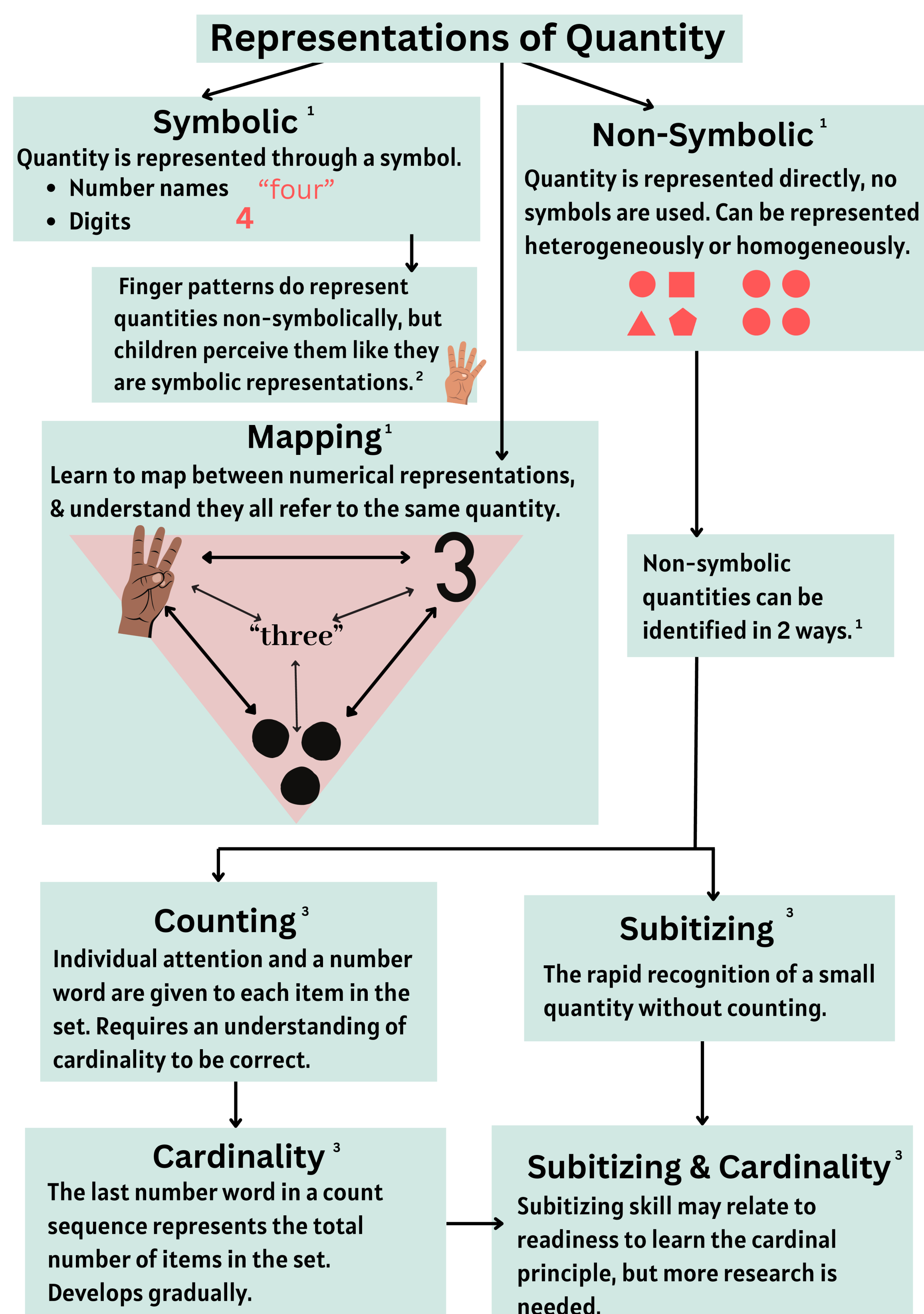# GIVE ME FIVE:
THE DEVELOPMENT OF QUANTITY RECOGNITION

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MATH LAB

BACKGROUND

Representations of Quantity

Symbolic [1]
Quantity is represented through a symbol.
- Number names   "four"
- Digits   4

Finger patterns do represent quantities non-symbolically, but children perceive them like they are symbolic representations. [2]

Non-Symbolic [1]
Quantity is represented directly, no symbols are used. Can be represented heterogeneously or homogeneously.

Mapping [1]
Learn to map between numerical representations, & understand they all refer to the same quantity.

3
"three"

Non-symbolic quantities can be identified in 2 ways. [1]

Counting [3]
Individual attention and a number word are given to each item in the set. Requires an understanding of cardinality to be correct.

Subitizing [3]
The rapid recognition of a small quantity without counting.

Cardinality [3]
The last number word in a count sequence represents the total number of items in the set. Develops gradually.

Subitizing & Cardinality [3]
Subitizing skill may relate to readiness to learn the cardinal principle, but more research is needed.

Gaps in the Literature
1. Subitizing as a step towards developing an understanding of cardinality.
2. Naming of finger patterns, and, digits, in comparison to quantities.
3. Non-symbolic representation: differences in recognising heterogeneous and homogeneous quantities.

RESEARCH QUESTIONS

1 Are there differences in how children perform across naming different representations of quantity, including digits, finger patterns and arrays of shapes?

2 Are there differences in how children perform between heterogeneous and homogeneous non-symbolic representations of quantity?

3 Is there a relation between cardinality and performance labelling different representations of quantity?

METHOD

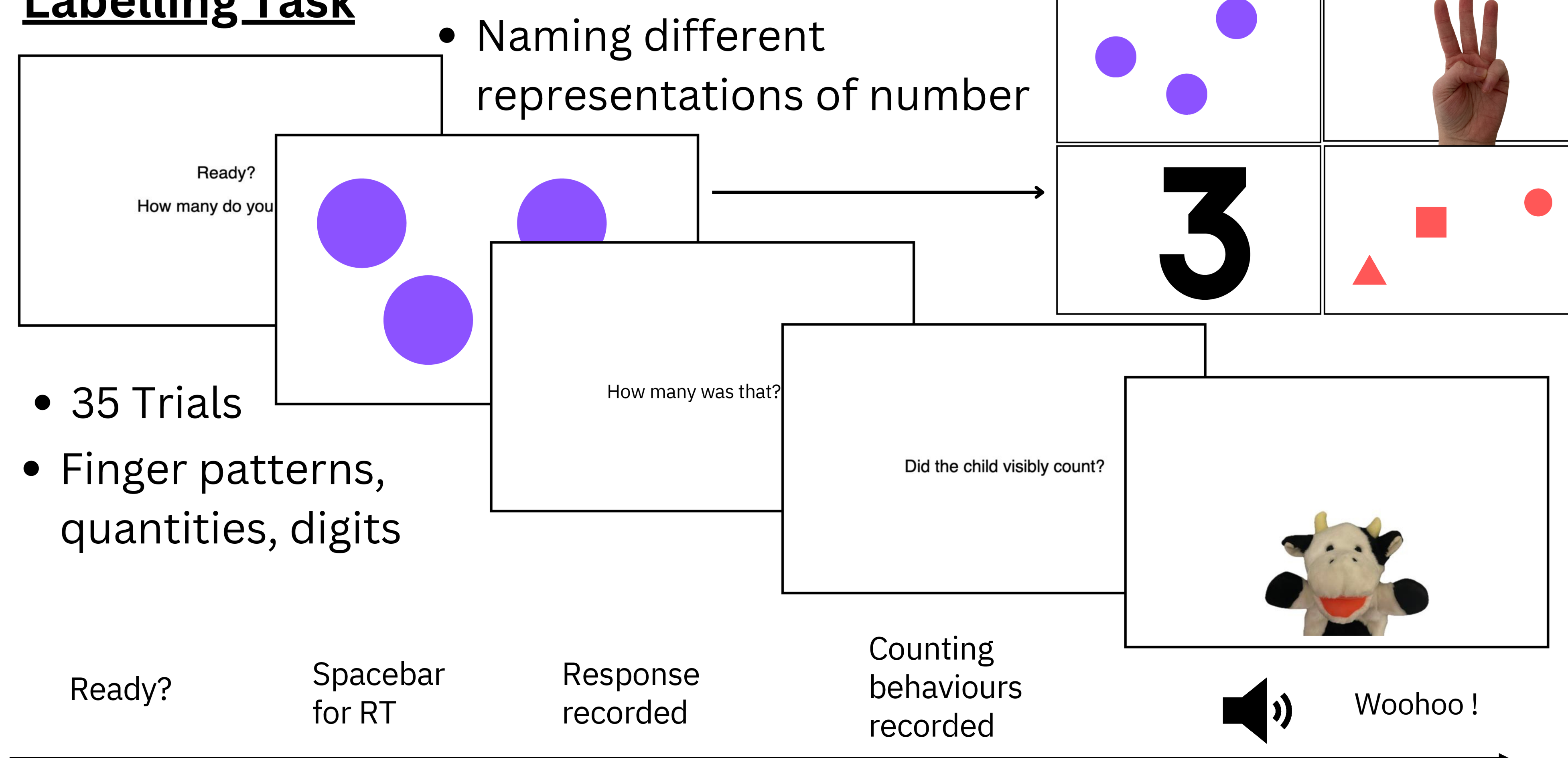**21 Participants, *M* age = 3.45**

Give-N
- Children were asked for 1-6 blocks
- Task ends when the wrong quantity is given for a number 2x or 6 is given correctly 2x

Object Count
- Children counted a line of 10 blocks

Labelling Task

- Naming different representations of number

Ready?
How many do you...

How many was that?

Did the child visibly count?

- 35 Trials
- Finger patterns, quantities, digits

Ready?   Spacebar for RT   Response recorded   Counting behaviours recorded   Woohoo !

PERCENTAGE OF CORRECT PARTICIPANT RESPONSES BY NUMBER & FORMAT

Percentage of Correct Participant Responses
Number Represented

- Digits
- Finger Patterns
- Homogeneous Shape Sets
- Heterogeneous Shape Sets
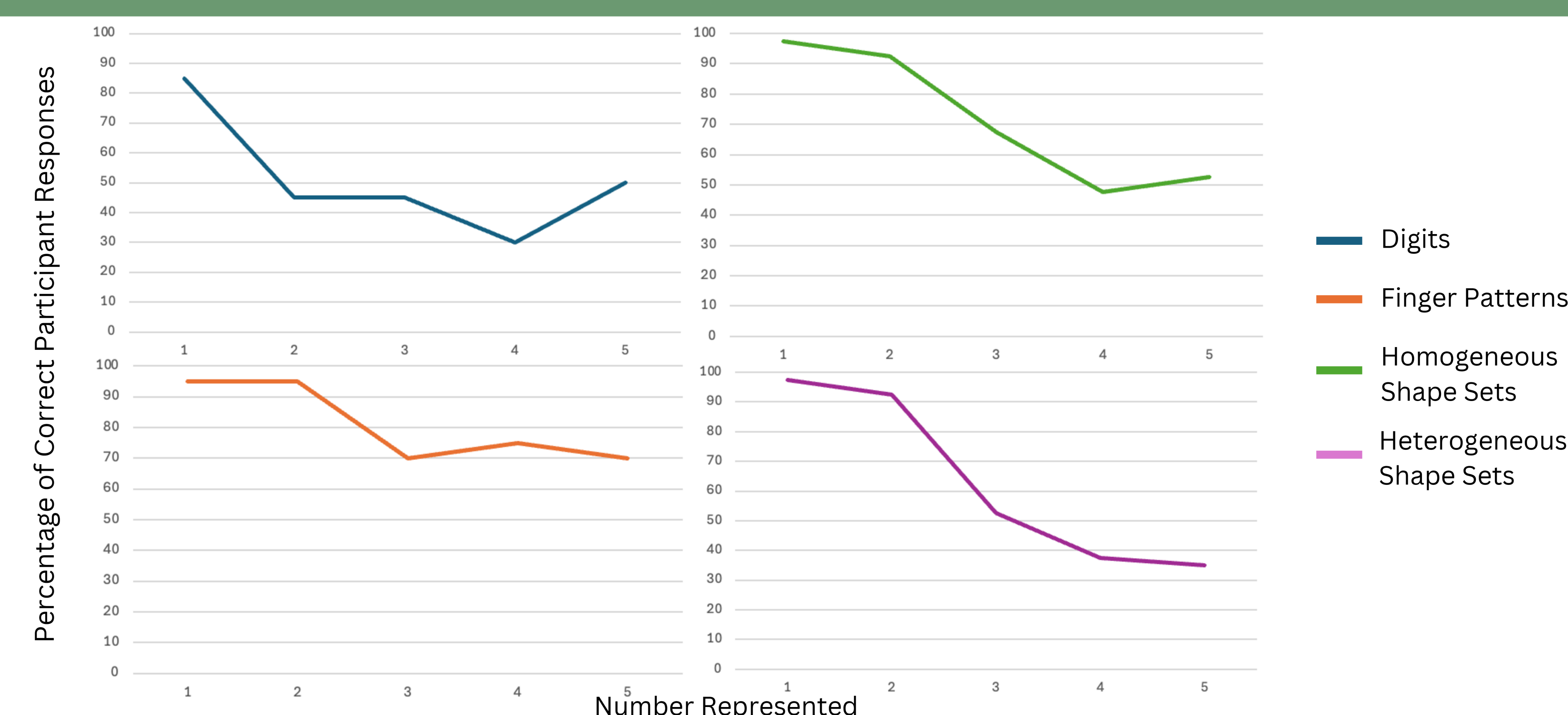
RESULTS & DISCUSSION

Percentage of Correct Responses by Format

Digits   Fingers   Homo   Hetero
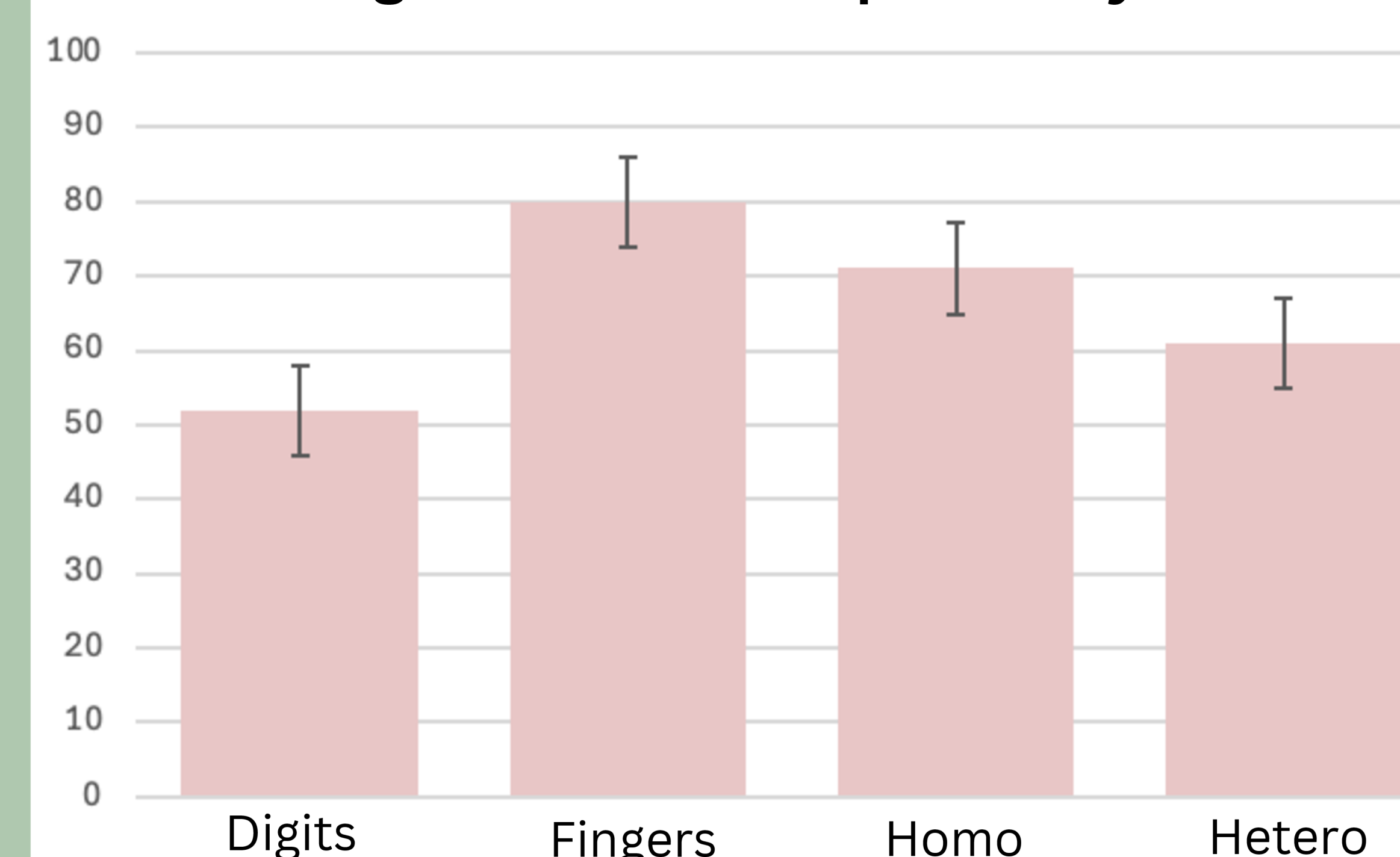
Children performed significantly better (*p* = .019) on homogeneous trials than on heterogeneous trials.

Children performed significantly better (*p* < .001) on finger pattern trials than any other representation of number.

There were no significant differences between digits and heterogeneous, or homogeneous, quantity representations.

Children were more successful on trials that represented smaller numbers than larger numbers.

Preschoolers are more familiar with finger patterns than other representations of number!

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