

# Young children's reasoning about artifact function: an action-protest paradigm

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# Artifacts



# Intended Design

Intended design function



Alternative function



Bloom (1996); Keleman (1999)  
Callanan & Siegel (2007);  
German, Truxaw & Defeyter et al., (2007)

# Design Stance

- An object's identity is explained in terms of it having been intentionally designed to serve a particular purpose (Dennett, 1987).
- Adult's reasoning about artifacts appears to reflect the adoption of a '**design stance**' (e.g. Keleman, 1999; German & Johnson, 2002; Matan & Carey, 2001).
- An object's designed function is central to children's artifact representation, (see Kelemen & Carey, 2007; Kemler Nelson et al., 2002; Gelman & Bloom, 2000)

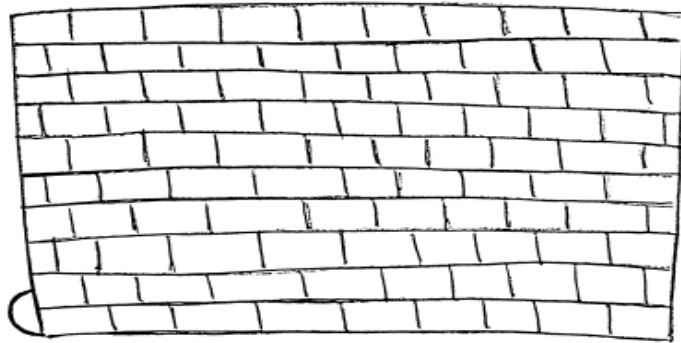


Developmental changes within the core of  
artifact concepts

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Participants told a story about a person who made an object to water flowers (the original intended function) and about another person who was using the object for making tea (the current function).

Adults: Design Stance ✓

6 year-olds: Design Stance ✓

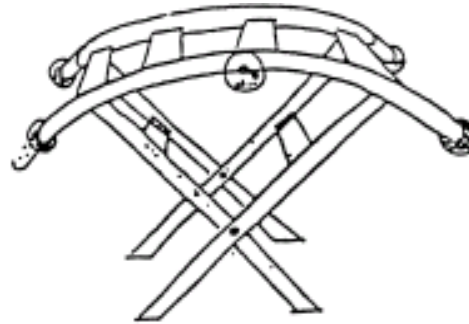
4 Year-olds: Design Stance ✗

The scope of teleological thinking in preschool children

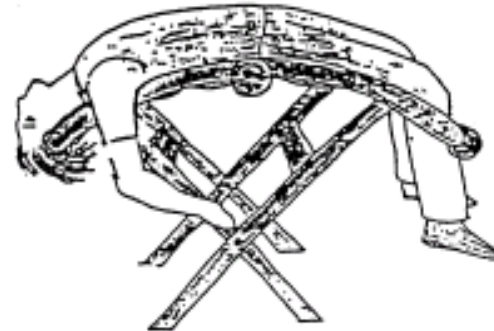
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Design Function



Current Function:  
Accidental or  
Deliberate

Adults: Design Stance ✓

5 Year-olds: Design Stance ✓

4 Year-olds: Design Stance ✓

# Shared Convention



- In the majority of cases the design function and the conventional use usually match (Callanan et al., 2007).
- The way communities use artifacts is just as important as design intentions in children's artifact conceptualisation (Diesendruck et al., 2010; German, Truxaw & Defeyter, 2007).
- Children learn about artifacts through observations of how “we” use them (Tomasello et al., 2005).

# Violating conventional function



Do young children view atypical functions of artifacts as plain wrong?





# Young children's normative awareness of artifact function

(Casler, Terziyan & Greene, 2009)

- Action-protest paradigm (Rakoczy, Warneken & Tomasello, 2008).
- Demonstration phase –Adult demonstrated the conventional function of familiar and novel artifacts.
- Test Phase – Puppet demonstrated an alternate atypical function.



# Toddlers view artifact function normatively

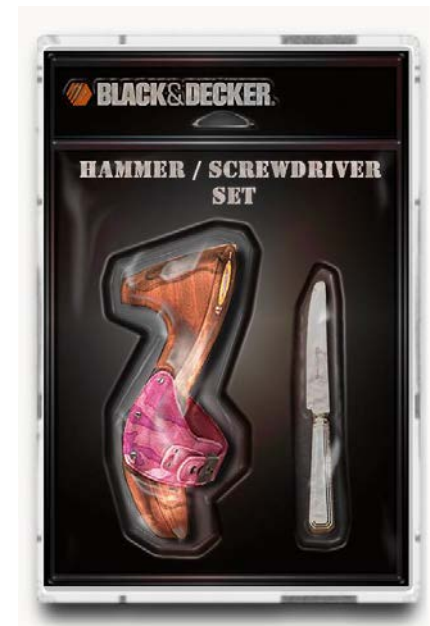
- 2- and 3-year-olds demonstrated normative protests towards a puppet using artifacts in ways that violated conventional function.

***“No! It’s not for that!”***

- Toddlers strongly believe that there are ‘proper’ ways to use objects and any other use is simply ‘wrong’.

# Research question

Do young children believe that artifacts embody their conventional function across different contexts rendering other plausible uses as completely wrong?



# Hypothesis



Conventional function = No protest



Violation of conventional function = Protest

# Method

Participants = 80 children

## **Three year olds**

N = 39, mean age = 3.7, range 3.1 - 3.9

20 females and 19 males.

## **Four year olds**

N = 41, mean age = 4.8, range 4.3 – 4.10

20 females and 21 males

Children were tested individually.

Sessions were videotaped and lasted 25 minutes.

# Conditions

1. Conventional function -



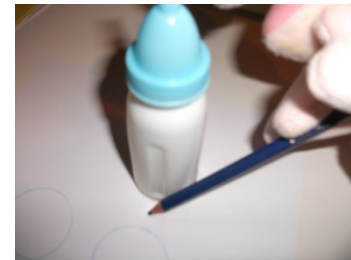
Idiosyncratic function



2. Conventional function -



Non-violation function



Order Function Counterbalanced →

3. Idiosyncratic function - Conventional function

4. Non-violation function - Conventional function

# Materials

Three familiar objects were used:



Stirring liquid  
Tapping



Rolling Play Doh  
Drawing circles



Brushing doll's hair  
Turning 180 degrees

# Procedure

- Warm up phase – To make child feel at ease with the experimental setting



- First function - Demonstration phase by ‘Sam’ the bear.
- Second function - Test phase by ‘Sally’ the pig.
- Control question - “What is ‘X’ for?”



# Condition 3 - Idiosyncratic - Conventional

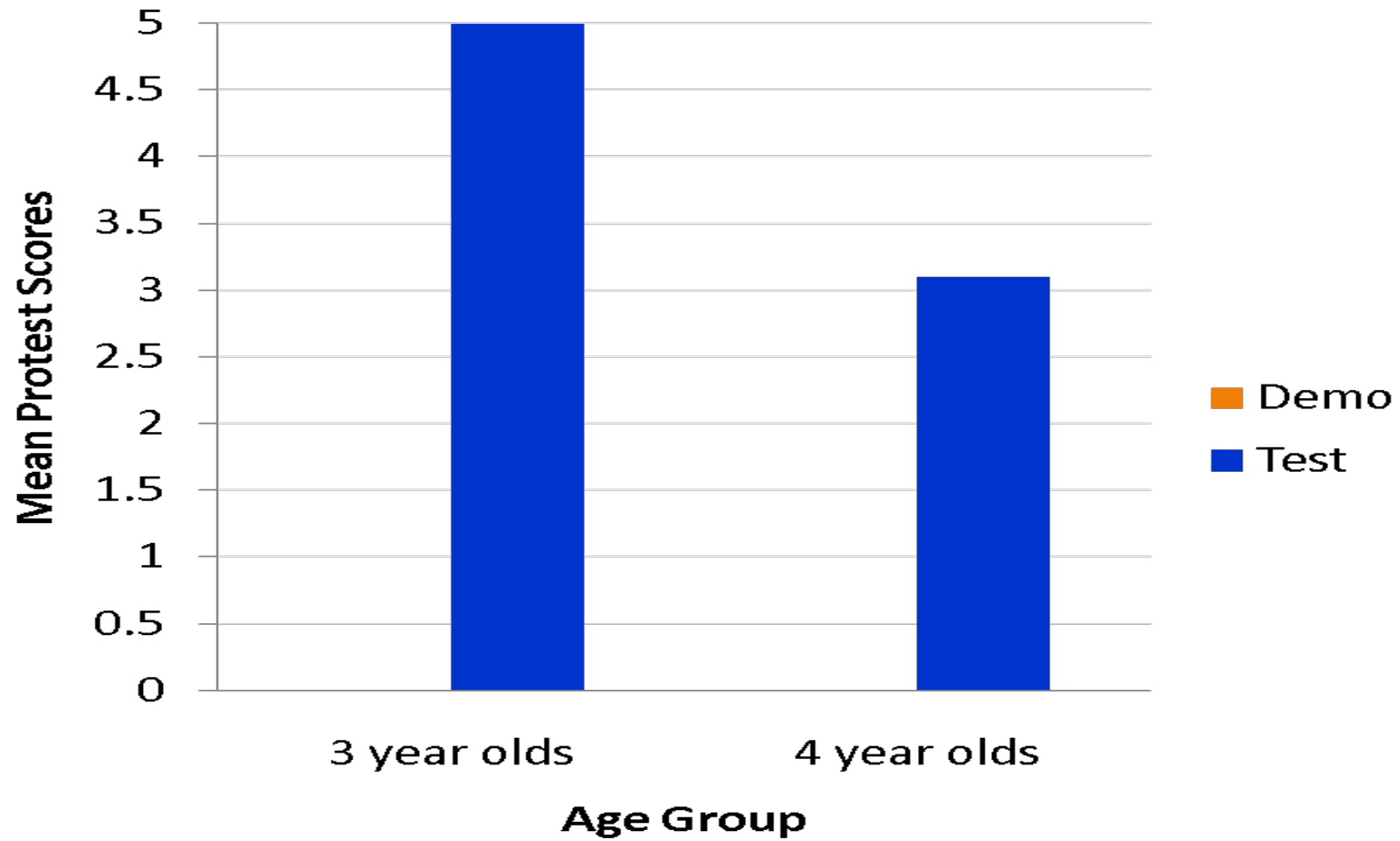
Sequence 01.mpg

# Results: Overall

- **Test phase:** No significant main effect of function:  $F(3, 72) = 0.178; p = .905$
- No significant main effect of age  $F(1,72)=0.48, p = .540$
- No significant Function x Age interaction ( $F(3,72) = 0.80, p = .496$ )

In all conditions both groups of children protested towards **any** second function demonstrated.

# Figure 1: Mean number of protests in the Conventional-idiosyncratic condition



# Figure 2: Mean number of protests in the Conventional- Non-violation condition

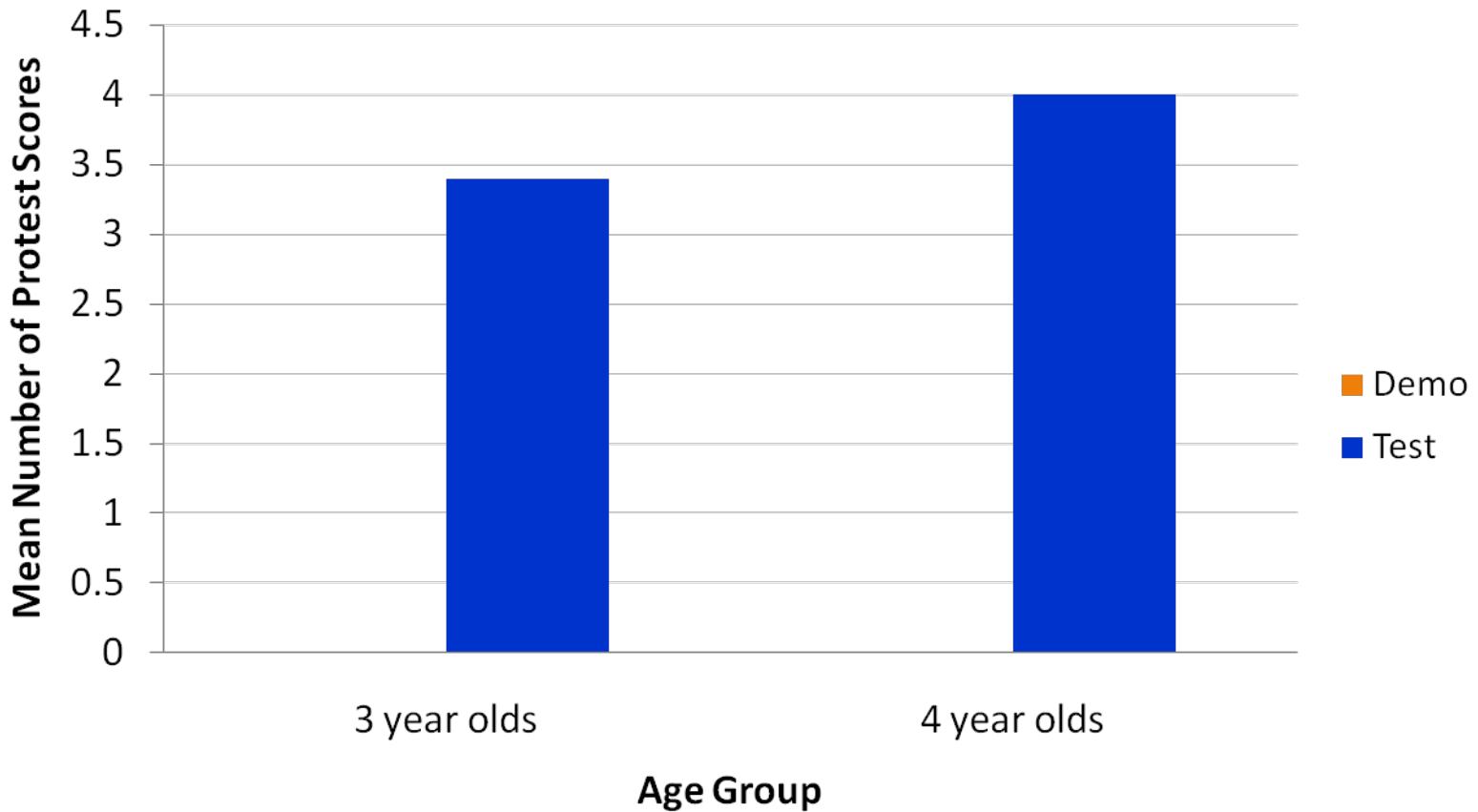
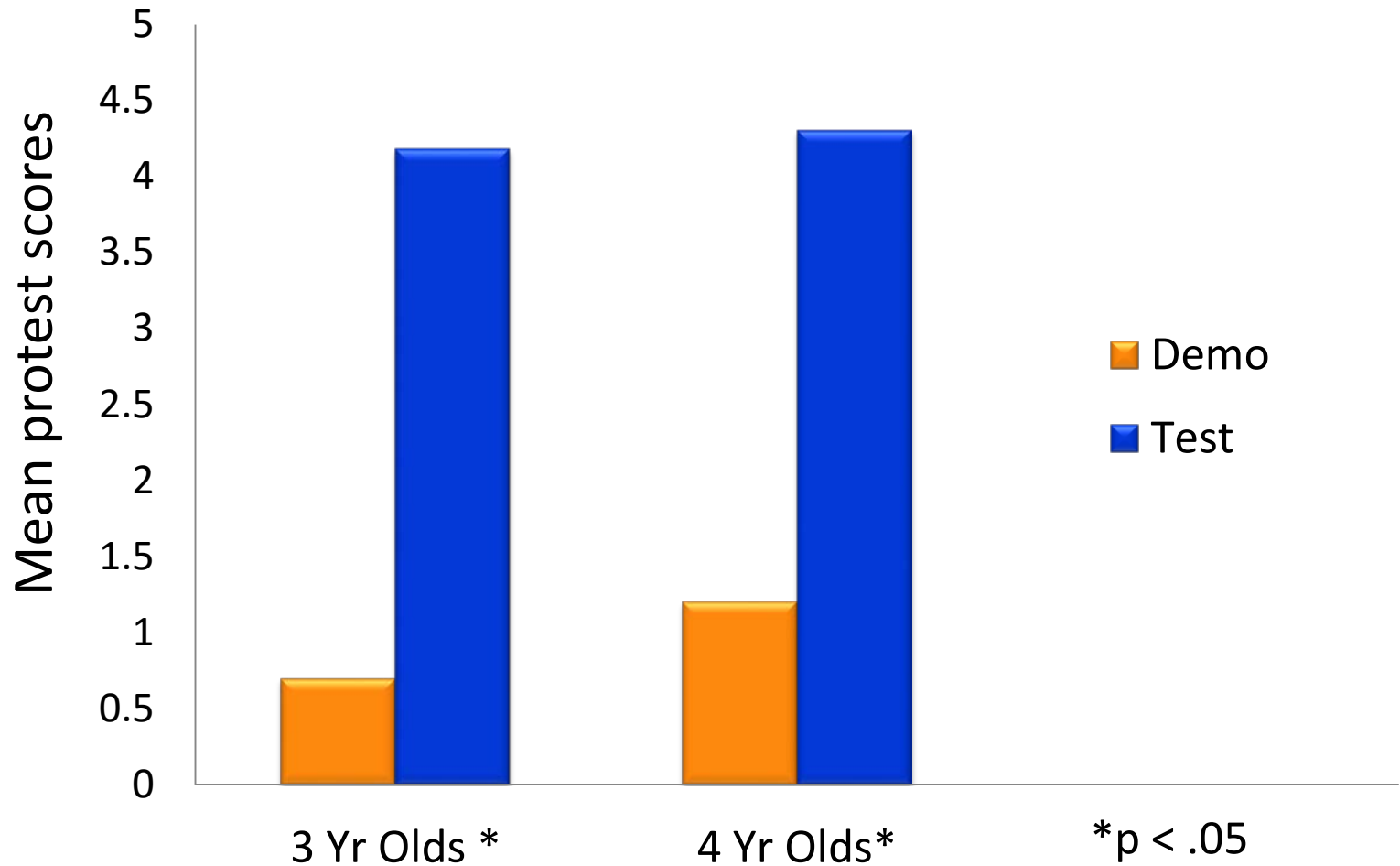
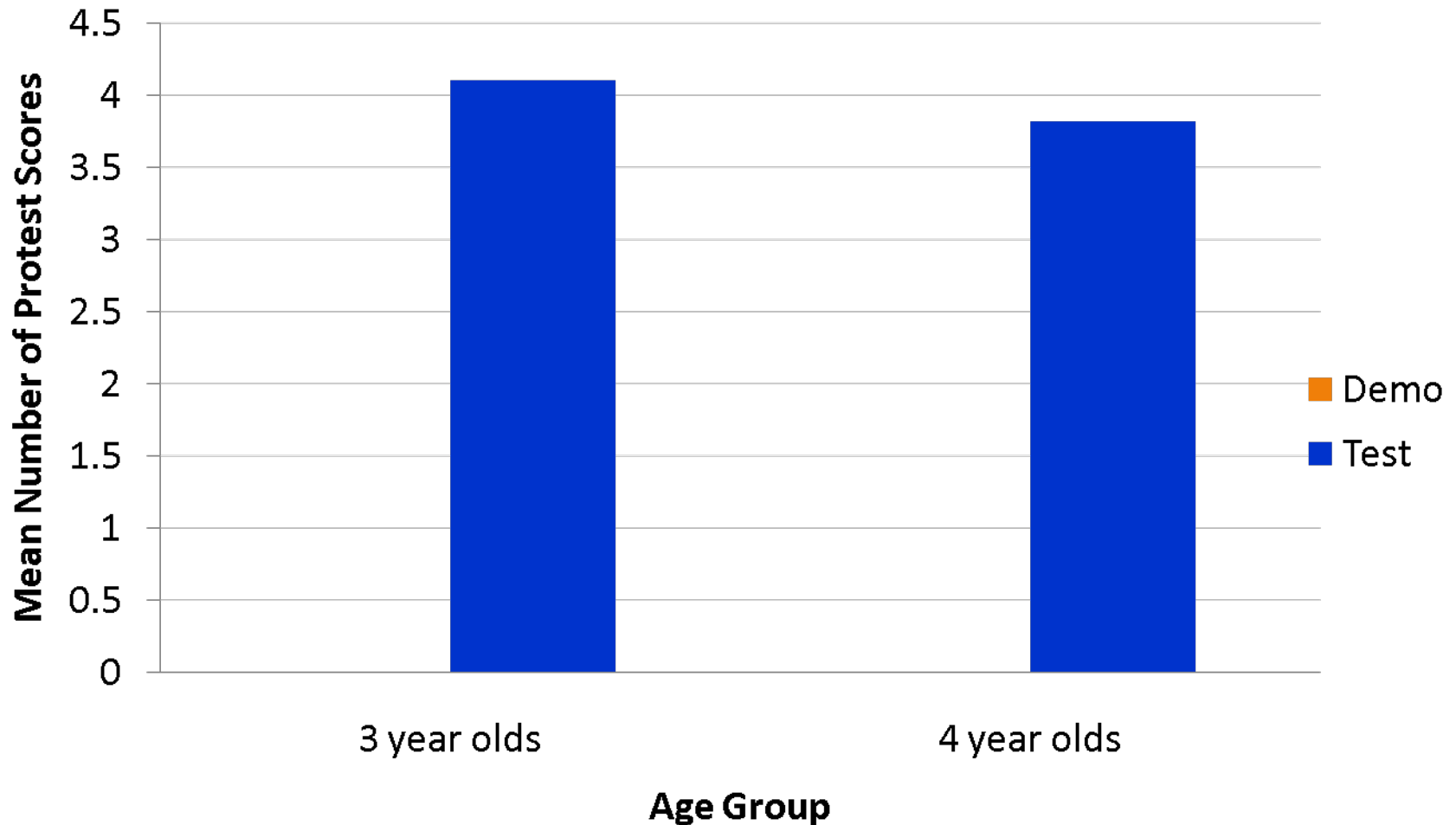


Fig. 3: Mean number of protests in the 'idiosyncratic-conventional' condition.



# Figure 4: Mean number of protests in the Non-violation-Conventional condition



# Results: Control question

## What's X for?

92% of children generated the conventional function of the three test objects.



To draw



To feed



To brush teeth

# One week later

- The same children were tested again one week later under the same conditions.
- 86% children spontaneously generated the first function demonstrated.
- No effect of condition.



# Discussion



- Young children did not view violations of conventional function as wrong *per se*.
- 3- and 4-year-olds understood the first function of each artifact to be the correct one in this context.
- The action-protest paradigm measured protest against the first function or rule provided (Rakoczy et al., 2008).



# Discussion



- Young children understand that objects have a stable conventional function.
- Non-conventional functions are not necessarily viewed as mistakes but perfectly feasible alternatives within specific contexts (Rakoczy et al., 2009; Callanan et al., 2007).
- Within rule-governed contexts young children understand that everyday artifacts can serve different functions which may deviate considerably from their conventional use.