# Preschool children reason about third-party goals when evaluating acoustic environments

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## Introduction

- **Children as flexible learners**
  - Learning flexibility in children includes:
    - Adjusting attention to stimuli that is learnable (Gerken et al., 2011; Kidd, 2011)
    - Using emotional expressions as cues for novel object exploration (Wu & Gweon, 2021)
    - Reasoning about environmental structure and goals to determine approach strategies (Meder et al., 2021)
- **Background noise and learning**
  - Acoustic noise is ubiquitous
  - Repeated noise exposure influences learning and development in critical ways:
    - Reduces speech perception and word recognition (Klatte et al., 2013; Bjorklund et al., 1990)
    - Decreases word learning (McMillan & Saffran, 2016)
    - Impinges on already limited cognitive resources for adaptive strategy building (Loh et al., 2022)
- **(Ecological) Active learning**
  - Traditional active learning:
    - Learners interact with individual stimuli within their environment (Settles, 2009)
    - Accurate stimuli labeling is a primary goal
  - Ecological active learning:
    - Children learn by tracking environmental features and adapt their exploration strategies accordingly (Ruggeri, 2022)
    - Exploratory strategies for learning are context-dependent
    - Exploit statistical regularities in the environment to reduce demands on cognition
- **Environmental selection**
  - Learners preferentially select acoustic environments that align with a set of goals
  - Emphasizes acoustic information
  - Goal-directed
  - Addresses variabilities across environments
  - Children can rely exclusively on acoustic information to make exploration decisions

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## Background: Metacognition

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- **Mauris tempor** risus nulla, sed ornare
- **Libero tincidunt** a duis congue vitae
- **Dui ac pretium** morbi justo neque, ullamcorper

## Methods

| | Experiment 1 Children | Experiment 2 Children | Experiment 2 Adults |
|---|---|---|---|
| N | 72 | 54 | 37 |
| $\mu$ | 4.46 years | 4.55 years | 40.43 years |
| African American/Black | 4.2% | 3.7% | 4.2% |
| Asian American/Pacific Islander | 23.6% | 37% | x% |
| Caucasian/White | 27.8% | 31.5% | 70.3% |
| Multiracial | 26.4% | 20.4% | x |
| Hispanic/Latinx | 8.3% | 7.4% | x |
| Other | 8.3% | | |

- **Experiment 1**

Figure 1. Dance

Figure 2. Read

Figure 3. Sleep

Figure 4. Talk

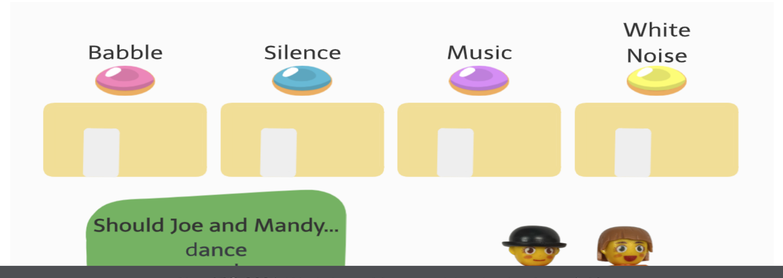
- **Experiment 2**

Figure 5. Dance

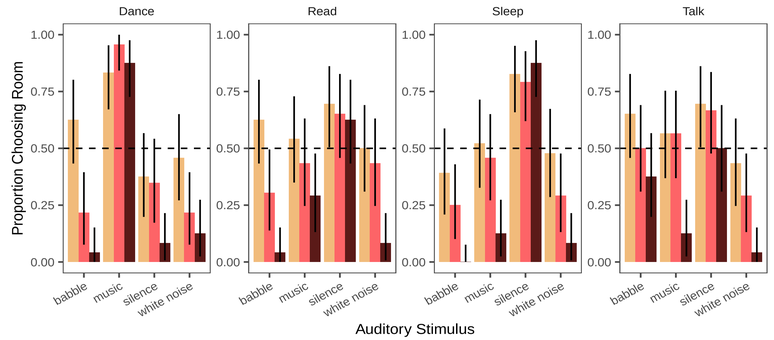
Figure 6. Read

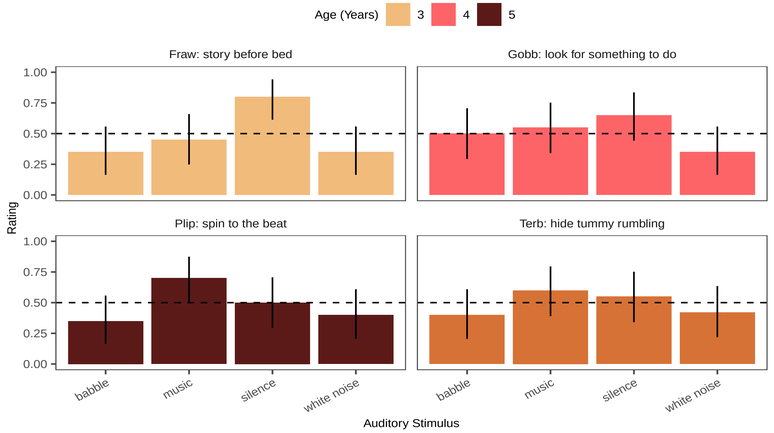
Figure 7. Sleep

Figure 8. Talk




## Results

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## References

[1] Claude E. Shannon.