



University
of Colorado
Boulder

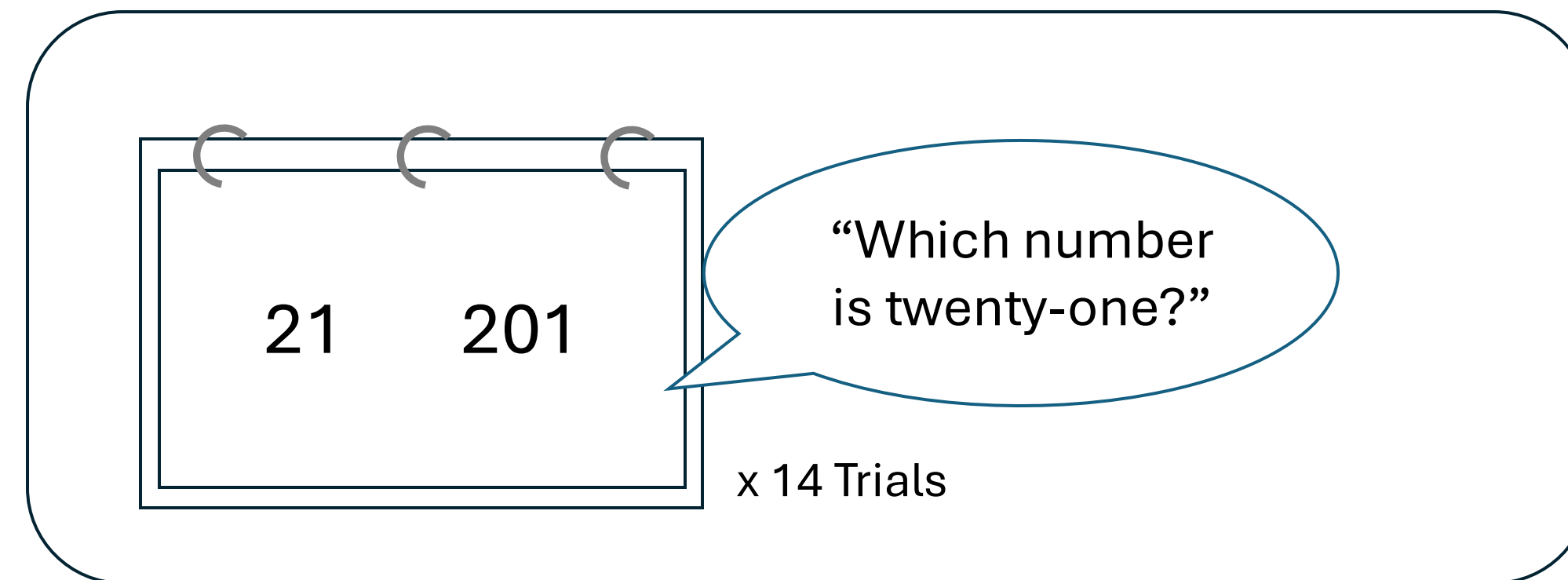
How Multi-digit Number Names Guide Attention, Memory, and Place Value Learning in Early Elementary Mathematics

Lei Yuan & Lucie Vleugels. CU Boulder



Study 1: How hearing number names guide attention and memory, and how it relates to prior knowledge

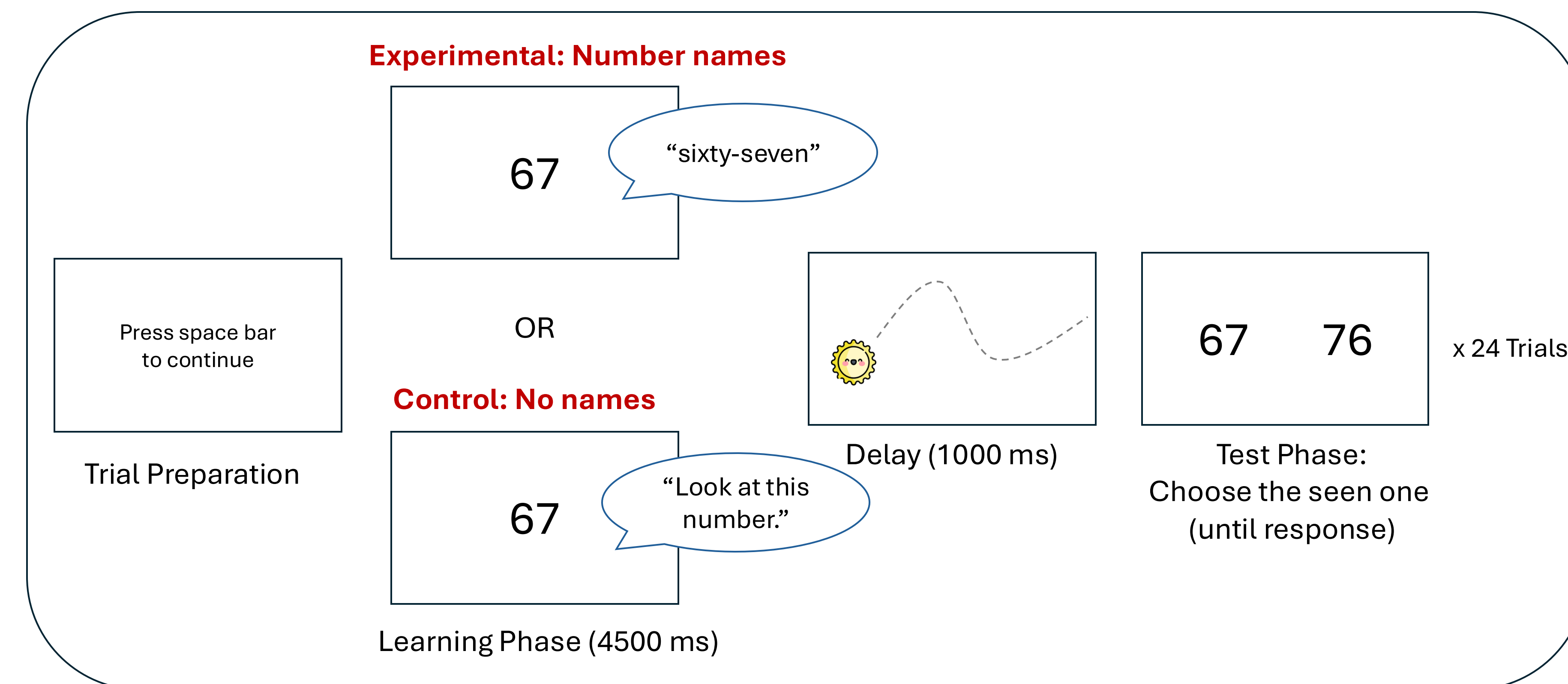
Pretest: Choosing a named multi-digit number (Prior knowledge)



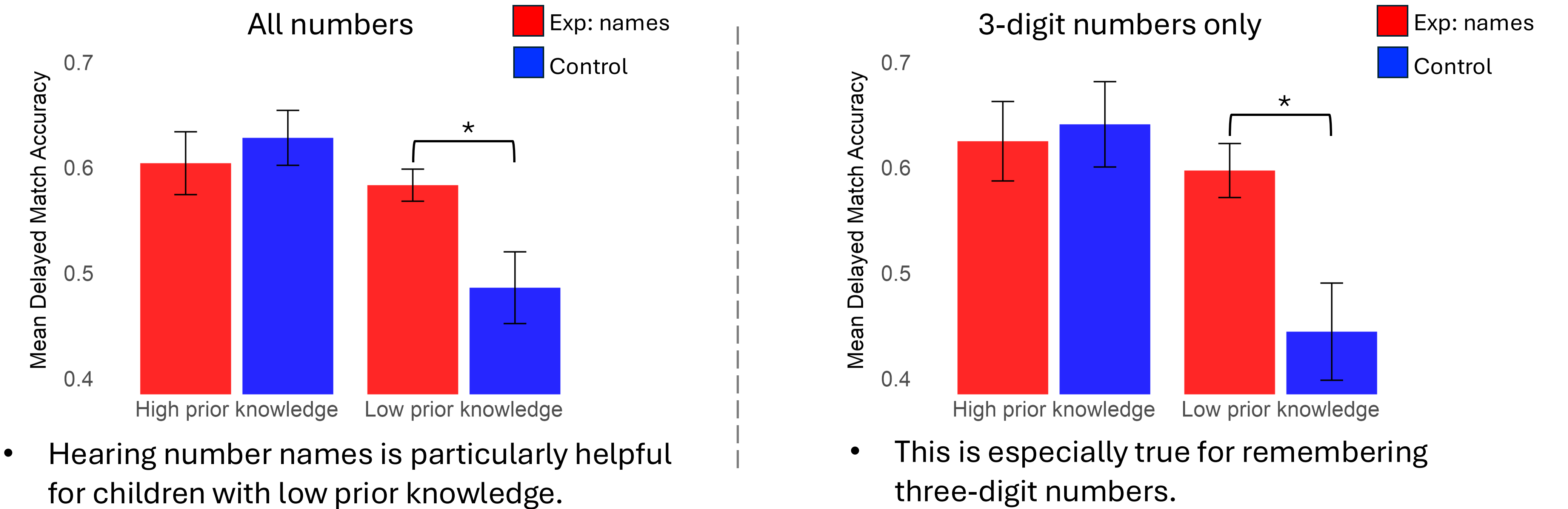
Participants:

N = 51, 4- to 6-year-olds
(mean age = 4.69, N
males = 29)

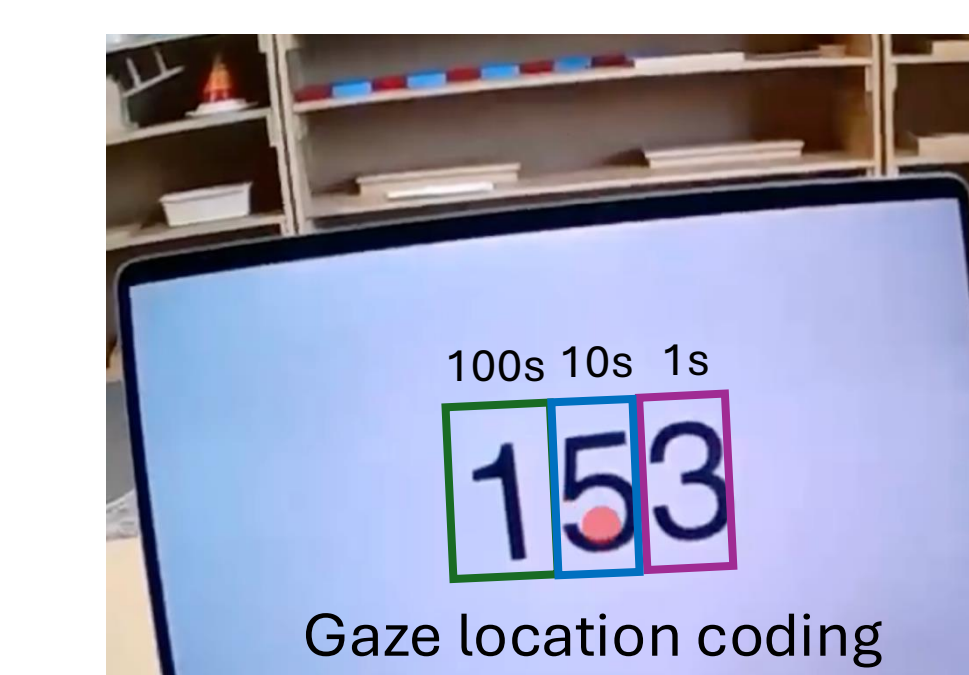
Main task: Match-to-sample task with or without names (Encoding new numbers)



Behavior Measures

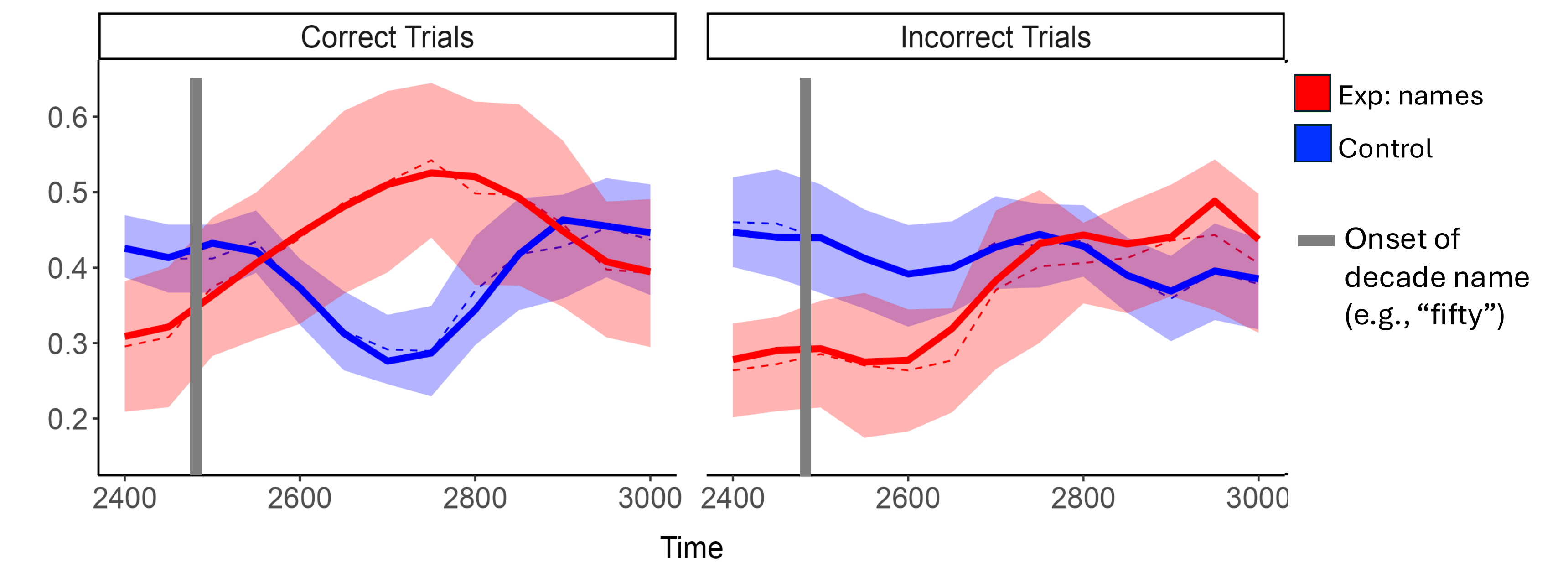


Gaze Measures



- Low prior knowledge children were more likely to attend to the decade location in the Exp condition (after hearing its name)

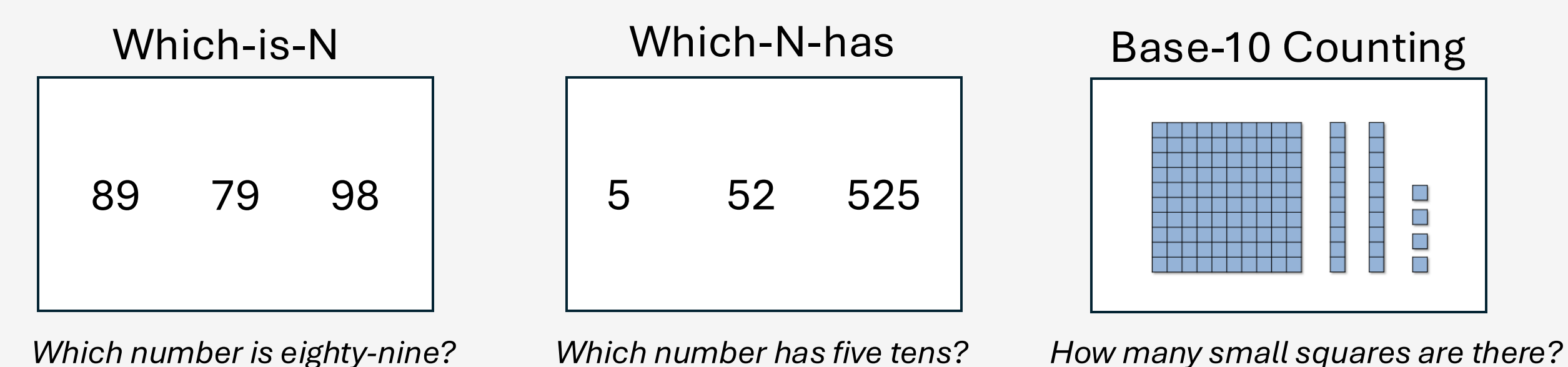
Gaze Proportion to Tens Place (3-Digits) for Low Prior Knowledge Children by Trial Accuracy



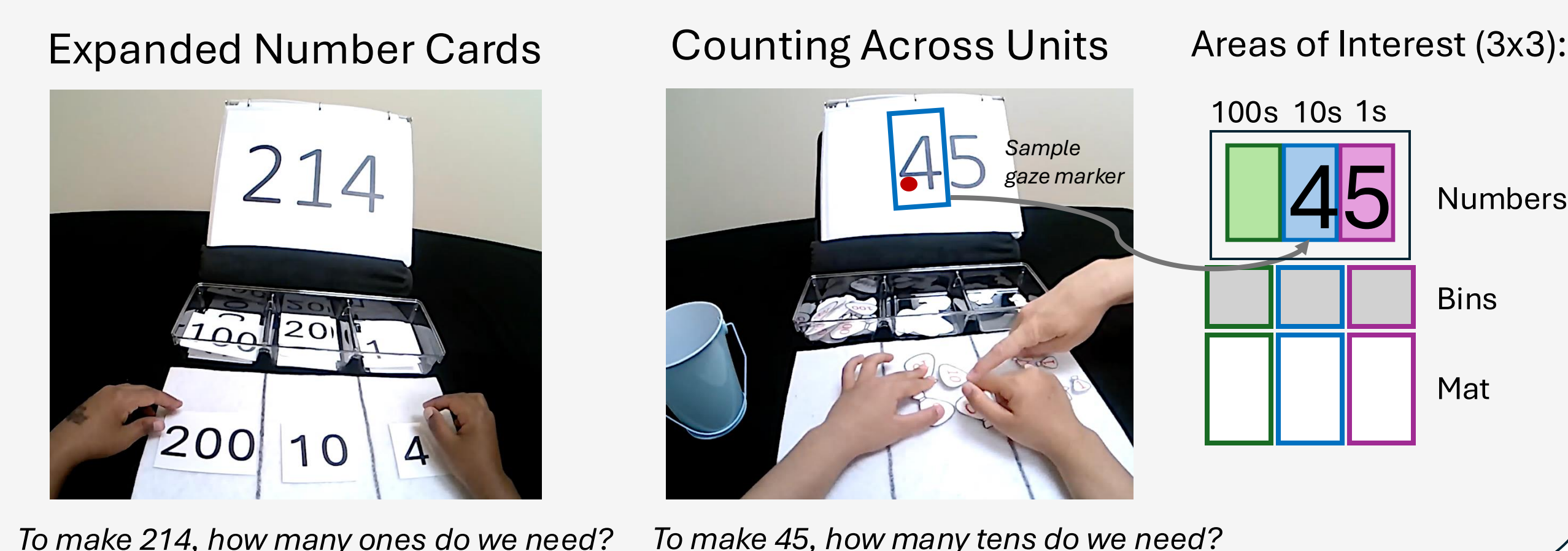
Study 2: How early knowledge influences attention, action, and learning during real-time instruction (a summer camp study)

Participants N = 27, 4-to 6-year-olds (mean age = 5.34, N of males = 20)

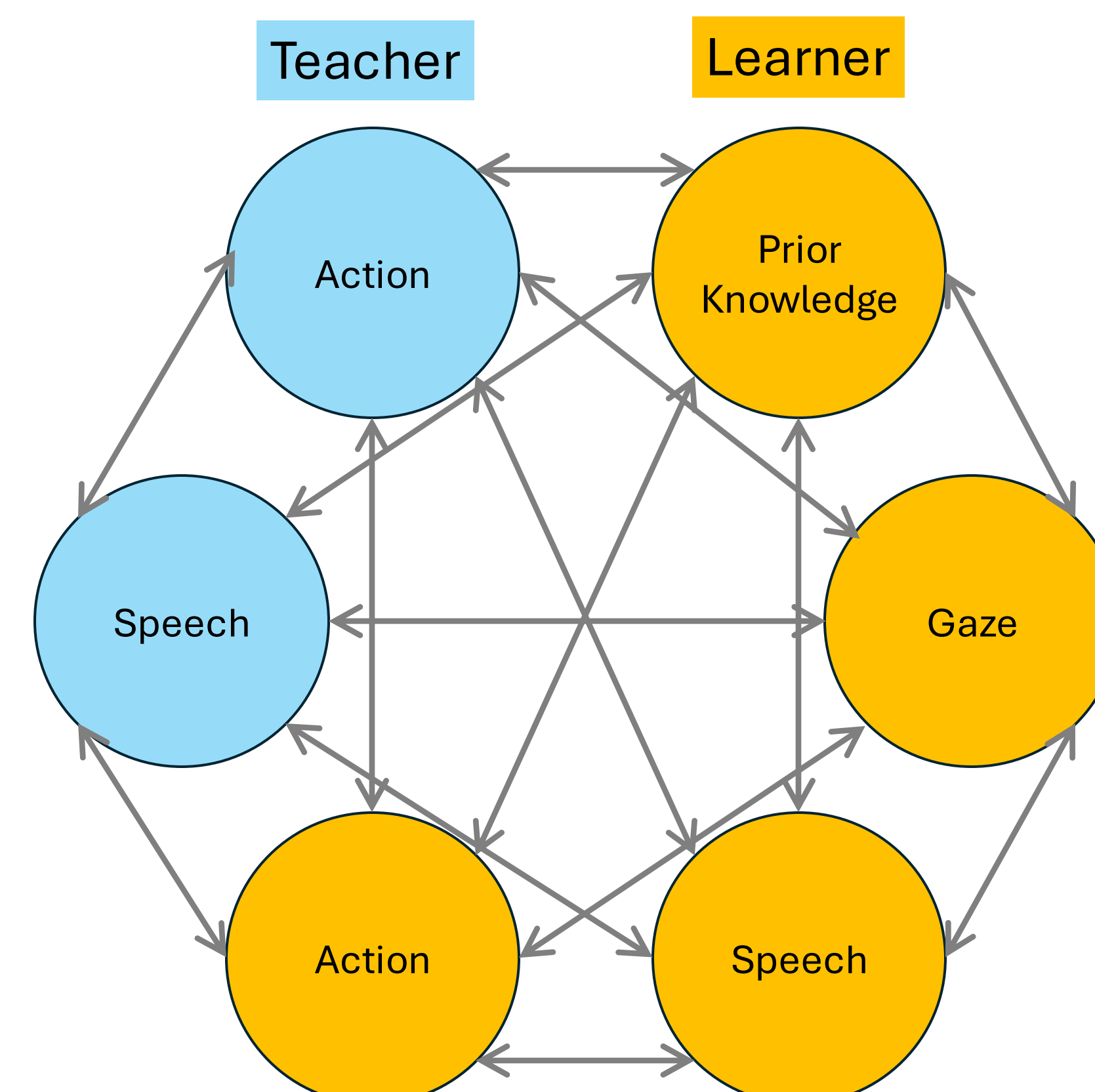
Days 1 & 4: **Pretest (and post-test)** (3 tasks)



Days 2 & 3: **Instruction Phase** (2 tasks)



Learning as a Dynamical System



Quantifying dynamic multisensory and social interactions during instructions

Time (in milliseconds)

