

# Teaching Shoe Tying Using a Large Scale Model

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The Judge Rotenberg Educational Center ([www.judgerc.org](http://www.judgerc.org)) operates day and residential programs for children and adults with behavior problems, including conduct disorders, emotional problems, brain injury or psychosis, autism, and developmental disabilities. The fundamental approach taken at JRC is the use of behavioral psychology and its various technological applications, including behavioral education, programmed instruction, precision teaching, behavior modification, behavior therapy, behavioral counseling, self-management of behavior, and chart-sharing.

In this study, we will discuss the use of specially created adaptive equipment in teaching shoe tying. We developed a large scale model of a shoe; and by using the large shoe, and small, pre-determined steps, students became fluent on the skill of shoe tying. Data will be plotted on a standard acceleration chart. We will examine the generalization of the skill taught using this large scale model.

## Method

### Participants and Setting

There were five participants in this study. Their ages ranged from 11 years 2 months to 17 years 5 months old. There were four males and one female. All five participants were diagnosed with autism or PDD and severe MR. All five participants attended school at the Judge Rotenberg Center and lived in one of JRC's group homes.

Participants worked on shoe tying in a one to one room, with a staff that was specially trained to deliver one to one instruction.

### Measures and Instruction

Participants learned the skill of shoe tying through backwards chaining. The skill was broken down into the following steps.

9	Student pulls both loops tight
8	Student folds 1 loop under the other loop
7	Student crosses the loops
6	Student makes a loop with the other lace
5	Student makes a loop with 1 lace

4	Students pulls both laces tight.
3	Student folds 1 lace under the other lace
2	Student crosses the laces
1	Student picks up both laces

Participants used a large model of a shoe (height 8.5 inches, width 10 inches, length 22 inches), with thick rope (.75 inches) for laces (Exhibit 1). They were then moved onto to a regular sized shoe, with athletic style shoe laces. The final step was tying their own shoe, on their foot.

Participants worked on this task for ten minutes with a staff who would give them as many physical, verbal and gestural prompts as needed. They would then complete a duration timing with an initial verbal prompt. Physical, verbal and gestural prompts were recorded during the timing and plotted on a standard celeration chart. During this entire process, participants were reinforced with various items, such as edible rewards or toys.

## Results

Participant 1 (Exhibit 2) worked on this task over a period of nineteen 10 minute sessions. During his first session, using the large shoe, he completed all 9 steps in 31 seconds, with 10 physical prompts, 9 verbal prompts and 0 gestural prompts. When moved onto a regular shoe, he completed all 9 steps in 14 seconds with 4 physical prompts, 0 verbal prompts and 0 gestural prompts. The first time he attempted to tie his own shoe, on his foot, he was able to do so in 19 seconds, with 7 physical prompts, 1 verbal prompt and 2 gestural prompts.

Participant 2 (Exhibit 3) worked on this task over a period of twenty-three 10 minute sessions. During her first session, using the large shoe, she completed all 9 steps in 32 seconds, with 12 physical prompts, 9 verbal prompts and 0 gestural prompts. When moved onto a regular shoe, she completed all 9 steps in 12 seconds with 3 physical prompts, 0 verbal prompts and 1 gestural prompt. The first time she attempted to tie her own shoe, on her foot, she was able to do so in 60 seconds, with 3 physical prompts, 0 verbal prompts and 1 gestural prompt.

Participant 3 (Exhibit 4) worked on this task over a period of twenty 10 minute sessions. During his first session, using the large shoe, he completed all 9 steps in 41 seconds, with 11 physical prompts, 14 verbal prompts and 0 gestural prompts. When moved onto a regular shoe, he completed all 9 steps in 15 seconds with 6 physical prompts, 4 verbal prompts and 2 gestural prompts. The first time he attempted to tie his own shoe, on his foot, he was able to do so in 20 seconds, with 9 physical prompts, 5 verbal prompts and 0 gestural prompts.

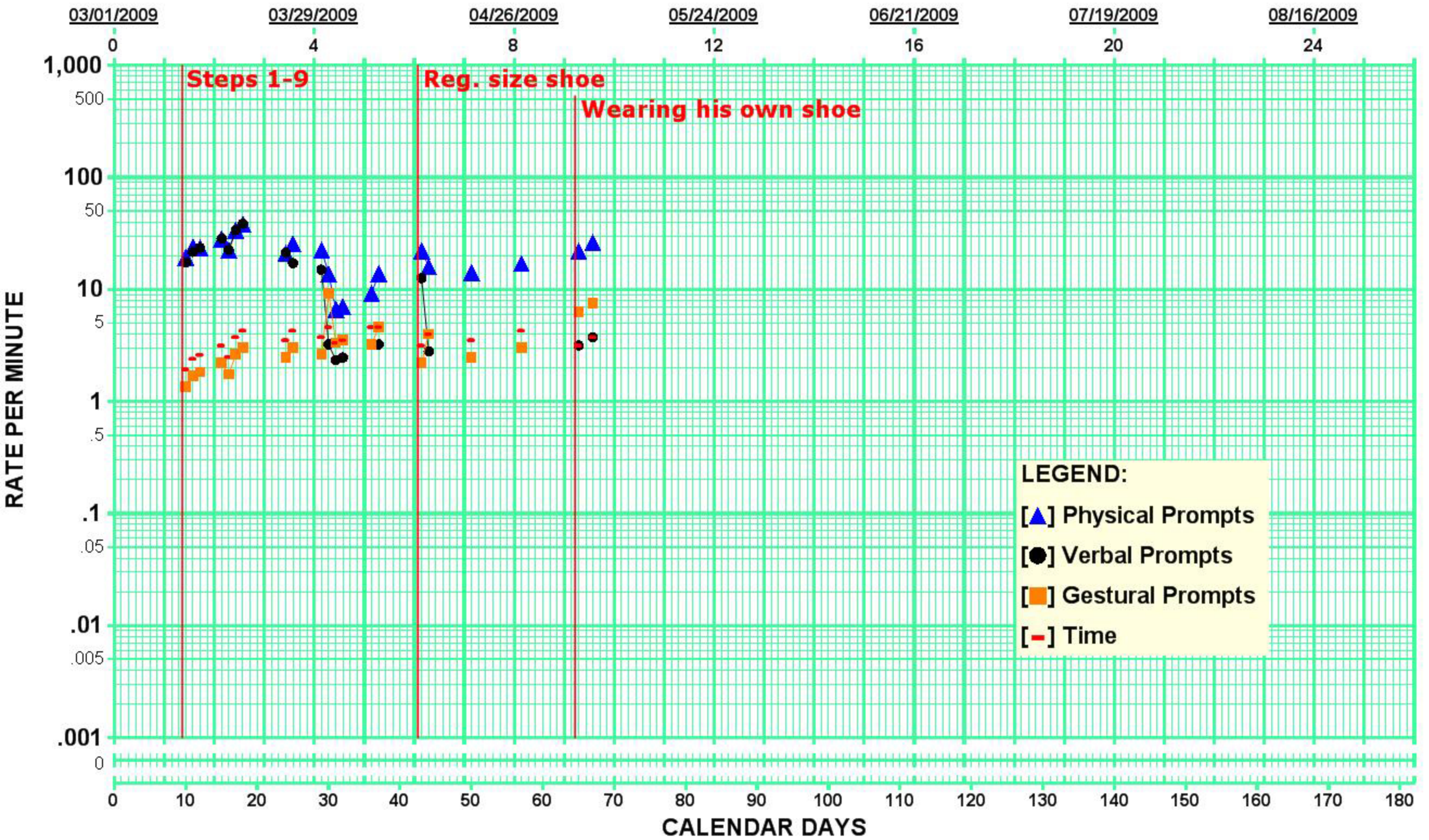




Exhibit 1



# DAILY CHART



**LEGEND:**  
[▲] Physical Prompts  
[●] Verbal Prompts  
[■] Gestural Prompts  
[-] Time

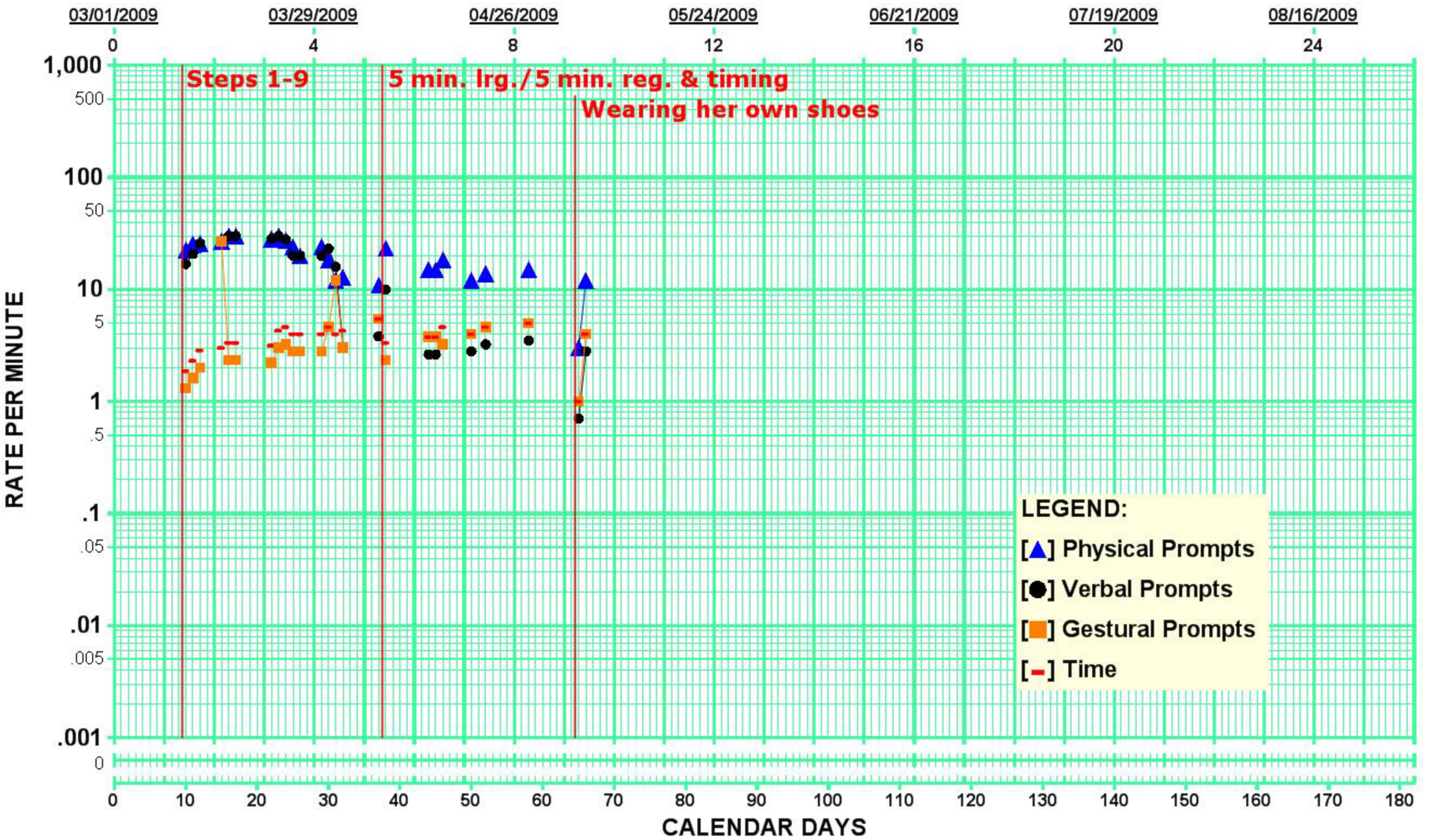
*Participant 1*  
NAME

*One to One Curriculum Tie Shoes*  
ITEM MEASURED

**Exhibit 2**



# DAILY CHART



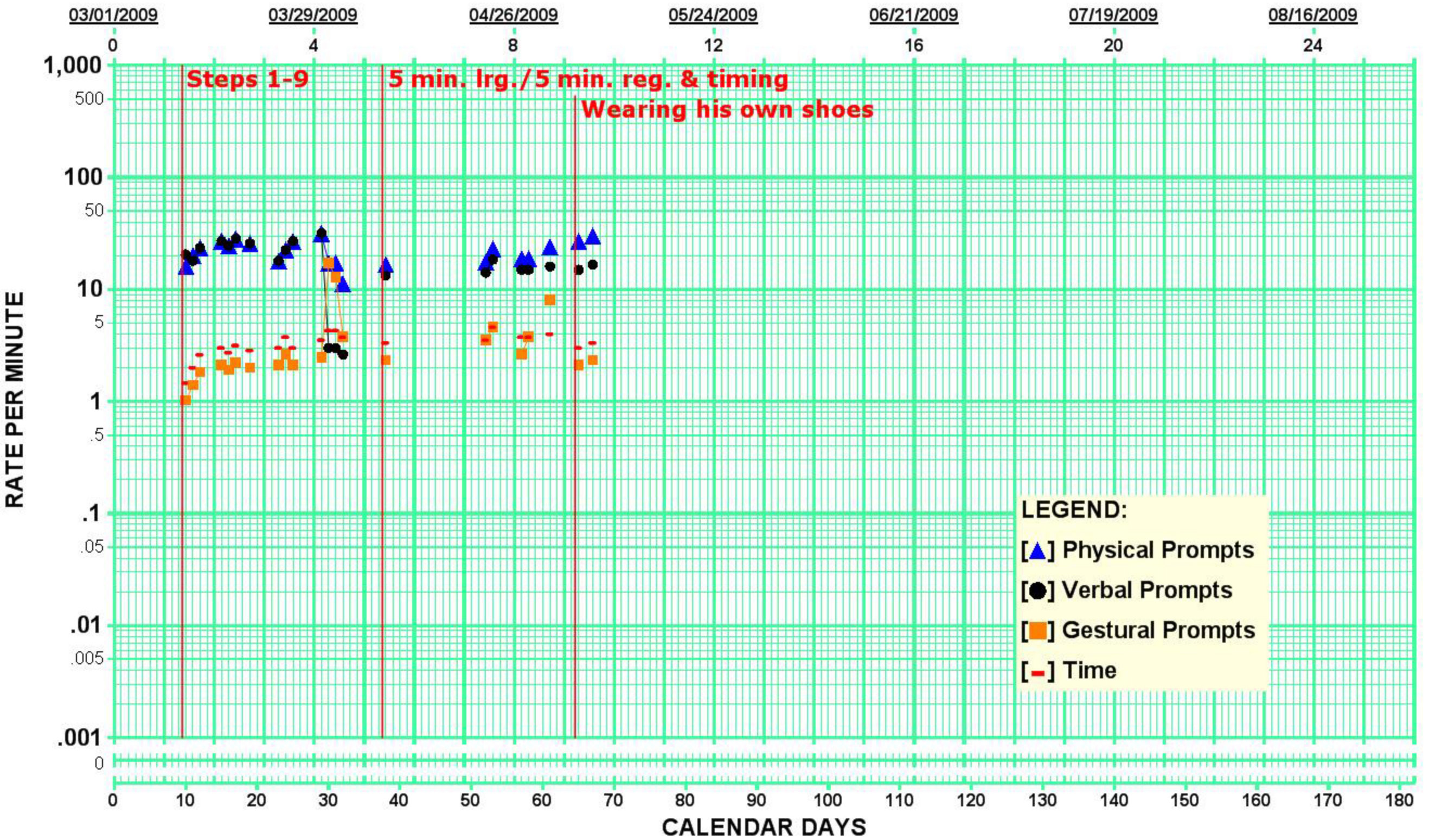
Participant 2  
NAME

One to One Curriculum Tie  
Shoes  
ITEM MEASURED

Exhibit 3



# DAILY CHART



Participant 3  
NAME

One to One Curriculum Tie  
Shoes  
ITEM MEASURED

Exhibit 4



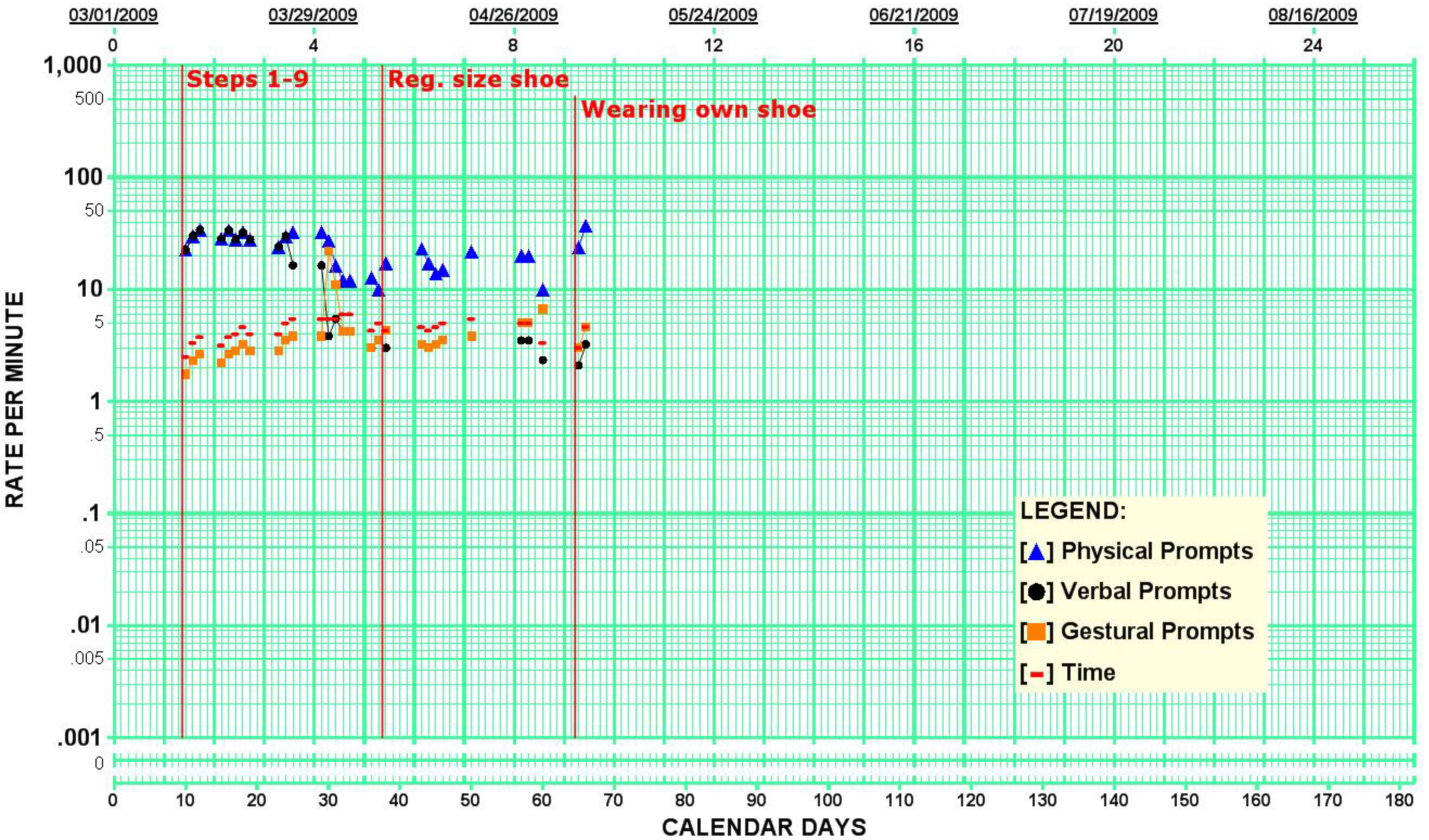
Participant 4 (Exhibit 5) worked on this task over a period of twenty-seven 10 minute sessions. During his first session, using the large shoe, he completed all 9 steps in 24 seconds, with 9 physical prompts, 9 verbal prompts and 0 gestural prompts. When moved onto a regular shoe, he completed all 9 steps in 18 seconds with 3 physical prompts, 0 verbal prompts and 2 gestural prompts. The first time he attempted to tie his own shoe, on his foot, he was able to do so in 20 seconds, with 8 physical prompts, 0 verbal prompt and 1 gestural prompt.

Participant 5 (Exhibit 6) worked on this task over a period of twenty-four 10 minute sessions. During his first session, using the large shoe, he completed all 9 steps in 50 seconds, with 18 physical prompts, 13 verbal prompts and 0 gestural prompts. When moved onto a regular shoe, he completed all 9 steps in 19 seconds with 4 physical prompts, 0 verbal prompts and 0 gestural prompts. The first time he attempted to tie his own shoe, on his foot, he was able to do so in 25 seconds, with 9 physical prompts, 1 verbal prompt and 9 gestural prompts.

## **Discussion**

Using the large model shoe has shown to be effective in teaching the skill, shoe tying. Participants were able to learn this skill in an average of 226 minutes, over a period of 22 days. The skill generalized from large model shoe, completed at a table, to regular sized shoe, completed at a table, to the participant's own shoe, worn on their foot. Further practice will be needed to ensure that the participants are able to tie their shoes tight enough for them to remain tied throughout the day. Also, further practice is needed to continue fading prompts.

# DAILY CHART



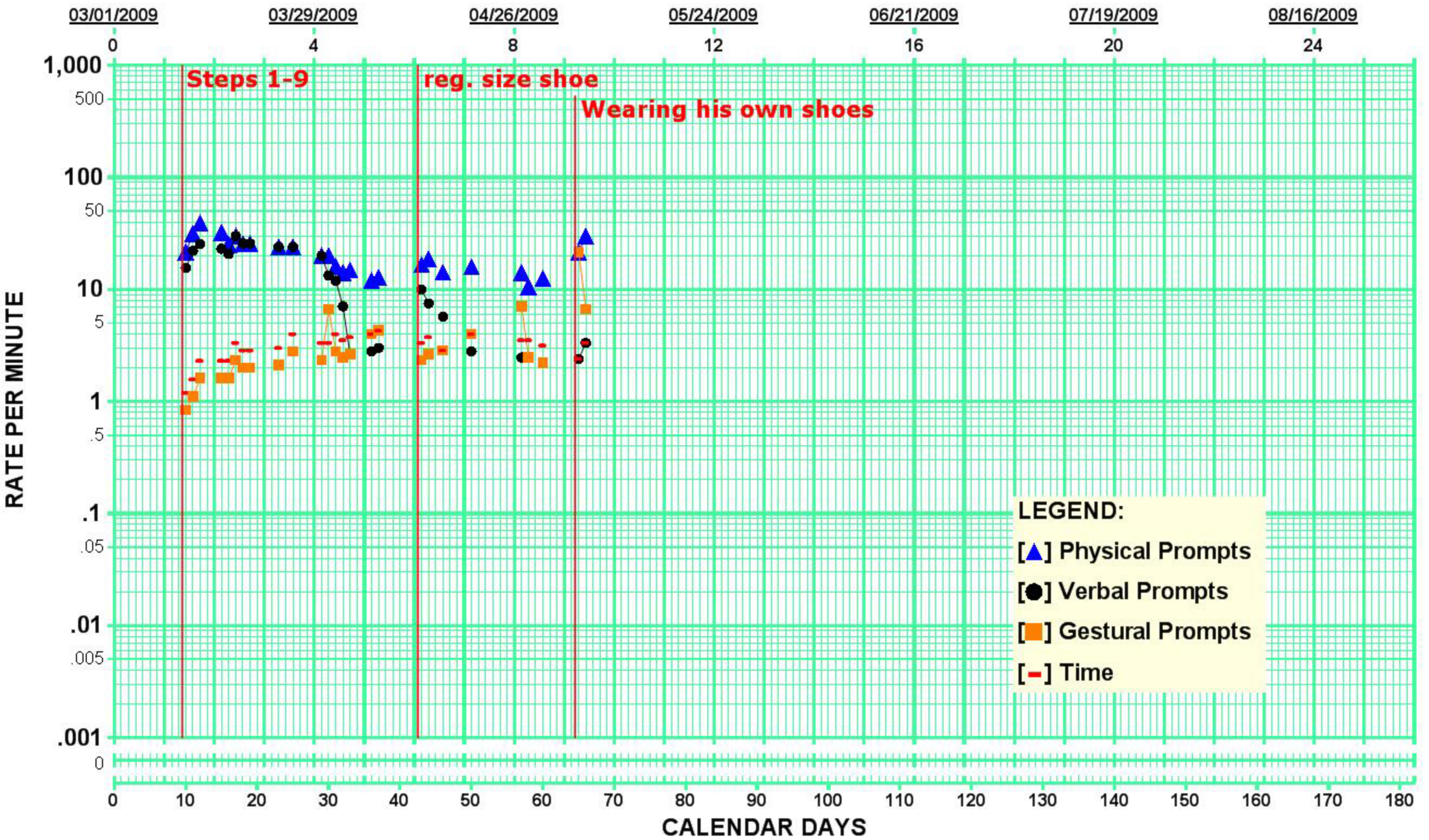
Participant 4  
NAME

One to One Curriculum Tie  
Shoes  
ITEM MEASURED

Exhibit 5



# DAILY CHART



**LEGEND:**

- [▲] Physical Prompts
- [●] Verbal Prompts
- [■] Gestural Prompts
- [-] Time

Participant 5  
NAME

One to One Curriculum Tie  
Shoes  
ITEM MEASURED

Exhibit 6