Teaching Tooth Brushing to Developmentally Disabled Individuals

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We examined different strategies to teach developmentally disabled and autistic individuals to brush their teeth. We used both manual and electric toothbrushes. Procedures used included (1) using a backwards chaining and a set of small predetermined steps, (2) teaching with a group performing each step together, and (3) use of external models of teeth, Participants were required to be fluent on each step, before moving to the next step. Data was plotted on a standard celeration chart

Method

Participants and Setting

There were a total of twenty two participants in this study. They ranged in age from thirteen years and one month to twenty two years and one month. There were eighteen males and four females. Participants were chosen based on compliant behaviors and classroom placement. Participants can be described as moderately to severely mentally retarded. Twenty of the participants were classified as autistic, while two were classified as multiply handicapped. Dental reports for participants described two as having good oral hygiene, two as having fair oral hygiene, ten as having poor oral hygiene and eight did not have dental reports available.

All participants attended school at the Judge Rotenberg Center and lived in one of JRC's group homes.

Teeth brushing took place in various bathrooms located at the school. Participants that took part in the group lessons also received instruction in their assigned classroom. Participants that used the model teeth received instruction in the Daily Living Skills classroom.

Measures and Instruction

Participants were broken into four groups. The first group learned to brush their teeth using a manual toothbrush. Instruction was delivered by one person, who used a task analysis with steps that were arranged in a backwards chain. Instruction was one to one, in the bathroom. Sessions were timed, and data was taken on the number of physical prompts, verbal prompts and gestural prompts needed. Data was plotted on a standard celeration chart. The second group learned to brush their teeth using an electric toothbrush. Instruction was delivered by one person, who used a task analysis with steps that were arranged in a backwards chain. Instruction was one to one, in the bathroom. Sessions were timed, and data was taken on the number of physical prompts, verbal prompts and gestural prompts needed. Data was plotted on a standard

celeration chart. The third group learned to brush their teeth using a manual toothbrush, in a group lesson setting. During the group lessons, participants sang a song about brushing teeth and learned to recite the steps of brushing their teeth. These group lessons were conducted for five days.   Data was taken before the first group lesson and after the last group lesson. The same task analysis was used, and data was recorded on steps completed correctly, incorrectly and steps missed. The fourth group learned to brush their teeth using a large scale model of a mouth, teeth and a large toothbrush (Exhibit 1). The same task analysis was used. Data was taken before the first session with the model mouth, and after the last session with the model mouth. Data was recorded on steps completed correctly, incorrectly and steps missed.

Results

Group one completed the tooth brushing sequence using a manual toothbrush. Participants worked for sixty sessions that lasted about seven minutes each. Before starting sessions, participants required a mean (average) of 554 seconds to complete the sequence, 30 physical prompts, 13 verbal prompts and 19 gestural prompts. After 60 sessions, participants required a mean (average) of 383 seconds to complete the sequence, 10 physical prompts, 11 verbal prompts and 12 gestural prompts. Individual results can be seen on Exhibit 2.

Group two completed the tooth brushing sequence using an electric toothbrush**.** Participants worked for sixty sessions that lasted about five minutes each. Before starting sessions, participants required a mean (average) of 483 seconds to complete the sequence, 6 physical prompts, 10 verbal prompts and 12 gestural prompts. After 60 sessions, participants required a mean (average) of 286 seconds to complete the sequence, 4 physical prompts, 7 verbal prompts and 8 gestural prompts. Individual results can be seen on Exhibit 3.

Group three completed the tooth brushing sequence after participating in group lessons that went over the steps of tooth brushing. There were five group lessons conducted, each lasting between 45 and 60 minutes. Before completing the group lessons, participants required a mean (average) of 122 seconds to complete the sequence, with 7 steps completed correctly, 4 steps completed incorrectly and 8 steps missed. After completing the group lessons, participants required a mean (average) of 102 seconds to complete the sequence, with 12 steps completed correctly, 1 step completed incorrectly and 6 steps missed. Individual results can be seen on Exhibit 4.

Group four completed the tooth brushing sequence after learning to brush a large scale mouth model. Five sessions, each lasting approximately 2 minutes were conducted. Before learning to brush the model's teeth, participants completed a mean (average) of 6 steps correctly, 3 steps incorrectly and 9 steps were missed. After learning to brush the model's teeth, participants completed a mean (average) of 8 steps correctly, 1 step completed incorrectly and 9 steps missed. Individual results can be seen on Exhibit 5.
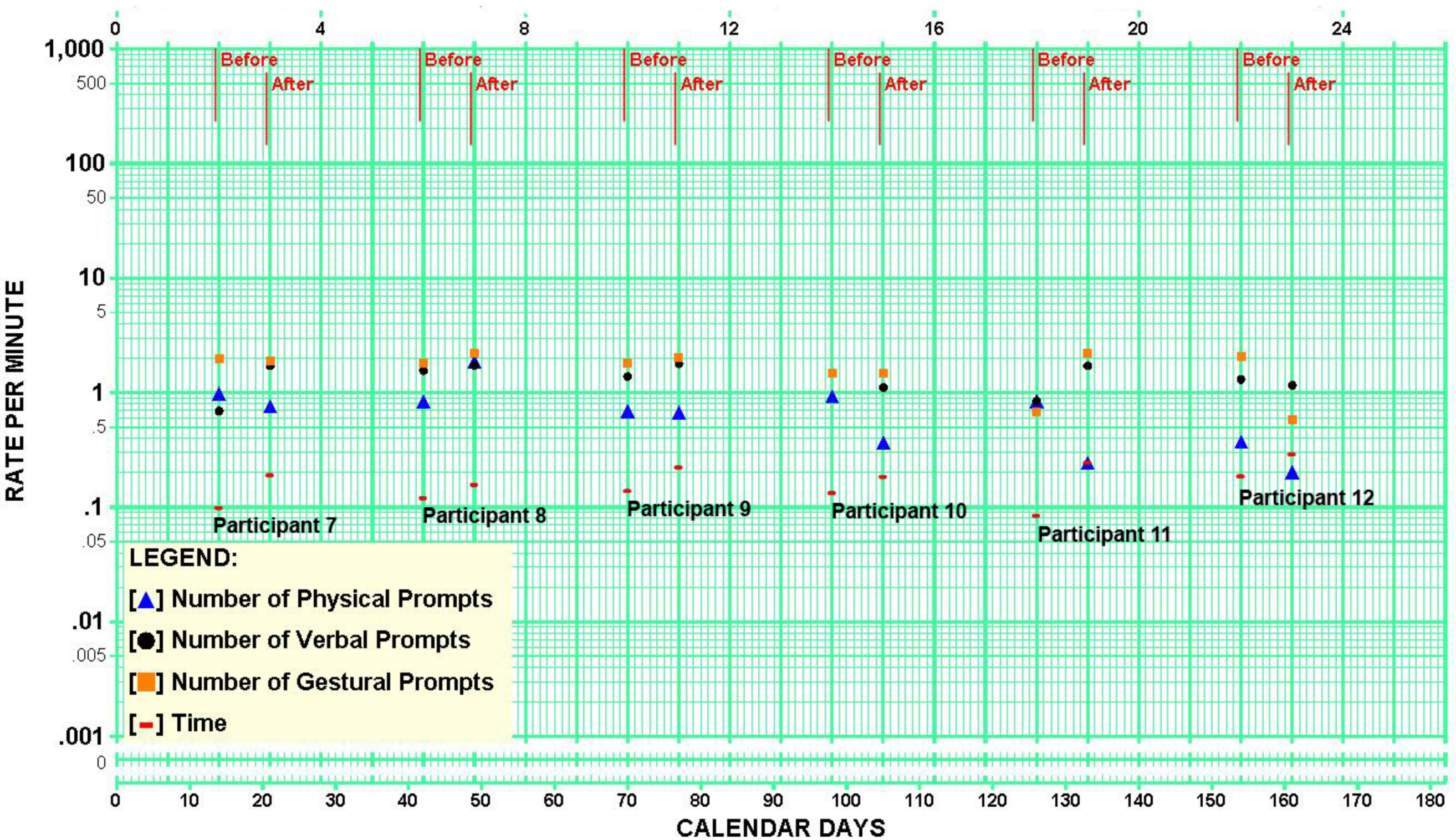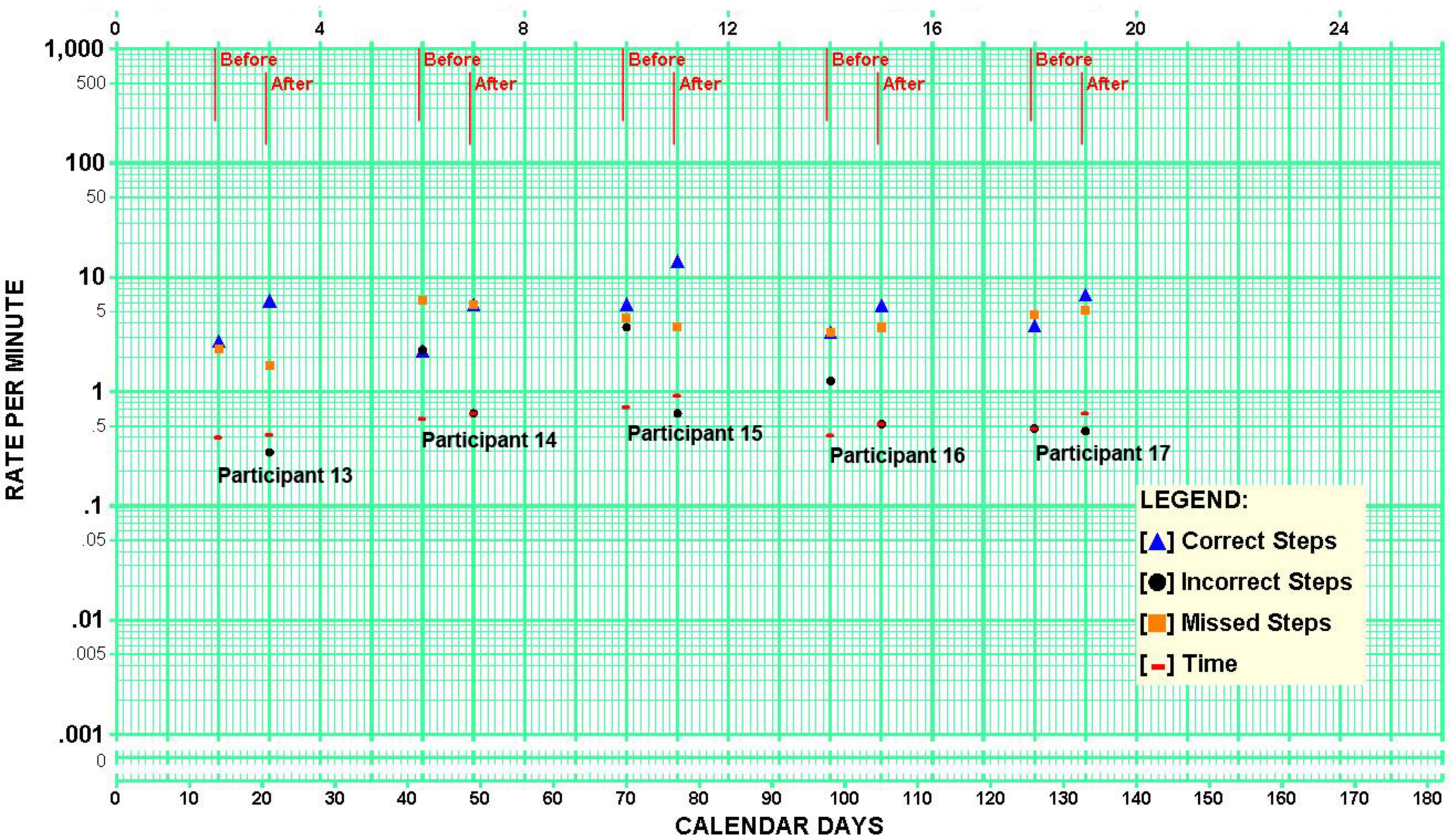
Exhibit 1

DAILY CHART
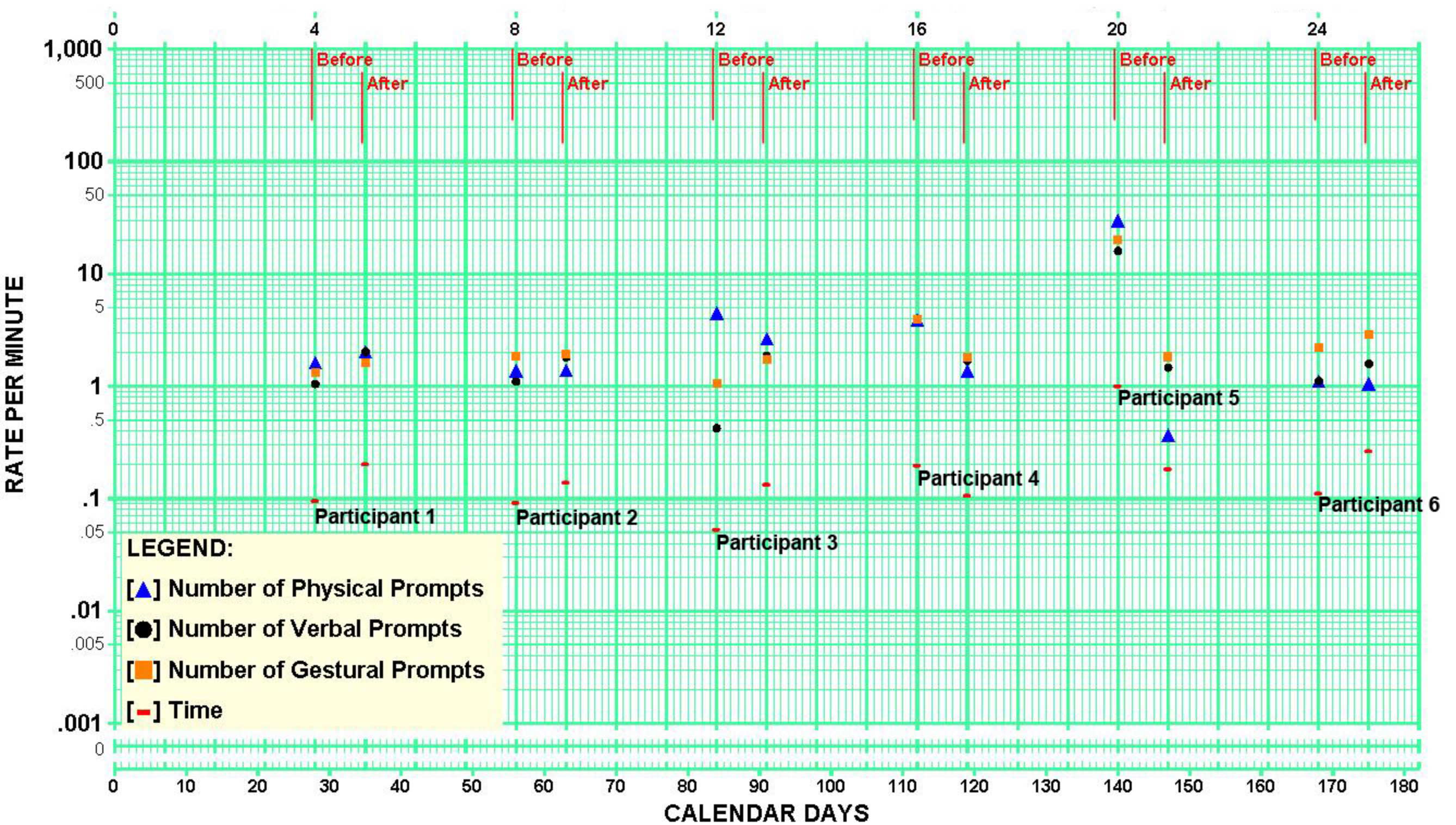
Individual Results Before and After Sessions with a Manual Toothbrush

Exhibit 2

DAILY CHART

Individual Results Before and After Sessions with an Electric Toothbrush

Exhibit 3

DAILY CHART

Individual Results Before and After Group Lessons
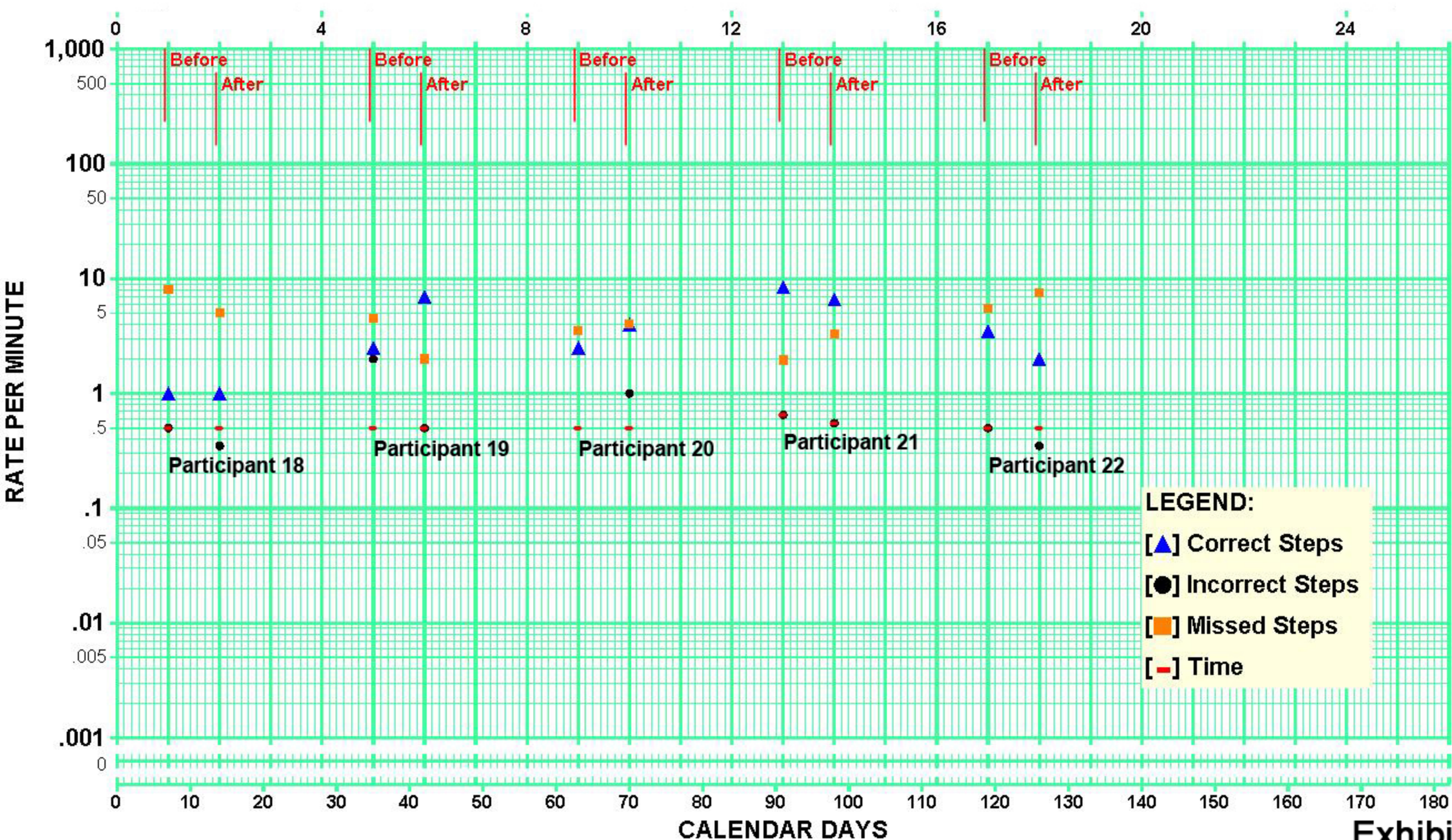
Exhibit 4

DAILY CHART

Individual Results Before and After Sessions with the Large Scale Mouth Model and Toothbrush

Exhibit 5

Group means (averages) for each method used can be seen on Exhibits 6 and 7.

Discussion

No one method of teaching tooth brushing proved to be 100 percent effective in making a participant completely independent in tooth brushing. Completing one to one sessions, with a pre-determined task analysis took the most time to implement, but also was the most successful in bringing prompts down. Use of the manual toothbrush showed the most improvement between the before and after sessions.

We will continue to re-test all participants on the steps of the tooth brushing sequence. This will help us determine if one method ensures better retention over another. We will also be checking dental hygiene reports as check ups occur. This will show us if the participants are completing the sequence independently over time.

DAILY CHART
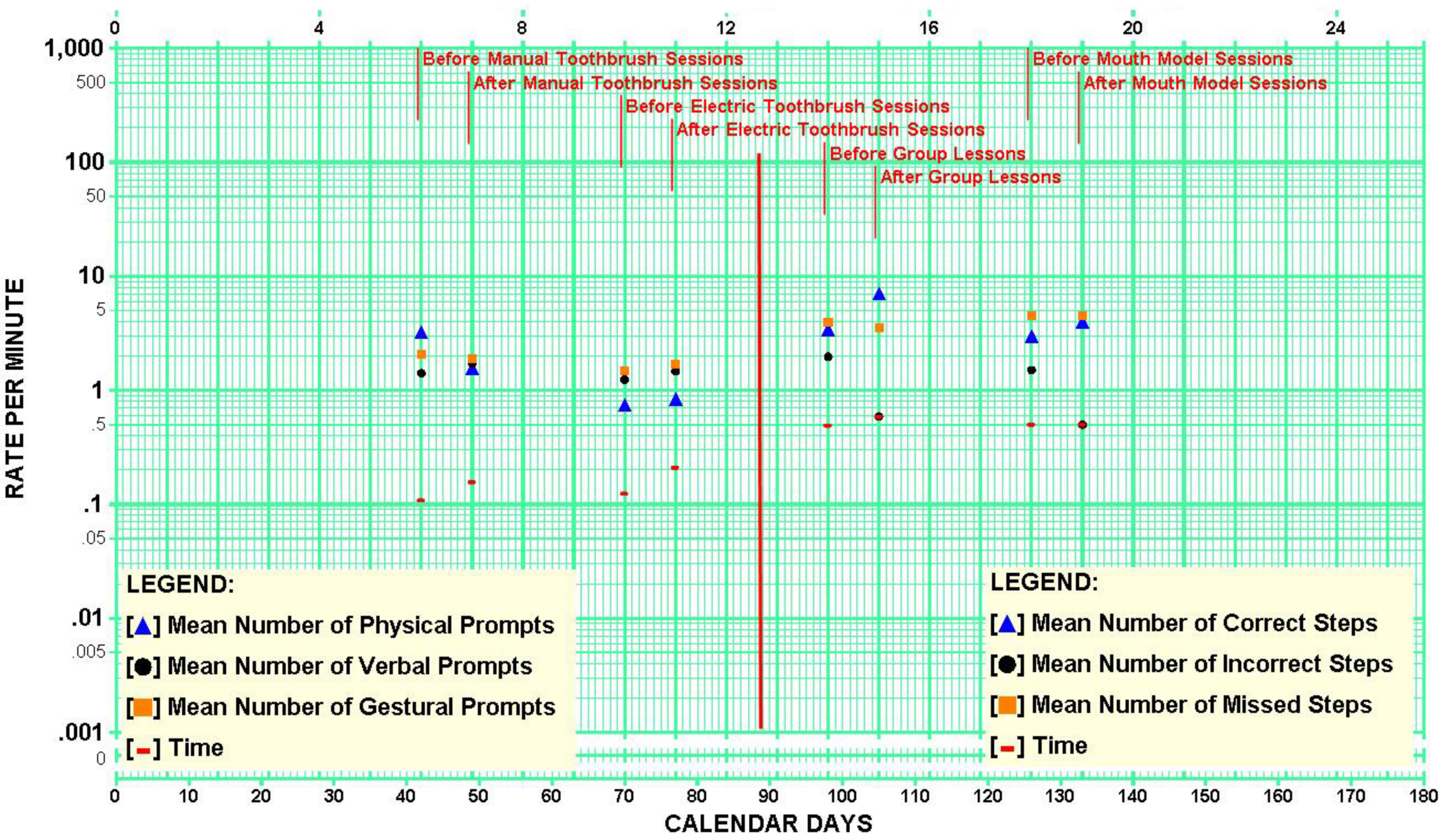
Combined Mean Results for Each Method Used

Exhibit 6

Combined Mean (Average) Results for Each Method Used

	Physical Prompts	Verbal Prompts	Gestural Prompts	Time (seconds)
Before Manual Tooth Brush Sessions	29	12	19	534
After Manual Tooth Brush Sessions	10	11	12	383
	Physical Prompts	Verbal Prompts	Gestural Prompts	Time (seconds)
Before Electric Tooth Brush Sessions	6	10	12	483
After Electric Tooth Brush Sessions	4	7	8	286
	Correct Steps	Incorrect Steps	Missed Steps	Time (seconds)
Before Group Lessons	7	4	8	122
After Group Lessons	12	1	6	102
	Correct Steps	Incorrect Steps	Missed Steps	Time (seconds)
Before Mouth Model Sessions	6	3	9	120
After Mouth Model Sessions	8	1	9	120

Exhibit 7