The Acquisition of Stimulus Equivalence Through the Use of Computer Software

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We examined the use of computer software that was designed to make use of the stimulus equivalence phenomenon. Using pictures of common household items, participants matched to sample, paired spoken words to image and paired image to written worked. We tested for transitivity, evaluating if matching the spoken word to the written word emerged without training. Each step of this sequence had a predetermined fluency rate required, before moving onto the next step. All data was plotted on a standard celeration chart.

Method

Participants and Setting

There were three participants in this study. Their ages ranged from twelve years and two months to thirteen years and 11 months. There was one female and two males. Participant one was 12.2 years of age, diagnosed with Autism, Disruptive behavior disorder NOS, Participant two was 13.11 years of age, diagnosed with Autism and Mental Retardation, Participant three was 13.11 years old diagnosed with Severe Mental Retardation and Multiple Disabilities. The participants where chosen as a result being capable of using the computer. They all completed the prerequisite program to these programs, called Basic Skills. In this program, participants learned skills such as matching shapes, using a touch screen, matching picture to picture skills etc. They also had pre-attending skills such as sitting quietly, attending to task and following directions.

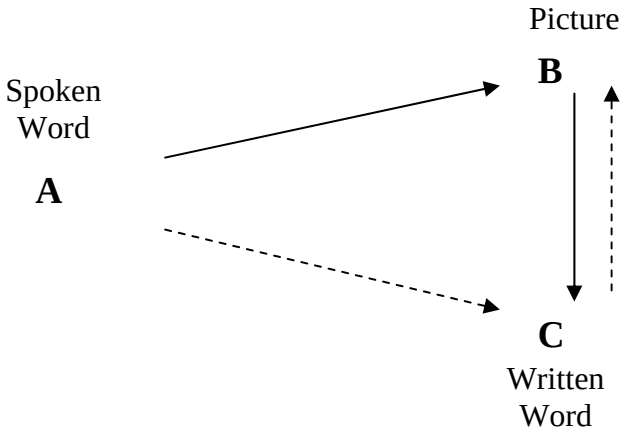
All three participants attended school at the Judge Rotenberg Center and lived in one of JRC's group homes.

Participants worked on the computer programs in their classrooms with their teacher or teacher's assistants guiding them while independently completing the timings. Computer program are set up as touch screens, meaning the participant is able to touch the correct answer using their fingers on the computer screen. All of these participants had this ability.

Measures and Instruction

Two proprietary computer programs were used in this study, Receptive Vocabulary and Sight Words. While in the Receptive Vocabulary program the

participants were already able to match to sample, (i.e. picture of fork to picture of fork). In the step one, the spoken word (a) was trained to the picture (b), resulting in a = b. Then, in step 2 the picture (b) was trained to the written word (c), resulting in b = c. The end result should be the participant should be able to match the written word (c) to the picture (b) without any additional training, resulting in c = b. This was our test for symmetry. The final test for reflexivity is to see if the spoken word (a) to the written word (c) emerged without any additional training or reinforcement, resulting in a = c (step three). Below is what this looked like.



When training (a = b) the participant was provided with a verbal and or edible reinforcement for the correct response and both types of reinforcement were withheld for the incorrect response. In addition when an incorrect response was given the correct response would pop up on the computer screen placed superimposed on a target looking like a bull's eye. The participant must then touch that stimuli before it would return back to the timing the participant was working on. When testing for symmetry the participant did not receive any reinforcement or correction for correct or incorrect responses. In the final phase testing for the emergence of the stimulus-stimulus relations (transitivity) the participant again was not given any reinforcement of correction for correct or incorrect responses.

Results

Participant one, when working on step one (spoken word to picture), mastery was set at a rate of 5 correct responses per minute. This step was trained (training methods described in the Measures and Instruction section). Participant one was able to reach mastery in nine trials. For step two (picture to word), also trained sessions, the participant was able to reach mastery again in ten trials; mastery was set for a rate of 5 per correct responses per minute. When testing for symmetry c = b (written word to picture), mastery (rate of 5) was reached in

the first trial. In step three, a-c (spoken word to written word); the emergence of stimulus- stimulus relations was tested. Mastery for this step was again set for a rate of 5 correct responses per minute. This participant was able to reach mastery on the second trial. Results are shown on Exhibit one.

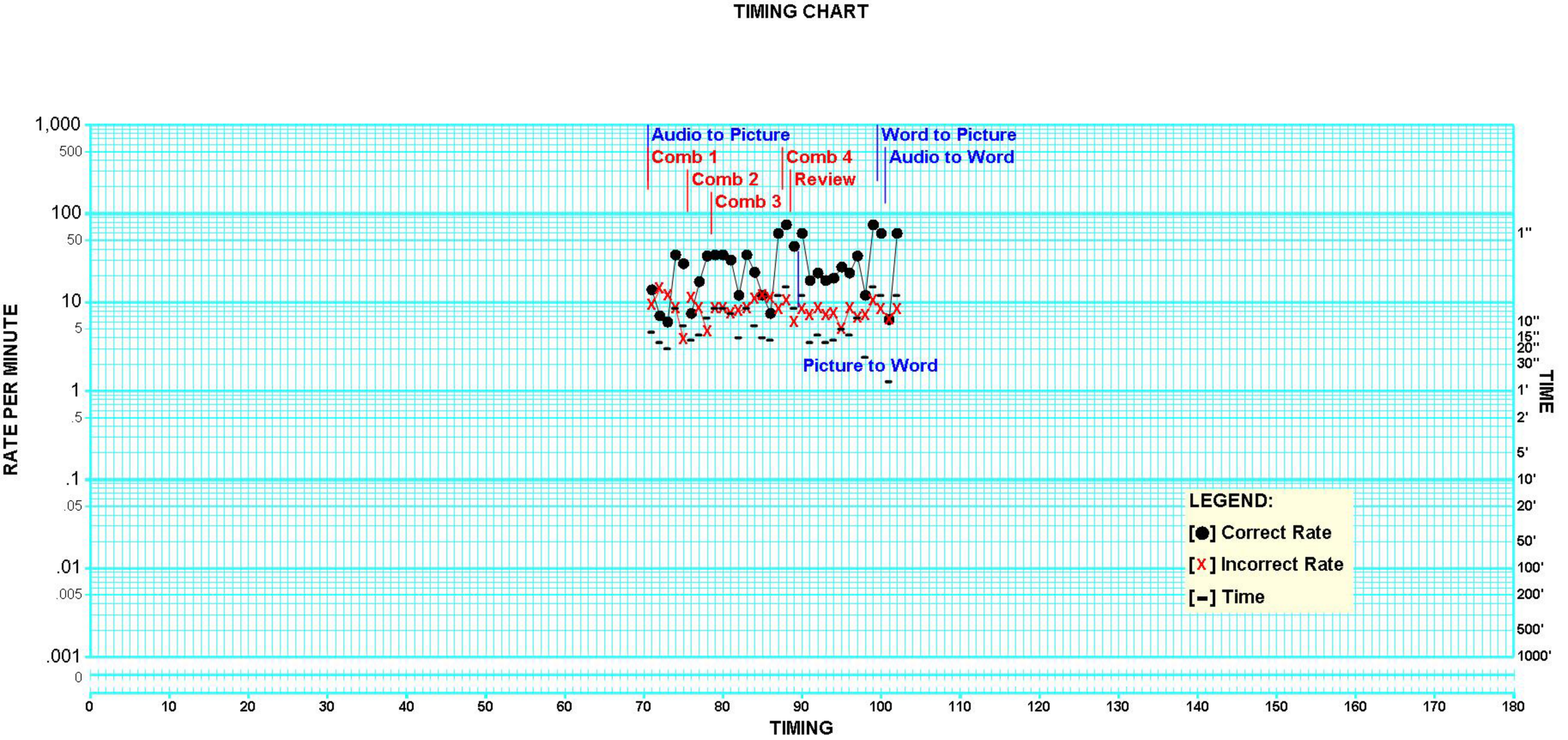
Participant two, when working on step one (spoken word to picture), mastery was set at a rate of 40 correct responses per minute. This step was trained (training methods described in the Method and Instruction section). Participant two was able to reach mastery in two trials. For step two (picture to word), also trained sessions, the participant was able to reach mastery in eight trials; again mastery was set for a rate of 40 per correct responses per minute. When testing for symmetry c = b (written word to picture), mastery (rate of 40) was reached in the second trial (he scored a rate of 40 correct and1 incorrect on the first trial). In step three (spoken word to written word), the emergence of stimulus- stimulus relations was tested. Mastery for this step was again set for a rate of 40 correct responses per minute. This participant was able to reach mastery on the second trial. Results are shown on Exhibit two.

Participant three, when working on step one (spoken word to picture), mastery was set at a rate of 10 correct responses per minute. This step was trained (training methods described in the Measures and Instruction section). Participant three was able to reach mastery in two trials. For step two (picture to word), also trained sessions, the participant was able to reach mastery in nine-teen trials; again mastery was set for a rate of 10 per correct responses per minute. When testing for symmetry c = b, (written word to picture), mastery (rate of 10) was reached in the first trial. In step three (spoken word to written word), the emergence of stimulus- stimulus relations was tested. Mastery for this step was again set for a rate of 10 correct responses per minute. This participant was able to reach mastery on the second trial. Results are shown on Exhibit three.

Discussion

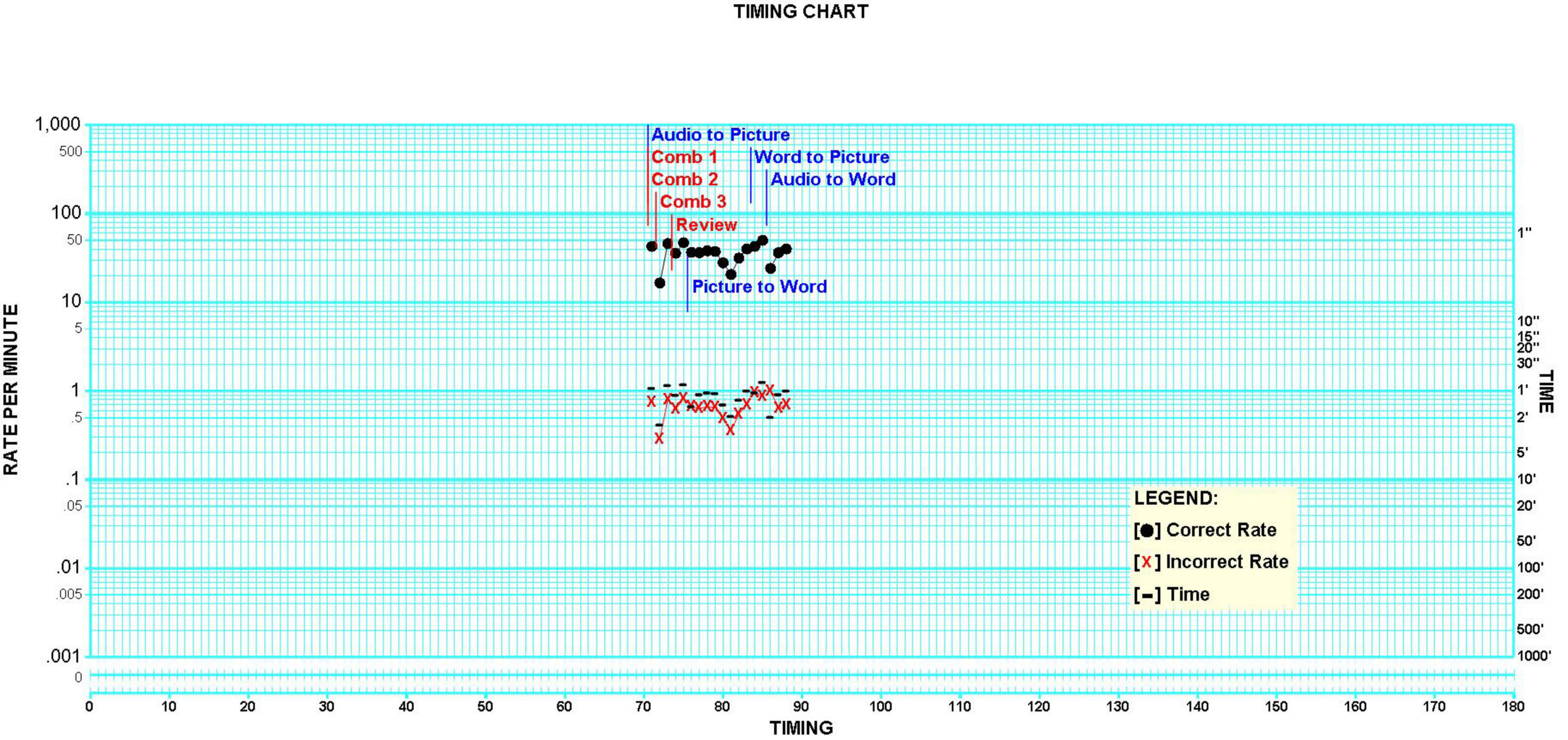
In this study, we found that the use of computer software that was designed to make use of the stimulus equivalence phenomenon was successful. By using pictures of common household items, participants matched to sample, paired spoken words to image and paired image to written worked. When testing for transitivity, evaluating if matching the spoken word to the written word emerged without training, we also found this to be successful. Although participant three did not reach mastery for transitivity on the first trial he had one incorrect response during the trial, this was due to him not scanning well enough and two words being very similar to each other. Additionally participants one and two did not reach mastery on the first trial not due to any errors but not reaching the aim that was set for them. As a result it took them two trials to reach it. The results of this study will be used and implemented with more students at our center. The results were surprising to us, as we have never paired just an audio stimulus to a

written stimulus. We were not sure that the population of students that work on these programs would truly correlate the spoken word with the written word without the picture stimuli included. However we have found that this method instruction is very successful and we are eager to begin the same program set up with our other students.



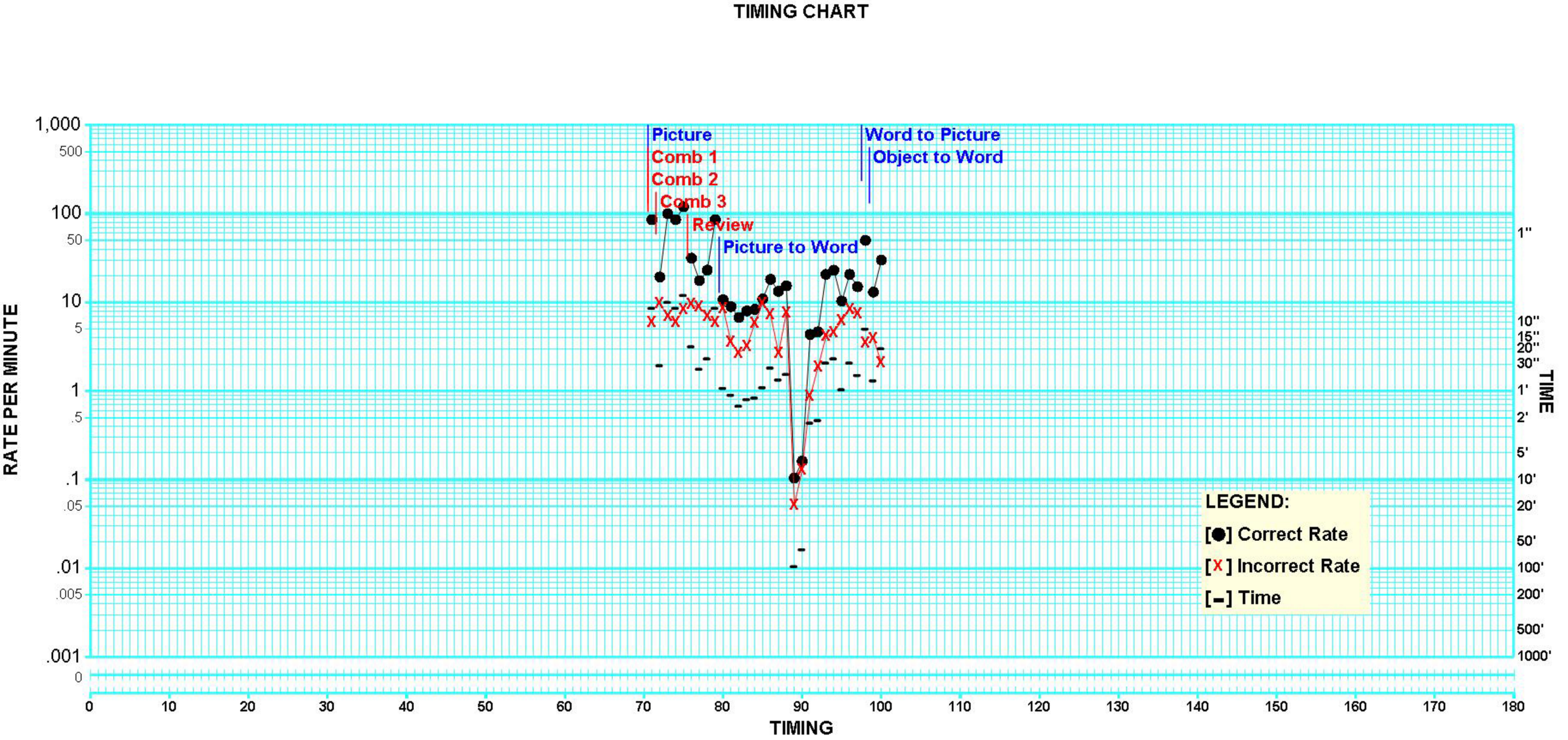
Participant 1

Exhibit 1



Participant 2

Exhibit 2



Participant 3

Exhibit 3