



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Phu-Phuc Phan	Project Number S1012
Project Title Practice Schedules to Enhance Motor Learning	
Abstract Objectives/Goals A stroke is when blood supply to the brain is interrupted by a hemorrhage or occlusion causing damage to the brain. Stroke is the leading cause of disability among American adults. Post-stroke individuals often need to learn or re-learn many tasks. Determining practice schedules that optimize the learning of motor tasks is important for rehabilitation. Studies have found a benefit of random practice over massed practice in both word and motor learning in healthy adults. The purpose of this pilot study was to determine if an expanded practice schedule could be applied to the learning of several motor tasks simultaneously. This will allow us to see if the expanded schedule, which has both random and massed schedule traits, could be beneficial in motor learning in healthy and post-stroke subjects. Methods/Materials 1)Subjects were randomly assigned to one of three practice groups defined by practice schedule: Massed, Random, or Expanded. 2)Subjects learned to match a specified pattern of force for three tasks defined by grasp: Full Hand, Precision, and Overhand. 3)Practice took place over 2 consecutive days; 50 trials per task per day (100 trials total per task). Feedback was provided after every practice trial based on peak force. The materials used were a laptop, grasping sensor apparatus, and a program called Matlab for statistical analysis. Results 1) The acquisition period between the three practice schedules revealed not much of a difference in learning between the three schedules based on error readings. 2) Expanded schedule revealed the highest confidence reading as it had the greatest "constant" increase in his slope. 3) Expanded schedule had the best learning effect overall during the retention test. Conclusions/Discussion 1) All subjects improved over two days of practice. There were no difference in error measurements among 3 groups during acquisition phase. 2)As practice progress, subjects in Expand Schedule appeared to have greater increased in confidence level than other 2 groups. 3)Subjects in Expand Schedule group seemed to have lowest error measurement in retention tests. 4)Our preliminary data supports our hypothesis since it demonstrated that people working in an expanded	
Summary Statement I am trying to find a practice schedule that will help with the rehabilitation of motor functions in post-stroke patients.	
Help Received Used lab equipment at USC under the supervision of Dr. Schweighofer and Ph.D. student Hui-Ting Goh	