Engstrom completed her third season at Albany. She helped guide UAlbany to its third conference championship in the last four seasons and produced the program’s first NCAA Tournament victory. UAlbany finished 24-10 overall and reached the NCAA’s second round for the first time in team history. Engstrom has also worked with the USA Men’s and Women’s National Volleyball Teams. She served as an assistant coach with the women’s A2 summer program squad in 1999. She is on the editorial board for the International Journal for Volleyball Research and is a member of the USA Volleyball Sports Medicine and Performance Commission.

The USA Volleyball Sports Medicine and Performance Commission has created this column to briefly explain findings from primary research in various fields and extrapolate a pragmatic message that could be a benefit coaches in the practice/competitive environment—something coaches can use.

USA Volleyball Sports Medicine and Performance Commission mission is to serve volleyball coaches and athletes through the assimilation, generation and dissemination of information in the areas of sports medicine and performance and to coordinate future research in these areas.

The Research:
There has been a great debate for decades about whether transfer in learning (either in motor learning or learning in general) is a valid phenomenon - (Detterman & Sternberg, 1996). In this article, the author explores new data suggesting that exposure to a number of varying paradigms may enhance subjects ability to learn other skills, ie, there is measurable transfer under certain circumstances.

The Research:

The purpose of this study was to expand on recent findings suggesting the transfer of learning after exposure to a variety of paradigms. Citing experiments done in 2001 by Bock, Schneider, & Bloomberg; and Roller, Cohen, Kimball, & Bloomberg: the author explains that these prior studies suggest that there is “transfer to a new skill that is independent from those recently experienced, if they first participate in multiple bouts of learning.” The studies cited above only tested one type of visuomotor adaptation. Seidler’s experiment expanded on these studies and tested across three different visuomotor tasks (rotation, linear, and sequential) to find whether generalized learning “primes” the brain for more learning.

The experiment was conducted over two days. The first day was a learning period, with the timing and quality of movements measured for each group. Day two was a testing day. Thirty-three subjects were divided into three groups; a Multiple Learning (ML) group learned five different aiming tasks, three (tasks 1, 2 and 3) were similar to each other and the other two were un-related. There were two control groups. One learned a “gain” visual task (GL - where the visual information was linear - task 4); the other control group learned a “sequence” of movement (SL - task 5). All groups used a joystick to aim a cursor on a computer monitor with targets. Feedback was in real-time. The ML group learned the three related rotational adaptations (tasks 1-3) in random order. The other two tasks were also presented in blocks randomly, where some of the ML group learned task 5 before task 4 and vice versa. Two Control groups did the same total number of trials as the ML (Experimental) group, but only learned one of the two non-rotational tasks. In other words, the ML group learned five different tasks while the other two groups learned only one of the tasks, but had 5 times the practice the ML had at that one task. On day two, all 3 groups were tested on all 5 tasks.

The results found a generalization of learning across rotational tasks 1, 2, and 3 for the Multiple Learning group (ML). Regardless of the order the experimental group learned the tasks, the last rotational task presented was adapted to more quickly than the first two. The ML group also adapted more quickly to tasks 4 and 5 than their control counterparts during the early acquisition phase of each task. Interestingly, the control groups showed no adaptation (transfer) on the second day when tested in the rotational tasks (tasks 1, 2, and 3).

Practical Application
One other interesting finding was that following the learning
experiences all subjects performed three additional blocks of trials. On a random basis, “the feedback was rotated by an amount that the subjects had not previously experienced.” Under these “perturbations”, the ML group was effected to a greater extent and this lasted longer than either of the other two groups.

What this means for volleyball. A couple of things can be extrapolated from these results. First, these data support the findings of other recent learning experiments - there is transfer in visuomotor learning tasks. The evidence suggests that learning “primes” our brain for more learning (i.e., learning to learn). The results of this experiment suggest that perhaps learning an easy movement prior to introduction of a new, more complicated or difficult skill, may augment learning.

Secondly, this experiment found: 1) learning varied tasks, complimented additional learning and; 2) less variability in the number of task learned, retarded the speed of learning new tasks. This seems to fly in the face of the “Keep It Simple Stupid” (K.I.S.S.) theory. The evidence seems to suggest that if you “keep it simple” it perpetuates simple thinking. If you enhance the expectations of learning, the subjects respond positively to the challenge.

Finally, on the negative side, the ML group seemed to be more “upset” by a random perturbation of feedback than the other two groups. Though they made a recover over several trials, they did take longer than the other two groups to return to “normal”. The author did not have an explanation for this phenomenon, though we could speculate that the ML group, after seeing many altered blocks of feedback, was searching for another change in task.

More research needs to be done on the ideal rate of change between introductions of new tasks. What is the ideal number of tasks introduced per unit time? What is the brain’s strategy for task learning - e.g., is passing of time or number of trials the determining factor in learning? How “related” do the tasks have to be to have significant, measureable transfer to occur?

References:


More Information Please! To find out more about the SMPC go to the usavolleyball.org, to contact MJ email her at mengstrom@uamail.albany.edu