VisuoMotor Adaptation – Debriefing

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In this study, we're looking at the mechanisms underlying adaptation to situations that "deviate from the norm". You were asked to do a simple mouse "click-and-move" task through the study.

The first block of this study comprised of regular mapping of the mouse and on-screen cursor movements.

For one set of participants the second block comprised of a 10 degree rotation of the cursor relative to mouse movements. That is, in order to move the cursor 45 degrees from the center to the front-right large circle, you had to move the cursor at a 55 degree angle from the horizontal line. This change might not have been noticeable. The angle of rotation was increased by 10 degrees in each block with the last two blocks comprising of 90 degree rotations. The last block again consisted of a normal, non-rotated mapping of the mouse and cursor movements.

Another set of participants in the "sudden rotation" condition were given a condition where they completed 10 blocks of 90-degree rotated trials as opposed to in 10-degree increments. We expect that the participants in the sudden condition to be more accurate and will tend to get back to the regular mapping quicker than the participants in the gradual rotation condition.

One set of participants were also asked to do perform your mouse movements as quickly as possible. In a different condition, participants are being asked to make their movements as accurately as possible. We expect that participants in the gradual condition who were asked to emphasize speed over accuracy will be worse off in the final stage of non-rotated trials as compared to participants who were asked to emphasize accuracy over speed.

These results are particularly interesting to us because prior results demonstrated that gradual rotation learning is different than sudden rotation learning, involving different brain regions and producing different patterns of errors when the rotation is undone (i.e., returning to a normal mouse, such as at the end of the experiment). However, no one has ever examined whether different kinds of instructions (speed versus accuracy emphasis) can produce the same results as these two different kinds of learning. The results from this experiment will allow us to further develop and refine "reinforcement learning" computational models of how the brain learns from trial and error.

If you wish to learn in more detail about the experiment and how the two sets of conditions interact with each other and how our hypothesis links to reinforcement learning please feel free email Tejas Savalia at tsavalia@umass.edu.

Thank you for your participation!