

concluded that multiple motor maps rather than a single, continuous map of the body might be located in the premotor area.

### **The role of reinvestment in performance of simulated laparoscopic surgery under time pressure**

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**Objective** To examine the impact of ‘reinvestment’ on laparoscopic performance under a common intra-operative stressor, time pressure. **Background** Study of the breakdown of performance under stress has been gaining momentum in the motor skill learning domain as well as domains like aviation and anesthesia, but this has not been the case in the domain of surgery until recently. Research on intra-operative stressors has focused on external factors without considering individual differences in the ability to cope with stress. One individual difference that is implicated in adverse effects of stress on performance is ‘reinvestment’, the propensity for conscious monitoring and control of movements. **Methods** Thirty-one medical students were divided into high and low reinvestment groups based on their scores on the Movement Specific Reinvestment Scale. Participants were first trained to proficiency on a peg transfer task and then tested on the same task in a control and time pressure condition. In the control condition, participants were simply asked to do their best, as they had in training. In the time pressure condition, participants were informed that operating surgeons sometimes are required to perform under time constraints and they should try to complete the task faster than their best time in training (of which they were informed). **Outcome measures** included generic performance and process measures. Stress levels were assessed using heart rate and the State Trait Anxiety Inventory (STAI). **Results** High and low reinvesters demonstrated increased anxiety levels from control to time pressure conditions as indicated by their STAI scores, although no differences in heart rate were found. Low reinvesters performed significantly faster when under time pressure, whereas high reinvesters showed no change in performance times. Low reinvesters tended to display greater performance efficiency (shorter path lengths, fewer hand movements) than high reinvesters. **Conclusion** Trained medical students with a high individual propensity to consciously monitor and control their movements (high reinvesters) displayed less capability (than low reinvesters) to meet the demands imposed by time pressure during a laparoscopic task. The finding implies that the propensity for reinvestment may have a moderating effect on laparoscopic performance under time pressure.

### **Effect of practice time in decision-making in volleyball defense**

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The goal of this study was to analyze the effect of practice time in decision making in a defense task in volleyball players. Forty-eight young adults (all males) were assigned into three groups based upon their accumulated experience playing systematic volleyball: the experienced group (EG) had 16 individuals (27.3±6.8 years old) with about 13.1±5.7 years of experience playing volleyball; the intermediate group (IG) had 16 individuals (17±0.4 years old) with 2.2±1.0 years of experience in volleyball; finally, the third novice group (NG) had 16 individuals (22.2±1.5 years old) with no systematic volleyball experience – only deliberated practice. All participants were asked to watch videos of professional players