The role of peripheral activation in motor imagery *De Vries SJ*, Zijlstra S, Mulder Th Institute of Human Movement Sciences, University of Groningen, Groningen

The neuromuscular theory (NMT) of motor imagery explains the facilitating effect of repeated motor imagery (i.e. mental practice, MP) on motor skill learning by means of the occurrence of movement related peripheral output. That is, during imagination of movements the occurrence of minimal peripheral output signals is expected. Indeed, a number of studies have found peripheral activity in heart rate, breathing rate, respiration, and muscle activity that is related to motor imagery. However, these research results are not uniformly. There are also a number of studies which do not find any imagery related peripheral output.

Particularly, there is much controversy regarding muscle activation during motor imagery. One possible explanation might be that different types of tasks are used which differ in intensity. Therefore, the present study investigated the muscular involvement in three different types of movement imagery: imagination of abduction of a small body segment (toe); imagining an effortful movement (squatting); and imagining a goal directed movement (dart-throwing).

During movement imagination muscle activity was obtained from the muscles relevant for movement execution specific for the different tasks. Muscle activity during imagination of movement was compared to muscle activity during rest.

No significant changes could be found in muscle activity levels during all three motor imagery experiments. Also, no relation with imagery ability could be obtained. An intriguing result, however, was that respiration changed as a result of motor imagery. These results will be discussed in the light of the NMT.

Sjoerd de Vries, MSc, Institute of Human Movement Sciences, University of Groningen, Postbus 196, 9700 AD Groningen, t 050 363 8903, e-mail <u>s.j.vries@ppsw.rug.nl</u>

Speaker on Friday, June 4, 2004, Session 47