ELSC Seminar: Tamar Makin

January 1, 2015

On the topic of: Adaptive and maladaptive brain plasticity in amputees?

ELSC cordially invite you

to the lecture given by:

Tamar Makin
FMRIB Centre, University of Oxford

On the topic of:

Adaptive and maladaptive brain plasticity in amputees?

The lecture will be held on Thursday, January 1, 2015 at 17:00, at ELSC: Silverman Bldg., 3rd Wing, 6th Floor, Edmond J. Safra Campus

Light refreshments at 16:45

Happy Hour with wine and snacks will take place after the seminar

Abstract:

Following arm-amputation, a person faces overwhelming challenges to adapt to their daily routine. Simple everyday tasks, such as lacing shoes, become a tremendous challenge, which amputees have to learn to overcome single-handed. Their brain, too, will undergo major changes. Brain areas that previously operated the hand will become unemployed, and will subsequently be recruited to work for other body parts. This ability to dynamically reassign processing responsibilities to a certain brain area based on changing circumstances (termed plasticity?) is key for our basic ability to adapt to new situations. In amputees, this process is widely held to result in the experience of phantom limb pain (pain that is perceived to be arising from the missing hand), and is therefore considered to be maladaptive. I present evidence to challenge the proposed link between cortical reorganisation and phantom pain, and instead demonstrate that plasticity in amputees can be adaptive. First, I demonstrate that despite years of input and output loss, representation of the missing (phantom?) hand is preserved in the human brain. I will show that phantom pain is associated with maintained representation of the phantom hand as opposed to brain plasticity, with potential implications on future treatment. I will also provide new evidence that compensatory behaviour leads to extensive structural and functional adaptive reorganisation, both within the missing hand territory and across the brain. Based on this evidence, I suggest that plasticity in amputees is experience-dependant, and is not inherently maladaptive.
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