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**Tamè, Luigi and Holmes, Nicholas P. (2013) *The role of primary somatosensory cortex in tactile detection and discrimination: fMRI-guided TMS investigations.* In: VII Edition, Concept Action and Objects, 23 May - 26 May 2013, Rovereto, Italy.**

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# Role of primary somatosensory cortex in tactile detection and discrimination: fMRI-guided TMS investigations

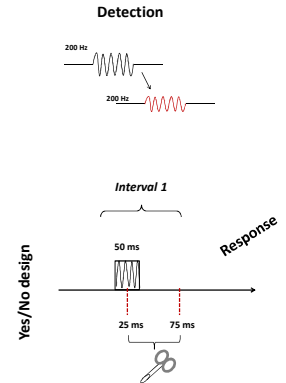
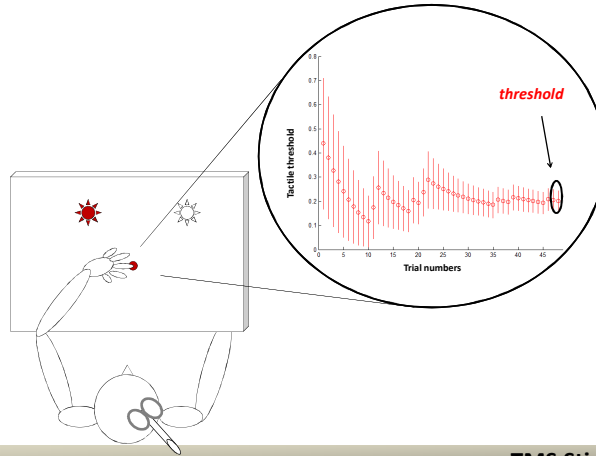
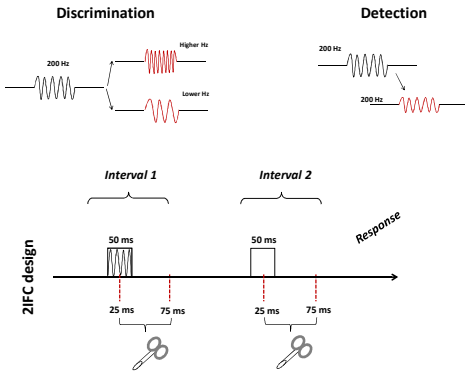
## Introduction

In the present study in **seven experiments** we investigated the contribution of the **primary somatosensory cortex (SI)** to the perception of tactile stimuli at the fingers in **discrimination** and **detection** task. We combined the **QUEST** threshold estimation method with **MRI-guided** single and double pulse **TMS (sp/dpTMS)**.

### ZIFC

### Design

### Yes-no

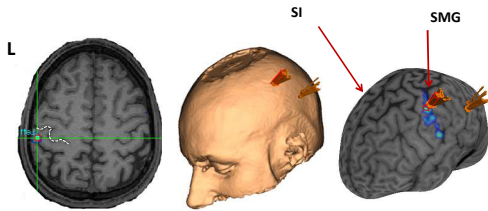


### fMRI-guided TMS

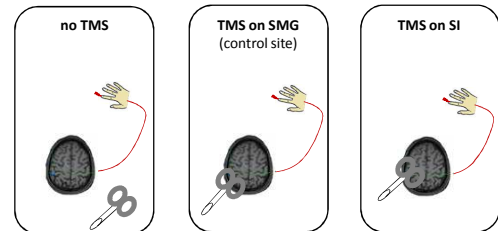
### TMS Stimulation conditions

Participants (**N=20**) underwent a series of fMRI scans (localisers) to produce somatotopic maps of SI and SII cortices.

The tactile stimuli were **200Hz sinusoidal vibrations** applied to the **index or middle fingers** for **50 ms**.

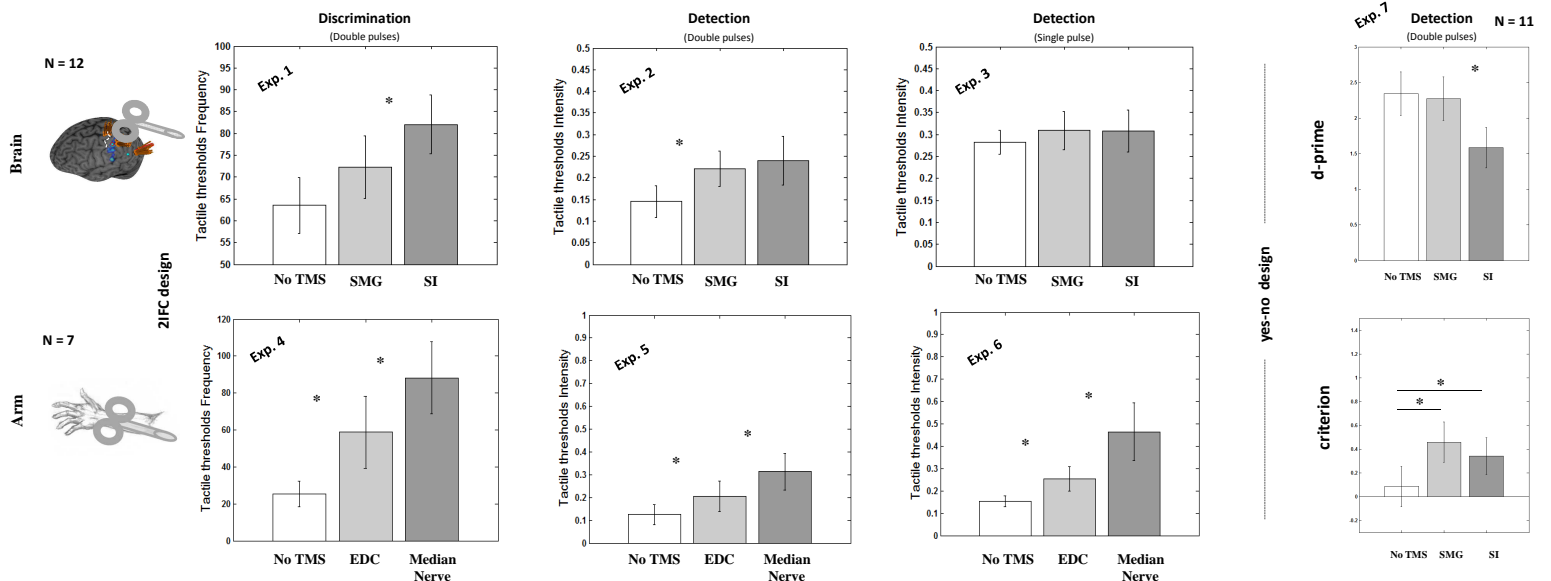


The peak activation focus in SI was lateral to the hand motor area, and on the posterior bank of the post-central gyrus was used to position the TMS (~2.5 cm from the target area) during a modified version of the behavioural task.



## Results

Data values represent the mean (+/- SE) of the last point of the series of 48 trials used to determine the threshold (82 % correct).



## Conclusions

**Frequency discrimination** thresholds at the fingers are increased by double-pulse TMS over SI in comparison to SMG. By contrast, **detection** thresholds at the fingers are not increased by either single or double pulse TMS over SI. This suggests that **SI is required for discrimination**, but **may not be for detection**, of tactile stimuli at the fingers.