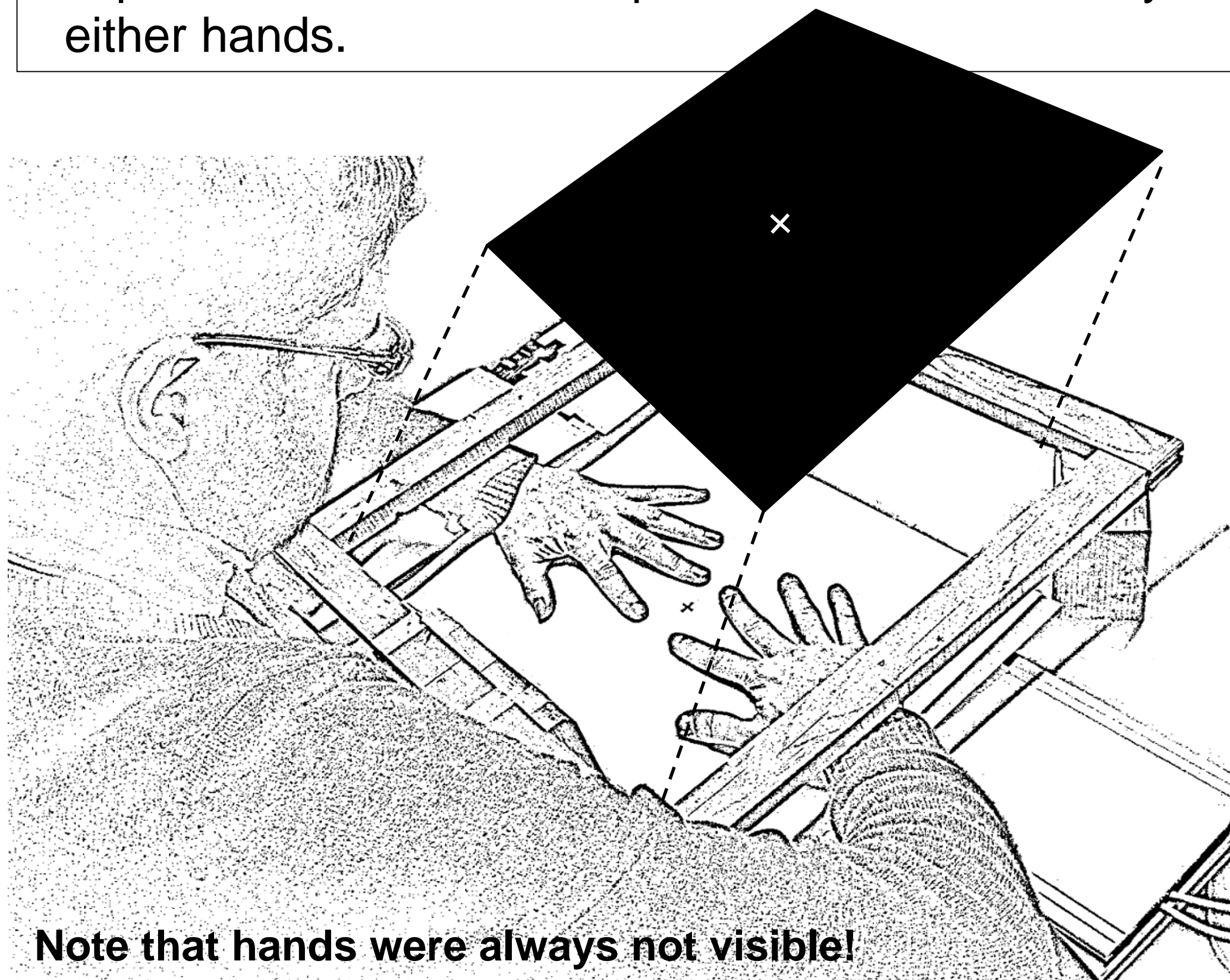


# TACTILE MASKING WITHIN AND BETWEEN HANDS: INSIGHTS FOR SPATIAL CODING OF TOUCH AT THE FINGERS

## INTRODUCTION

A tactile stimulus at the finger can be encoded according to multiple spatial reference frames: hand-specific (which finger was stimulated?), body-specific (which finger and hand was stimulated?) and space-specific (which region of space was stimulated?). We examined the relative importance of these multiple reference frames by adapting a tactile masking paradigm for stimuli presented at the index or middle fingers of either hands.



## MATERIALS AND METHODS

**Task:** detect a vibrotactile target (go-no-go task) at a pre-specified finger (e.g., right index), when this was presented alone or with a concurrent distractor either on the same hand (right middle finger), or on the opposite hand (at homologous or non-homologous locations with respect to the target finger; e.g., left index or left middle finger, respectively).

### Conditions:

- (T) Target only
- (T + SH) Target plus same hand distractor
- (T + DHSF) Target plus distractor on different hand same (homologous) finger
- (T + DHDF) Target plus distractor on different hand different (non-homologous) finger

## RESULTS

### Experiment 1.

When the target was presented alone  $d'$  was 2.31, and mean RT was 732 ms. No significant masking effect emerged on sensitivity, regardless of distractor location. By contrast, a masking effect emerged on RTs both when the distractor appeared within the same hand as the target (T+SH), and at the non-homologous finger between hands (T+DHDF).

This suggests a hand-specific (rather than body- or space-specific) reference frame for the masking effect.

In Exp.1 non-homologous fingers of the two hands were also aligned in external space. To further examine the role reference frames in tactile masking, in Exp.2 one of the hands rotated by 180° around the wrist in half of the trials.

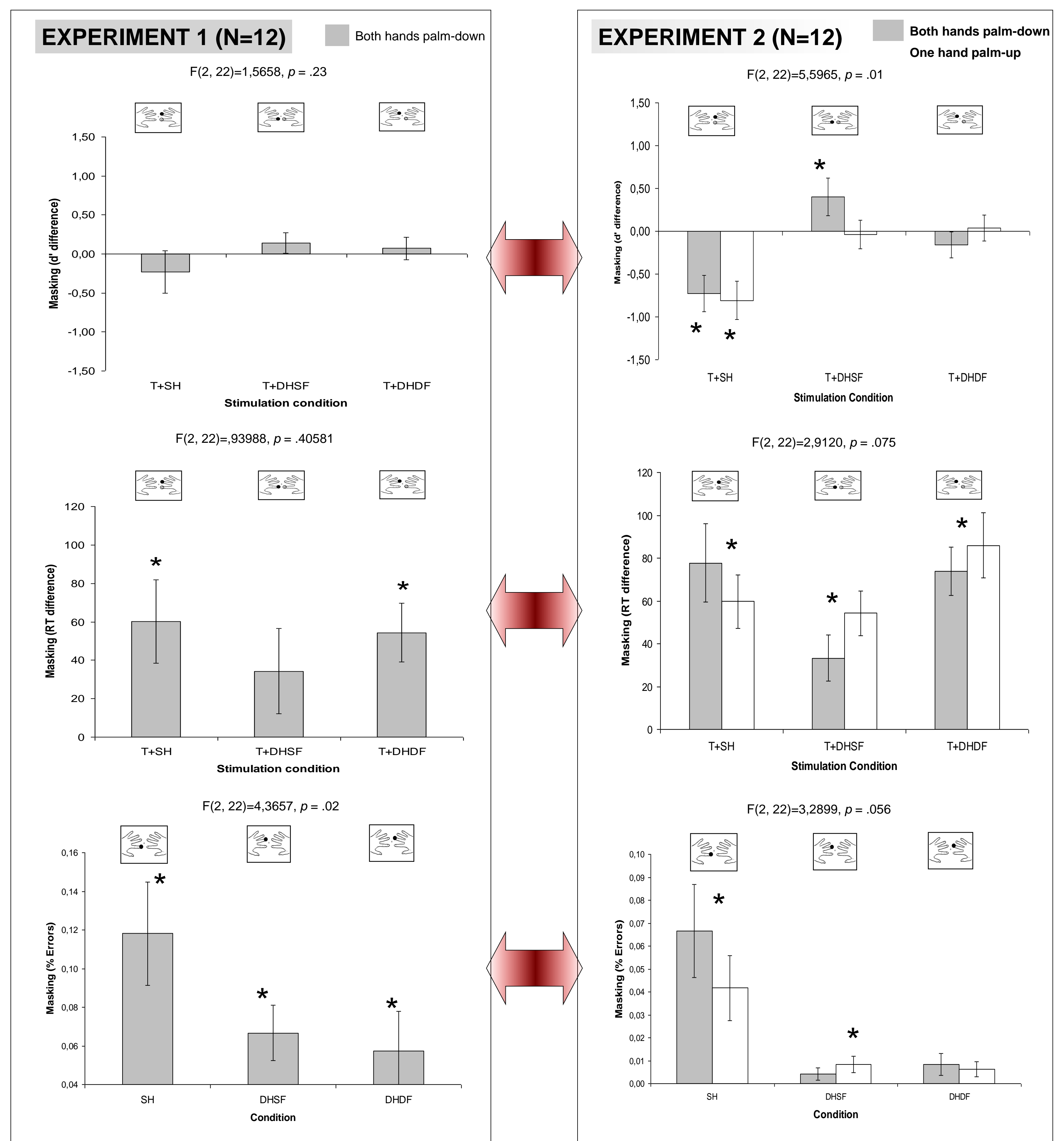
A purely hand-specific account predicts tactile masking from non-homologous fingers should not change across postures

### Experiment 2.

Sensitivity and RT when the target was presented alone were not modulated by hand posture (palm down:  $d'$ =2.99, RT=537 ms; palm up:  $d'$ =3.21, RT=545 ms).

A significant effect of masking emerged on sensitivity (unlike Exp.1), but only within hand. Between hands, a facilitation emerged when the distractor occurred at the homologous finger. This effect, however, was clearly space specific as was modulated by posture.

Notably, the masking effect in RTs was again comparable for non-homologous fingers, regardless of hand. In addition, was not modulated by hand posture



## CONCLUSIONS

The results of the current study reveal two effects: 1) a masking effect on RTs for distractors at the non-homologous fingers, which appears to operate in hand-specific coordinates (as it was not affected by hand posture changes); 2) a facilitation effect (on both sensitivity and RTs) for distractors at the homologous finger, which appears to operate in space-specific coordinates (as it was modulated by hand posture changes).