

Background

Body model= the representation of the spatial content of the body. This representation combines with afferent signals to guide position sense.

	Hand width	Finger length
Coelho et al, 2017	13.4%	-17.1%
Coelho & Gonzalez, 2018	14.2%	-15.6%
Coelho & Gonzalez, 2019 (females only)	9.9%	-17.2%

How can manual action be accurate if it relies on a distorted body model?

Does haptic feedback reduce body model distortions?



	Vision + Haptics		Vision only		Haptics only	
	LH	RH	LH	RH	LH	RH
Hand width	↑	↑	-	-	-	↑
Finger Length	↓	↓	↓	↓	-	-

Haptics only group = most accurate

Coelho & Gonzalez, 2018

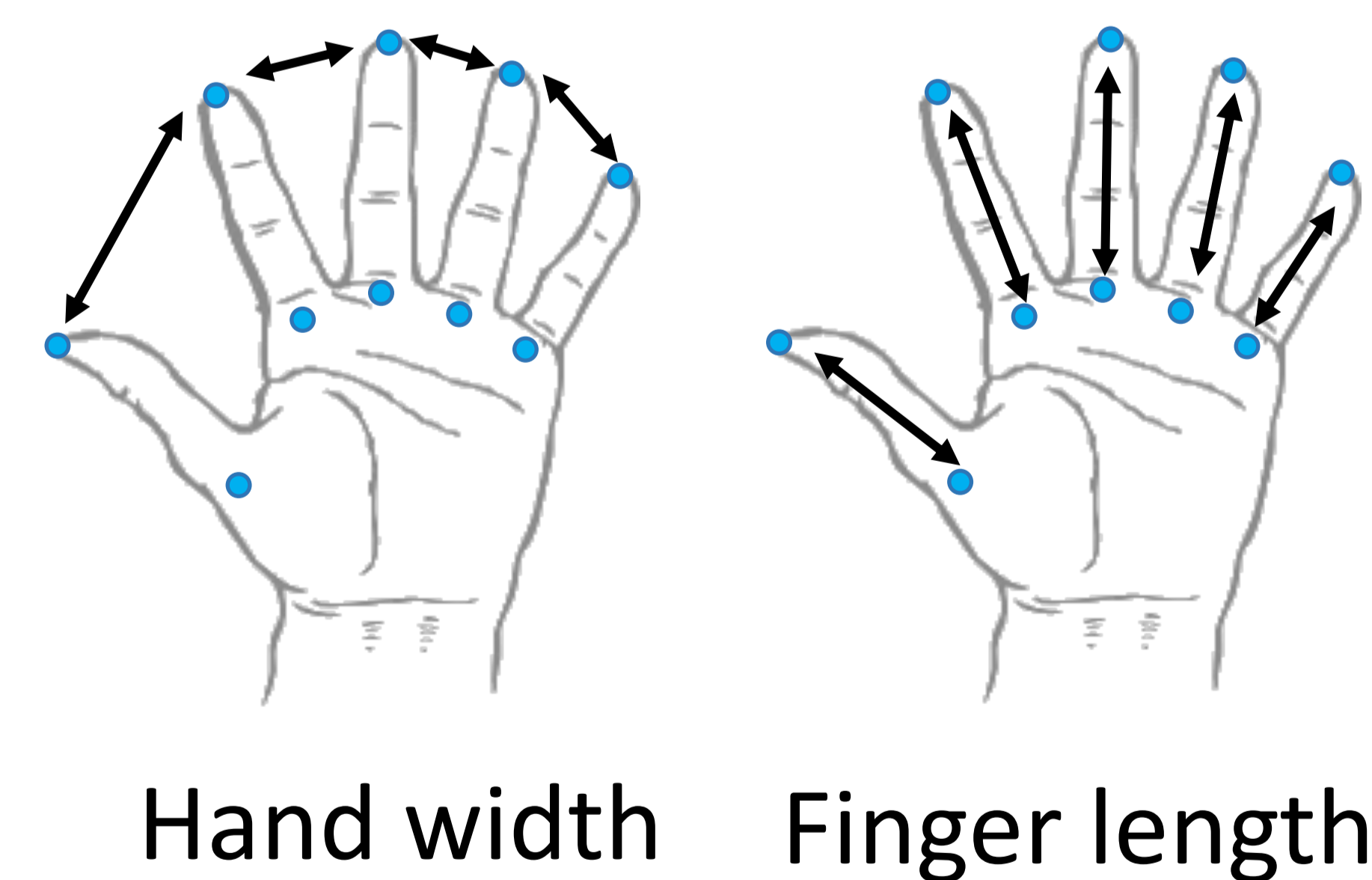
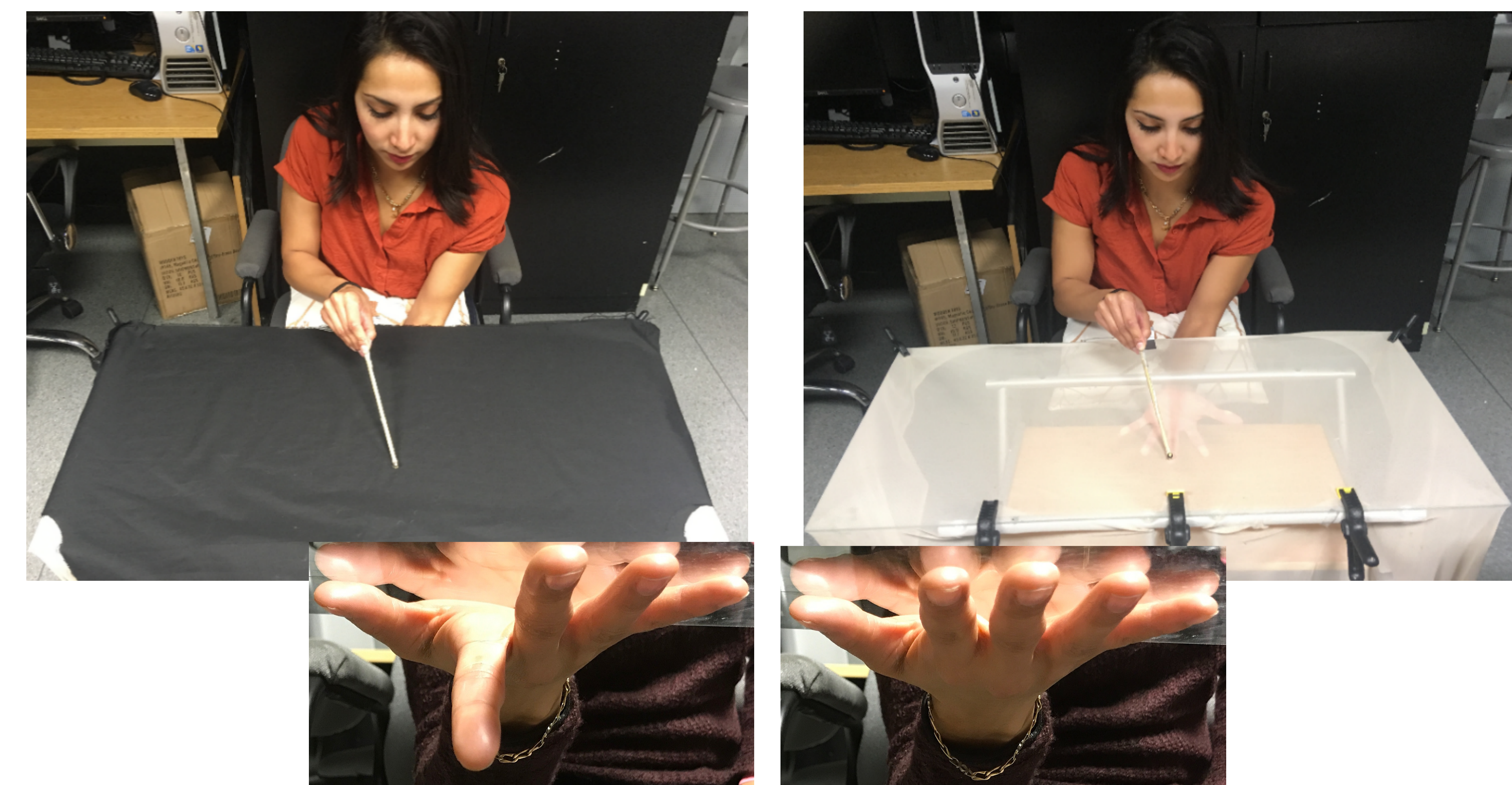
Research Question: Does the increased haptic feedback during movement modulate the body model (of the hand)?

Hypothesis: If increased haptic feedback modulates the body model, then tapping at the time of estimation, should reduce body model distortions.

Methods

Occluded hand condition

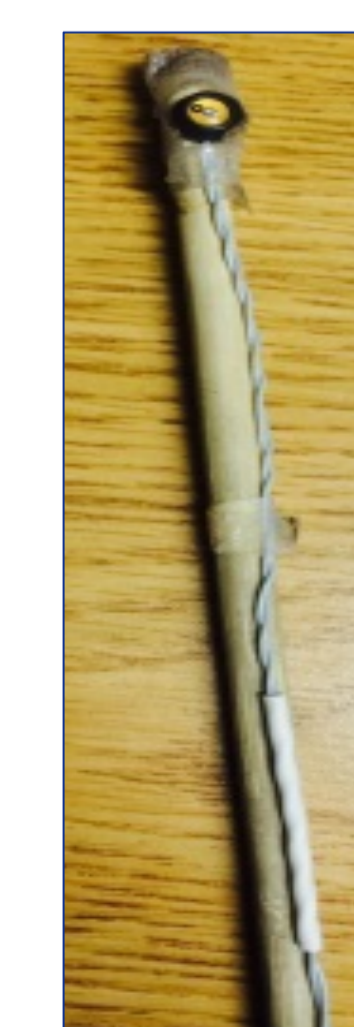
Non-occluded hand condition



Hand width Finger length



Optotrak camera



IRED marker

Before each estimation, the participant tapped their finger 5 times to the beat of a metronome set at 95 BPM.

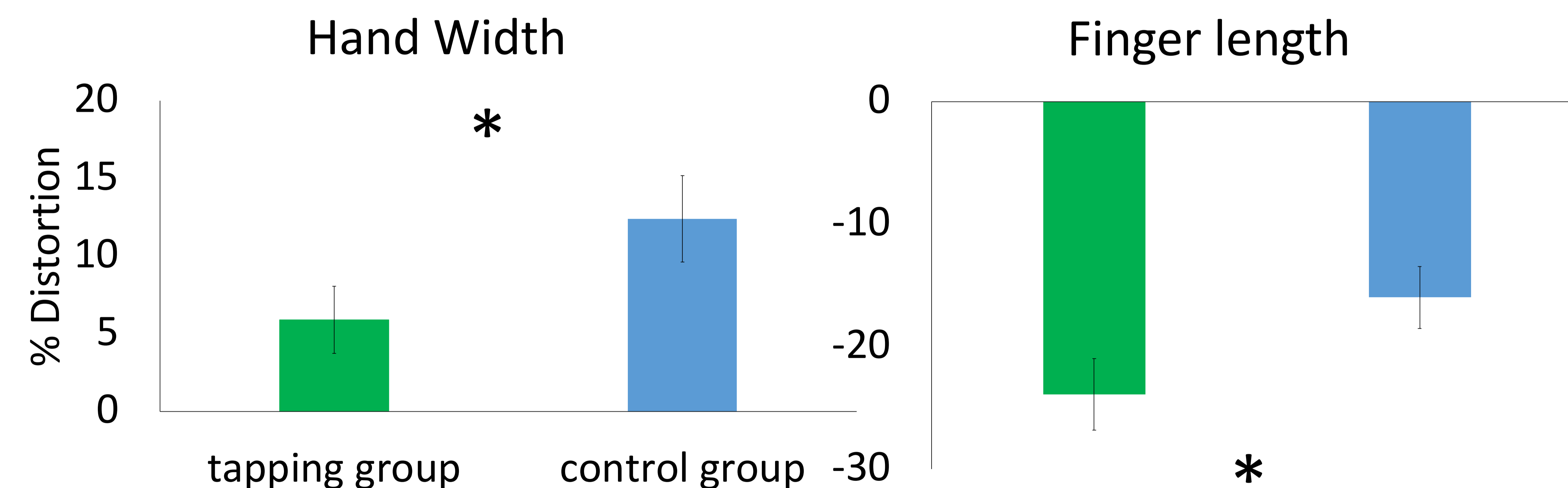
	N
Tapping group	33
Control group	32

Results

Body model distortions?

	Tapping group		Control group	
	LH	RH	LH	RH
Hand width	-	↑	↑	↑
Finger Length	↓	↓	↓	↓

Group differences



Discussion

- Hypothesis = partially supported
- Hand width was perceived more accurately, but finger length was more distorted.
- IP joint hits the table and not the finger-tip. Does this lead to smaller estimates of finger length.
- Separate body model for haptics?
- How then do we perform accurate manual actions? Is it possible that the body model is exclusively part of the ventral visual stream?