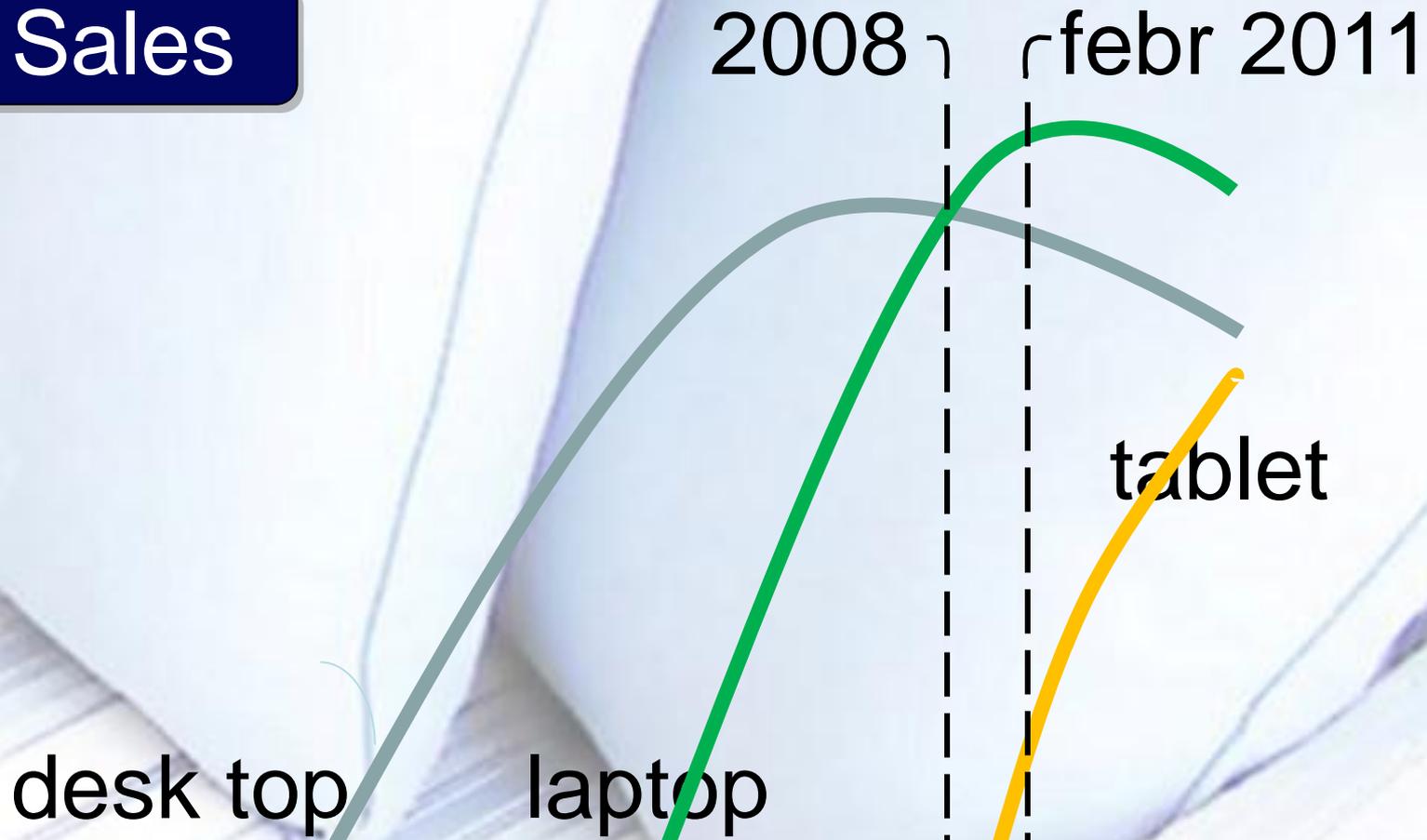




Comfort seats: Influence of laptop and tablet use for seat design

Prof dr Peter Vink

Sales



desk top



laptop

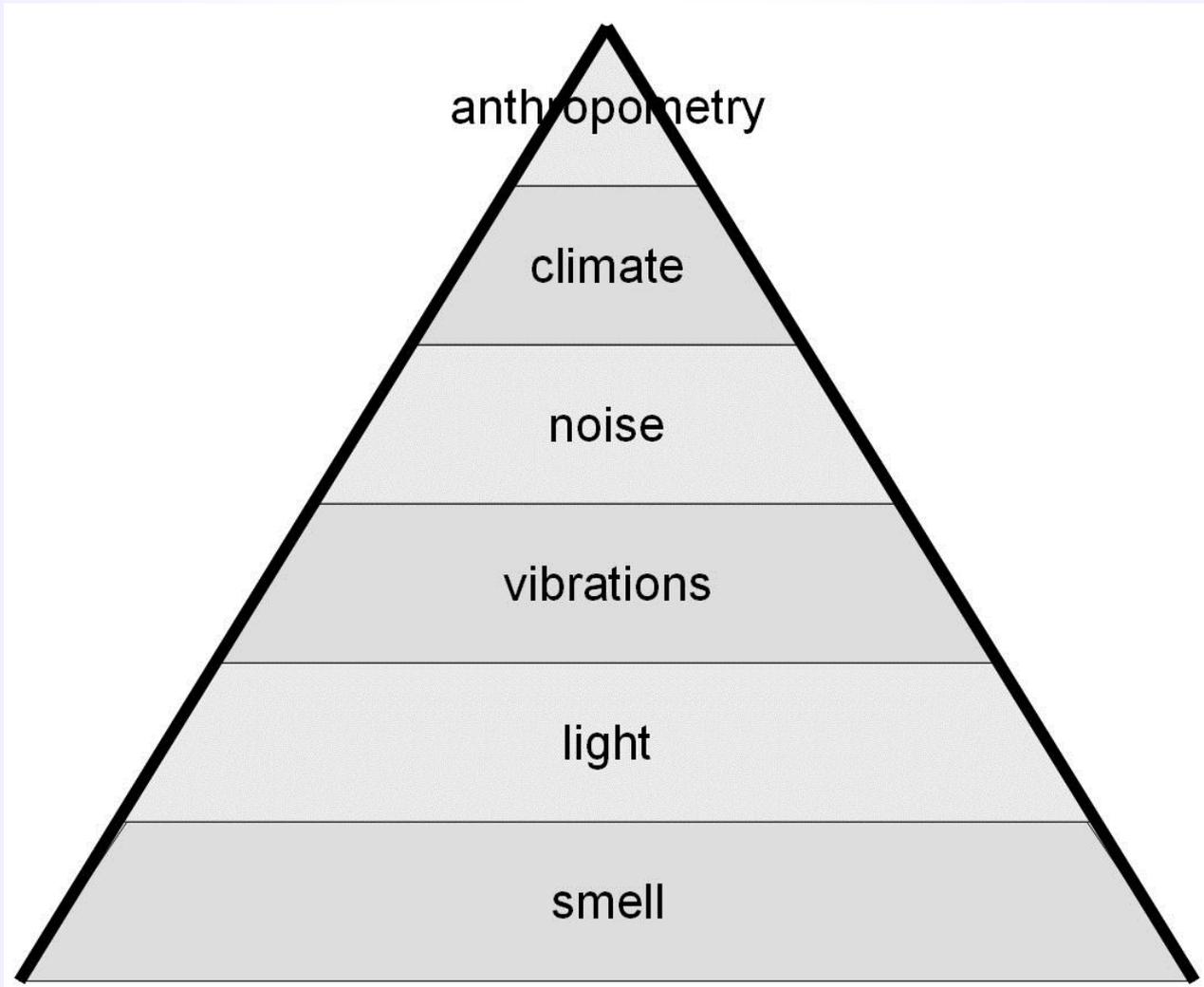


tablet

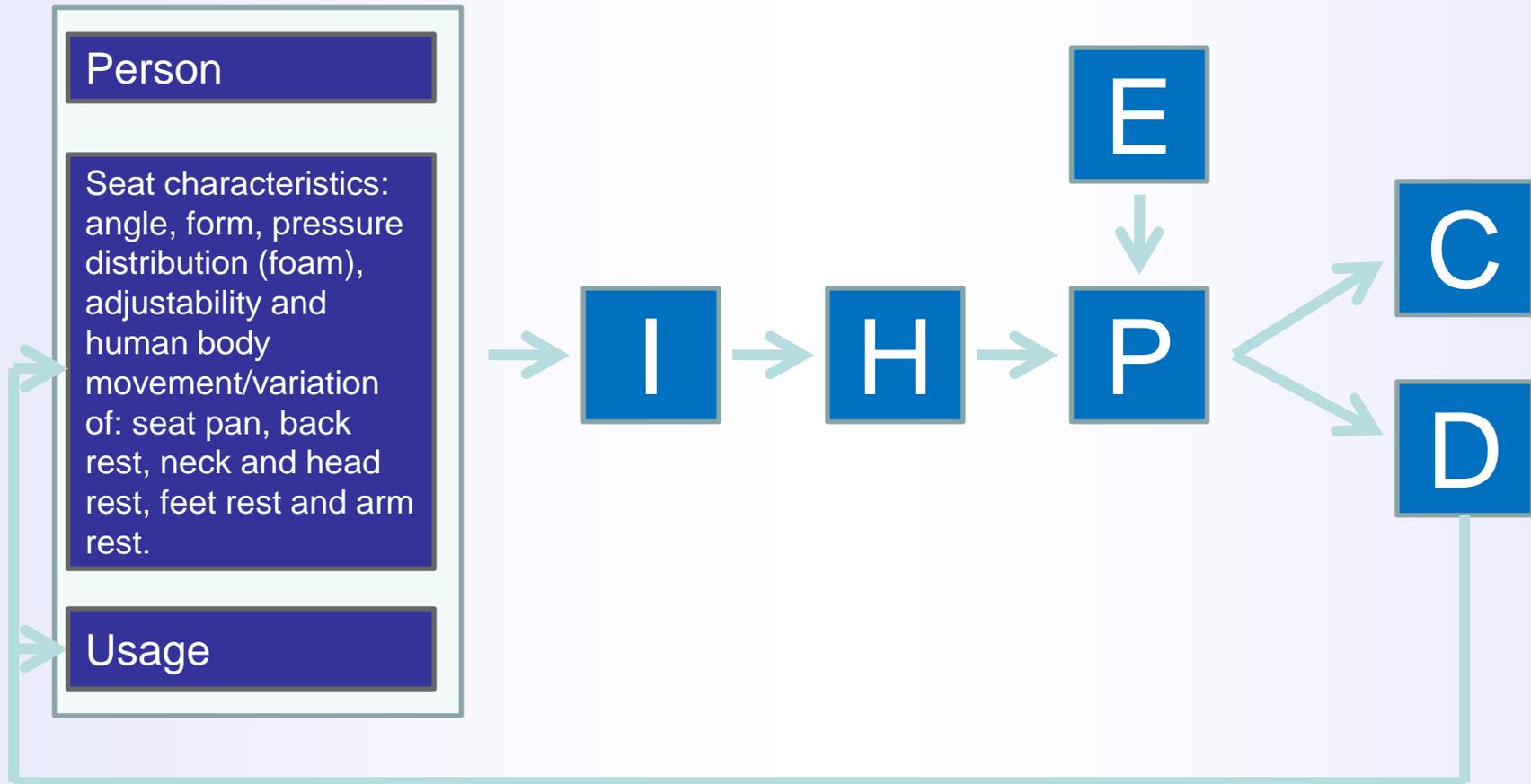


Source:
HFES2011

Model of Bubb (2009)



Model of Moes (2003)



history (reference) + state (soft factors)

visual input

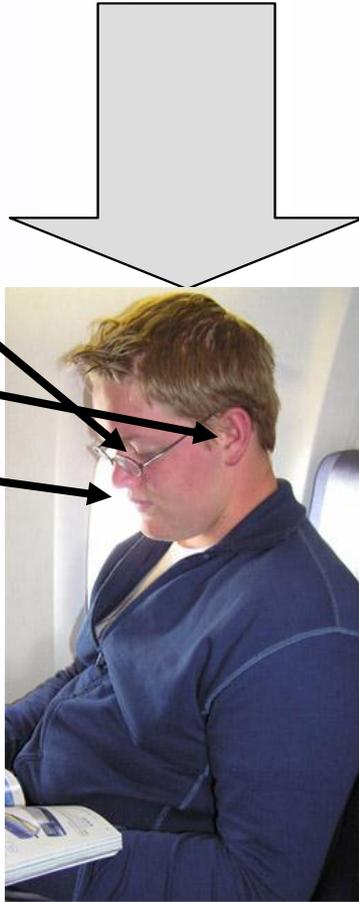
noise

smell

temperature/
humidity

pressure

posture/
movement



comfort

no discomfort

discomfort

(Vink, 2005)

8. New comfort model

Vink & Hallbeck March 201

Based on these reflections we propose a new model (see Fig. 4), which is heavily inspired by the models of Moes and De Looze.

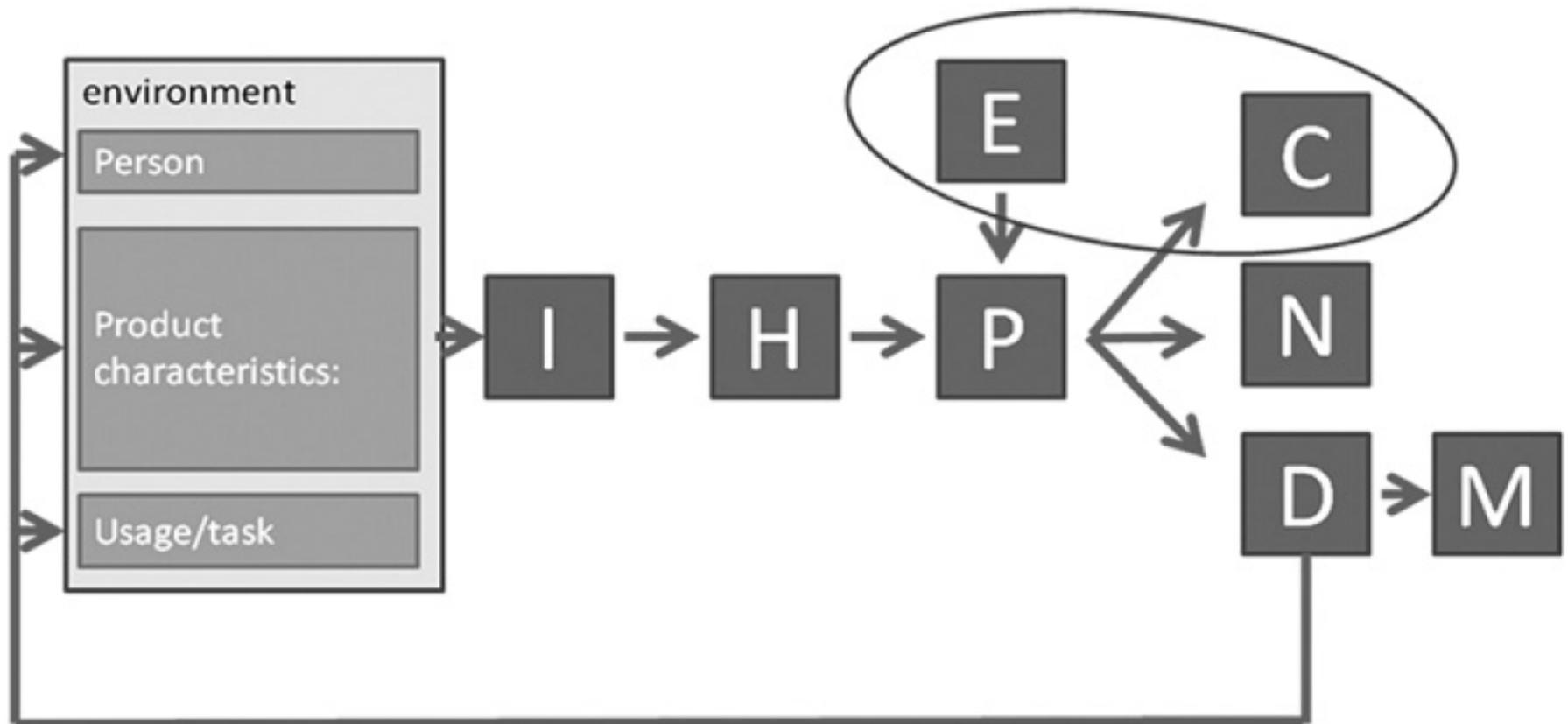
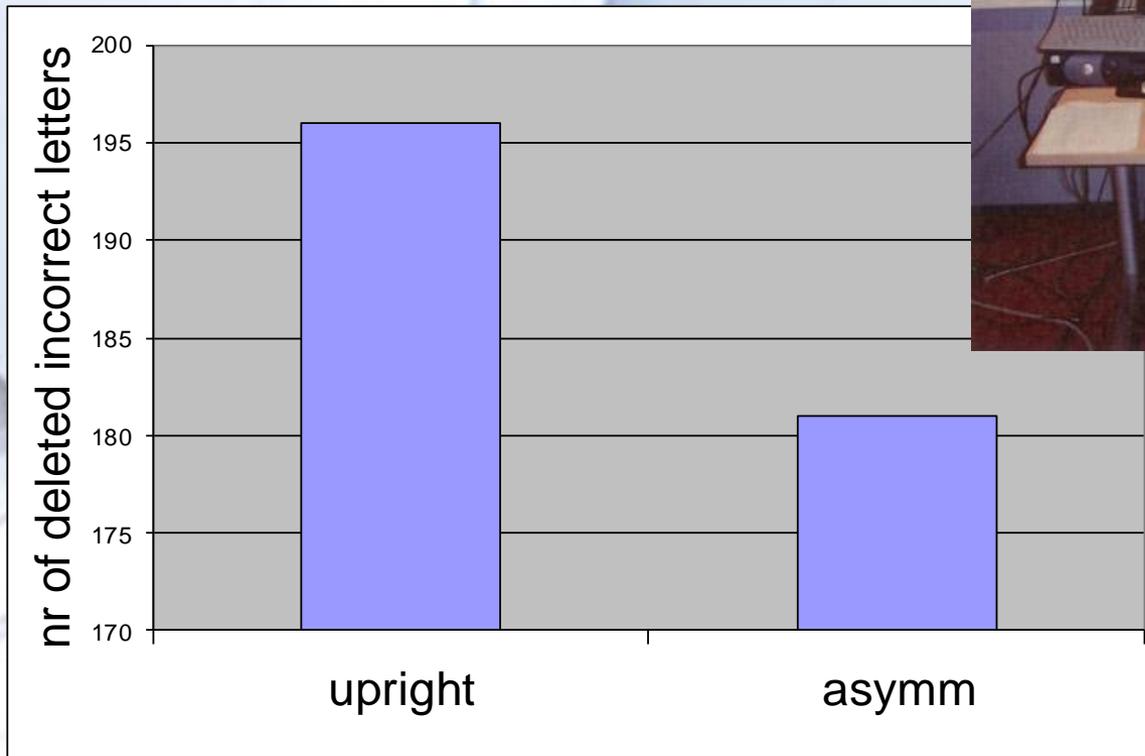


Fig. 4. The new proposed comfort model based on the findings of the 10 papers in this

Comfort and posture are related

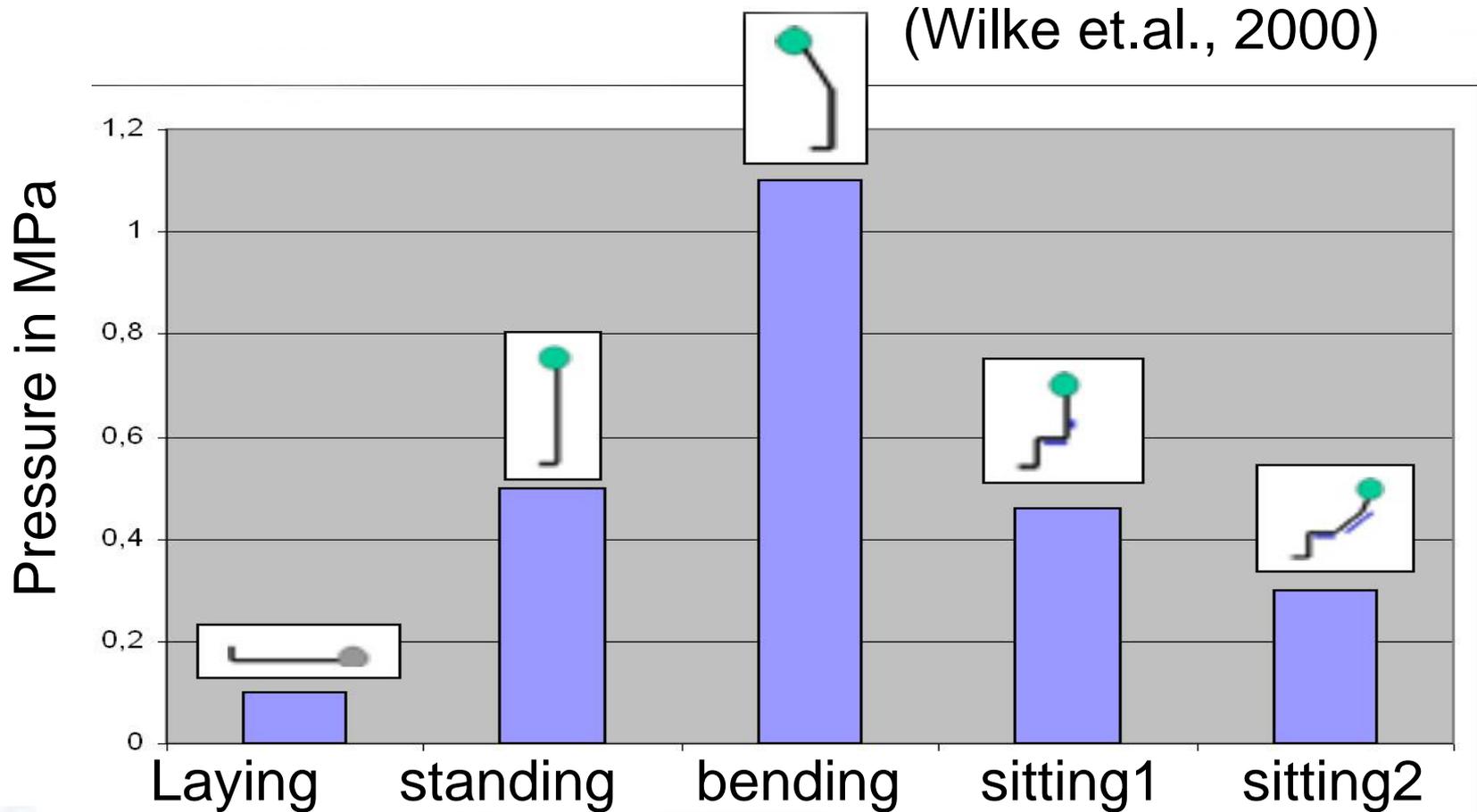


Productivity is higher upright



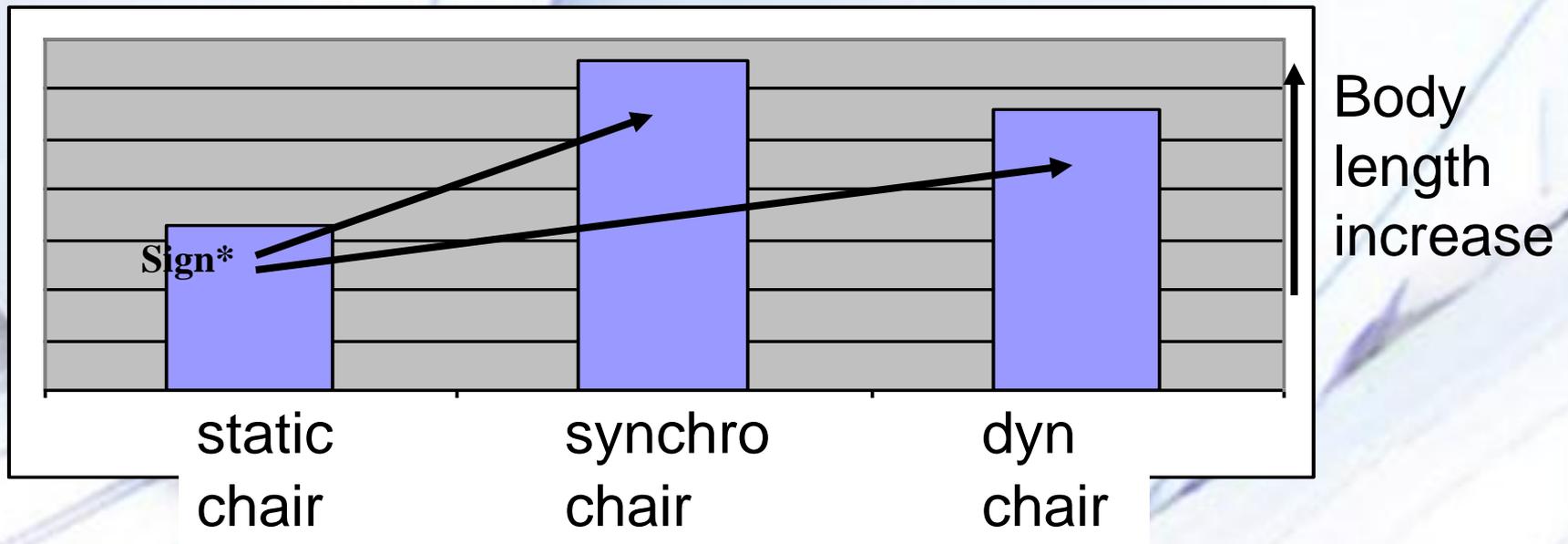
Bronkhorst
et al., 2008

is upright sitting best?

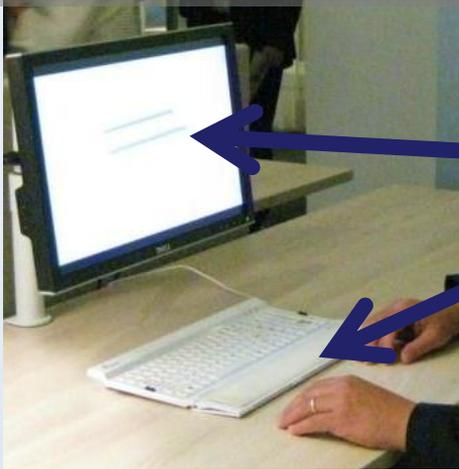


movement in the chair

(Dieën, 2002; Vink & Commissaris, 2005)

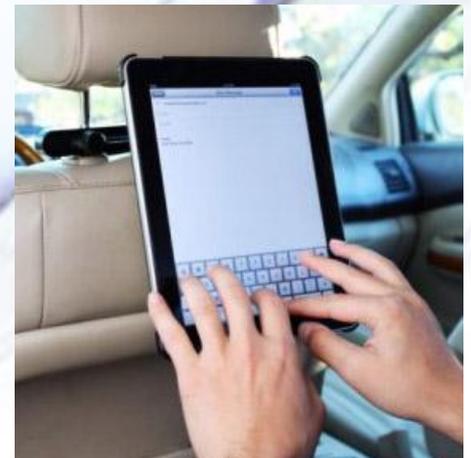


differences in posture



viewpoint
hand } seperated

hand-viewpoint connected



touchscreen work:

Shin (2011) uni Buffalo:

- more neck + shoulder muscle activity
- hand higher location and neck bended



Computer work:

Zhu et al. (2011) uni Buffalo:
armsupport reduces
muscle activity + discomfort



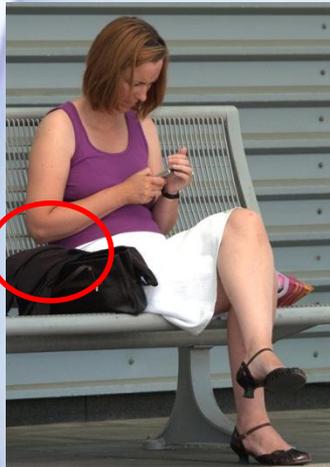
ideal armsupport ?



Hedge et al. (2011) :
shoulder complaints
24% → 16% (n=1504)



armsupport available?



Not always

is a tablet support available?



does it facilitate
ideal neck and
hand positions?



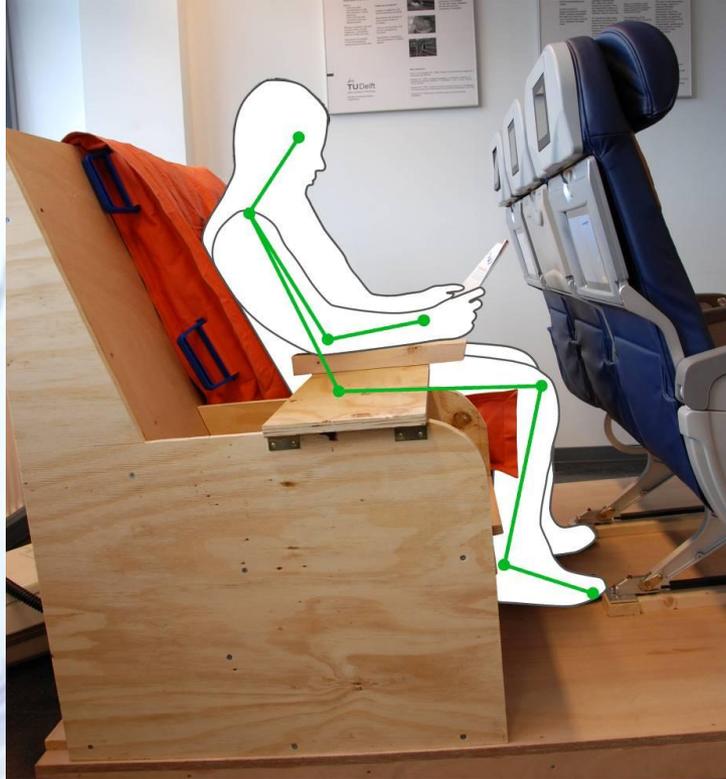
this presentation

1 ~~body posture and hand held devices~~

2 experiments

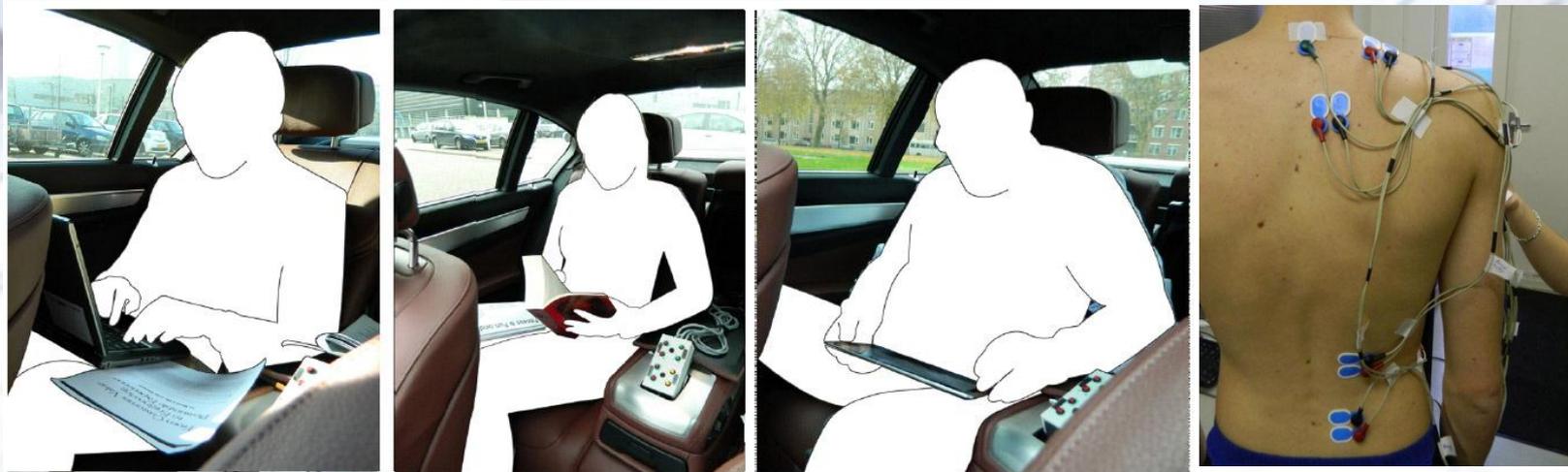
3 consequences for seat design

Part 2: experiments



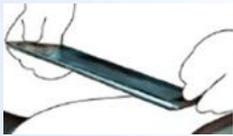
Experiment 1:

observing 24 passengers 30 minutes driving in back seat, while: lapping, reading a book and tabletting +EMG



Results (1):

posture strongly determined by car seat
minor sign differences between tasks



-tablet: head bent forward, one arm supported other free and touches screen.

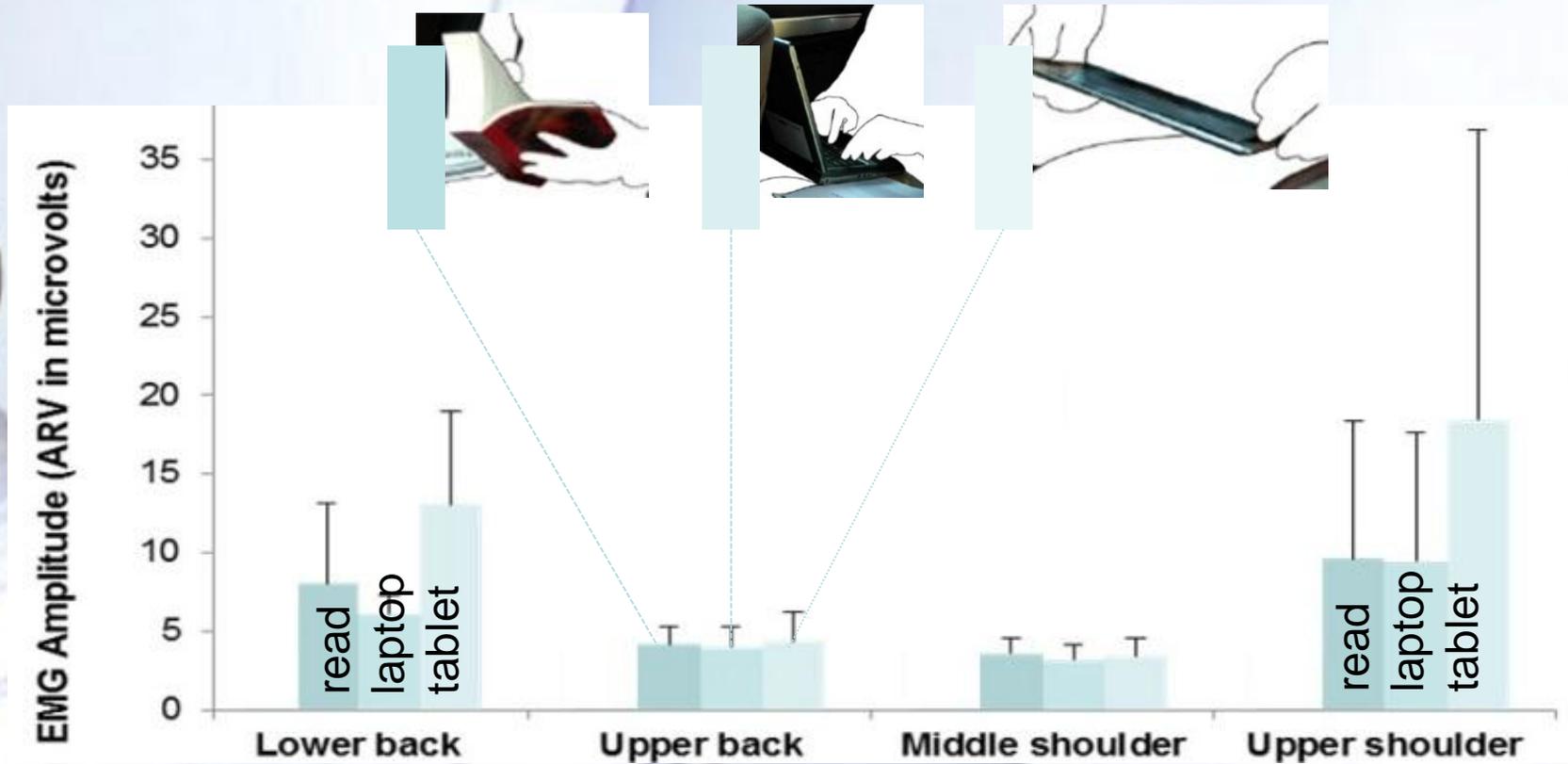


-reading: both hands on the book, one free arm

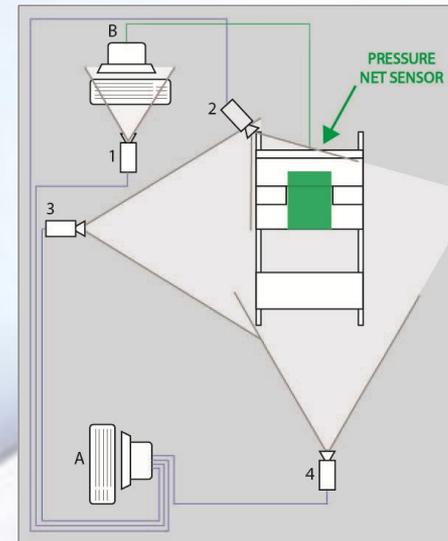


-laptop: both hands on keyboard

Results (2):



experiment 2 in the research chair



results: posture, pressure, preference



Other results:

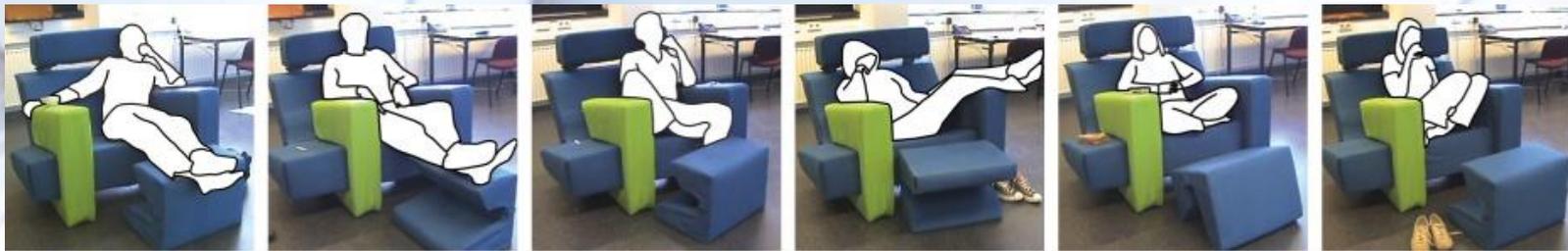
Neck: highest discomfort.

Self chosen condition:

- discomfort in neck lowest ($p=0.001$).
- if the back reclines 5° the seat pan 3° upwards ($p=0.027, R=0.667$).
- reading: $120-130^\circ$ back rest angle preferred
- typing on laptop: back rest forward and hands upwards

Experiment 3: observation at home

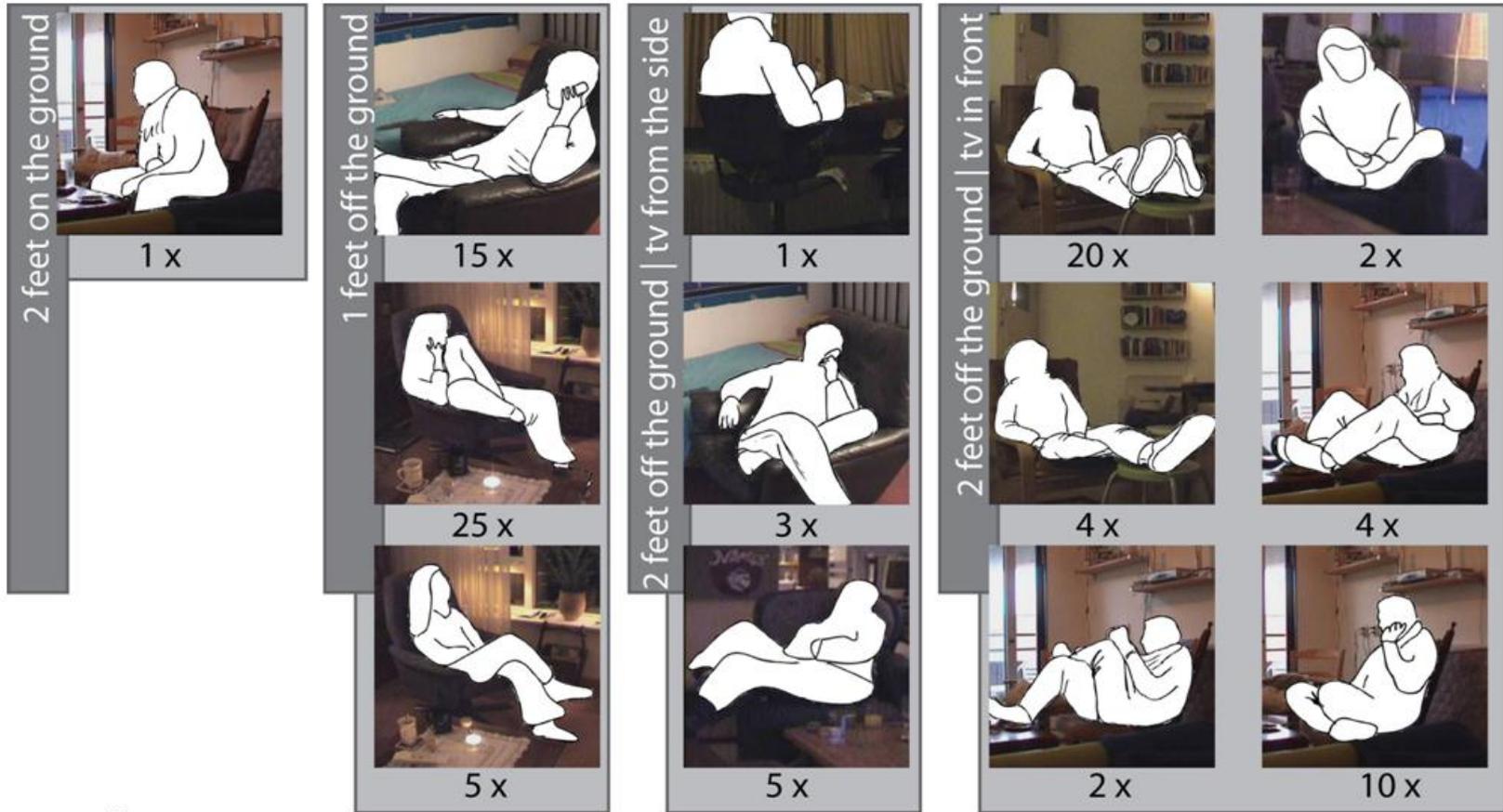
Cameras while watching TV at home
and in a new lounge TV seat:



-much variation and legs.....

Legs off the ground!!!

(Rosmalen et al 2009)



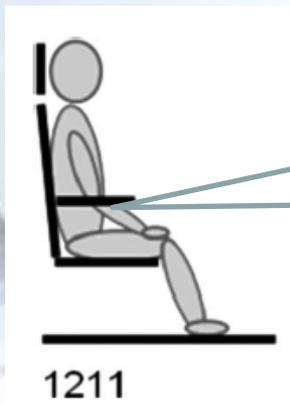
4. Study of Gold et al. 2011:



couch position: least discomfort

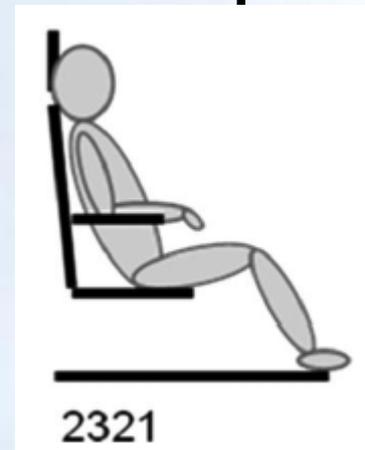
5. Study of Kamp & Vink (2011):

Most seen posture in 568 traintravellers and 175 subjects in public spaces:



no arm
rest use

64%: using
devices



29%: sleeping
watching/relax

this presentation

~~1 body posture and hand held devices~~

~~2 experiments~~

3 consequences for seat design

Part 3: consequences for seats



new devices will be there!!!



Consequences



study 1:
variable arm support
tablet: prevent neck bending



study 2:
support variation
reading backrest 120-130°
key use more upright

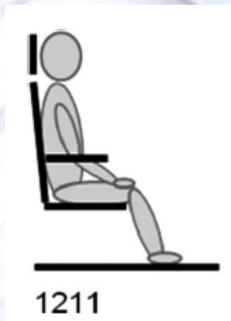
Consequences



study 3: evaluate possibility for legs off the ground for watching



study 4:
couch position better



study 5:
active device use: more upright