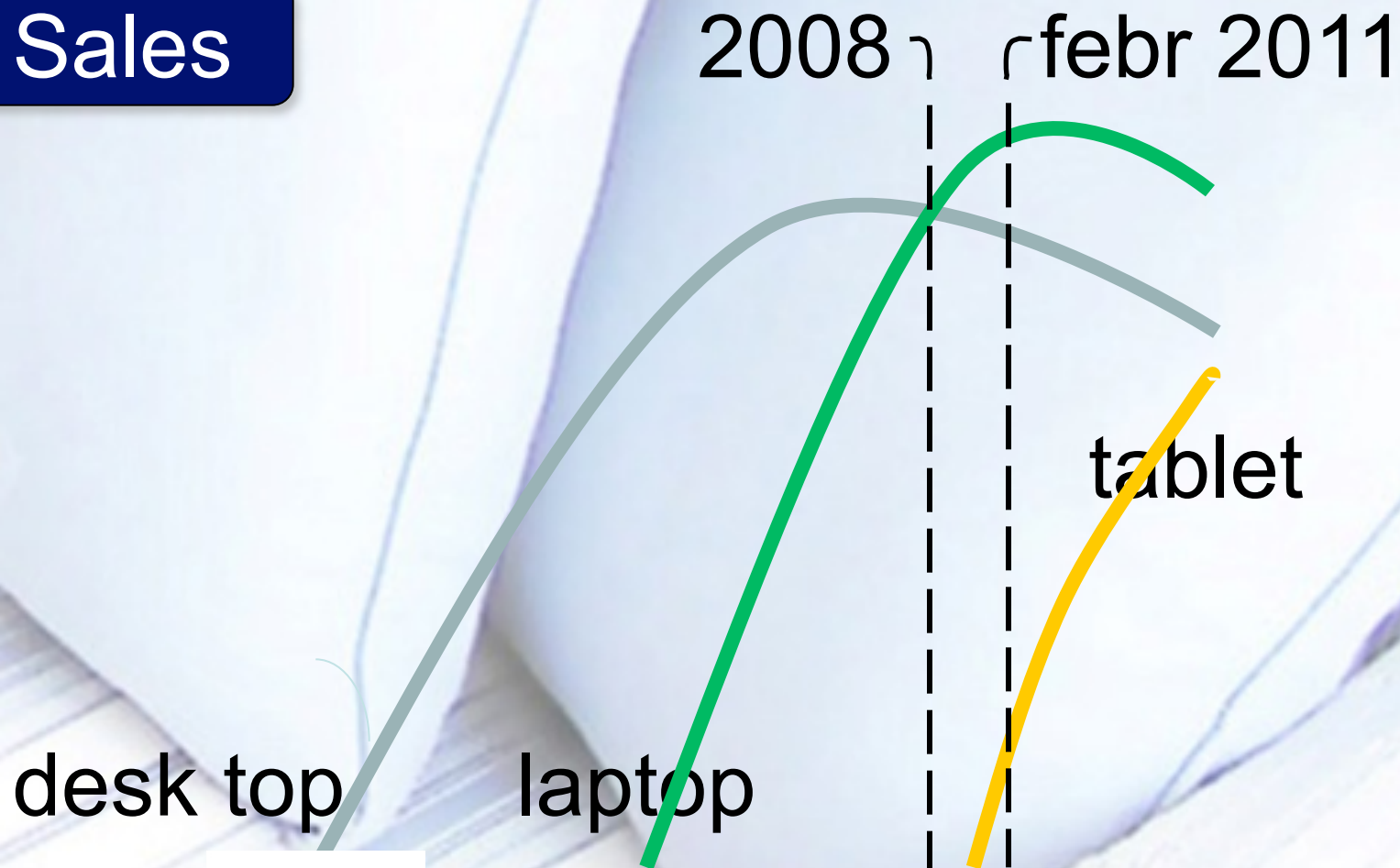


Consequences of laptops and mobile devices for seat design

Prof dr Peter Vink & Sigrid van Veen, MSc

Sales



Source:
HFES2011

“So, get ready for the tablet seat”, says Peter Vink





Prof. Dr. Peter Vink,
Faculty of Industrial Design Engineering,
Delft University of Technology
advisory board member

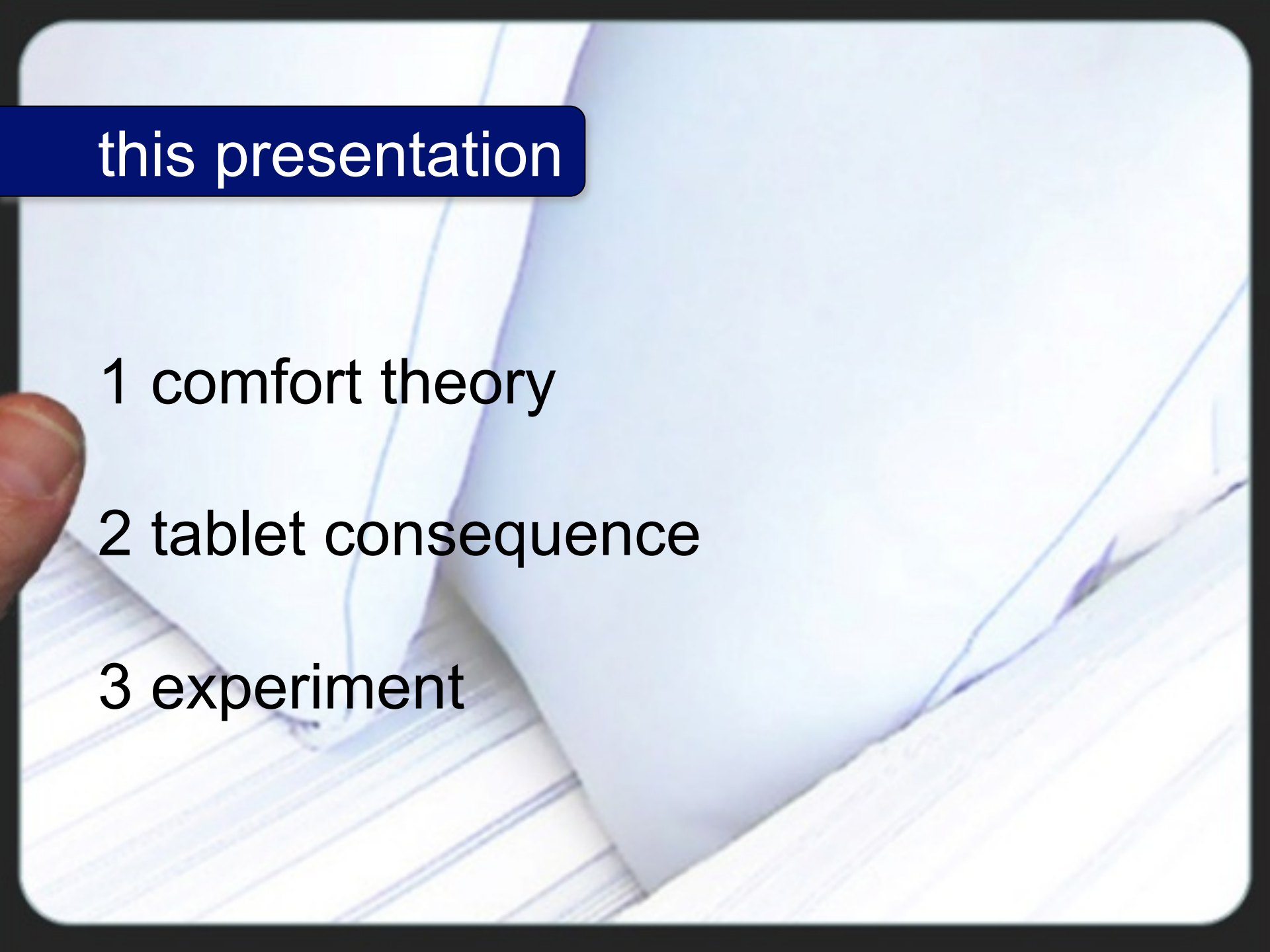


New chairman, judges and categories in Crystal Cabin Awards

It's all change for 2012's Crystal Cabin Awards. **Professor Peter Vink** of Delft

are you feeling comfortable?



The background of the slide is a photograph of a person's hand holding a blue pen, poised to write on a white notepad with horizontal blue lines. The notepad is slightly tilted, and the hand is visible on the left side. A dark blue banner with white text is positioned at the top left.

this presentation

1 comfort theory

2 tablet consequence

3 experiment

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.

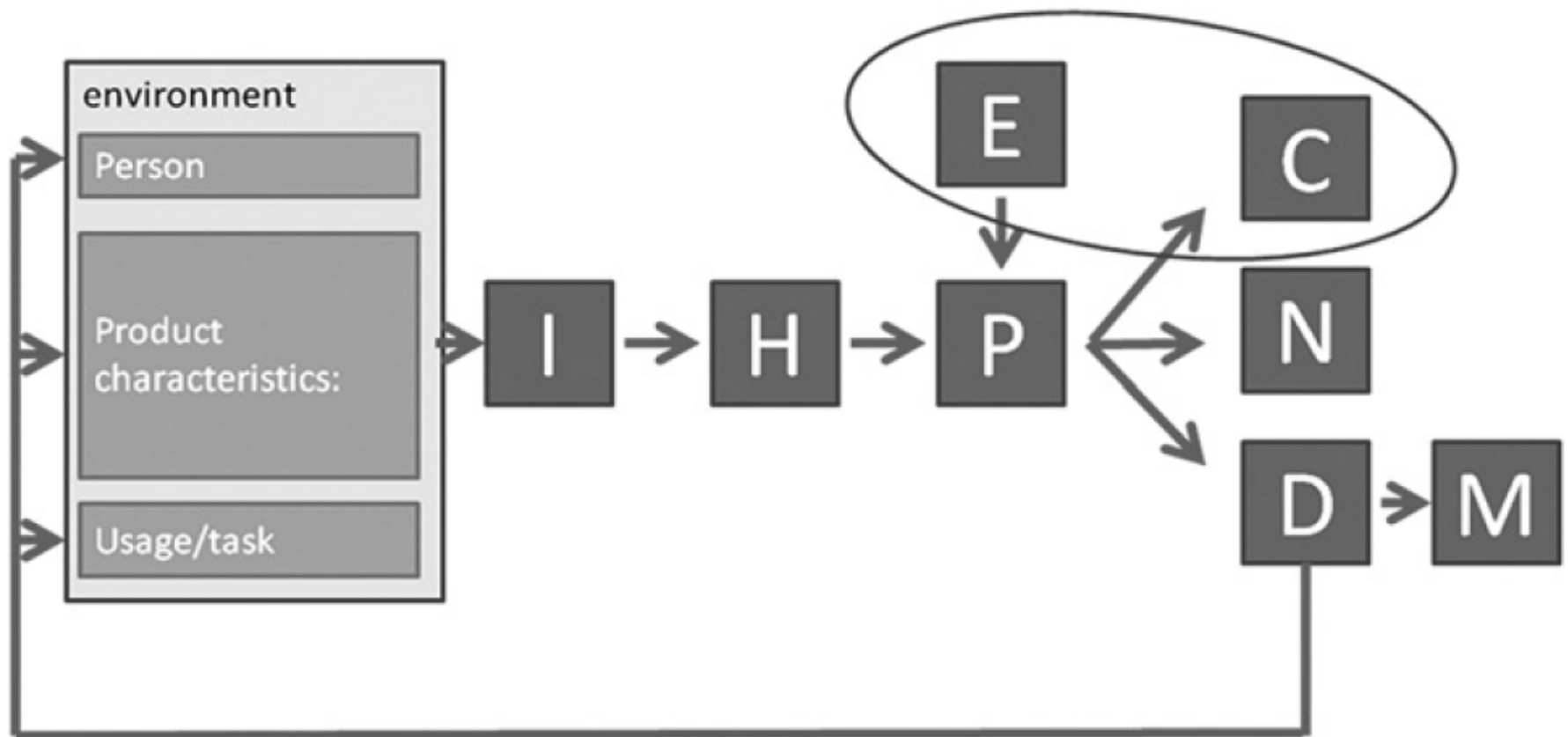


Fig. 4. The new proposed comfort model based on the findings of the 10 papers in this

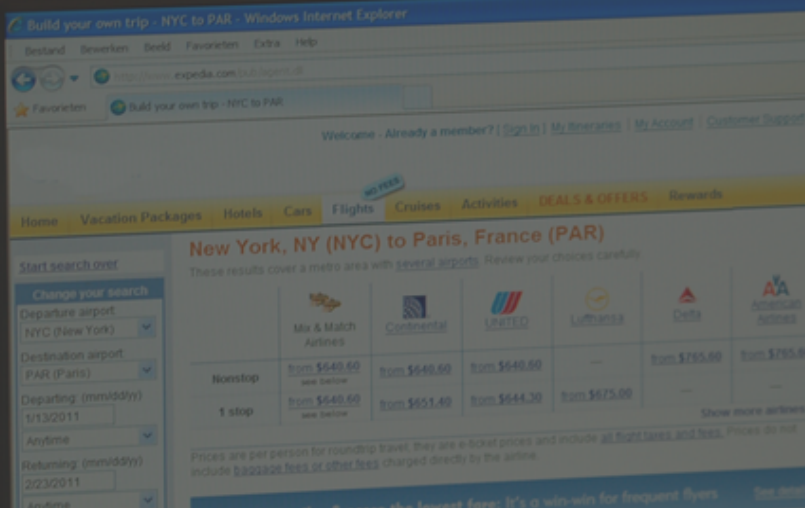
the comfort experience process

first sight

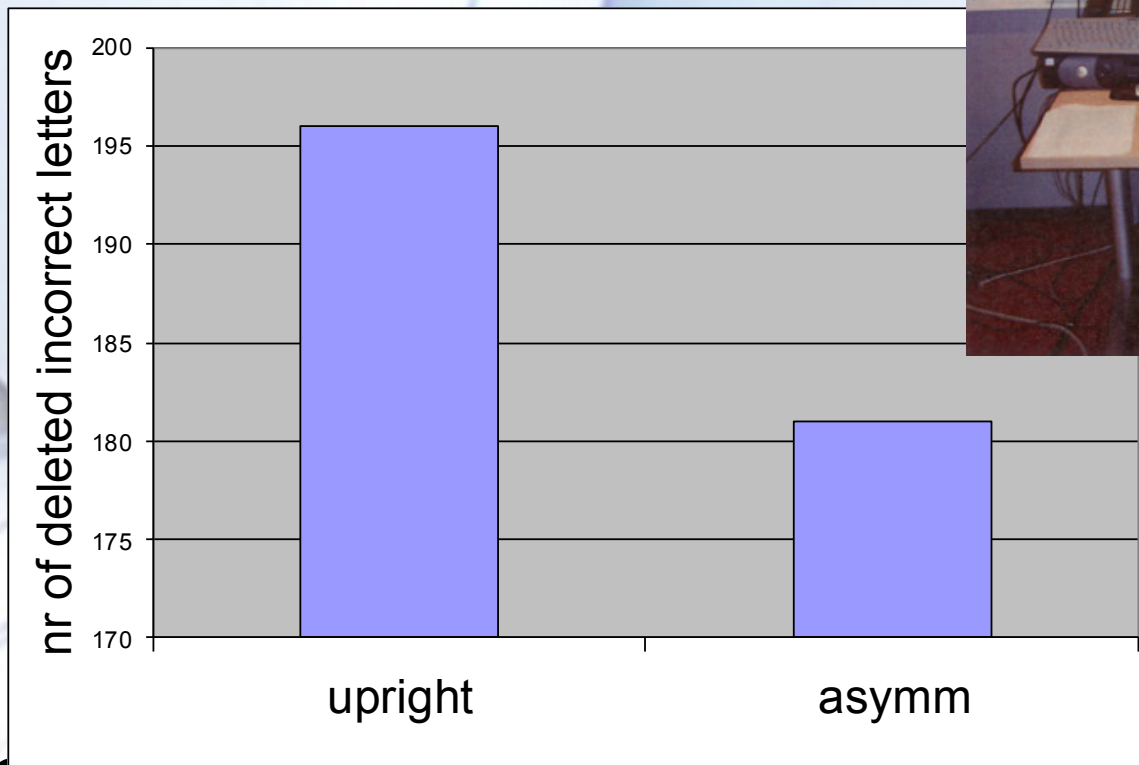
short term comfort

expectations

long term comfort



Productivity is higher upright



Bronkhorst
et al.,

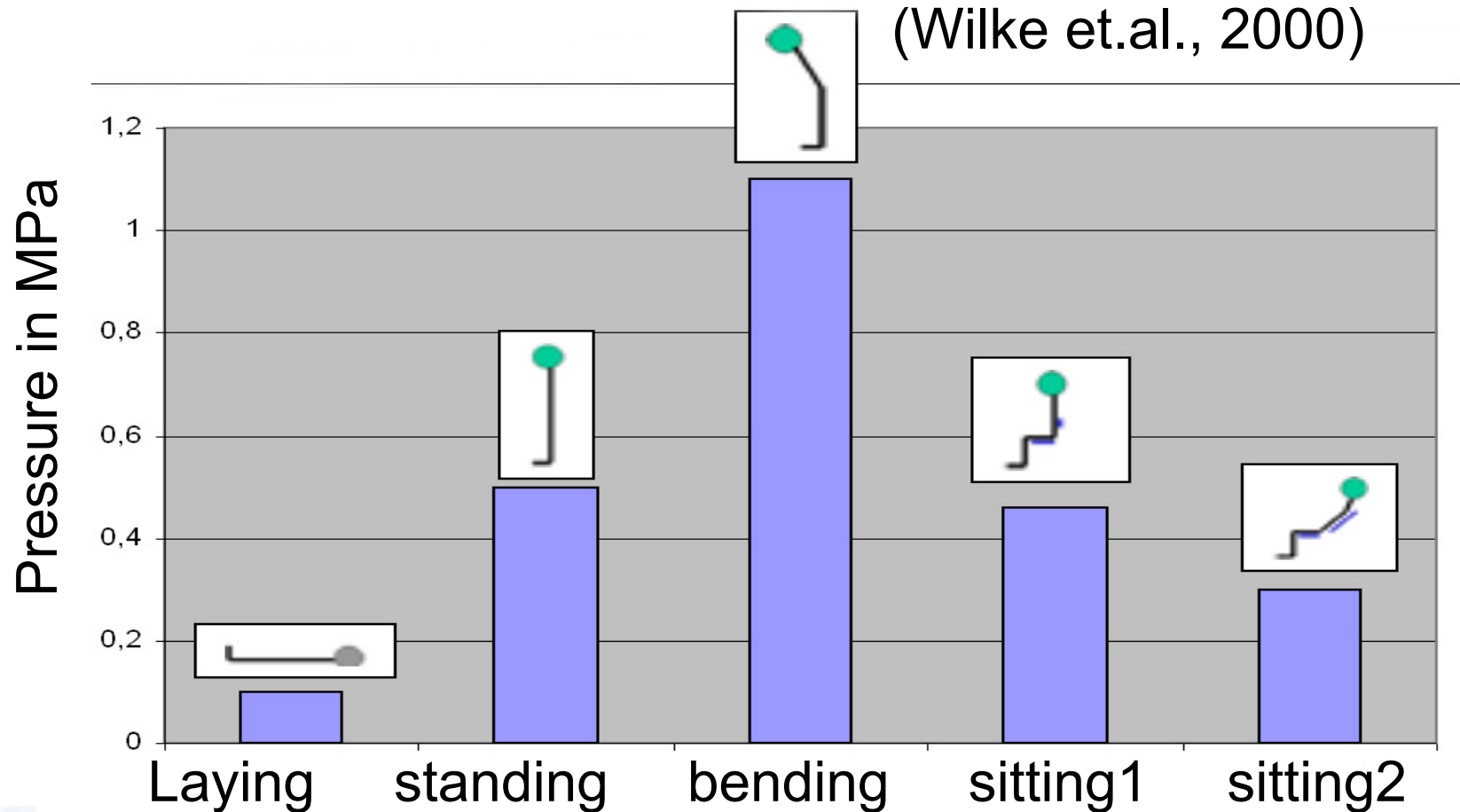
2008

Attention!!!: sit upright and say:

90°

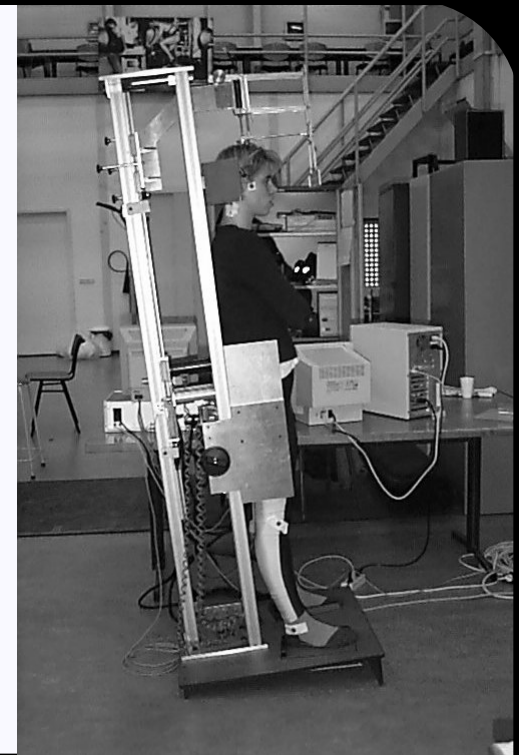
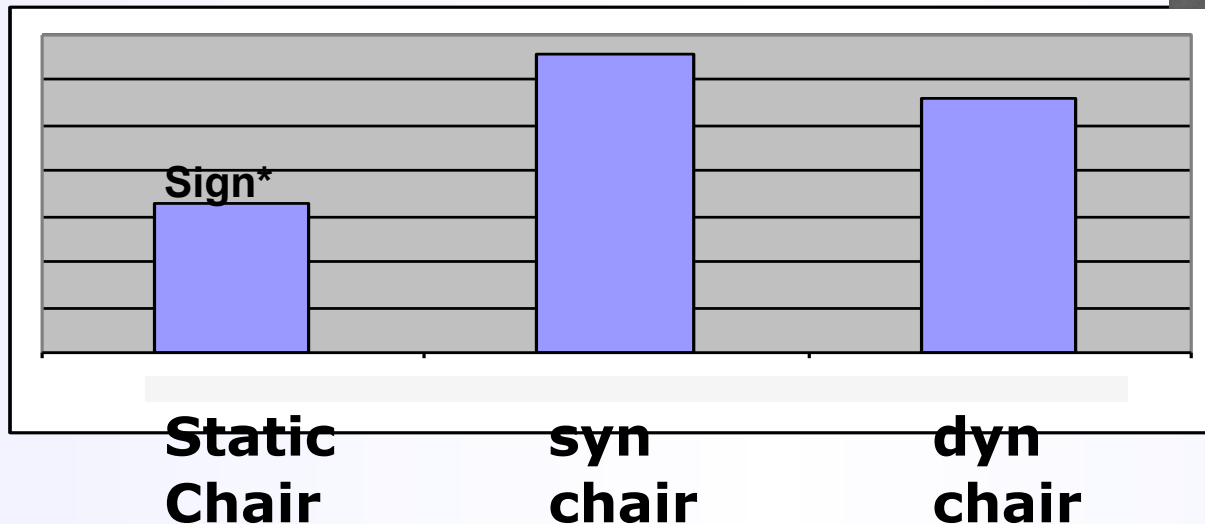
“For some tasks upright sitting is more productive”

is upright sitting best?



Variation in posture!!!

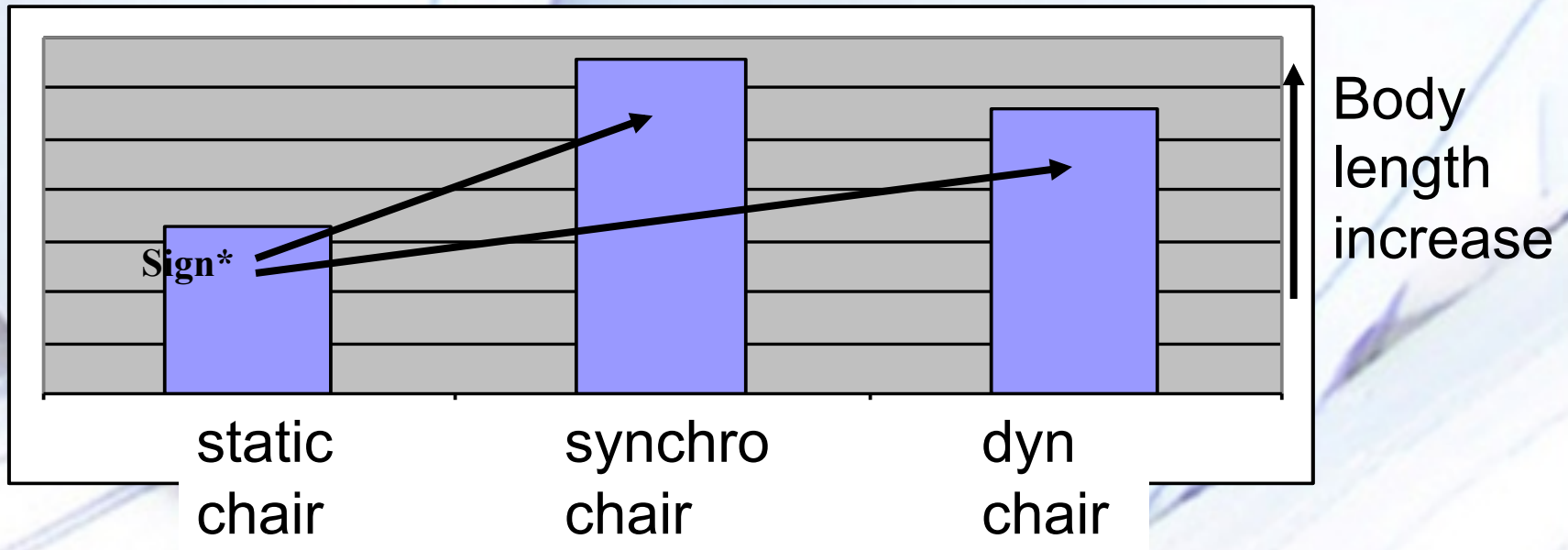
- Many studies on positive effects of variation (Vink & Brauer, 2011)
- Spinal length sign. influenced by static vs dynamic/synchro (Dieen et al., 2002)



↑
**Spinal
length
increase**

movement in the chair

(Dieën, 2002; Vink & Commissaris, 2005)

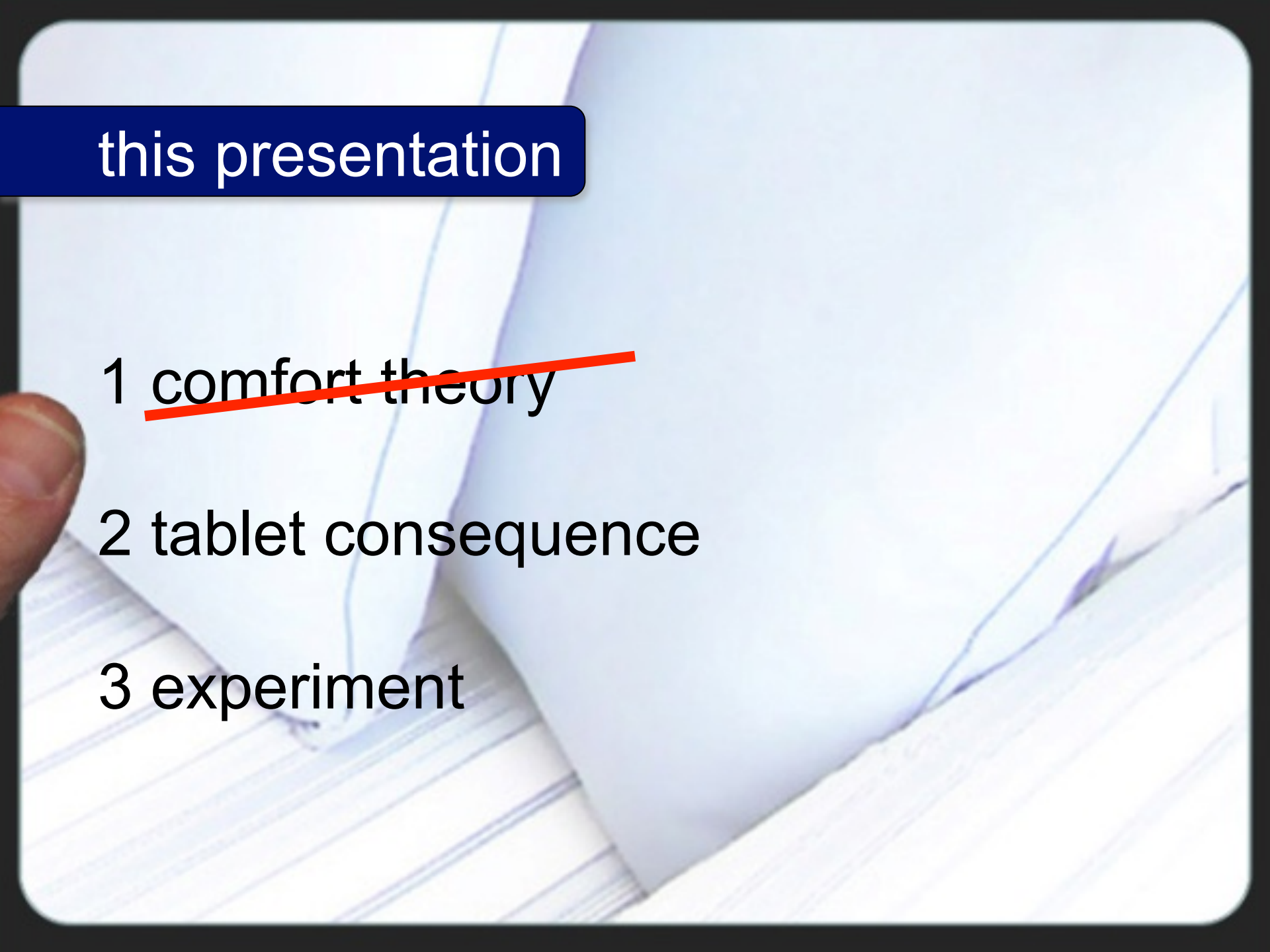


Stretch trunk, hands to the mouth:

SAY OUT LOUD:



“seats should stimulate variation in posture”

The background of the slide is a photograph of a person's hand holding a blue pen, poised to write on a white notepad with horizontal blue lines. The notepad is slightly tilted, and the hand is visible on the left side of the frame.

this presentation

1 ~~comfort theory~~

2 tablet consequence

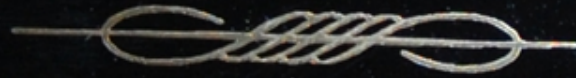
3 experiment



The Har W. Hendrick Distinguished
International Colleague Award

to

Peter Vink



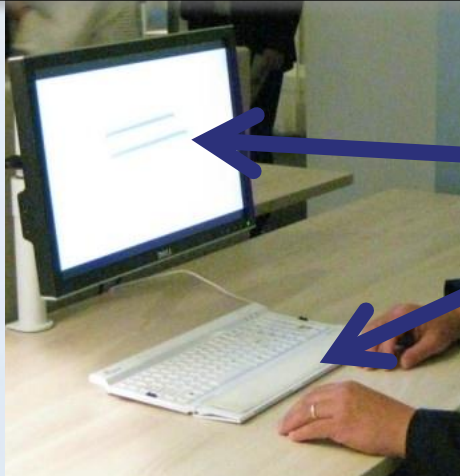
for outstanding contributions
to the
human factors and ergonomics field

September 2011

Tablet/smart phone: less movement?



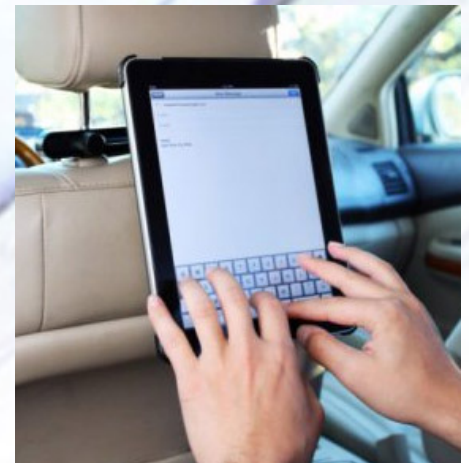
differences in posture



viewpoint
hand

} seperated

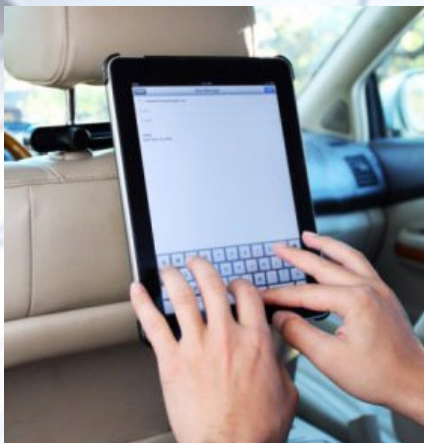
hand-viewpoint connected



touchscreen work:

Shin (2011) uni Buffalo:

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



With armsupport ...



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



Tablet support in toilet?



Of course back support is also needed







Student portal

Information

[Student Portal](#)[Information](#)[Faculty specific](#)[Industrial Design
Engineering](#)[Student news](#)[Agenda](#)

Prof. Peter Vink nominated for prestigious award

02 March 2011 by M&C

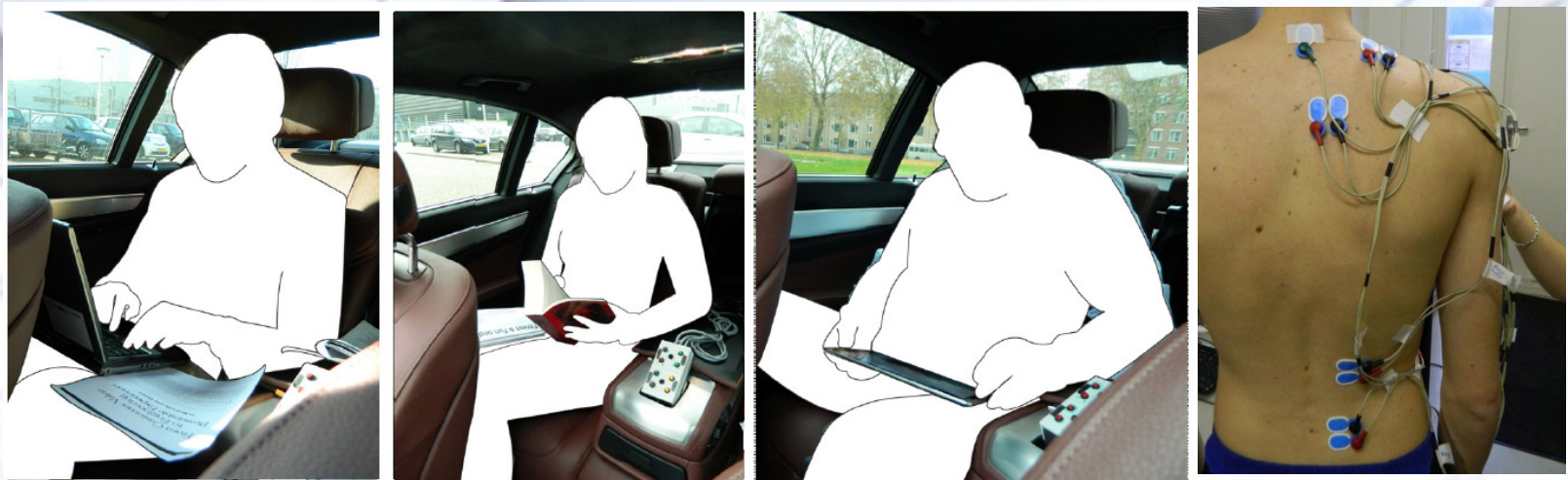
Prof. Peter Vink has been nominated for the Hal W. Hendrick Distinguished International Award. It will be presented in September 2011 by the Human Factors and Ergonomics Society and is awarded to the non-US citizen who has made the most valuable contribution to the field of human factors and ergonomics.

Peter Vink has been nominated by the Human Factors and Ergonomics Society, because of his contributions to:

- ➔ the further development of participatory ergonomics: adapting environments to the needs, together with relevant parties like end-users, managers and experts;

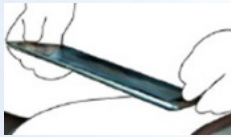
Van Veen et al. (2012):

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



Results (1):

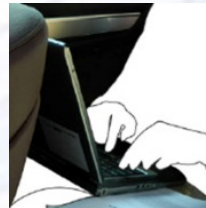
posture strongly determined by car seat
minor sign differences between tasks



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

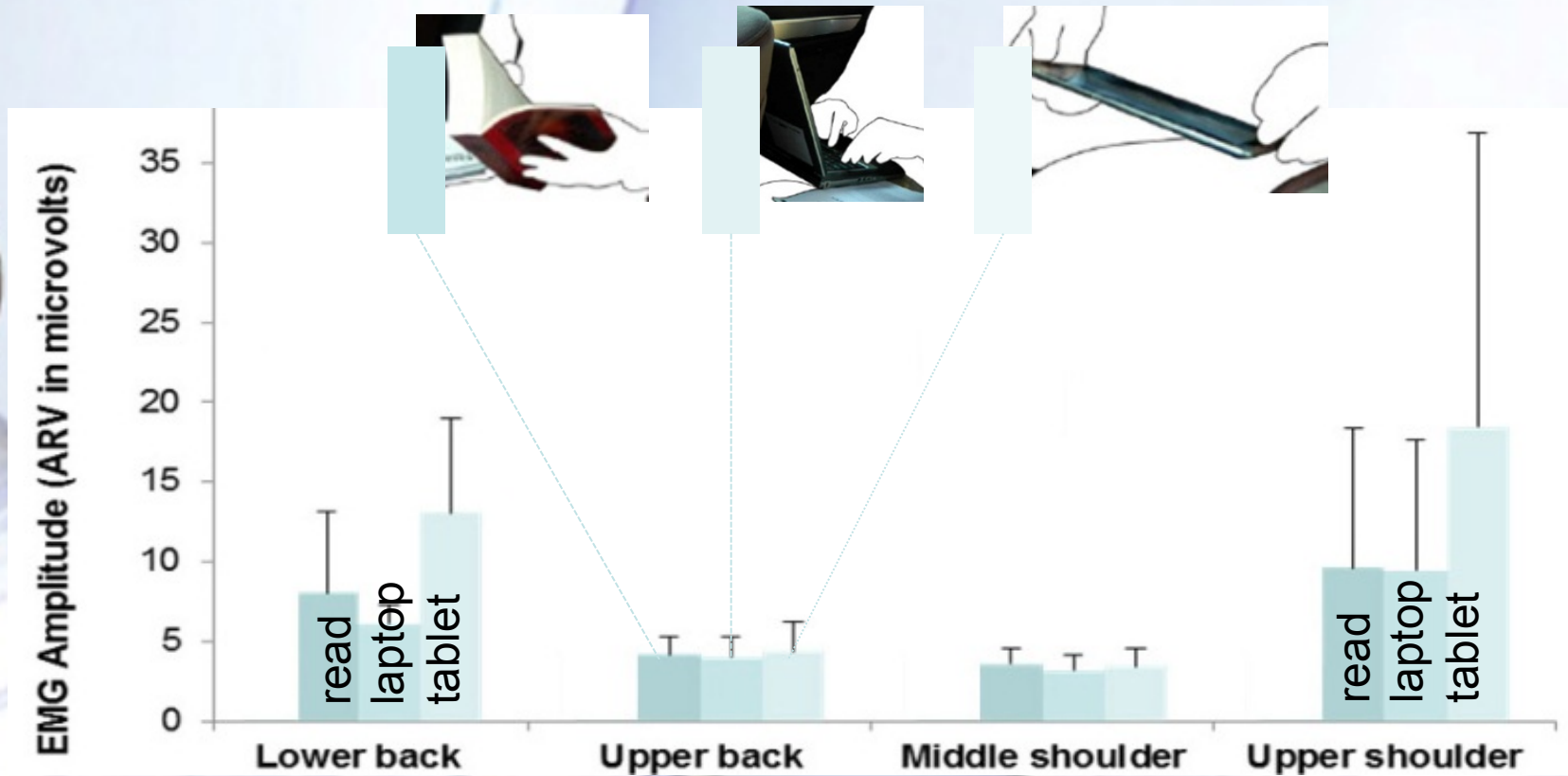


-reading: both hands on the
book, one free arm



-laptop: both hands on keyboard

Results (2):



Back seat design for tablet



this presentation

1 ~~comfort theory~~

2 ~~tablet consequence~~

3 experiment

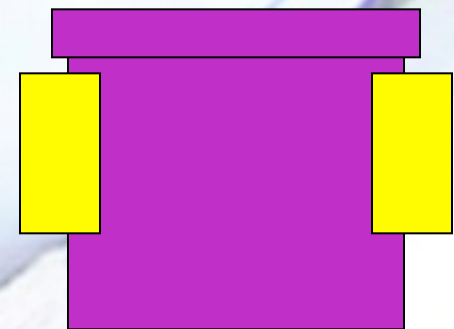
Apart from tablet: anthropometry

most international human dimensions: www.dined.nl



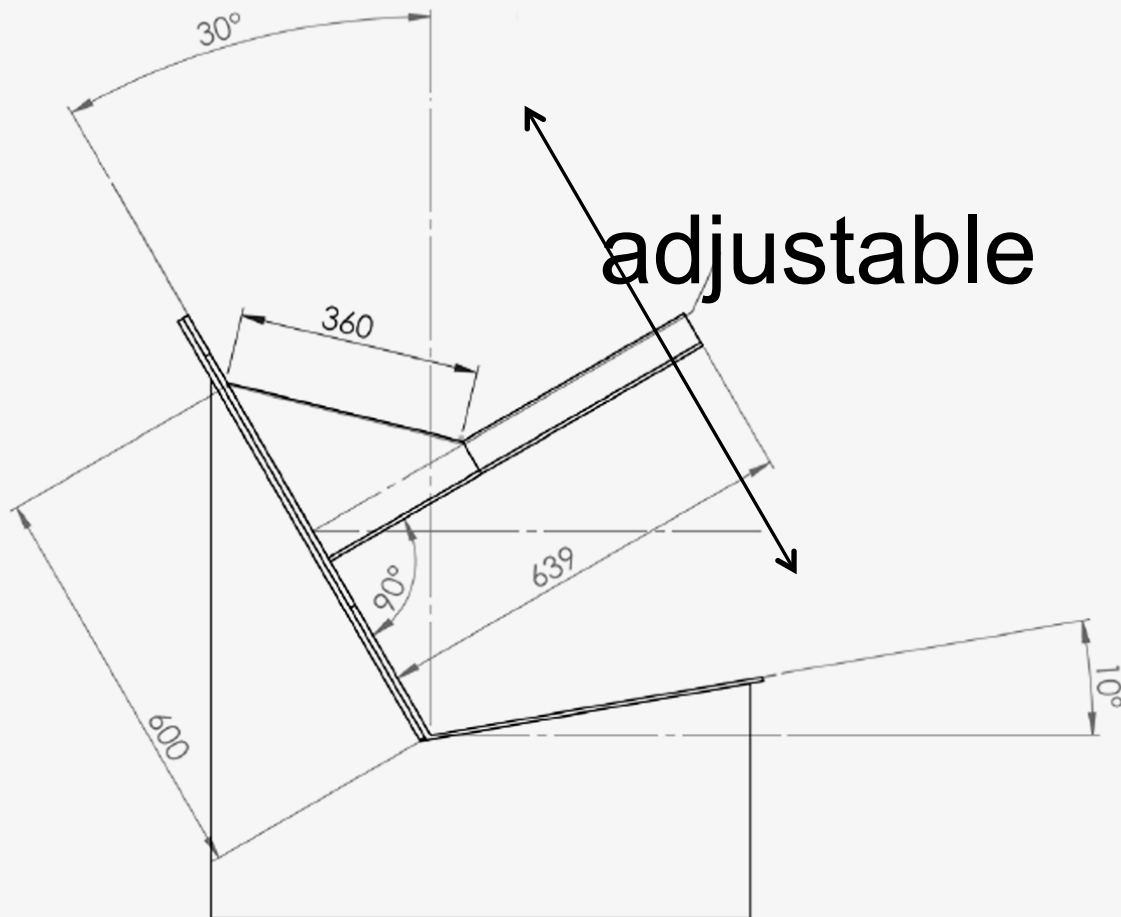
USA female: p5-p95

366-455mm



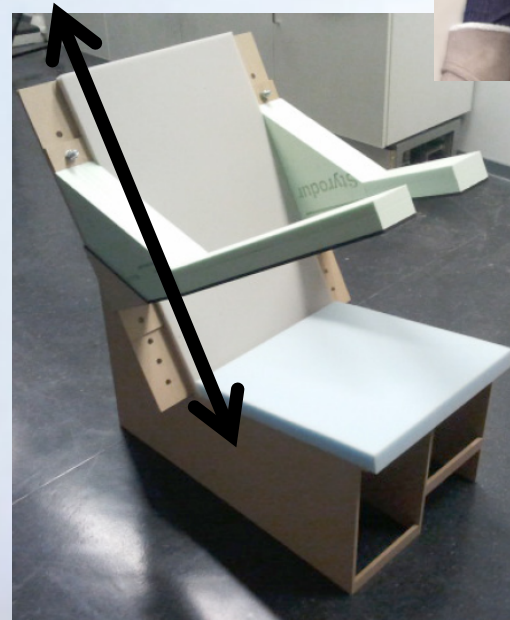
306-398mm

Dimensions of a mockup

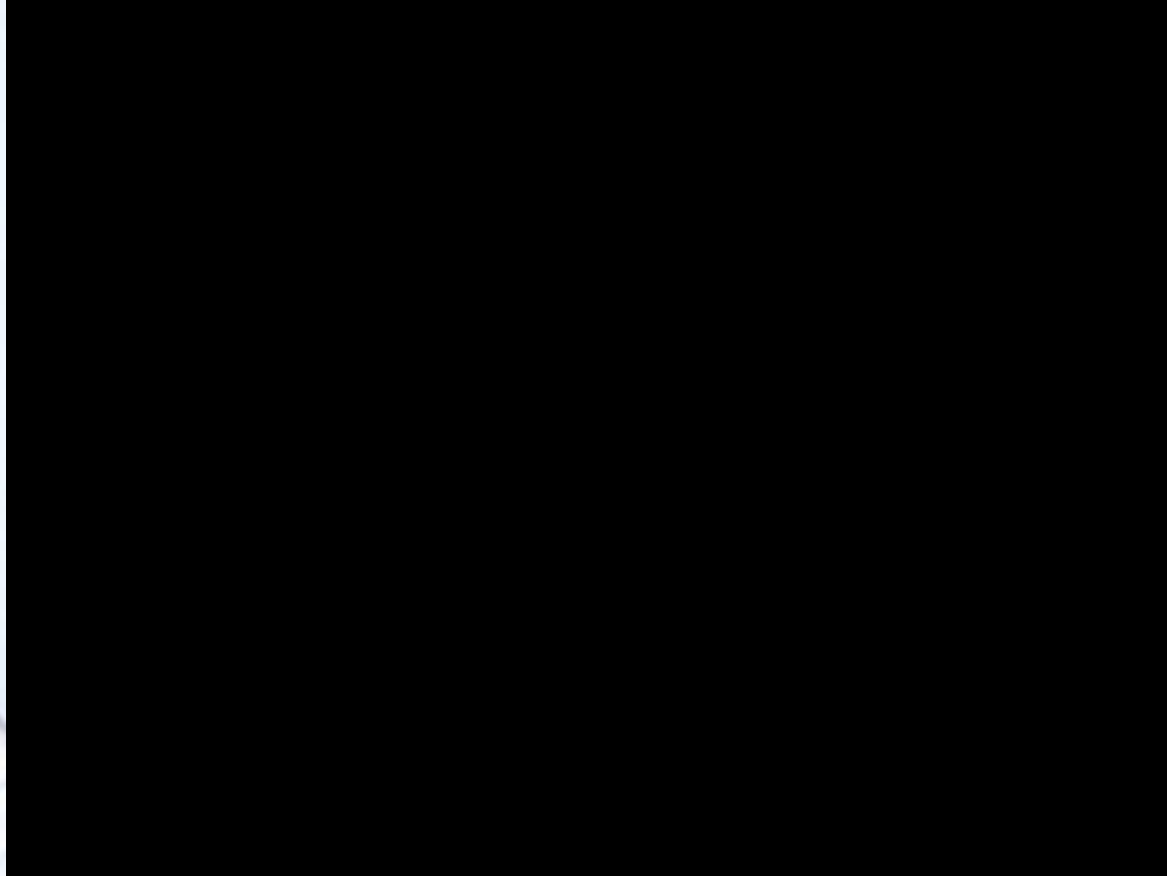


The mockup

Test 10 pp, (157-190 cm)



Test is important



Test with 10 subjects

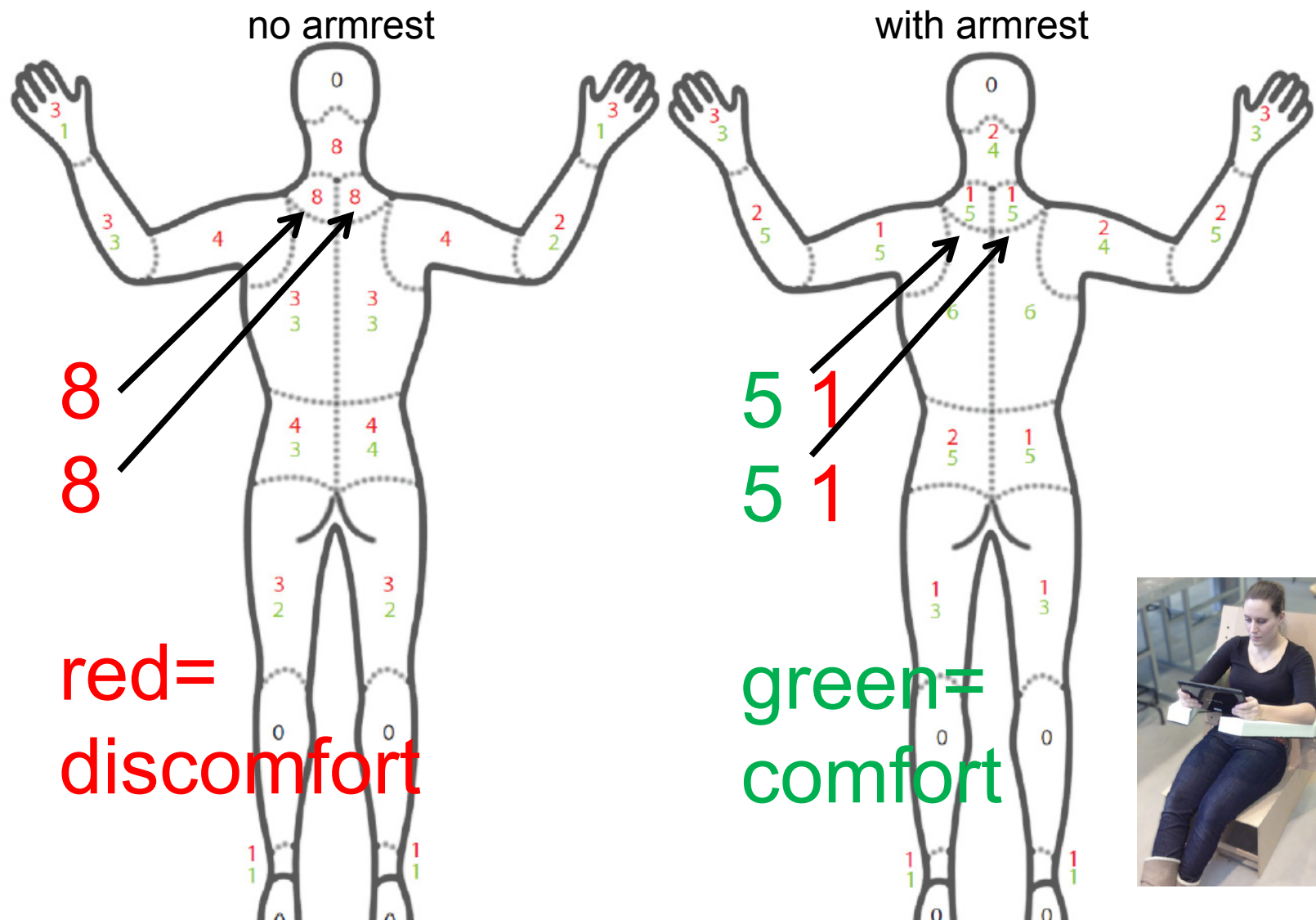
with armrest neck 10° more upright
than without armrest

9 out of 10 preferred armrest

9 out of 10 preferred one height



Test with 10 subjects



this presentation

1 comfort theory: variation

2 tablet consequence: neck/arm

3 experiment: arm support → comfort ↑

Examination (1)

Laptop sales was more than desk top sales starting in:

- a. 2006
- b. 2008

Hands and viewpoint are connected

- a. in tablet work
- b. In desk top work

Examination (2)

Hedge showed that an armrest reduces muscle activity from

- a. 20% to 16%
- b. 24% to 16%

The tablet chair with armrests is appreciated by

- a. 8 out of 10 participants
- b. 9 out of 10 participants

Examination (3)

Shoulder EMG in the car was highest using

- a.laptop
- b.tablet

Author of the book “comfort and design” + winner Hal Hendrick award is:

- a.Peter Vink
- b.Nick Moller

A photograph of two men in business suits. The man on the left has white hair and is smiling. The man on the right has a mustache and glasses, and is also smiling while holding a framed plaque. The plaque has a blue background with a gold border and some text, including the name 'Peter J. Vink'.

Thank you for
your attention

Questions: P.Vink@tudelft.nl