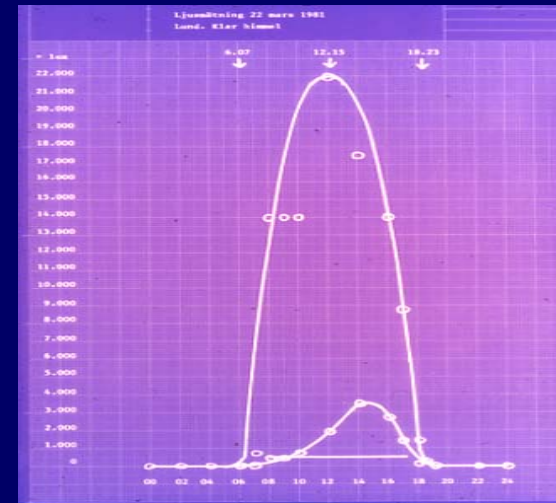


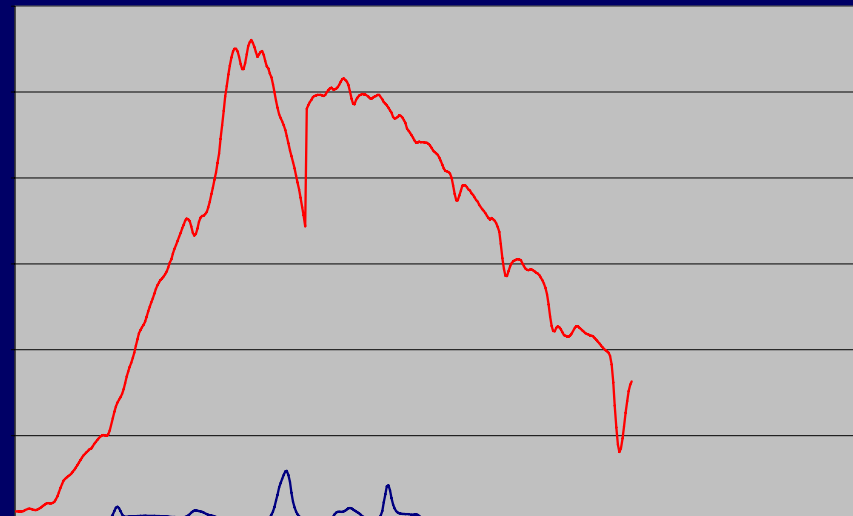
Människa och ljus från ett psykologiskt perspektiv

Thorbjörn Laike
Lunds Universitet

LIGHT

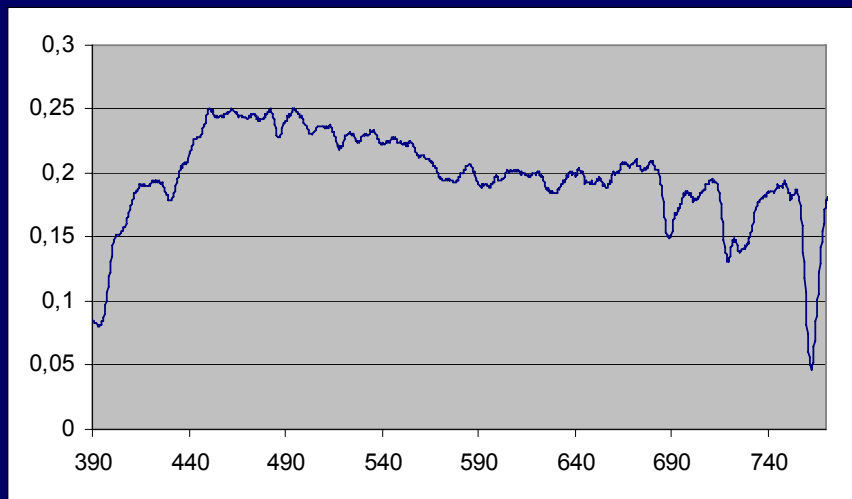


Irradiance

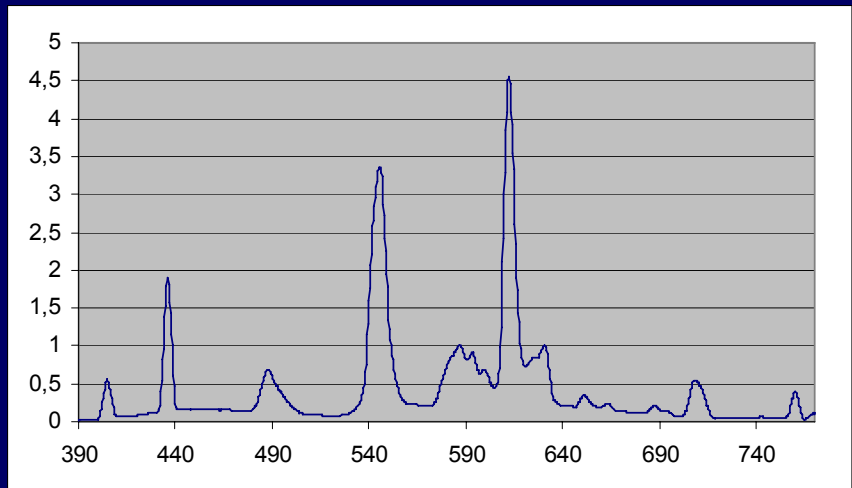
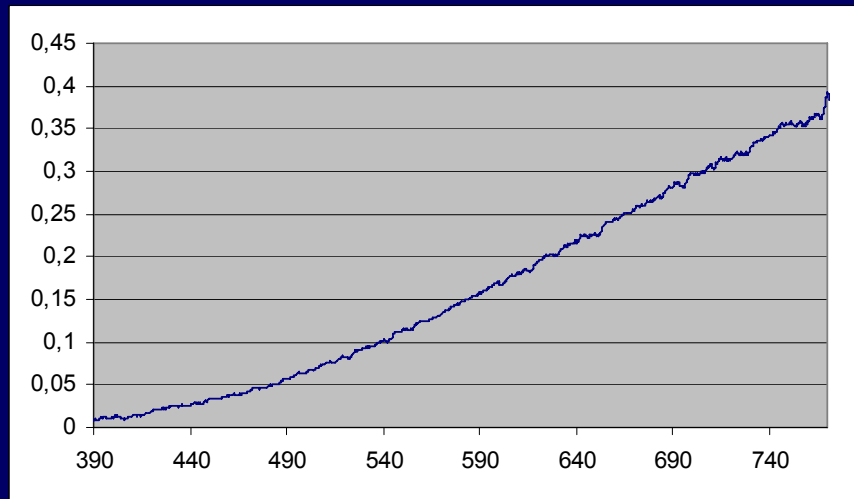


Examples of spectral distribution

Daylight

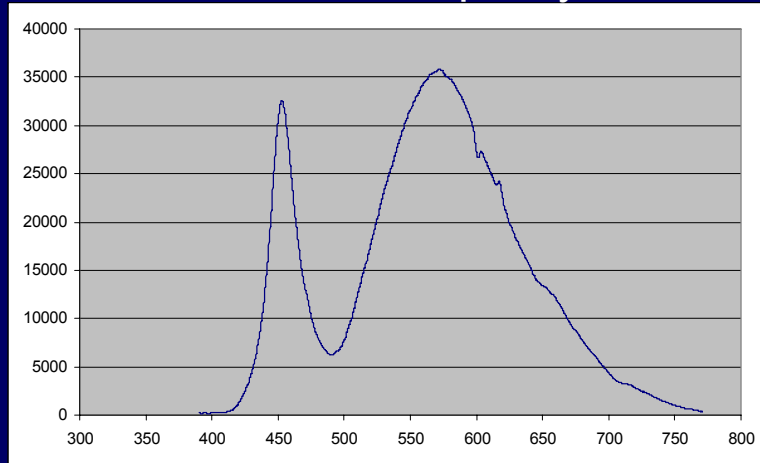


Bulb

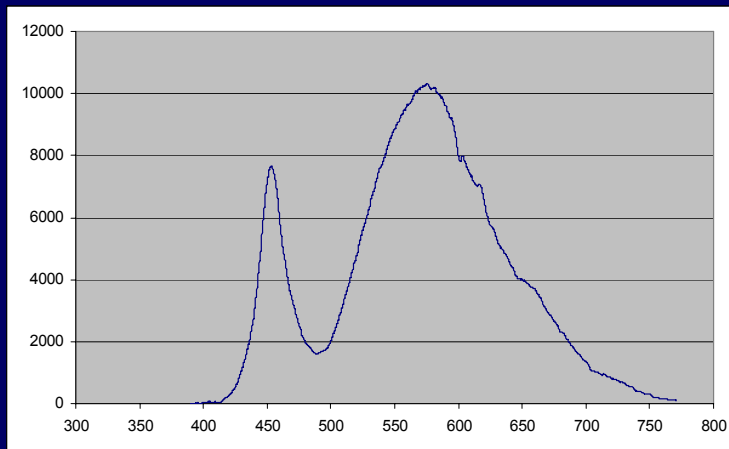


Fluorescent tube

LED Good quality

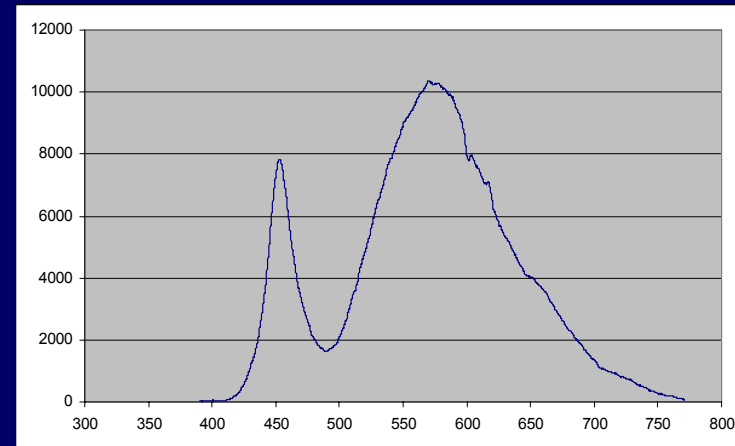


Quotient: Blue 454 nm/highest: .91
Wall

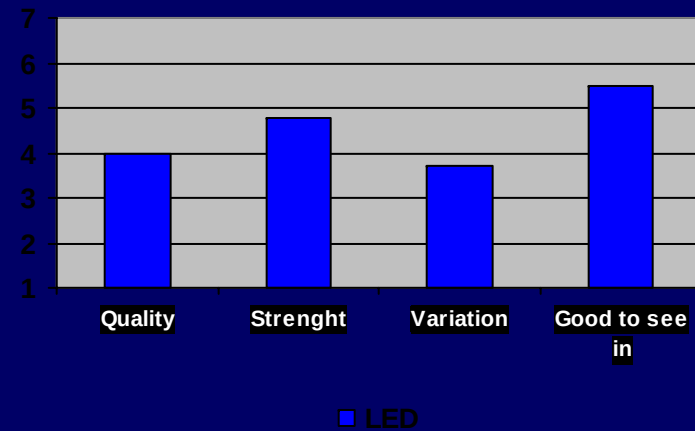


Quotient: Blue 454 nm/highest: .73

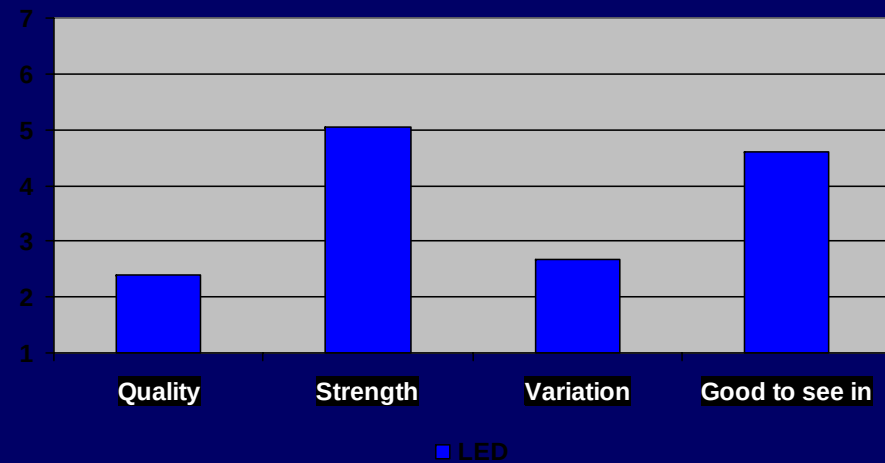
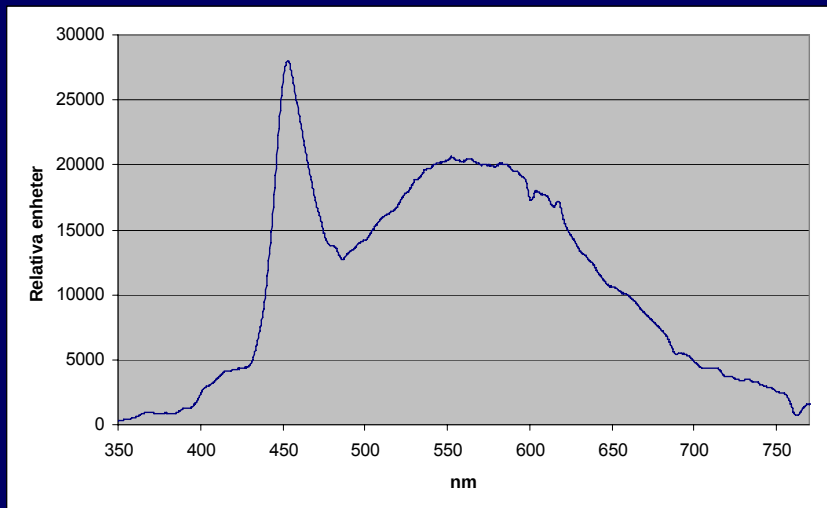
Table



Quotient: Blue 454 nm/highest: .76

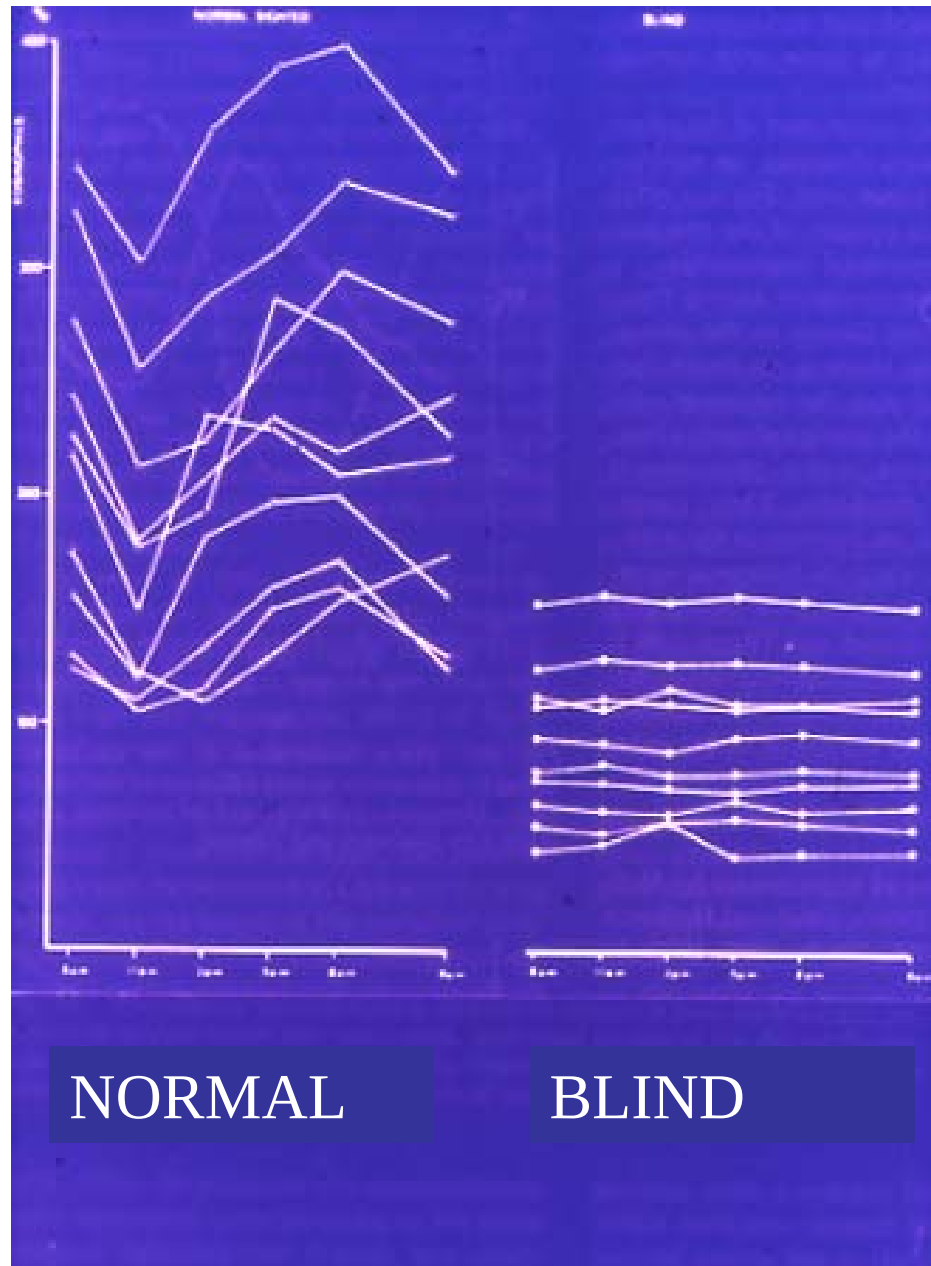


LED-light source Bad quality

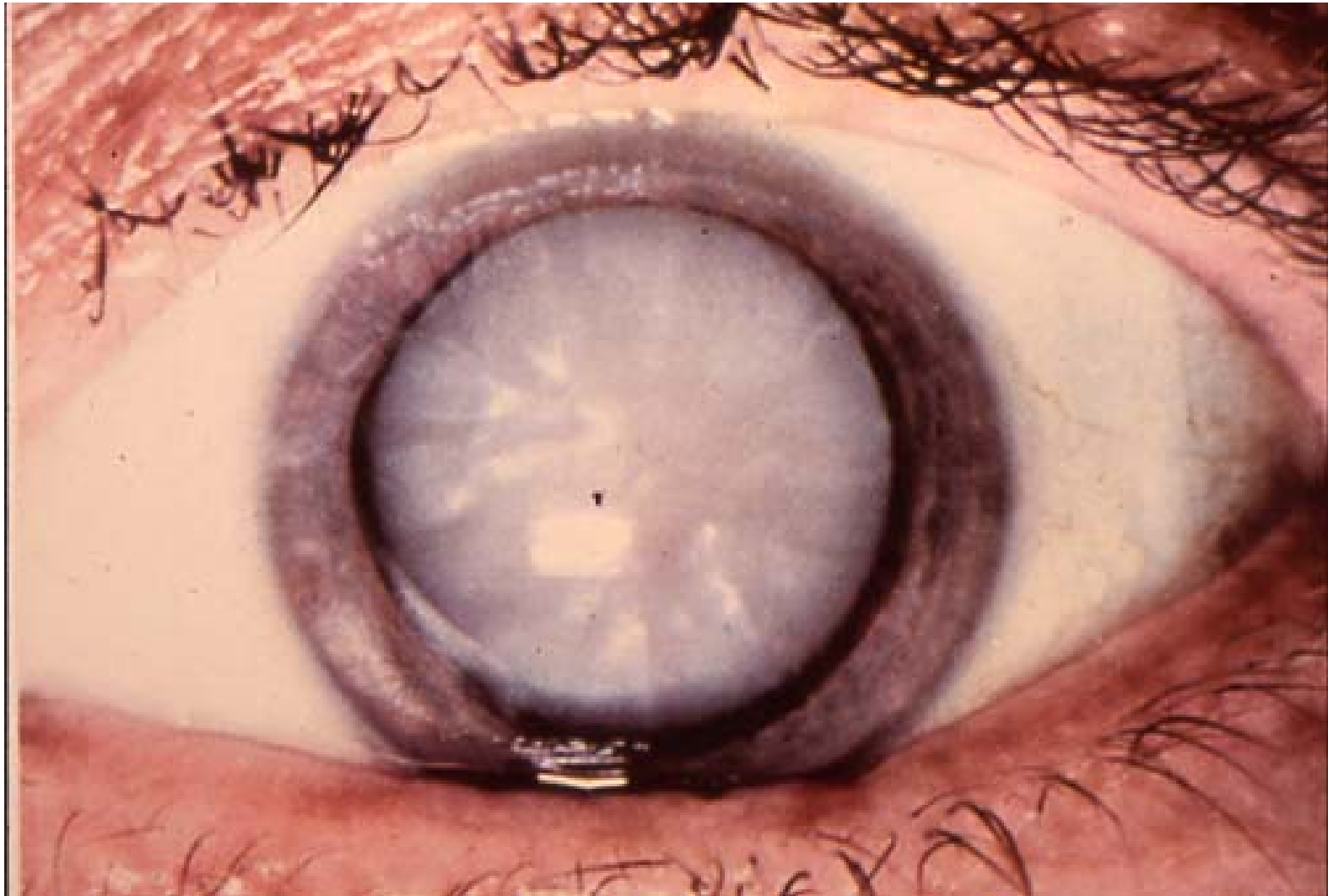


Quotient. Blue 454 nm/highest: 1.38

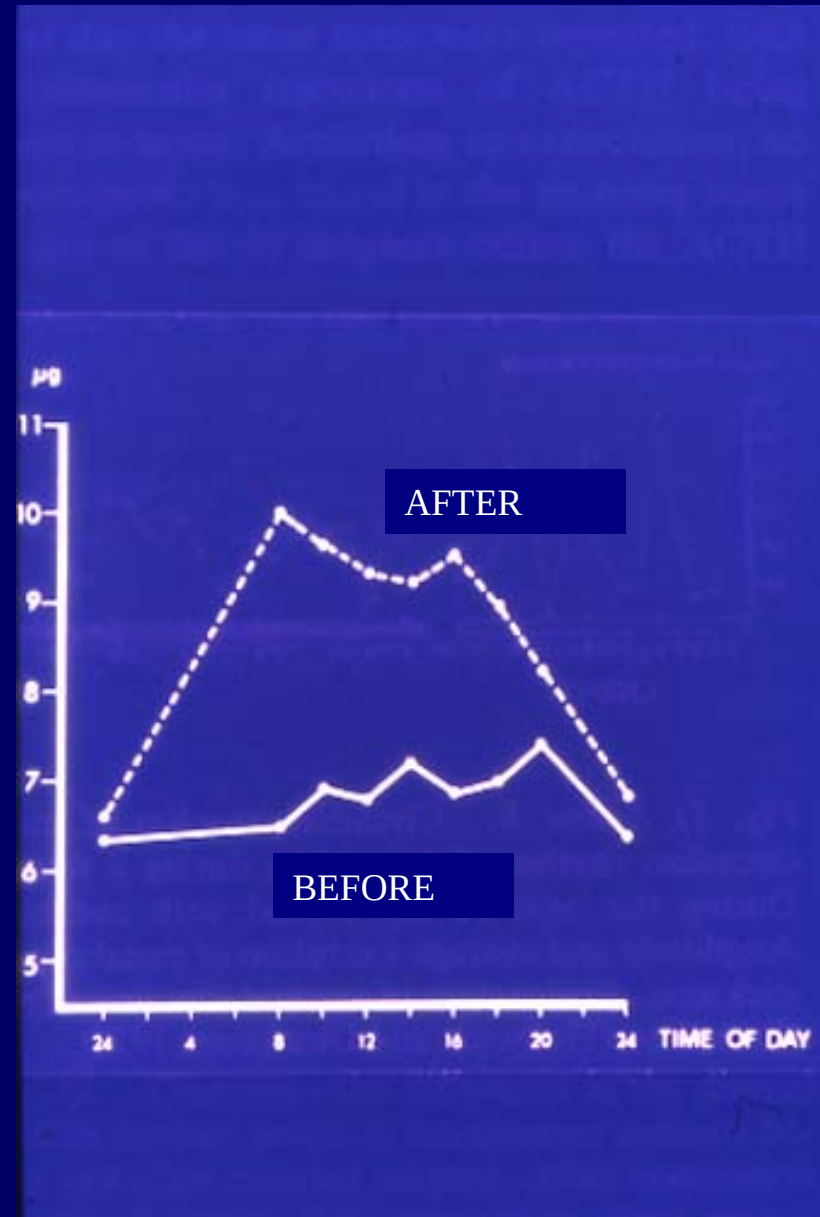
CORTISOL LEVEL



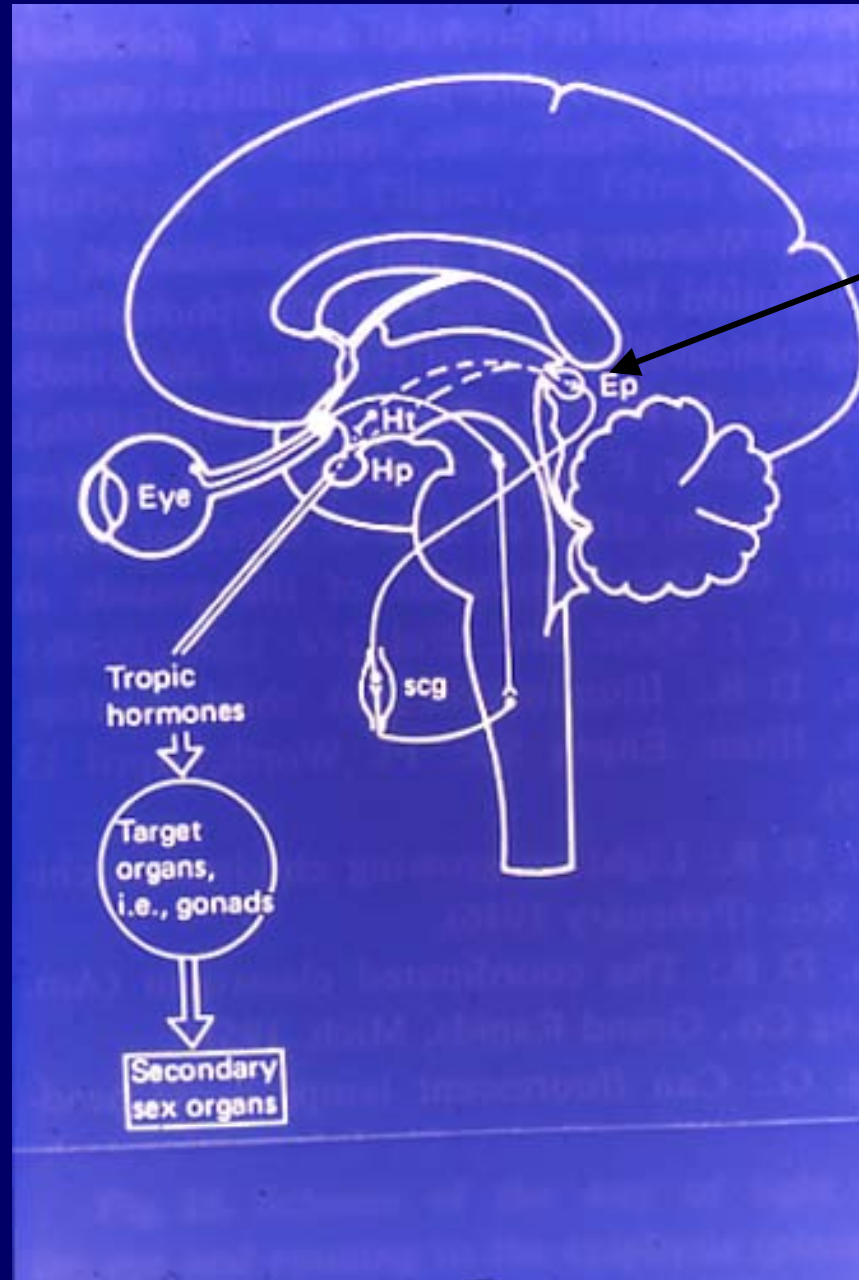
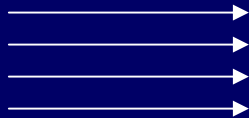
CATARACT



CORTISOL LEVEL



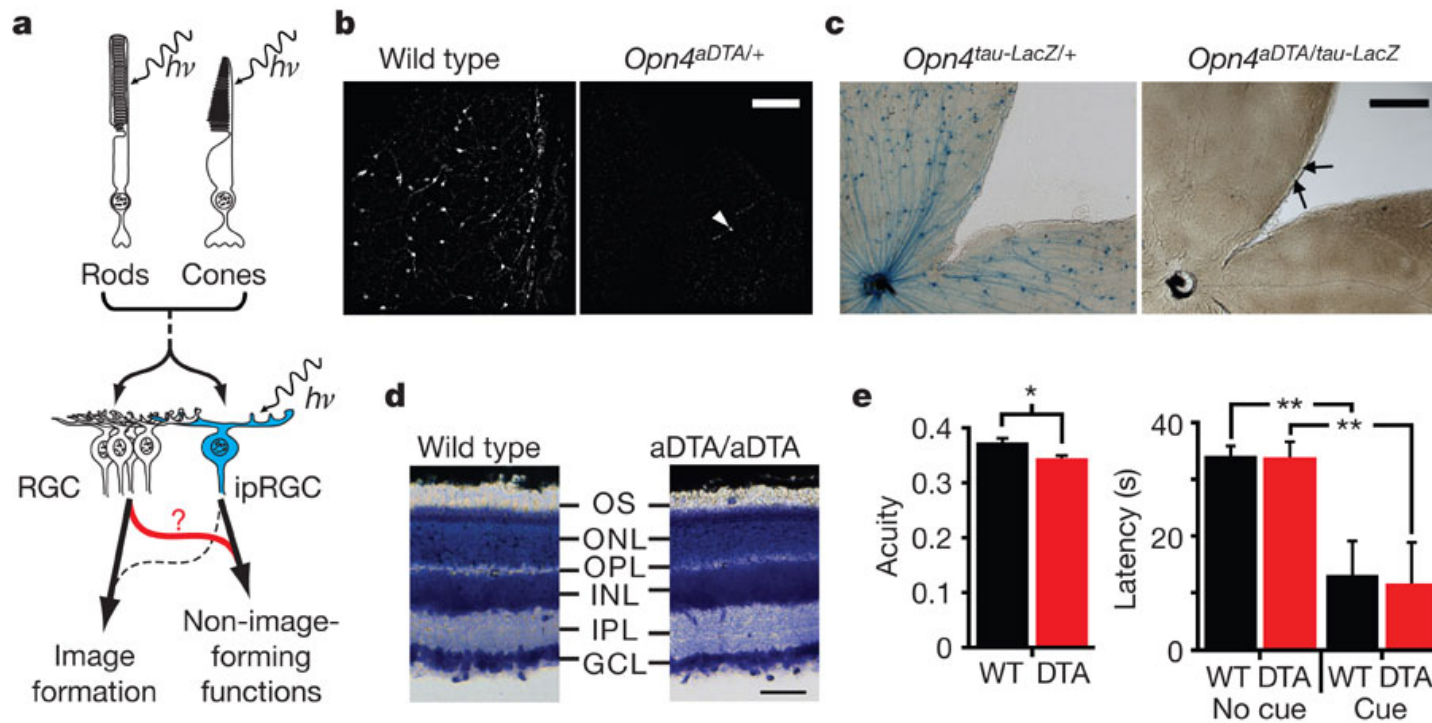
LIGHT



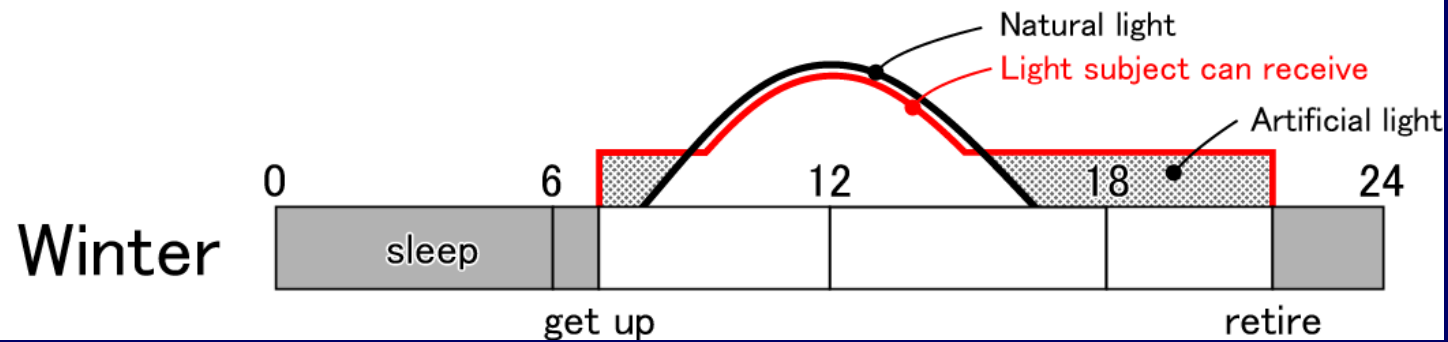
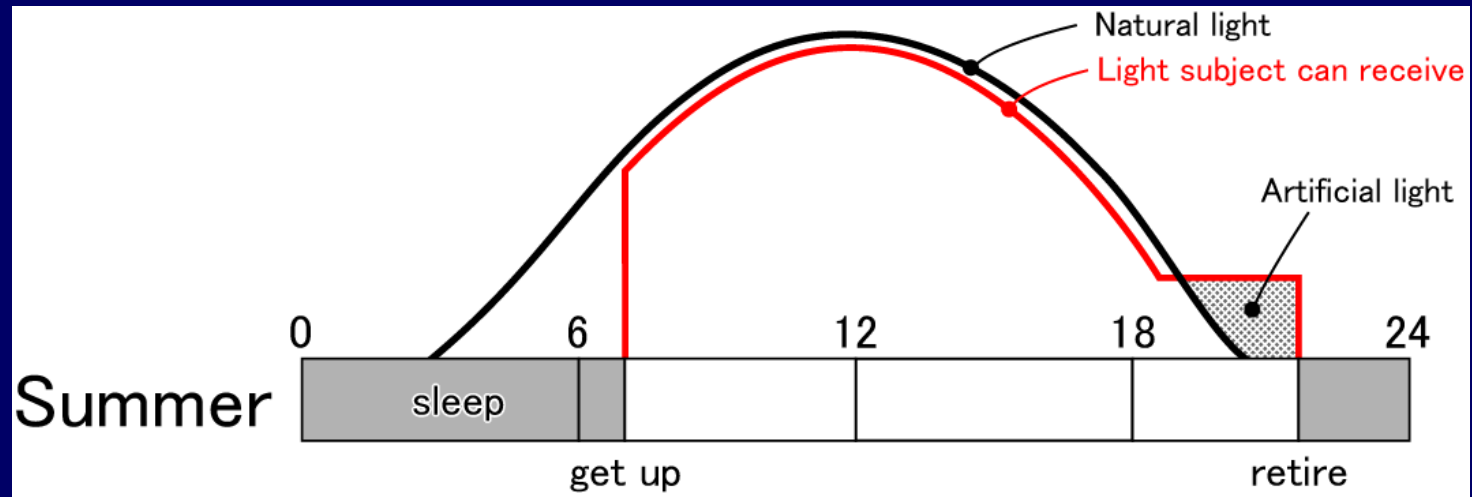
PINEAL GLAND



"third receptor"



Picture from: Melanopsin cells are the principal conduits for rod-cone input to non-image-forming vision
 Ali D. Güler, Jennifer L. Ecker, Gurprit S. Lall, Shafiqul Haq, Cara M. Altimus, Hsi-Wen Liao, Alun R. Barnard,
 Hugh Cahill, Tudor C. Badea, Haiqing Zhao, Mark W. Hankins, David M. Berson, Robert J. Lucas, King-Wai
 Yau & Samer Hattar *Nature* 453, 102-105 (1 May 2008)



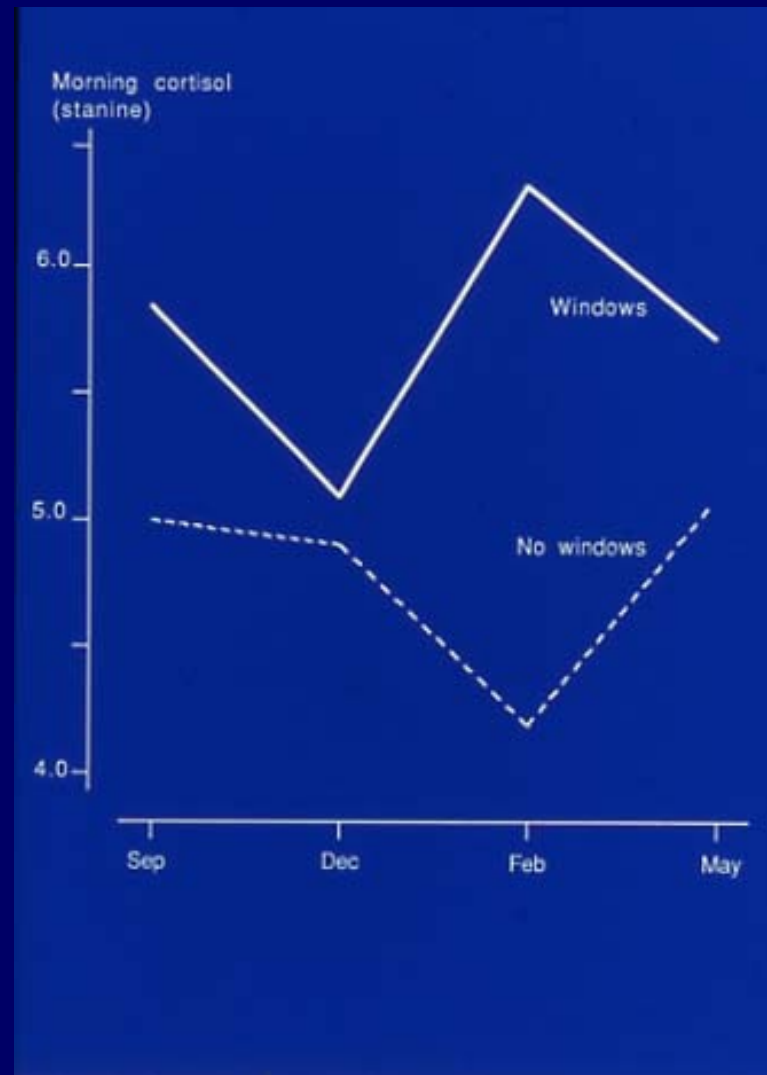
SCHOOL CHILDREN IN CLASSROOMS



WITH

AND WITHOUT
WINDOWS

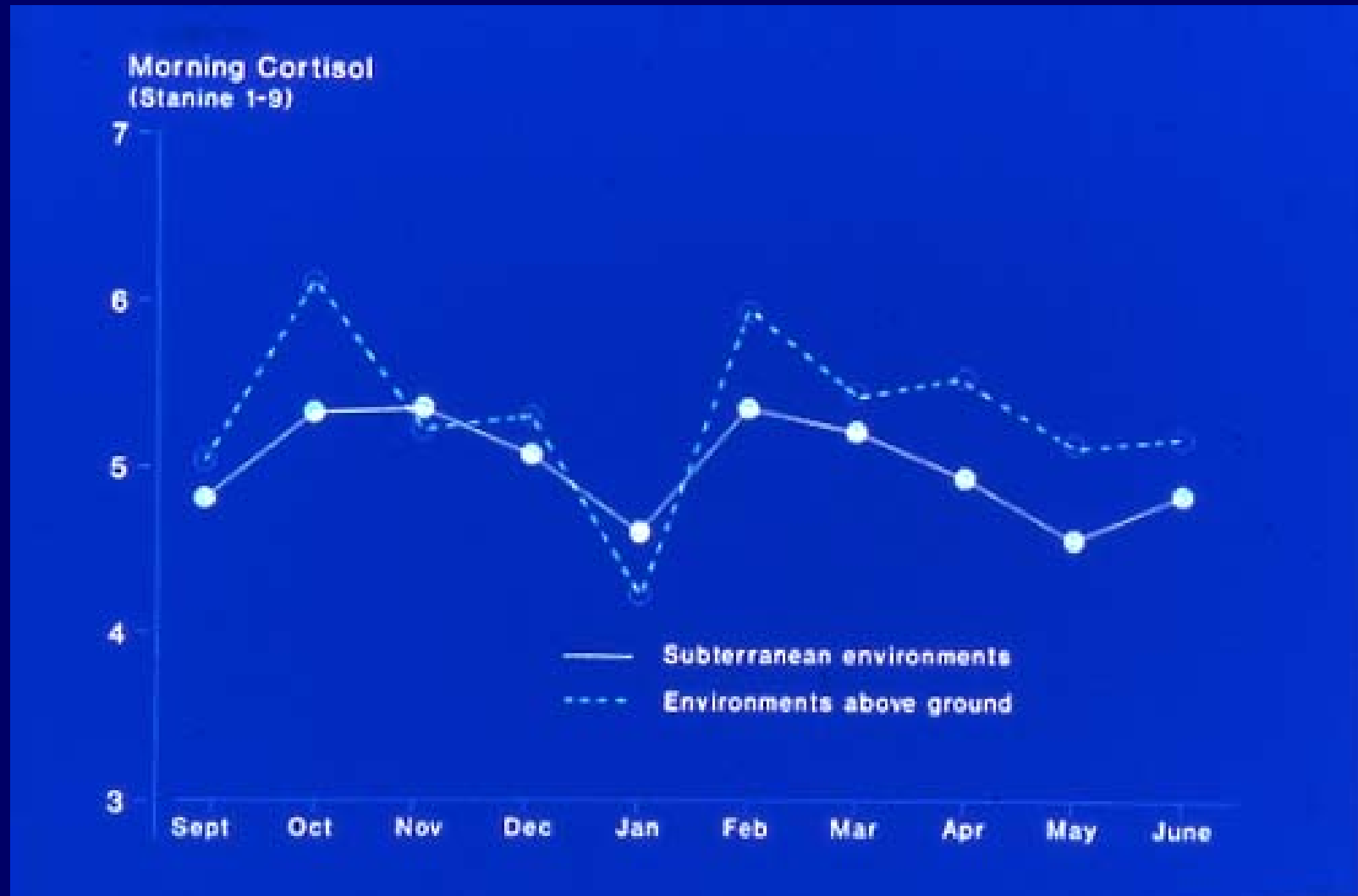
ANNUAL VARIATION OF CORTISOL



MILITARY PERSONNEL WORKING UNDERGROUND OR ABOVE GROUND

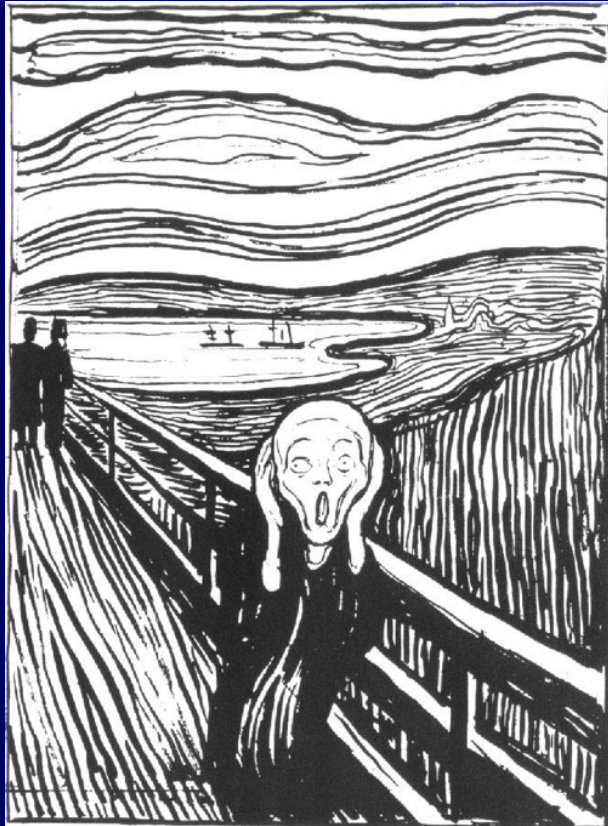


ANNUAL VARIATION OF CORTISOL



SEASONAL AFFECTIVE DISORDER

SAD



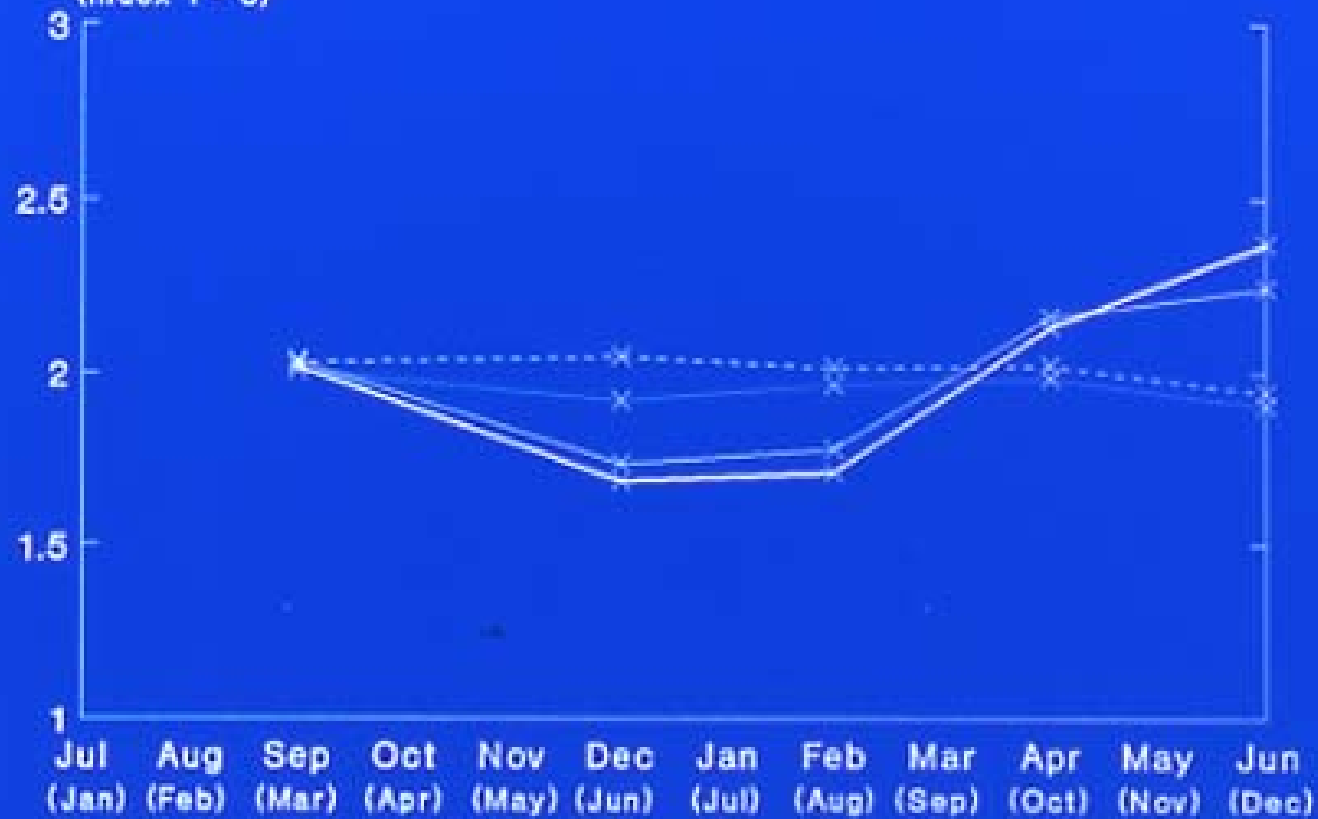
sub-SAD

milder version



MENTAL HEALTH

(Index 1 - 3)



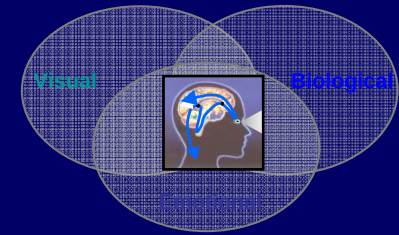
—+— Sweden —x— England -x- Saudi Arabia -x- Argentina

p = .000

p = .000

N.S.

N.S.



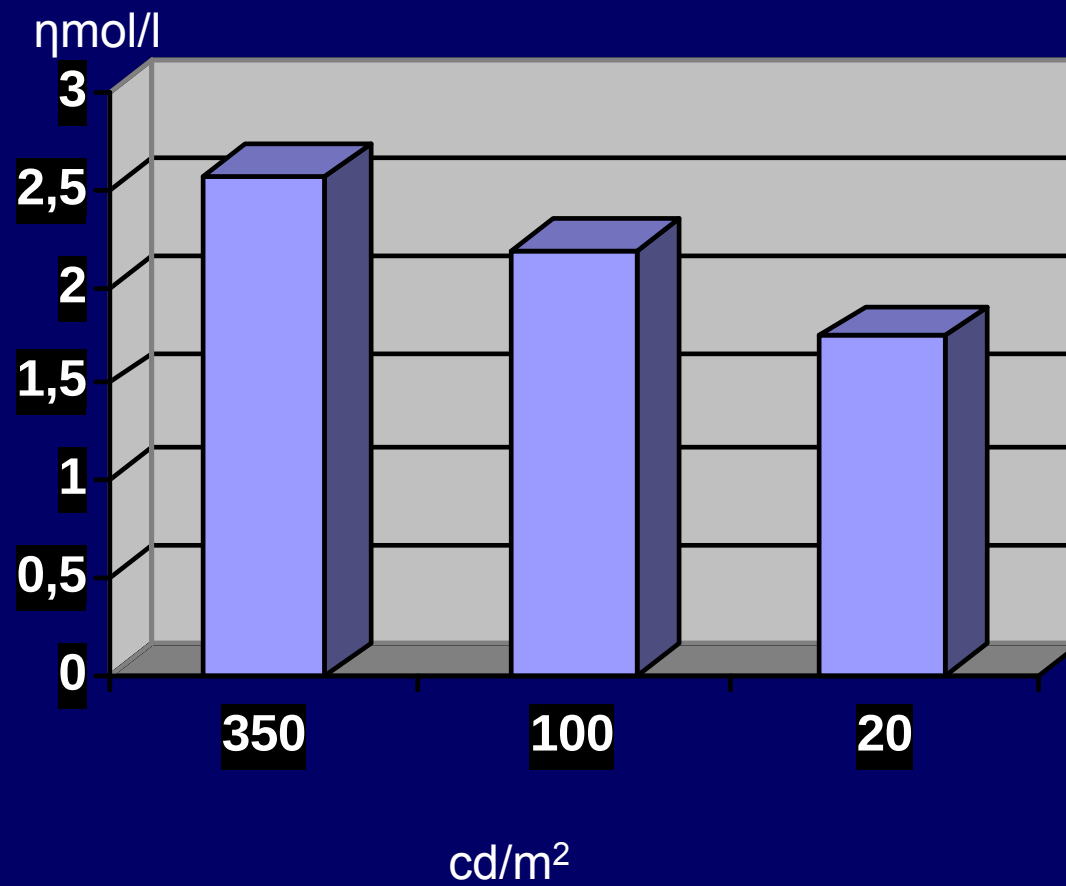
The background luminance and colour temperatures influence on alertness and mental health of the human being

- Govén, Laike, Pendse, Sjöberg 2006

Design and Method of the study

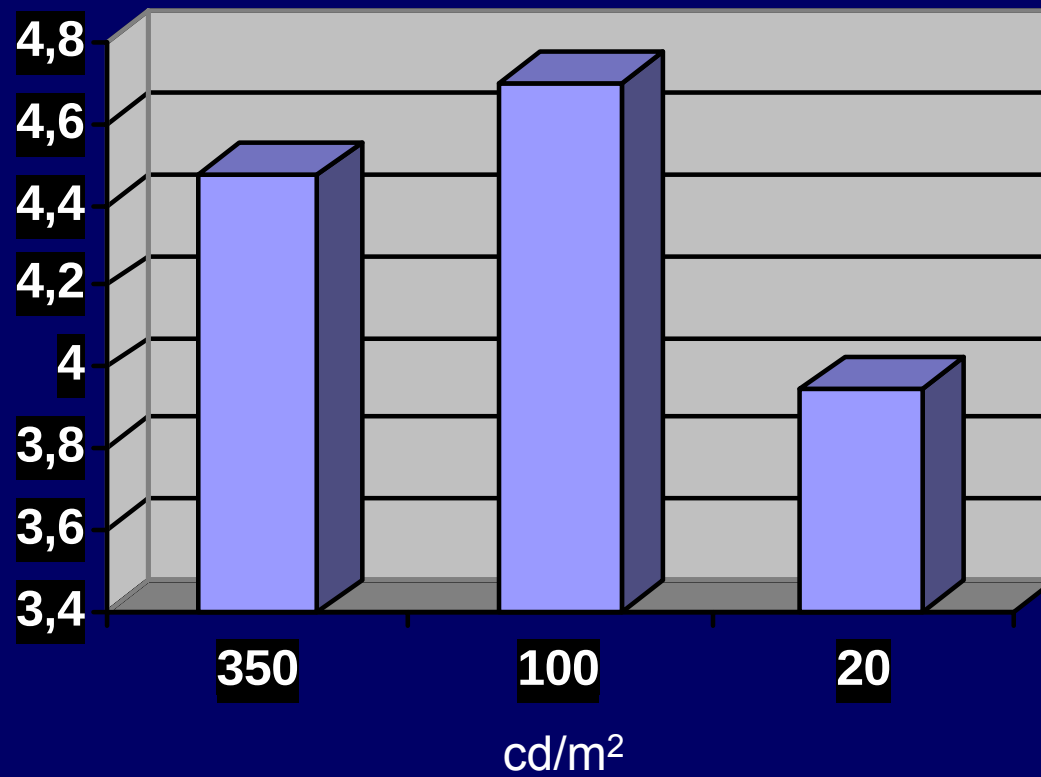


Cortisol level after exposure



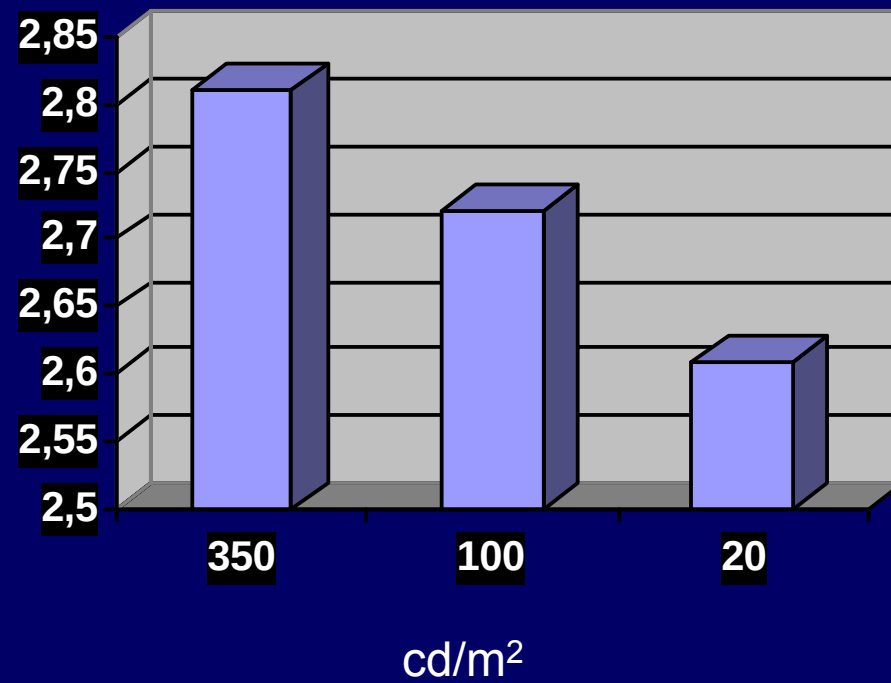
Experienced brightness

Points (1-7)



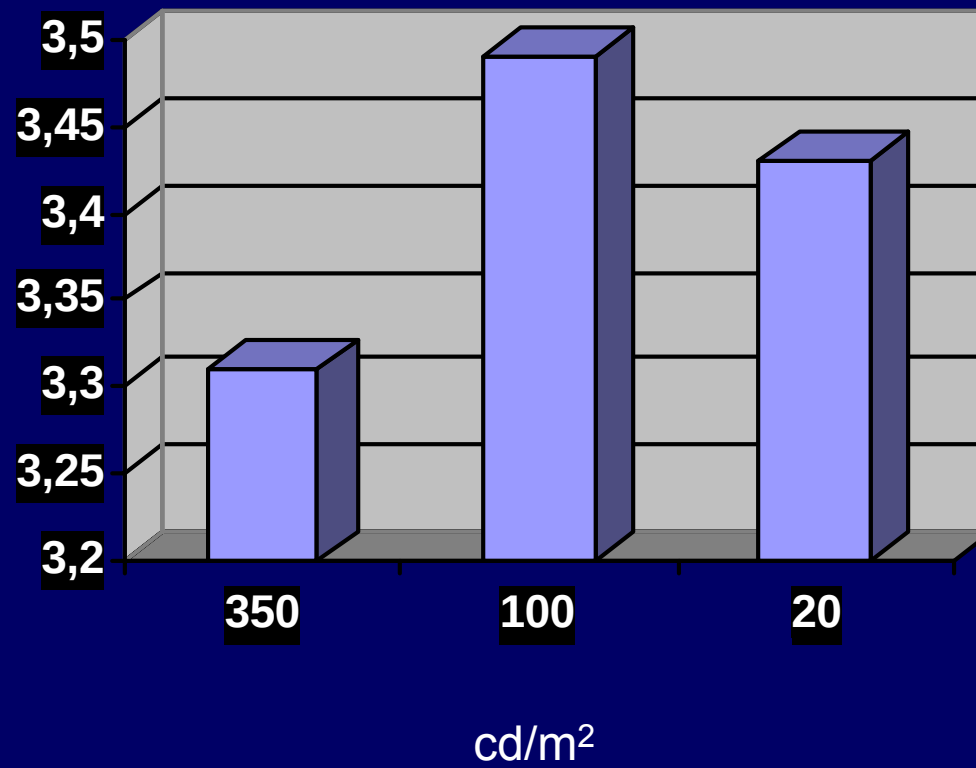
Emotions: Activation

Points (1-4)



Emotions: Evaluation Positive

Points (1-4)



Ljusfördelning i klassrummet

Kontroll rum (C1/C2)



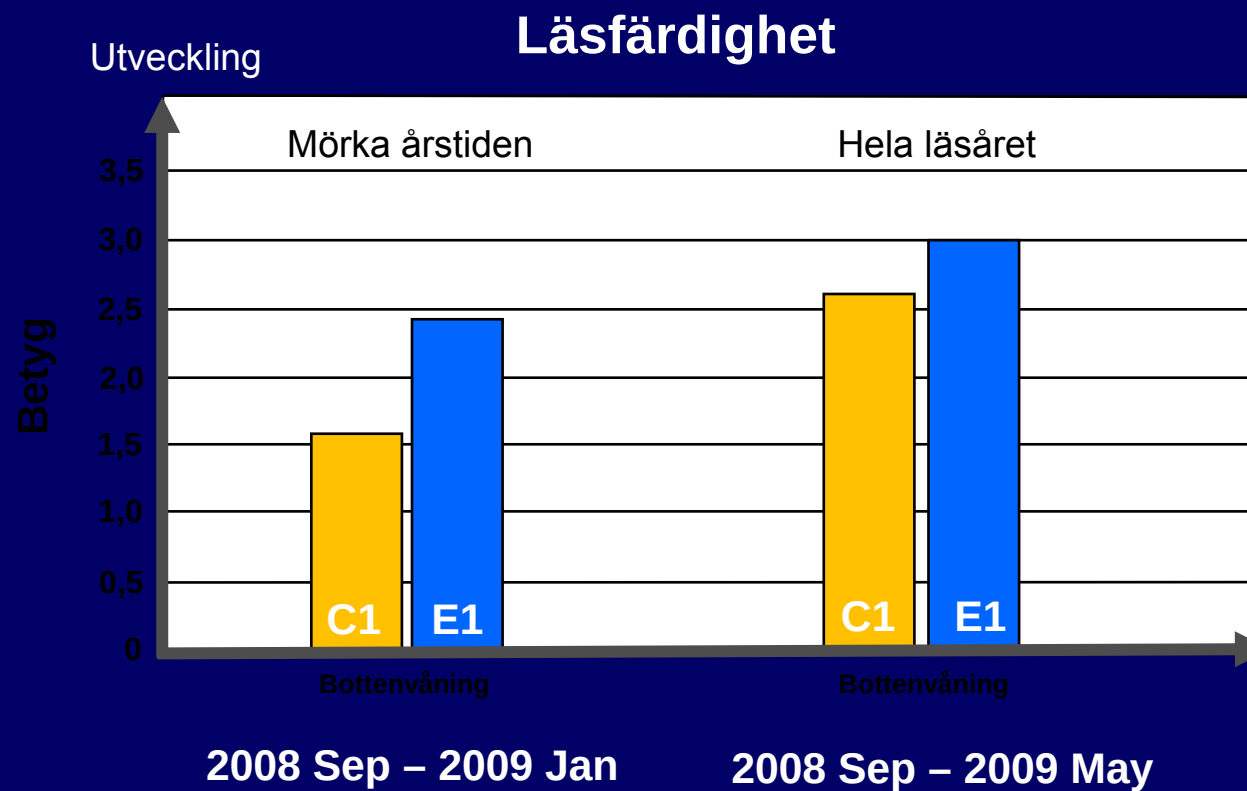
55 / 45 %

Experiment rum (E1/E2)



25 / 75 %

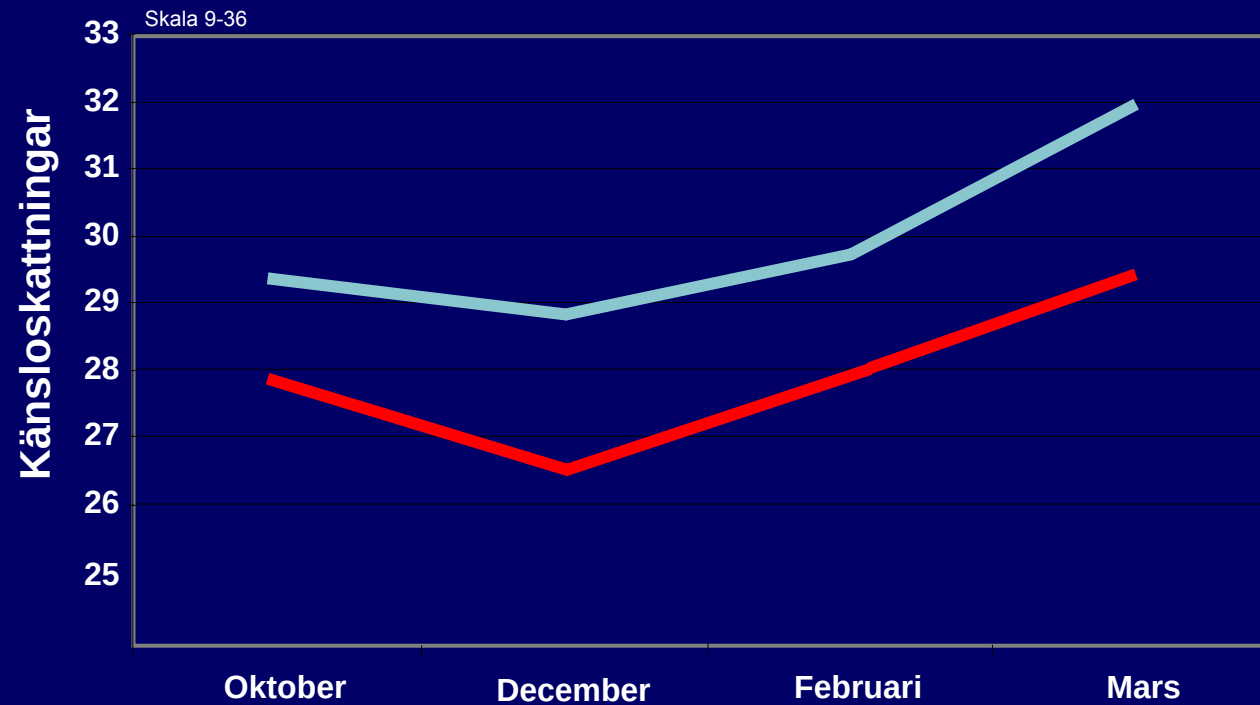
Resultat av jämförelsen



ANOVA Repeated Measures: Sep to Jan $F(1,24)=11,87$, $p=.002$



Resultat av jämförelsen



Känsluskattningar ANOVA Repeated Measures $p=.001$, between $p=.012$



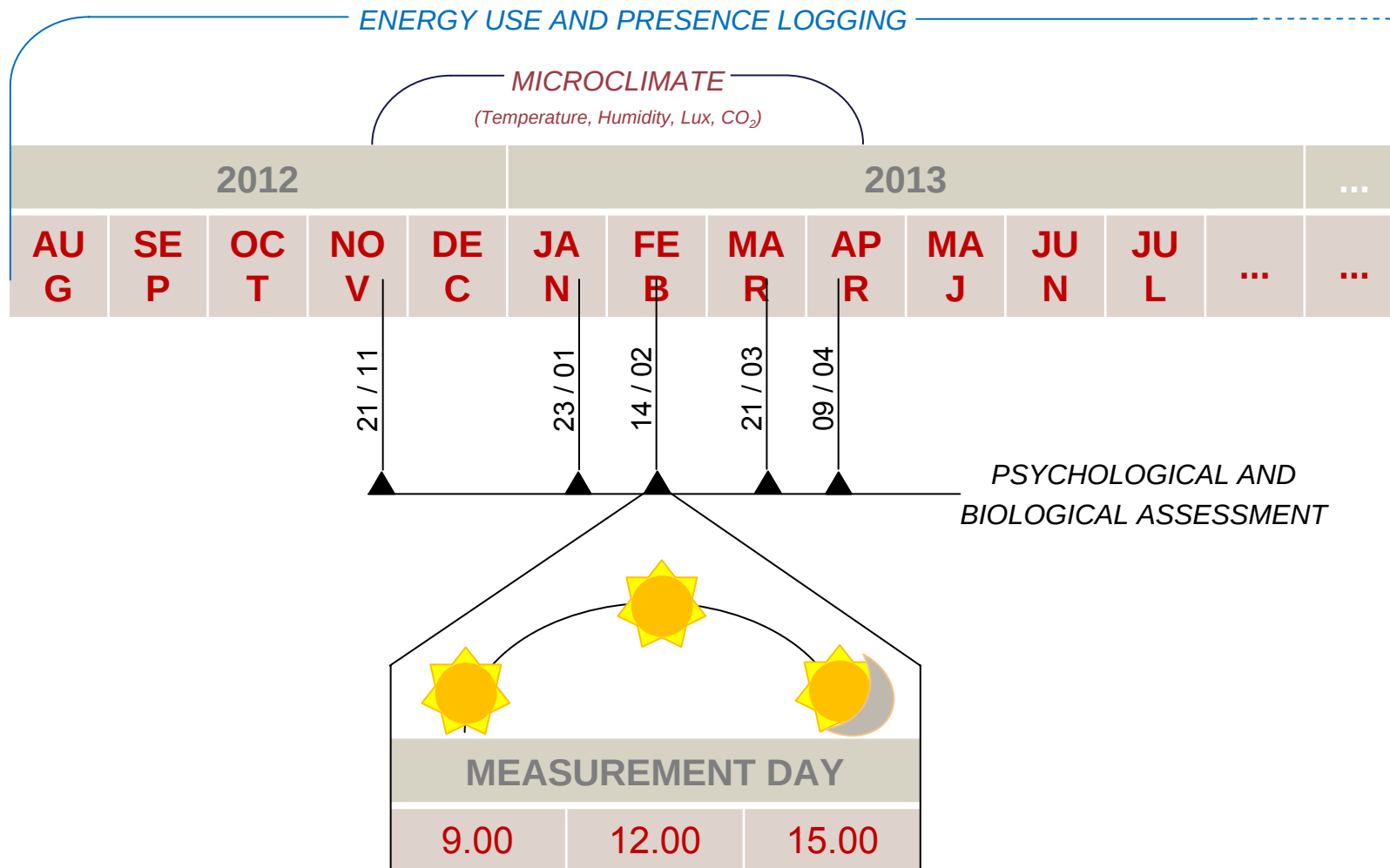
Methods: geometry and electric lighting

Experimental LED



Control 15

Methods: schedule of measurements

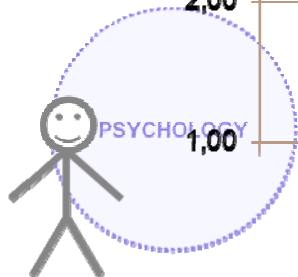
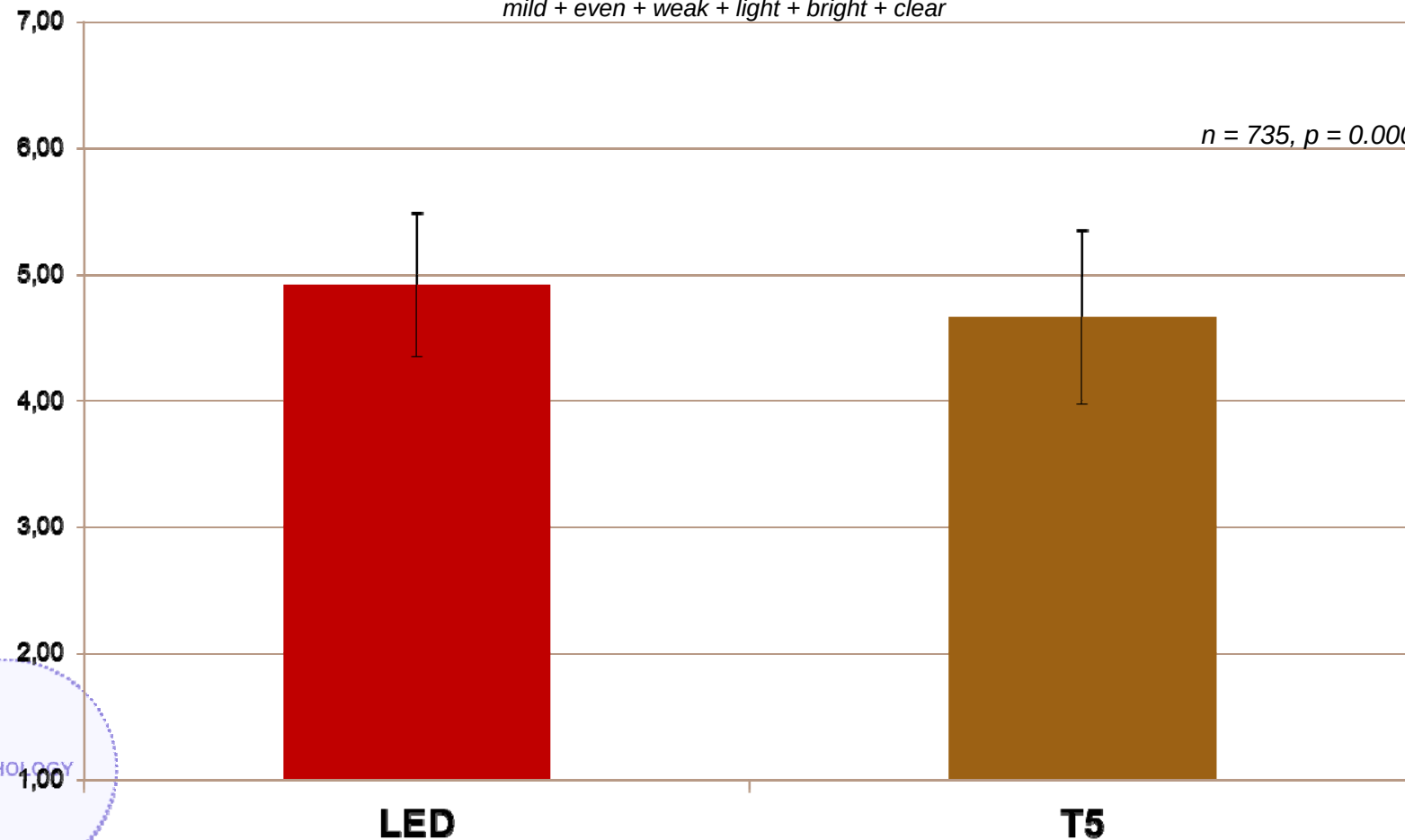


Results: psychological assessments

Perceived quantity of light

mild + even + weak + light + bright + clear

n = 735, p = 0.000

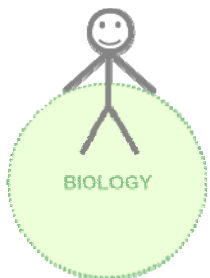
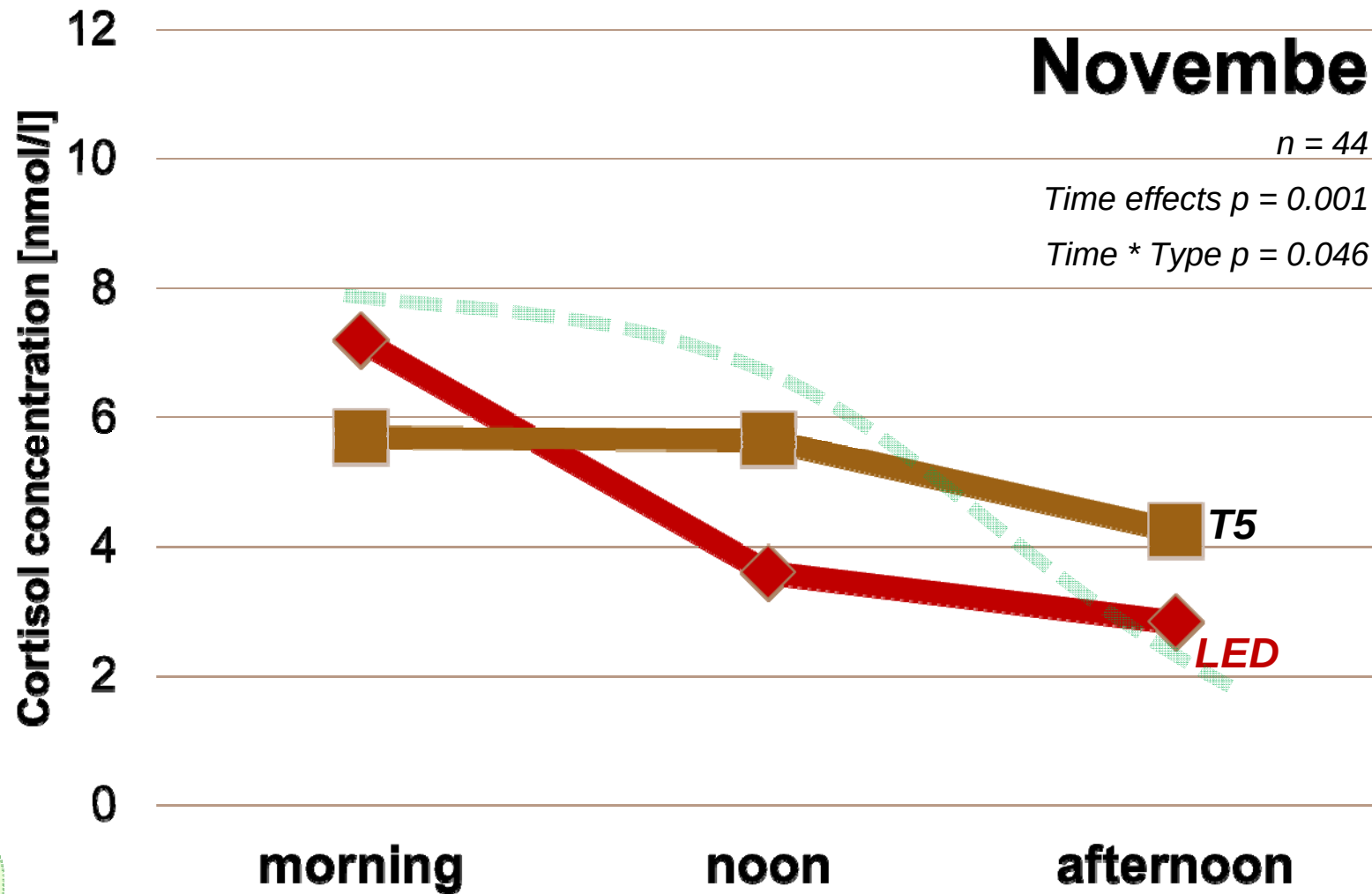


November

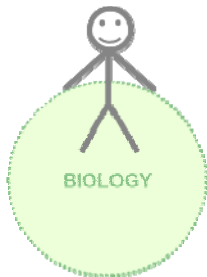
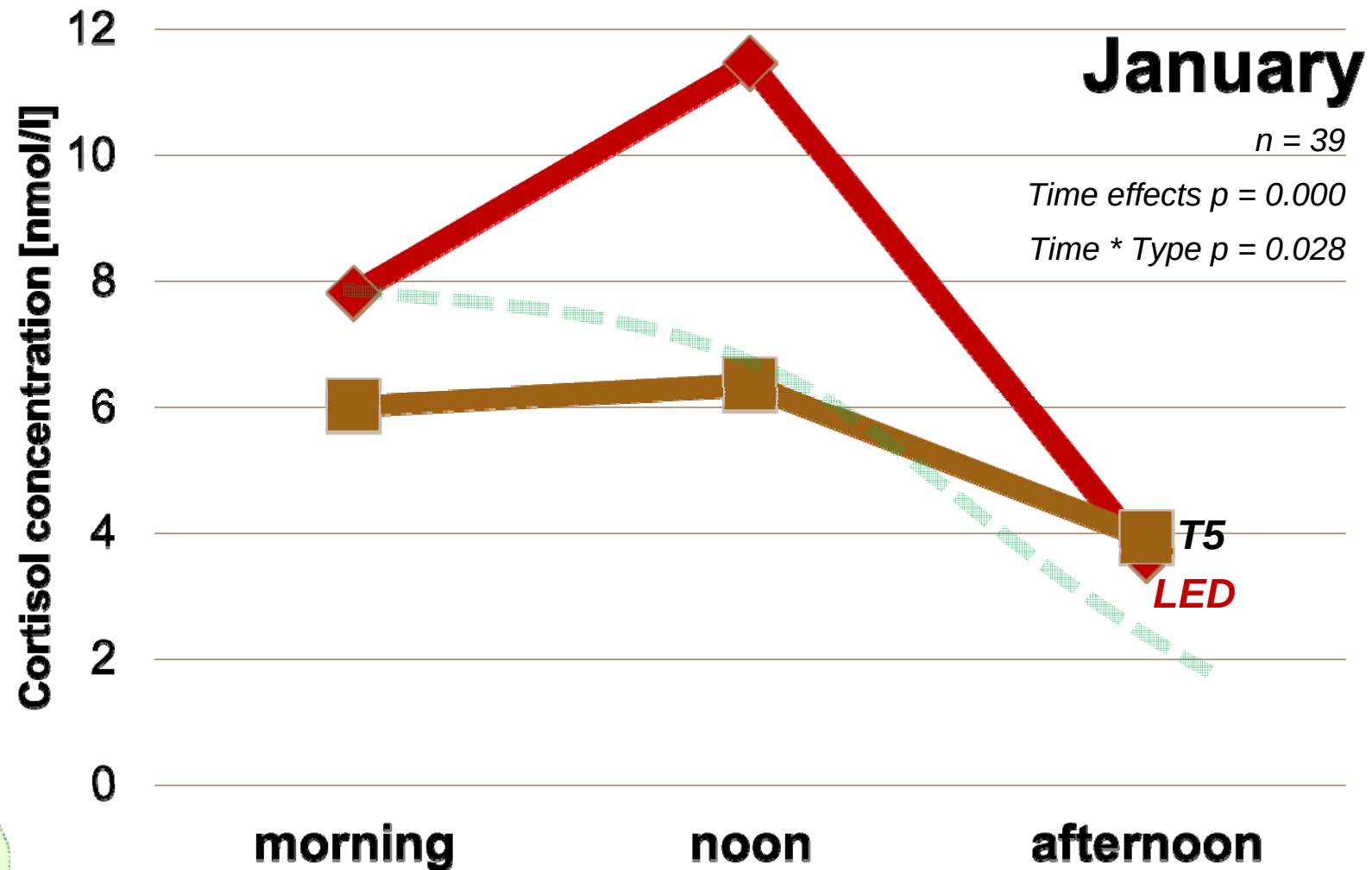
$n = 44$

Time effects $p = 0.001$

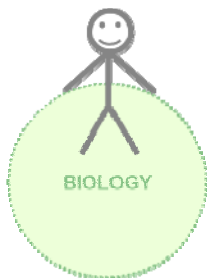
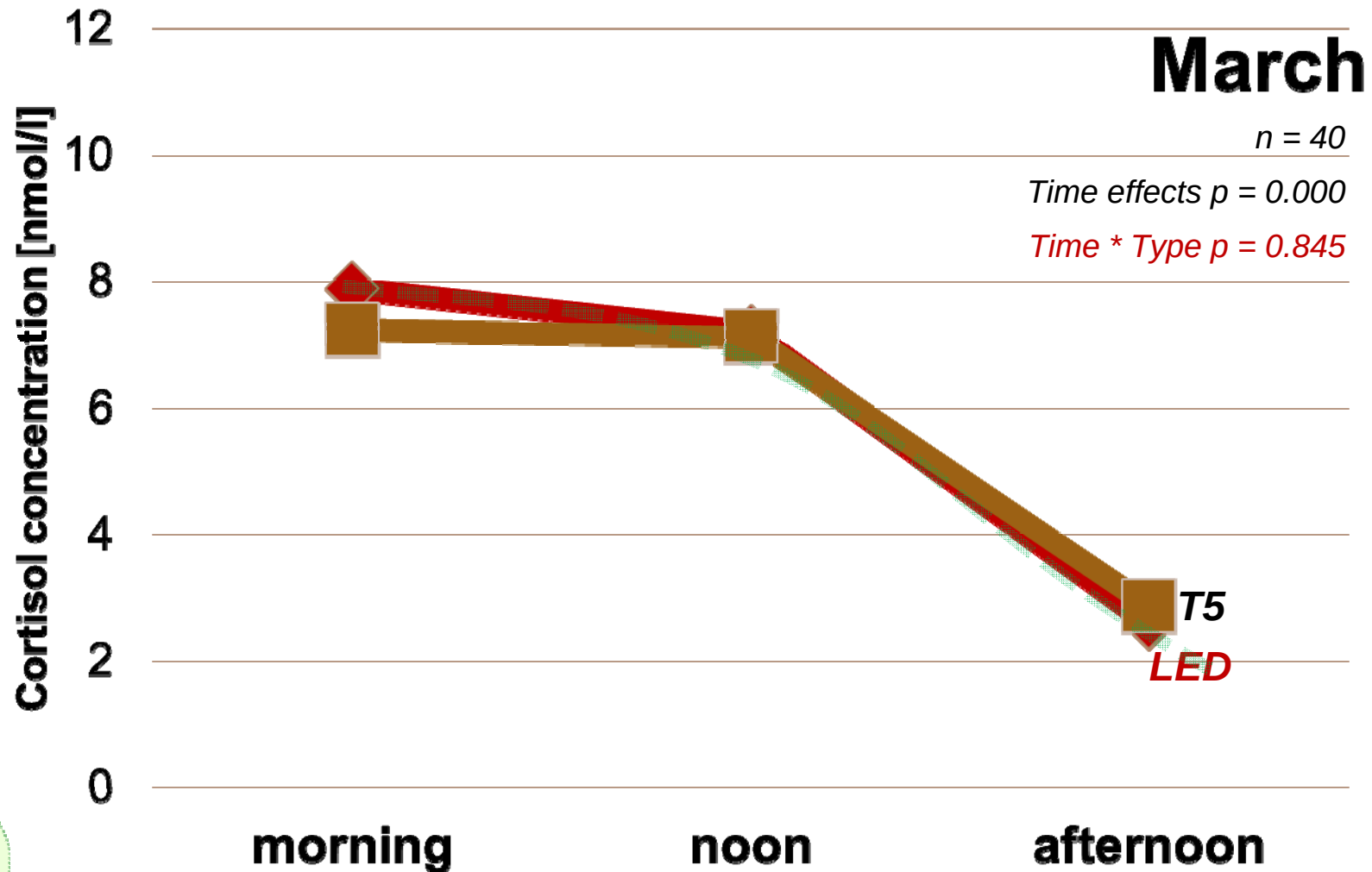
Time * Type $p = 0.046$



Results: biological evaluation



Results: biological evaluation



Evaluation of a lighting system

