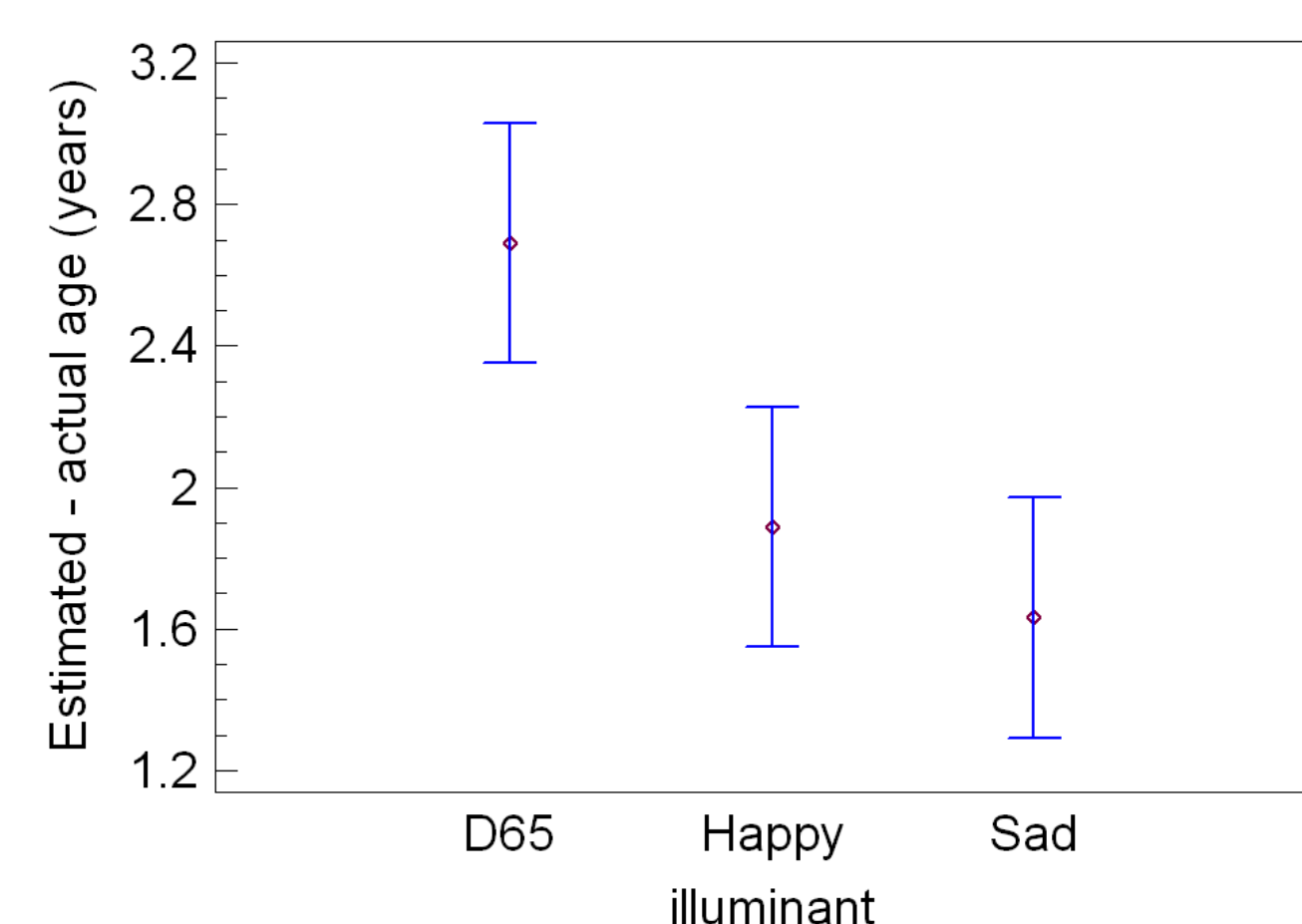
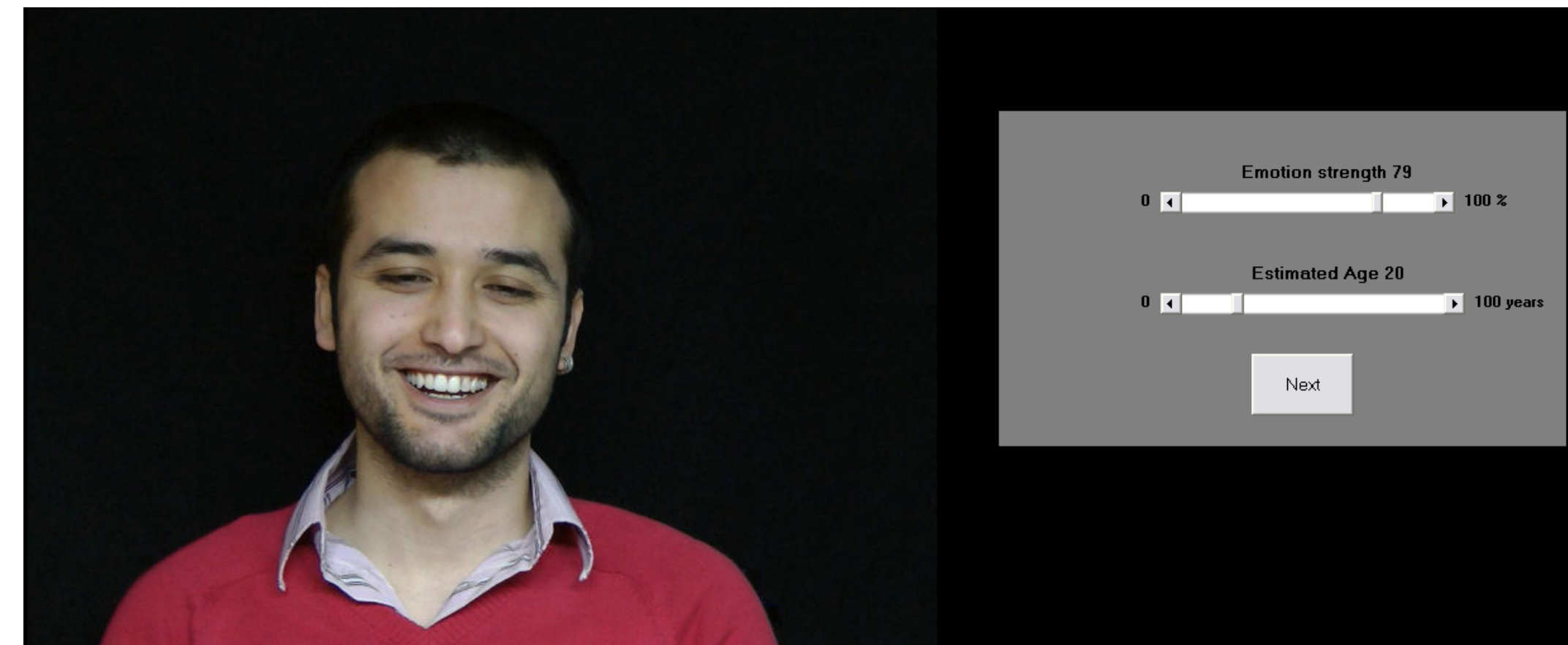


Introduction

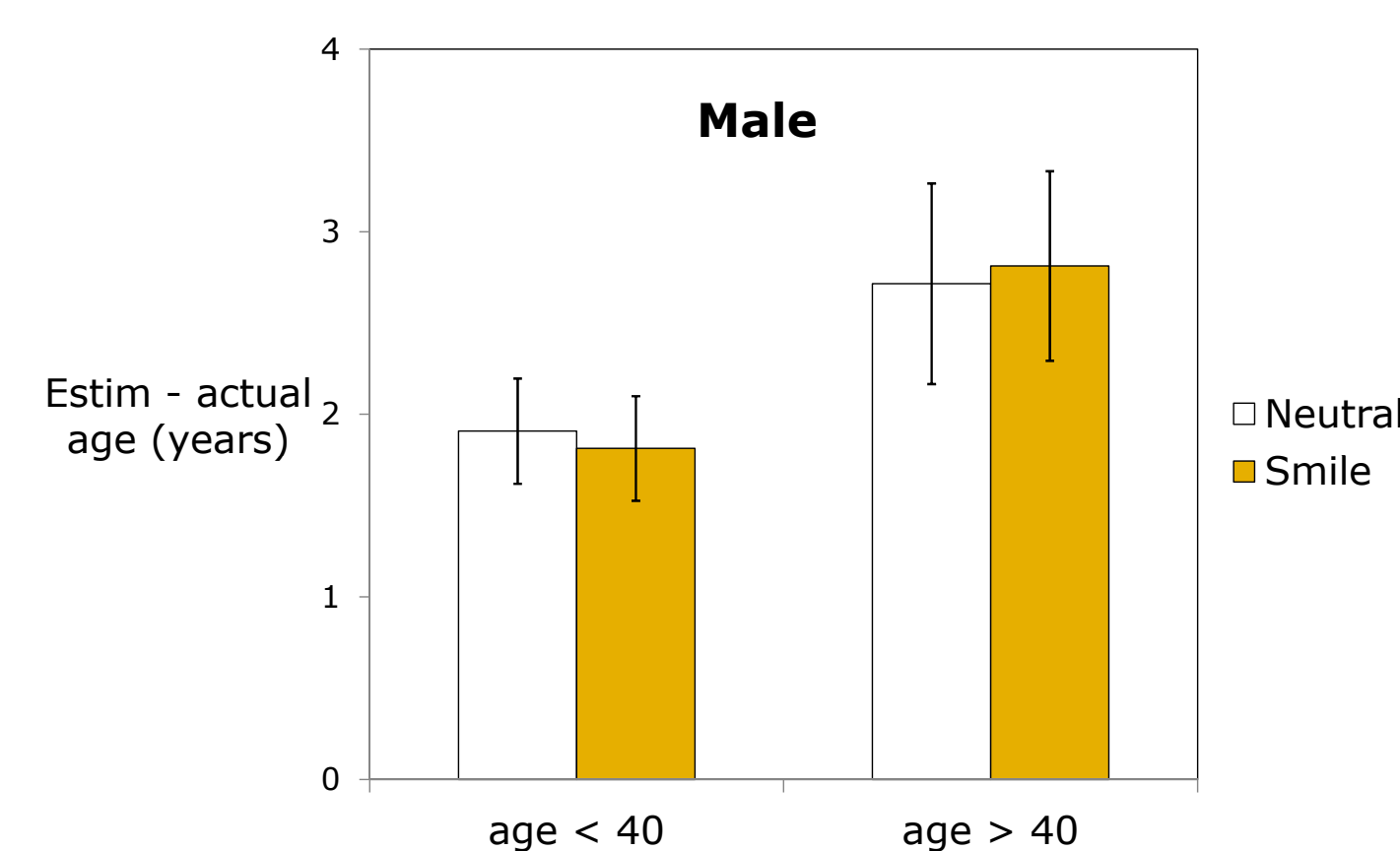
Age estimation (by computers or humans) is of great practical value, for example in cases where a minimum age is required to buy alcohol or cigarettes. Several factors may have an effect on perceived age, including facial expression¹.

We here describe two experiments showing that smiling and colored illumination can alter perceived age.

Experiment 2: smiling faces

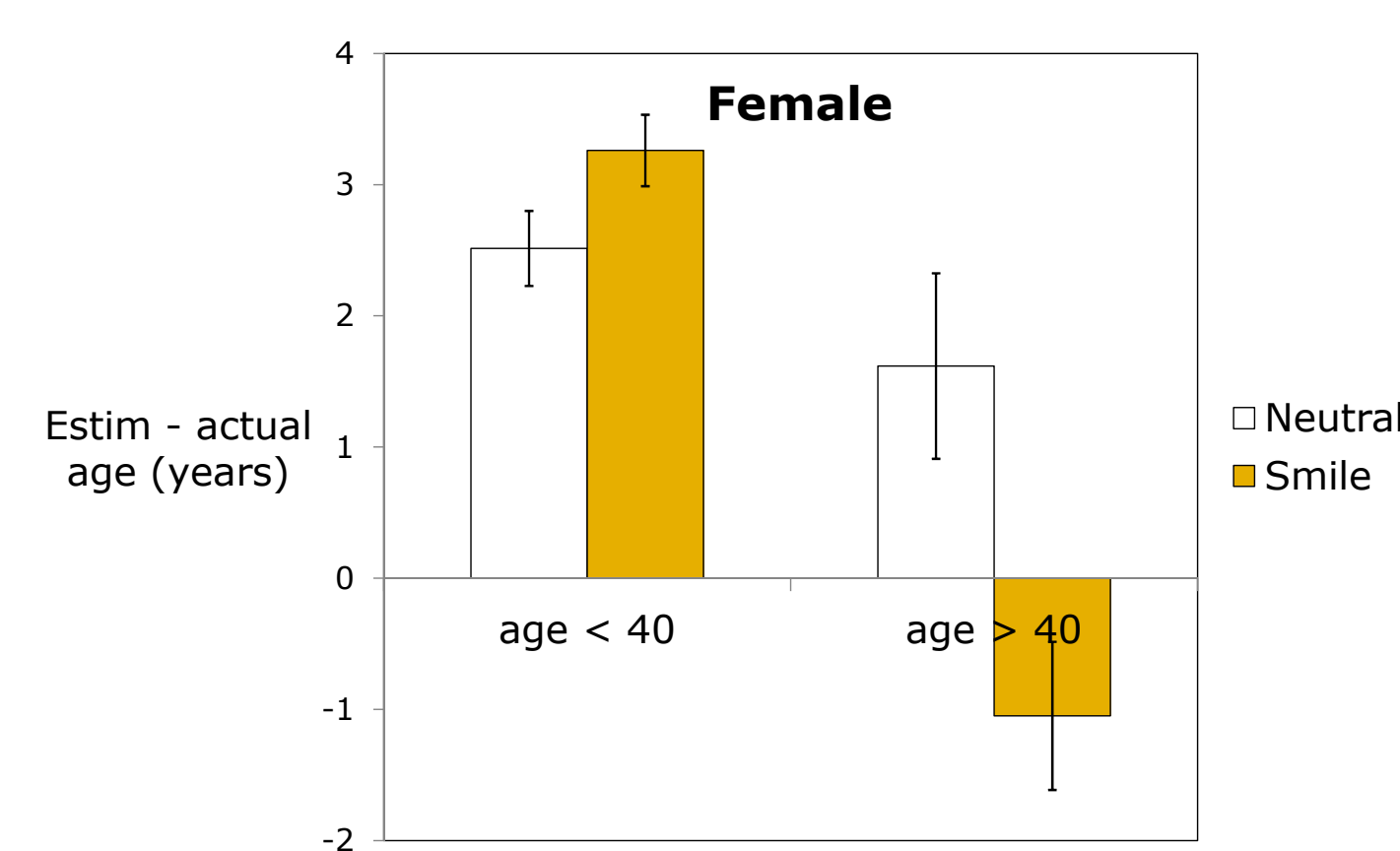


Significant effect of illuminant on estimated age ($p=0.004$)



No effect of smiling on estimated age for male faces

age < 40 $p=0.84$ age > 40 $p=0.78$



Effect of smiling on estimated age for female faces

age < 40 $p=0.016$ age > 40 $p < 10^{-4}$

Method

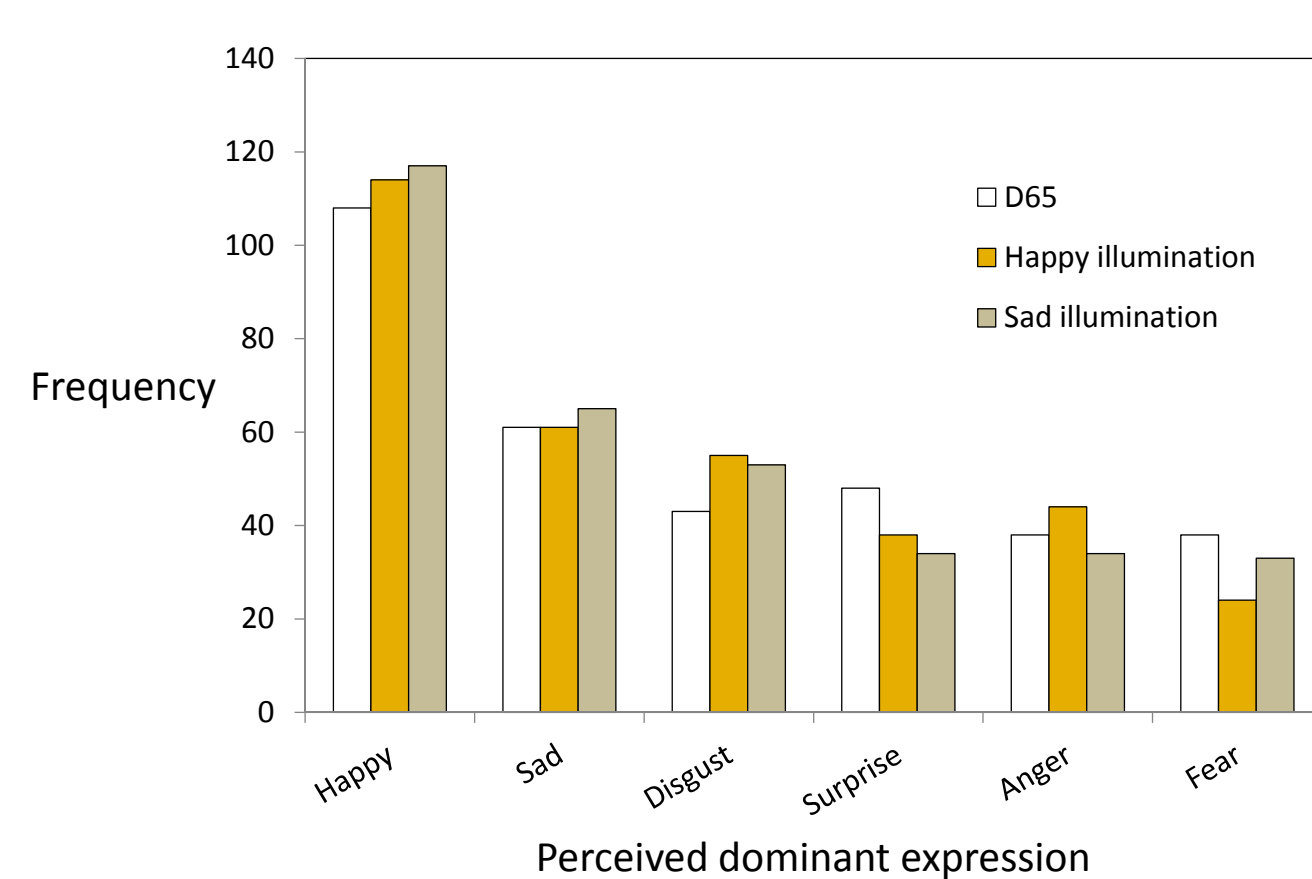
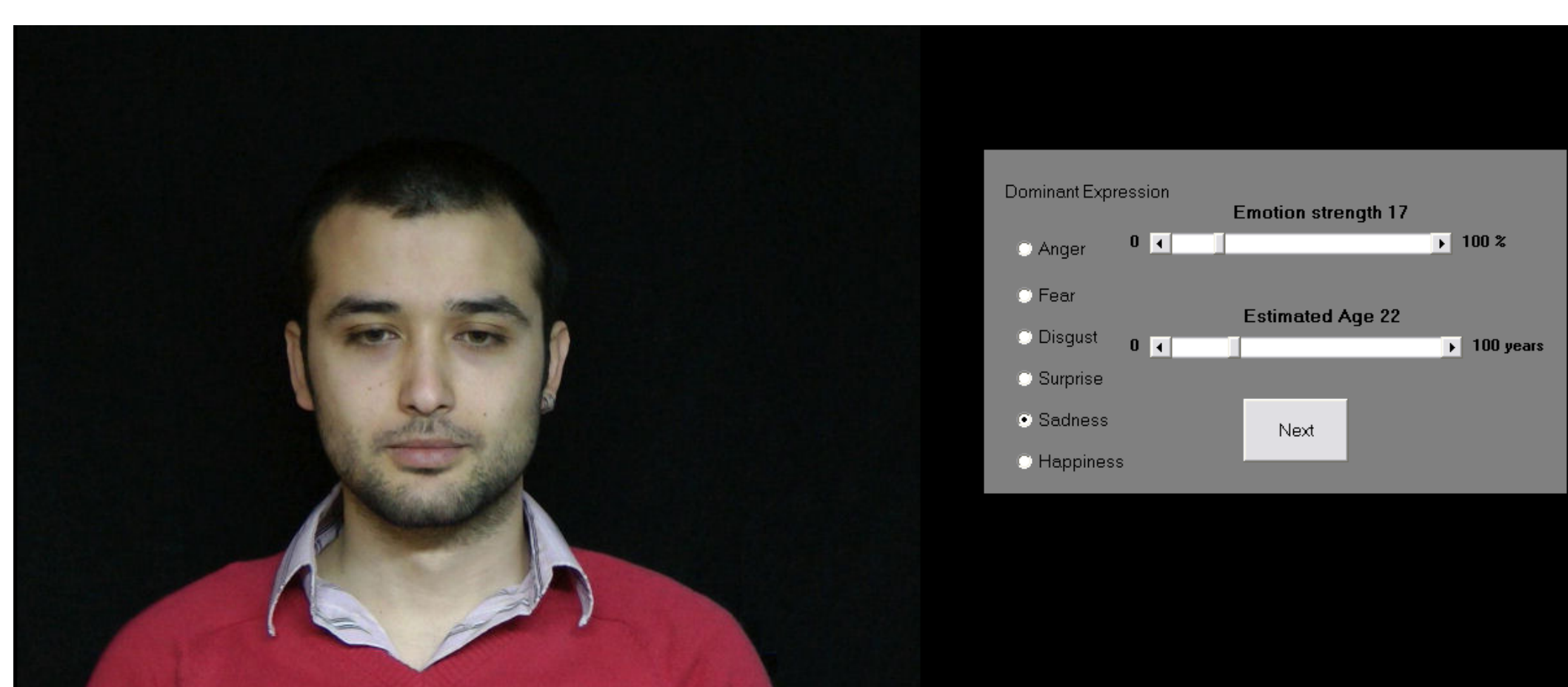
84 faces (42 M/42 F) were selected from the UvA-NEMO smile database^{2,3}. Age ranged from 8 to 76 years. From each video, two frames were extracted showing a neutral face and a spontaneous smile.

Images were captured under D65 illumination and rendered⁴ under two illuminants *Happy* and *Sad*. Under Happy and Sad illumination a white object will take on the color that people associate with a happy and a sad face⁵.



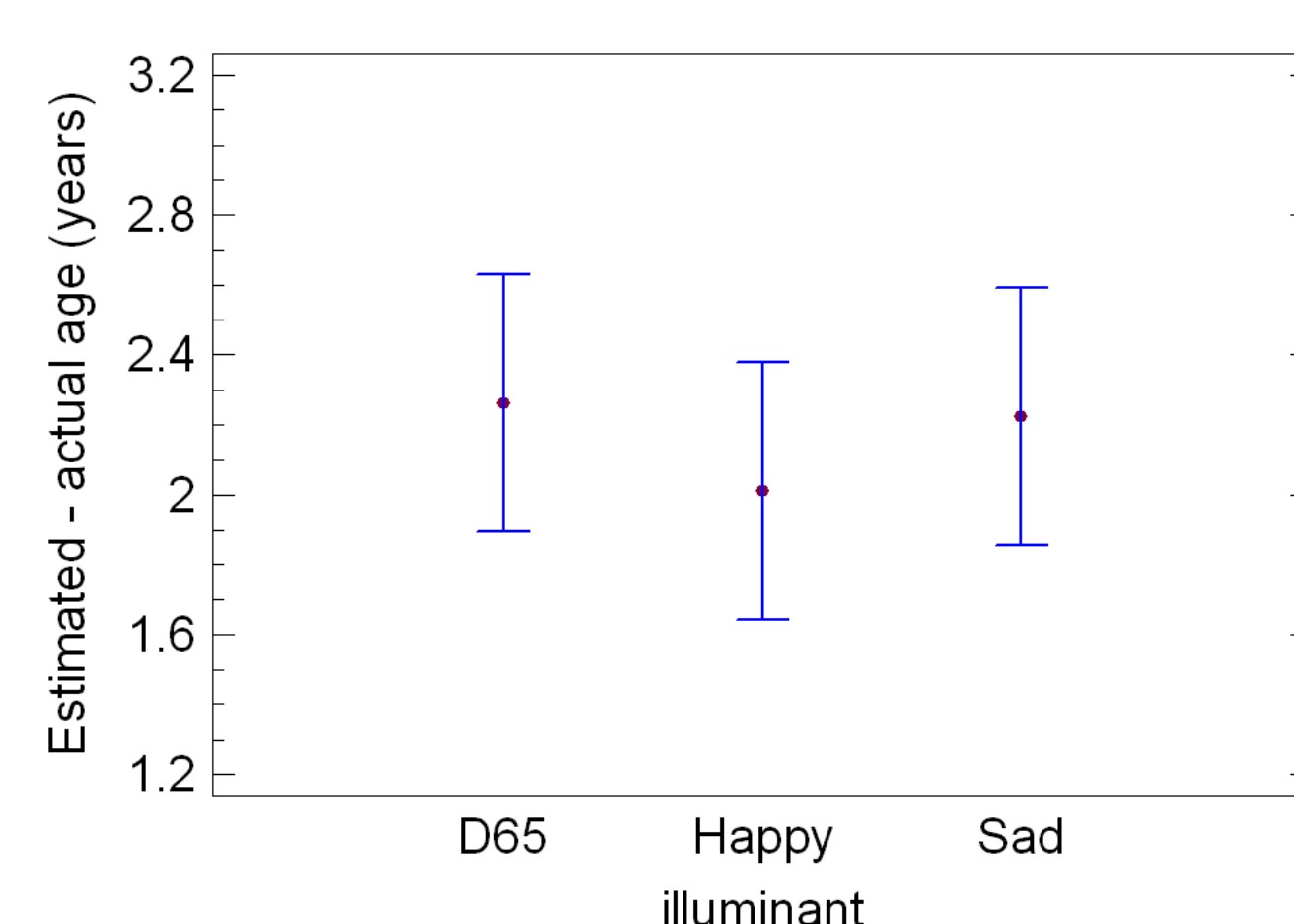
Images with faces were shown on a calibrated color monitor. 24 subjects rated type/strength of facial expression, and estimated the age.

Experiment 1: neutral faces



Subjects did not know faces were neutral

No significant effect of illuminant on perceived dominant expression ($p=0.64$)



No significant effect of illuminant on estimated age ($p=0.77$)

Conclusion

Perceived age of faces is affected by smile and illumination. Under colored illumination age estimation is more accurate. When smiling, women younger than 40 look older, and women older than 40 look younger.

Acknowledgement

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