

DISCOMFORT GLARE FROM DAYLIGHTING

STUDY OF FACTORS INFLUENCING DISCOMFORT GLARE PERCEPTION AND VALIDATION OF A UNIVERSAL DISCOMFORT GLARE INDEX

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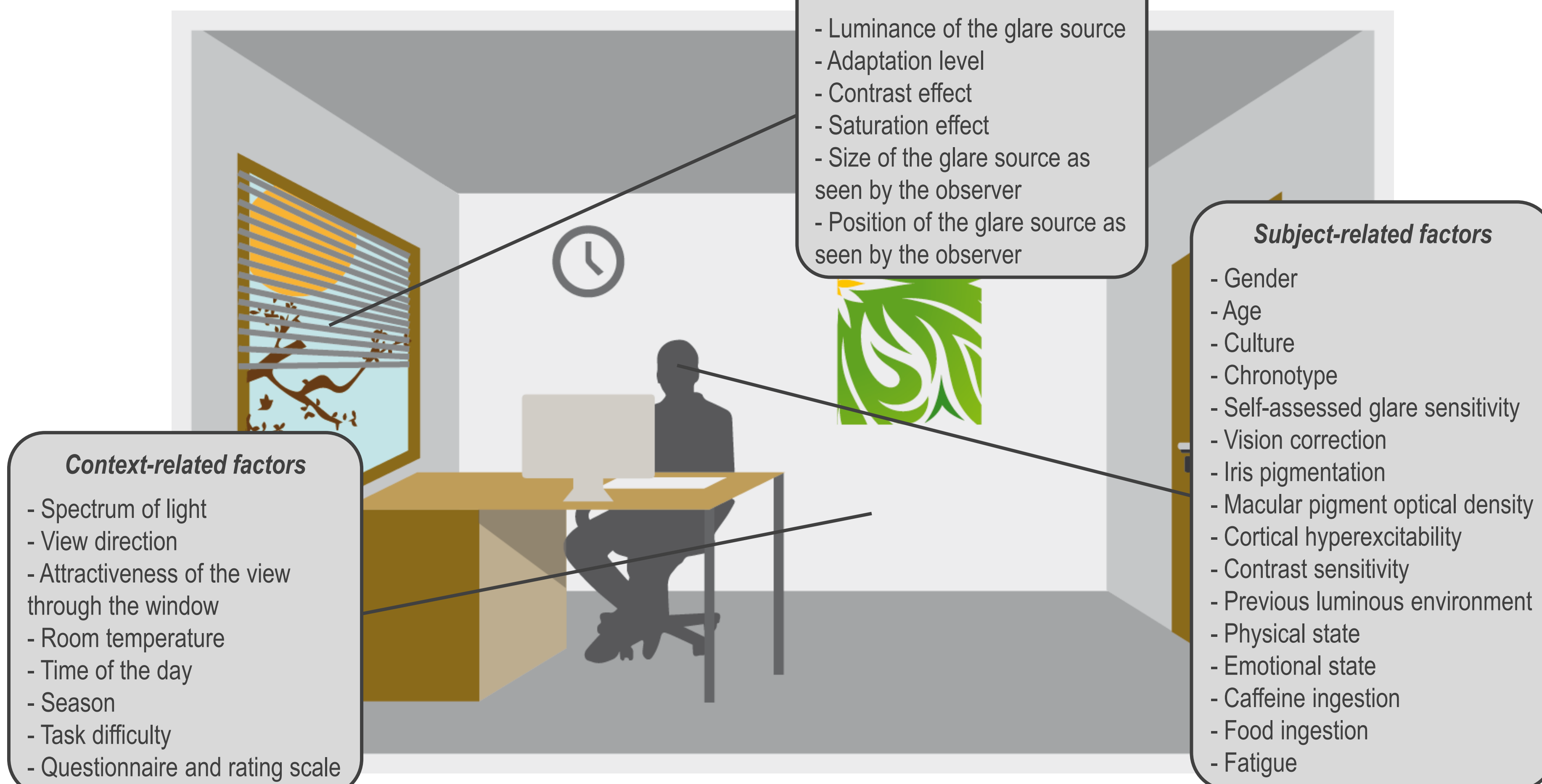


CONTEXT

Nowadays, **NO index** can explain the **great variability** existing between subjects' **discomfort glare perception**! However, automatic systems (that manage visual comfort) and European standards are being developed based on discomfort glare indices.

→ Which factors affect discomfort glare perception in daylighting and how to compile these factors in a formula so that discomfort glare from daylighting can be more accurately and universally predicted?

From literature, **30 potential factors** identified:



VELUX Daylight Symposium, May 2017

OBJECTIVES

→ Determine whether these factors* have an influence on discomfort glare perception

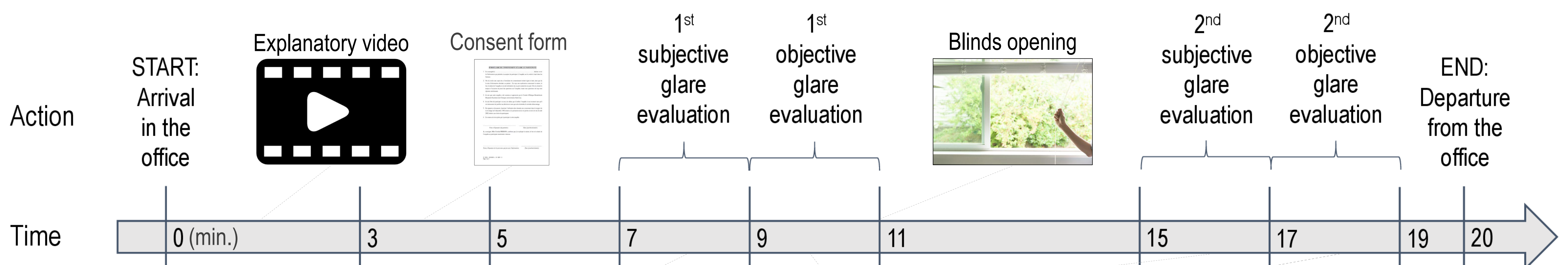
* attractiveness of the view through the window
room temperature
time of the day
gender
age
culture
chronotype
self-assessed glare sensitivity
vision correction
iris pigmentation
physical state
emotional state
caffeine ingestion
fatigue

→ Determine the influence of culture

→ Suggest a modified DGP index, which includes newly found factor(s)

METHODOLOGY

In-situ discomfort glare experiment



Where and when?

Chile		
03/2017 (summer)	85 subjects	
Belgium		
08/2017 (summer)	155 subjects	
Japan		
07/2018 (summer)	60 subjects	
Total	300 subjects	



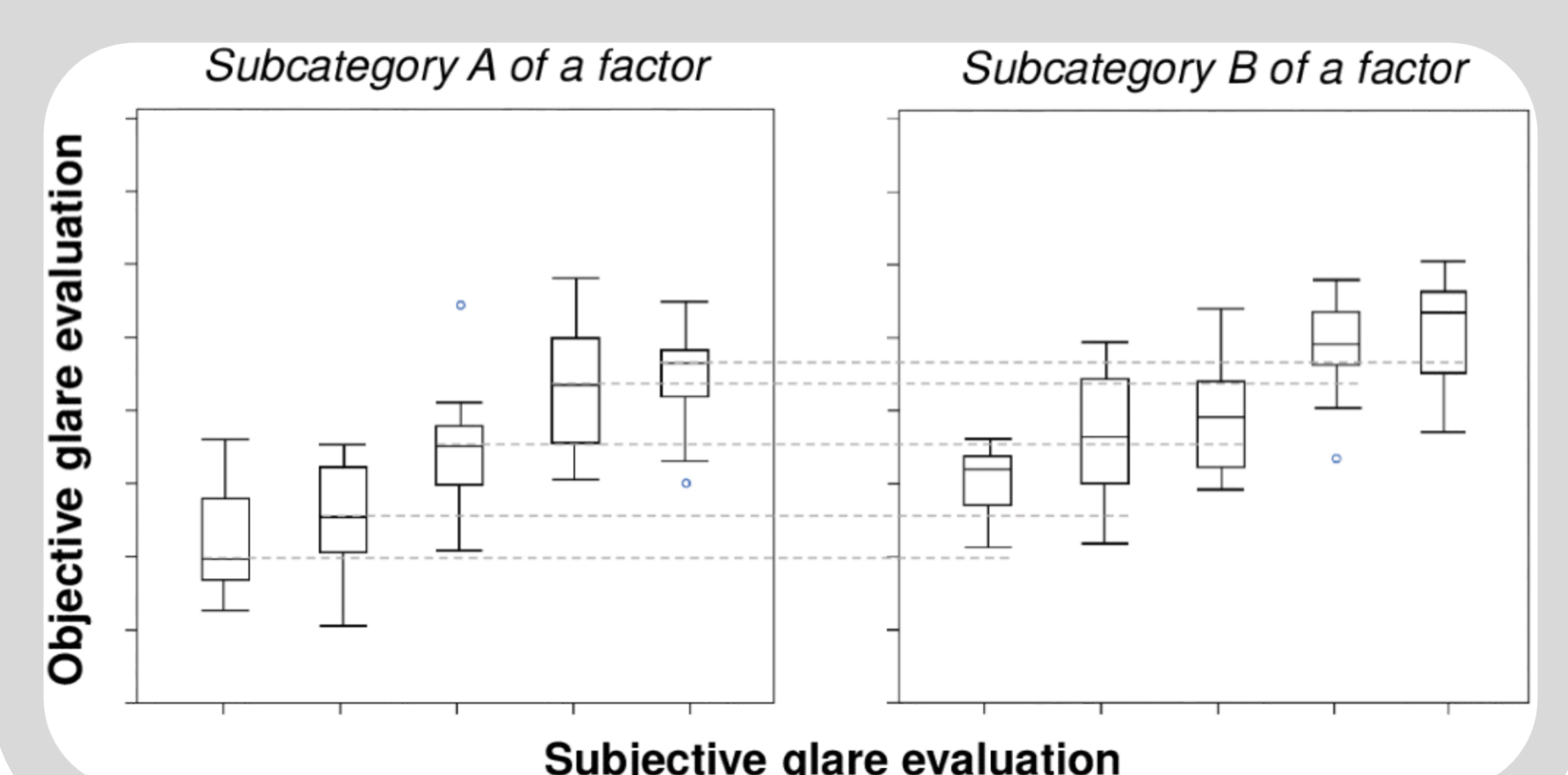
Subjective glare evaluation with a questionnaire



Objective glare evaluation with HDR images

Statistical analyses

Comparison between subcategories of each studied factor* to detect influential ones:



EXPECTED RESULTS

Modification of a discomfort glare index:

$$\text{Discomfort Glare Perception} = f\left(\frac{L_s * \omega}{L_b * P}, V_1, V_2, \dots\right)$$

with

L_s = luminance of the glare source [cd/m²]

ω = solid angle of the glare source [-]

L_b = luminance of the background [cd/m²]

P = position index of the glare source [-]

$V_1, V_2, \dots$ = other variables*² influencing discomfort glare perception

*² variables related to the lighting
related to the subject
related to the context

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CONTACT

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