OBJECTIVES

The overall aim of this work is to develop a rational scientific basis to assess human-centric lighting, whose final goal is to provide an adequate balance between visual and non-visual aspects in workspaces. The underlying research question that defines the nature of this research tries to delimit whether non-visual effects may constitute a dominant driver for determining quality of lighting conditions in a working context or not, and how these seem to interact with visual factors.

OVERVIEW

Few models are currently available to embed non-visual lighting in a design decision-making process beyond the ability to compare how effective different sources are expected to be generating non-visual effects. One model has been proposed that goes beyond this approach and attempts to address non-visual lighting in a design context, called the non-visual Direct Response model (nvRD) (Amundadottir, 2016), developed alongside another novel model for visual interest of daylight composition, named modified Spatial Contrast model (mSC) (Rockcastle, 2017).

HUMAN-CENTRIC LIGHTING

COMPONENTS

VISUAL ASPECTS
- visual comfort (illuminance and glare)
- visual interest

NON-VISUAL ASPECTS
- direct effects

EVALUATION

objective
- glare avoidance (DGP)
- illuminance on task (UDI)
- perceptual performance (mSC)
- alertness (nvRD)

subjective
- point in time self-rated surveys

context

working and learning environments

MED BUILDING, EPFL (CH)

9-day monitoring
9am to 5pm
clear and overcast sky conditions
two orientations (East / West)
29 offices
40 participants

ALERTNESS ASSESSMENT

<table>
<thead>
<tr>
<th>Orientation</th>
<th>Time of day</th>
<th>Weather condition</th>
<th>Num. of responses</th>
<th>Subjective response (1-9)</th>
<th>Relative value (0-1)</th>
<th>Cumulative value (0-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>Morning</td>
<td>Clear sky</td>
<td>63</td>
<td>6.3</td>
<td>0.94</td>
<td>3.30</td>
</tr>
<tr>
<td>West</td>
<td>Morning</td>
<td>Clear sky</td>
<td>57</td>
<td>6.3</td>
<td>0.97</td>
<td>3.30</td>
</tr>
<tr>
<td>East</td>
<td>Afternoon</td>
<td>Clear sky</td>
<td>62</td>
<td>6.0</td>
<td>0.90</td>
<td>6.89</td>
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<tr>
<td>West</td>
<td>Afternoon</td>
<td>Clear sky</td>
<td>55</td>
<td>5.8</td>
<td>1.00</td>
<td>7.86</td>
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<th>Cumulative value (0-8)</th>
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<tbody>
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<td>East</td>
<td>Morning</td>
<td>Overcast sky</td>
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<td>0.80</td>
<td>2.73</td>
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<td>Morning</td>
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