

Amsterdam University of Applied Sciences

(Eye)tracking users' patterns

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ANFA

The Academy of Neuroscience for Architecture

SHARED BEHAVIORAL OUTCOMES PRESENTED POSTERS

SEPTEMBER 20-22, 2018

SALK INSTITUTE

(EYE)TRACKING USERS' PATTERNS: VISUAL EXPERIENCE AND CHOICE BEHAVIOR IN TRANSITION ZONES OF AMSTERDAM-SOUTHEAST

ABSTRACT

Over the next 10 years, the City of Amsterdam plans to develop major housing schemes to provide 90,000 new homes within the existing urban fabric. At the same time, an urban renewal program is being launched to revitalize the most deprived neighbourhoods. Together, these challenges call for more evidence based design-principles to secure liveable places. Recent development in neuroscience, provides innovative tools to examine in a measurable, cause effect way, the relationships between the physical fabric, users' (visual) experience and their behavior in public spaces. In neuroscience, eye-tracking technology (ET) complements brain and behavioral measures (for overview see Eckstein et al. 2017). ET is already used to evaluate the spatial orienting of attention, behavioral response and emotional and cognitive impact in neuroscience, psychology and market research (Popa et al. 2015). ET may also radically change the way we (re)design and thus, experience cities (Sita et al. 2016; Andreani 2017). Until now, eyetracking pilot studies collected eye fixation patterns of architecture using images in a lab-setting (Lebrun 2016).

In our research project Sensing Streetscapes, we take eye-tracking outdoors and explore the potential ET may offer for city design. In collaboration with the municipality of Amsterdam and the local community, the H-neighborhood is used as a single case study. The main focus for urban renewal lies in the "transition-spaces". They connect the neighborhood with the rapidly developing adjacent areas and are vital for improving

the weak social-economic status. The commonly used design principles are validated (Alexander et al. 1977; Gehl 2011, 2014; Pallasmaa 2012) and the consistency of ET is tested, alongside (walk along) interviews and behavioral observations. In the next phase, the data will be analyzed by a panel of applied psychologists and urban designers.

The initial results provide valuable lessons for the use of eye-tracking in urban design research. For example, a visual pattern analysis offers more accurate images of the spatial key-elements that matters when moving through transition spaces. More sensory-based city design research is needed to gather a full understanding of the relationships between the configuration of space, users' (visual) experience, behavioral responses and in turn, perceptual decision making.



Fig.1 The 34 neighbourhoods designated for urban renewal in Amsterdam. AUAS active alongside action-research in three neighbourhoods including the H-neighborhood in the Southeast.

CASE STUDY H-NEIGHBORHOOD

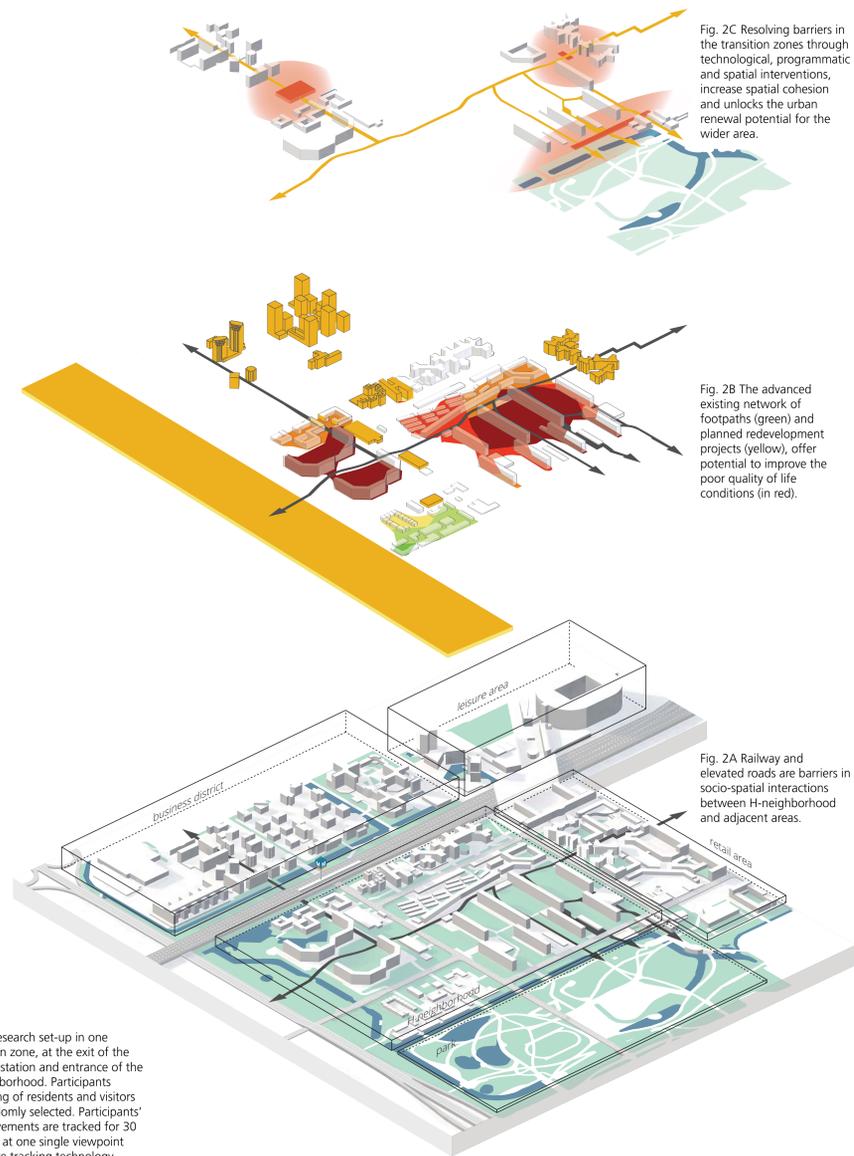


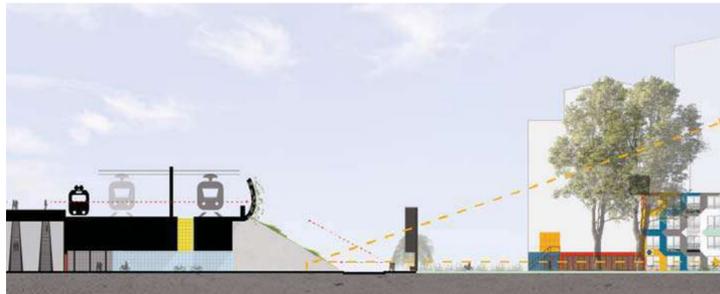
Fig. 2C Resolving barriers in the transition zones through technological, programmatic and spatial interventions, increase spatial cohesion and unlocks the urban renewal potential for the wider area.

Fig. 2B The advanced existing network of footpaths (green) and planned redevelopment projects (yellow), offer potential to improve the poor quality of life conditions (in red).

Fig. 2A Railway and elevated roads are barriers in socio-spatial interactions between H-neighborhood and adjacent areas.

Fig. 3 Research set-up in one transition zone, at the exit of the subway station and entrance of the H-neighborhood. Participants consisting of residents and visitors are randomly selected. Participants' eye movements are tracked for 30 seconds at one single viewpoint using eye tracking technology.

TRANSITION ZONE



USERS' VISUAL EXPERIENCE



PRELIMINARY FINDINGS



Fig. 3A Buildings with windows and in particular balconies, catch the eye.



Fig. 3B Interestingly, a large black flagpole shaped object was left unnoticed. One reason could be that the black colour worked as a blind spot due to the colourful buildings in the background.



Fig. 3C The underpass to the coffee bar including the signboard above draws the attention of several participants.



Fig. 3D Traffic such as pedestrians, cars and cyclists crossing the street deliver the most eye fixation.

NEXT STEP

Currently, the meta-data output consisting of eye patterns, behavioural responses and user perceptions, are analyzed by a panel of experts such as urban designers.

The research is taken forward to investigate opportunities to enhance human centred urban design through eye tracking research where urban densification continues.

Therefore, we are seeking for researchers from universities, research institutes and practitioners to join forces in this new field of research.