Sustainable Cognitive Ageing: What Role for the Physical and Social Environments?

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Abstract

The idea that the lived environment, physical and social, interacts with individual skills to produce adaptive (or maladaptive) behavior is not new. However a comprehensive account of how the environment affects cognitive changes with ageing and in turn the ageing individual may change the environment is still lacking. Technology offers now new avenues to study the individual-environment interaction and potential to induce adaptive changes supporting independent living in older adults.

Author Keywords

Ageing; cognition; environment; neighborhood; walkability; attention;

Introduction

The lived environment can represent a challenge and an opportunity for cognitive ageing. Physical and mental health are influenced by an individual's interaction with the environment, either rural or urban [1]. This fact is particularly relevant considering the global trends of population ageing and urbanisation. Given the crucial role of cognitive health in maintaining autonomy and quality of life in older age, there has been a growing interest in environmental influences on cognitive ageing. Particularly, social and socio-economic factors contributing in maintained cognitive abilities in older age have been found [2].

The interest in environment-individual interaction in relation to cognition is at least partly grounded in the tradition of Embodied and Situated Cognition [3]. In this interactive perspective the environment offers, or 'affords', certain behaviors and exert a level of 'press'

on the individual [4, 5]. For example a traffic light on a large cross-road may only afford crossing to younger but not older frail individuals who would require a longer time [6]. At the same time, attempting to cross the road at the traffic light is a form of dual tasking (walking, paying attention to the light and other pedestrians) which constitute cognitive stimulation as well as requiring a certain amount of cognitive effort. In fact it has been shown that the type of stimulation that different environments offer is associated with different cognitive abilities such as the attention and some environments, notably green environments, are more restorative for attention than urban landscapes. More complex and cluttered environments are more difficult to navigate for older people. The burden on cognition in dealing with complex environments has been shown in laboratory tasks [7] and in terms of choice of transportation and routes [8].

Technology and lived environment
The present paper is aimed at stimulating debate on two main issues derived from the tradition of studies briefly summarized above: 1) whether it is possible to individuate ways to capitalize on the current technological advancements in tracking and portable fitness to quantify the kind/quantity of environmental stimulation processed on-line by the individual and, potentially his/her reactions to the environment to assess environmental cognitive load; for example is it possible to track not only how much movement but also how much social interaction a person experiences when outdoor? How much noise one is subjected to? Have they to deal with traffic? This cognitive load could then be alleviated by community initiatives such as the Mobility Ambassadors

(http://www.seniormobility.org/ambassadors.html), showing the possibility to instigate positive change in older adults with community support. Intergenerational exchange may play an important role in this regard. Virtual communities may possibly be used to extend usability of the environment, for example through online updates on traffic, presence of other people in a given place or other information of interests for the older individual.

2) The paths, in geographical sense, chosen by an individual are filled with meaning, as well expressed in the work of artists (http://www.tlclark.com/atlasofthehabitual/). Different paths and exposure to different environments are associated with different subjective experiences of the environment, which can now be tracked on a large scale thank to GPS and mobile apps [9]. Older adults can potentially build their own maps of different locations and share them with anyone who may be interested. Simple information such as availability of footpaths or benches may be of use in deciding to explore different environments but also information on pleasantness to different age groups and people with different interests.

Subjective and objective cognitive and psychological ways to live the environment may have substantially different impact on health and quality of life. Although older age brings a natural restriction of activities and a different kind of interaction with proximal environments such as neighborhoods as well as the entire urban setting, it may be possible to use technology advancement to support a more broad idea of independent living in older age and to expand the lived environment in a cognitively, psychologically and physically manageable way.

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References

[1]   Wahl H-W, Iwarsson S, Oswald F. Aging Well and the Environment: Toward an Integrative Model and Research Agenda for the Future. The Gerontologist2012 June 1, 2012;52(3):306-16.

[2]   Stern Y. Cognitive reserve. Neuropsychologia2009;47(10):2015-28.

[3]   Clark A. An embodied cognitive science? . Trends in Cognitive Sciences1999 3(9):345–51.

[4]   Gibson JJ. The Ecological Approach to Visual Perception: Psychology Press; 1986.

[5]   Lawton MP, Nahemow L. Ecology and the aging process. In: C. E, P. LM, editors. The psychology of adult development and aging Washington, DC: American Psychological Association; 1973. p. 619–74.

[6]   Romero-Ortuno R, Cogan L, Cunningham CU, Kenny RA. Do older pedestrians have enough time to cross roads in Dublin? A critique of the Traffic Management Guidelines based on clinical research findings. Age Ageing2010;39(1):80-86.

[7]   Maylor EA, Lavie N. The influence of perceptual load on age differences in selective attention. . Psychology and Aging, 1998;13(4):563.

[8]   Aksan N, Dawson JD, Emerson JL, Yu L, Uc EY, Anderson SW *et al.* Naturalistic Distraction and Driving Safety in Older Drivers. . Hum Factors J Hum Factors Ergon Soc 2013;55:841–53.

[9]   Quercia D, Aiello LM, Schifanella R. The Shortest Path to Happiness: Recommending Beautiful, Quiet, and Happy Routes in the City. Hypertext2014.