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The role of cognitive skills on the complexity of walking behaviour and on spatial navigation in urban environment.

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The complexity of cities may pose challenges to those experiencing cognitive decline due to ageing. However, there is a dearth of studies on the effects of cognitive skills on individual spatial navigation in urban environment. We examined how cognitive skills (visuospatial working memory, selective attention and cognitive flexibility) moderate the associations between the built and natural environment and the walking behaviour, including engagement in walking and the spatial complexity of walking trips.

We used mobility behaviour data from 324 adults aged ≥50 and living in Melbourne who participated to the iMAP (international Mind, Activities and urban Places) project. GPS mobility and diary data over 7 days were used to quantify the complexity of the mobility patterns and exposure context (both residential and walking trips). Participants'cognitive skills were assessed through face-to-face cognitive function tests. Multilevel regression models with random intercept at the resdential neighbourhood and participant levels were used to estimate the associations of environmental variables with walking behaviour, as well as the moderating role of cognitive skills.

Results evidenced that individuals with low cognitive skills exacerbated detrimental environmental condition for walking and are less able to adapt to challenging urban situation. Also, lower levels of cognitive flexibility, selective attention and visuospatial short-term working memory intensified the association between entropy of street network orientation and twistiness of walking routes. These results add relevant information for the relationship between urban environment and individual features on walking behaviours and suggest that cognitive skills should be a target for policies promoting walking activities.

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