

Summary in English

Active mobility, particularly walking and cycling, is shaped by the interaction between individual decision-making and broader urban conditions, linking micro- and macro-level perspectives. At the micro level, individuals make travel decisions, including route choice, by balancing priorities such as distance or environmental quality of walking or cycling routes, which together reflect individuals' demand. At the macro level, urban planning and institutional settings influence how active mobility routes, including urban greenery, are provided and connected, thereby shaping the effective supply of greenery along routes.

This dissertation focuses on one aspect of environmental quality, the presence of urban greenery along hypothetical active mobility routes. Children are an exemplary group of urban inhabitants, for whom environmental quality during walking matters greatly. They often depend on local and walkable access to urban amenities. Although these issues are important in the context of increasingly sedentary lifestyles and children's growing disconnection from nature, they remain insufficiently studied. For instance, little is known about how urban greenery and the benefits it provides are distributed across socio-economic groups and urban contexts when active mobility routes are considered. This dissertation addresses these research gaps by bringing together children's visual exposure to urban greenery along hypothetical walking routes, with a focus on socio-economic inequalities, trade-offs, and the role of proximity-based planning.

Accordingly, this dissertation is guided by three research objectives: (1) to reveal socio-economic and spatial patterns in children's visual exposure to urban greenery along their active mobility routes; (2) to identify trade-offs in children's active mobility routes between travel distance and visual exposure to urban greenery; and (3) to understand institutional and planning conditions for the equitable provision of urban greenery in children's active mobility routes.

From an economic perspective, the dissertation conceptualises visual exposure to urban greenery along active mobility routes as a non-market environmental benefit that generates positive externalities. It adopts a microeconomic lens in which children's route choices reflect constrained decision-making and trade-offs between travel distance and visual exposure to urban greenery. At the same time, urban, environmental and institutional economics provide

the broad perspective for understanding how urban planning, infrastructure provision, and public investment decisions shape the provision of environmental benefits.

This dissertation consists of an introduction, three interconnected scientific papers published in international journals, and a general discussion and conclusion. The case study used in all three papers is Lodz – a post-socialist, post-industrial city characterised by socio-economic differentiation, a varied urban structure, and unevenly distributed urban greenery. These features make it a suitable context for exploring inequalities in route-based environmental conditions and trade-offs between walking distance and visual exposure to greenery.

The first paper brings together children's visual exposure to greenery along alternative hypothetical home-school walking routes and socio-economic inequalities. Comparing the shortest, simplest, and greenest routes shows that visual exposure to greenery varies substantially depending on the route chosen. The results indicate that children from lower socio-economic groups face higher costs, such as longer distances or more complex routes, when seeking higher visual exposure to greenery. This paper contributes to economics by demonstrating that route alternatives reflect different non-monetary attributes, with environmental attributes, such as visual exposure to greenery, unevenly distributed across socio-economic groups.

The second paper investigates trade-offs between walking distance and visual exposure to greenery. It demonstrates that achieving higher visual exposure to greenery as one aspect of environmental quality often requires longer hypothetical routes, and that these trade-offs vary across urban zones. In denser areas, shorter routes are typically associated with lower visual exposure to greenery, whereas greener routes are more available in less central areas but often require additional travel distance. From an economic perspective, this paper shows how urban structure shapes the trade-offs between distance as mobility costs and visual exposure to urban greenery as environmental benefits, showing that these trade-offs vary within a city.

The third paper integrates walking accessibility with visual exposure to greenery within a proximity-based planning framework, particularly the 15-minute city. The findings show that high accessibility to amenities does not necessarily correspond to high visual exposure to greenery along hypothetical routes. While some urban areas combine accessibility and greenery, in many cases these two dimensions are misaligned. This paper introduces a tool for identifying locations where preserving existing greenery or introducing new greenery would most effectively improve route-based environmental conditions. This paper contributes to

economic perspectives by showing that proximity-based planning alone does not guarantee the provision of environmental benefits. It emphasizes the role of planning practices and institutional settings in correcting mismatches between accessibility and environmental quality.

Taken together, the findings show that children's visual exposure to greenery is shaped by the relationships among route choices, socio-economic conditions, urban structure, planning practices, and institutional settings. Inequalities arise not only from differences in overall visual exposure to greenery but also from how greenery is embedded within walking routes. From the economic perspective, findings reflect constrained route choices under non-monetary attributes, where distance represents a mobility cost and visual exposure to greenery constitutes an environmental benefit . The results also show that improving visual exposure to greenery often involves trade-offs with travel distance, and that proximity-based planning alone does not ensure equal distribution of visual exposure to greenery. From a spatial data analysis perspective, this dissertation demonstrates how to combine network and viewshed analyses to explore visual exposure to greenery as an indicator of environmental quality along walking routes. These insights support more integrated urban mobility and a more equal distribution of environmental benefits, particularly for children.

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