

Research Title:

The Factors of Digital Mobility Divide and its Effect on Accessibility and Socio-Spatial Integration

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Cities increasingly seek to enhance municipal services and mobility through digitization, based on the assumption that “smart” technologies foster progress, efficiency, and sustainability. Yet, such advancements can unintentionally exclude populations with limited digital skills, deepening digital divides. Advanced digital mobility tools create opportunities for the digitally skilled while generating new barriers for others, thus widening inequality.

While most research on the digital divide focuses on socio-demographic factors, only a few have linked digital gaps to habitus—a set of cultural, social, and perceptual dispositions shaping individual actions. No prior study has systematically examined the relationship between habitus, the digital divide in urban mobility, and its effects on access to opportunities and social-spatial integration.

This study addresses this gap through a conceptual framework based on three hypotheses: (1) The digital divide in urban mobility stems from a “habitual mechanism” involving socio-demographic variables, attitudes, perceptions, and travel habits; (2) The digital mobility divide restricts access to opportunities (e.g., employment, education) for disadvantaged groups; (3) There is a positive relationship between accessibility and social-spatial integration.

A mixed-methods empirical study was conducted in Tel Aviv. The quantitative phase included a survey of 733 respondents from diverse socio-demographic backgrounds. The questionnaire, informed by two initial focus groups (low vs. high income and digital skills), measured access to digital mobility tools (smartphone ownership, proximity to shared mobility, perceived affordability), socio-demographics, attitudes and

perceptions toward digital mobility, digital skills, and perceived improvements in accessibility and integration. Structural Equation Modeling (SEM) was used to analyze relationships between observed socio-demographic variables, latent perceptions and attitudes, and actual use of digital mobility means.

Results revealed two latent factors and one manifest factor related to perceptions of digital mobility: digital competence self-concept, attitudes toward digital mobility, and privacy concerns. These factors were positively related to socio-demographic variables and access to mobility tools. Perceptions were also positively associated with actual digital mobility usage (e.g., public transport apps, shared mobility). Two additional latent factors emerged—accessibility and social-spatial integration. Digital mobility usage was found to enhance both perceived accessibility and integration. Importantly, a positive link was observed between accessibility and equity-related outcomes, including improvements in employment and education, and reduced travel costs.

In the qualitative phase, three focus groups were held with municipal mobility planners to interpret and validate the quantitative findings. These discussions both confirmed and enriched the analysis.

This research offers new insights into the mechanisms driving digital divides in urban mobility and highlights the importance of increasing digital accessibility to empower disadvantaged groups, foster social-spatial integration, and promote urban equality.

Integrating technological performance with ethical design, the system supports privacy preservation through facial anonymization while promoting sustainable and human-centered mobility. The project contributes a major step toward intelligent transportation ecosystems that minimize environmental, social, and human costs - advancing the goal of zero externalities and zero casualties in road safety.