



Gender difference in speed cycling – a cross-study between European countries

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Cycling stands as a fundamentally egalitarian, accessible, and cost-effective activity, serving as a powerful vehicle for empowerment among women and underserved communities. It enhances social unity, particularly in regions impacted by extensive road networks, and helps forge strong cycling bonds. Besides its societal advantages, cycling promotes better health, safer cities, reduced air pollution, lower carbon emissions, and diminished noise levels, positioning it as a sustainable and equitable transportation option. However, despite these positive attributes, cycling exhibits a noticeable gender imbalance. Data consistently shows that far fewer women cycle compared to men, with ratios of three to four times more men than women on the roads. This disparity is attributed to concerns about safety, lack of supportive infrastructure, societal norms, and the varied obligations women bear.

Strava's data, primarily focusing on sportive cycling, underscores these gender discrepancies, with women dedicating significantly less time to cycling than men in multiple nations: Spain (64% less), France (54% less), the United Kingdom (54% less), Germany (42% less), Japan (66% less), the United States (45% less), and Brazil (37% less). This pattern persists in everyday commuting and recreational cycling as well. Research suggests that greater gender inequality in urban environments limits women's access to private vehicles, increasing their reliance on alternative transportation methods such as walking or public transit. Daylight plays a crucial role in cycling for both leisure and commuting worldwide. From March to September, cycling activity among women peaks, but plummets during the winter months. In July 2022, for instance, women logged nearly three times more cycling activities than in December. Furthermore, women are 23% less likely than men to engage in cycling activities before sunrise and 8% less likely after sunset. The standard of cycling infrastructure, including lighting, smooth pathways, and segregation from other traffic, is vital. Also, women's heightened awareness of traffic dangers can deter their cycling engagement.

To delve into the variations in cycling behavior by gender, numerous studies have traditionally relied on surveys to gather data. These surveys typically collect self-reported information about cycling frequency, duration, preferences, and perceived barriers to cycling. However, while useful, these methods can be subject to biases such as self-reporting errors or selective memory. Recognizing these limitations, a smaller yet growing body of research has started to examine the riding behaviors of micromobility users from a gender perspective using objective data.



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This approach involves direct observation and measurement of behaviors using tools like GPS trackers, cameras, and sensors to provide more accurate and real-time data on aspects such as speed, routes, lane positioning, and stop durations. By combining both subjective survey data and objective observational data, researchers can gain a more comprehensive understanding of the differences in cycling behaviors between genders and potentially uncover underlying factors driving these differences.

This study aims to explore gender-specific behavioral patterns among cyclists, particularly focusing on differences in speed and lane positioning within designated bike lanes. The study seeks to analyze:

- The speed distribution measured in open bicycle sections at least 50m from intersections to minimize their impact.
- Cyclists' preference in their lateral position when riding in the outer lane of the bike lane, adjacent to motor vehicle traffic, which may indicate their perception of risk.

This research was conducted in four European countries in cities with similar levels of cycling activity. Two distinct types of bike lane infrastructures were examined:

- Two-way bike lanes segregated from the adjacent road traffic by physical barriers such as elevated curbs or guideposts.
- Two-way bike lanes positioned next to sidewalks.

Data on cyclist speeds and their lane positioning were collected using strategically positioned cameras that provided clear views of both the cyclists' speed and their chosen position within the bike lanes. The study sample included a statistically significant number of cyclists from various demographic groups, segmented by gender (male/female) and age category (young, adult, senior). All observations were made during daylight hours under favorable weather conditions to ensure the consistency and reliability of the data.

By analyzing these metrics across different types of bike lanes and demographic segments, the study aims to provide insights into how gender influences cycling behavior, potentially guiding future improvements in cycling infrastructure and safety measures.

After examining the gender differences in cycling behaviors within each city, we compare these variations across the different cities involved in the study using statistical methodology. Given the diverse cultural backgrounds and varying degrees of cycling infrastructure across these cities, it is anticipated that some locales may exhibit more pronounced gender disparities in cycling behaviors than others.