

How safe do you feel? - A large-scale survey concerning the subjective safety associated with different kinds of cycling lanes

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Background:

There is ample evidence that adequate cycling infrastructure increases cyclists' safety. It has also been shown that cyclists' safety depends on the specific kind of cycling infrastructure (e.g. cycle tracks or lanes). There is less research to what extent the specific design of cycling lanes affects subjective safety. This is an important issue, because subjective safety is likely to affect people's general willingness to use their bike, in particular of those population groups with little cycling experience or affinity. Promoting cycling as a mode of transportation would thus benefit from an enhanced understanding of the effects of different types of cycling infrastructure on subjective safety.

Aim:

We aim to identify the design features of cycling lanes that provide the highest levels of subjective safety.

Method:

We address this question by analysing data from a large-scale online survey, where participants rated images illustrating a wide range of cycling infrastructure designs for the anticipated level of subjective safety when imagining to cycle at the displayed location. The survey was published in the winter 2019/2020 on the website of 'Der Tagesspiegel', a newspaper based in Berlin City, Germany (see <https://interaktiv.tagesspiegel.de/lab/strassencheck/>). Participation was voluntarily and performed on the people's own devices (e.g., computers, tablets, or smartphones), at locations of their own discretion. After cleaning the data, a total N = 92,526 ratings of 13,735 participants of all ages remained. More than twice as many participants were identifying themselves as males (65.7%) than as females (32.5%). About a quarter of the participants (28.6%) reported to have one or more children. The sample showed a strong bias towards frequent cyclists.

Results:

Cycling tracks are perceived as safer than cycling lanes, which in turn are preferred over cycling on the street. Physical separations from the car lane, a greater lane width, and a coloured surface contribute most to a high subjective safety of cycling lanes. Additional buffers on the left- and right side of cycling lanes can have varying effects. On narrower cycling lanes, people experience extensive buffer designs as rather constraining and as impairing their safety. Combining several safety features (i.e. a sufficient demarcation of the left buffer and a coloured surface) is not necessarily beneficial for subjective safety.

When analysing only the less experienced cyclists in the sample, we found that blatant features of the cycling infrastructure affect the subjective safety of unexperienced cyclists. In contrast, they show little awareness of smaller design aspects. This may also imply that they are, for example, less sensitive to hazards posed by dooring through parking cars. These interpretations are, however, limited by the comparatively small sample size available.

Conclusions:

Our findings suggest that many design elements of cycling lanes (as well as those of the general traffic situation) affect the subjective safety of cyclists as intended. The most important factor to assure cyclists' subjective safety consist of providing them with enough space on the cycling lane. Cyclist do not appreciate extensive indications of buffers etc., particularly if the cycling lane is already rather narrow. These implications are limited to the subjective safety of cyclists. Further research is required to determine potential incongruences to their objective safety.