Cyclist’s interaction with motorized vehicles: challenges, user experiences and technological innovations

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University of Bologna, Italy
The XCYCLE Project
Advanced measures to reduce cyclists' fatalities and increase comfort in the interaction with motorised vehicles

Duration: 42 months (May 2015 - Nov 2018)
Coordinated by the University of Bologna, Italy

«It is time to find means to equalise the treatment of cyclists in traffic and thus both encourage cycling and make cycling safer.»

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 723970
How many Europeans are cycling daily?

Source: Eurobarometer survey (2016)
SAFETY and COMFORT
What is the most frequent opponent vehicle in cyclists crashes?

Source: 9th Annual Road Safety Performance Index (PIN) Report (European Transport Safety Council)
Which factors contribute to Bicycle – Motorized Vehicles Crashes?

Factors contributing to bicycle–motorised vehicle collisions: a systematic literature review. *Transport Reviews*, 1-25

What are the most dangerous scenarios?

Which are the most severe bicycle crashes?

XCYCLE user-centered technologies
Multimodal warnings
“Ear-con”
AEB
(Automatic Emergency Braking)
Cyclists equally treated by traffic infrastructure at intersections
Evaluation of user behavior and acceptance of an on-bike system

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Table 1
Reliability (Cronbach’s alpha), correlations (Kendall rank correlation coefficients) among and descriptive statistics for key study variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>$\alpha$</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Risk perception of mixed traffic</td>
<td>3.39</td>
<td>0.90</td>
<td>0.73</td>
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<tr>
<td>2. Perceived usefulness</td>
<td>3.71</td>
<td>0.82</td>
<td>0.90</td>
<td>0.24</td>
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<tr>
<td>3. Perceived ease of use</td>
<td>4.22</td>
<td>0.97</td>
<td>0.78</td>
<td>-0.18</td>
<td>0.25</td>
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<tr>
<td>4. Attitude toward technology</td>
<td>3.80</td>
<td>0.83</td>
<td>0.86</td>
<td>0.08</td>
<td>0.49</td>
<td>0.48</td>
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<tr>
<td>5. Facilitating conditions</td>
<td>3.72</td>
<td>0.88</td>
<td>0.70</td>
<td>0.04</td>
<td>0.49</td>
<td>0.46</td>
<td>0.49</td>
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<tr>
<td>6. Anxiety</td>
<td>2.05</td>
<td>0.99</td>
<td>0.84</td>
<td>-0.04</td>
<td>-0.43</td>
<td>-0.62</td>
<td>-0.61</td>
<td>-0.49</td>
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<tr>
<td>7. Perceived safety</td>
<td>3.99</td>
<td>0.82</td>
<td>0.75</td>
<td>-0.05</td>
<td>0.48</td>
<td>0.31</td>
<td>0.53</td>
<td>0.27</td>
<td>-0.36</td>
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<td>8. Trust</td>
<td>4.16</td>
<td>1.25</td>
<td>-</td>
<td>-0.05</td>
<td>0.38</td>
<td>0.30</td>
<td>0.57</td>
<td>0.33</td>
<td>-0.48</td>
<td>0.42</td>
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<td>9. Social influence\textsuperscript{a}</td>
<td>3.52</td>
<td>0.97</td>
<td>-</td>
<td>0.11</td>
<td>0.49</td>
<td>0.36</td>
<td>0.60</td>
<td>0.37</td>
<td>-0.53</td>
<td>0.17</td>
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<td>10. Behavioral intention to use</td>
<td>3.99</td>
<td>1.28</td>
<td>0.89</td>
<td>-0.01</td>
<td>0.40</td>
<td>0.35</td>
<td>0.56</td>
<td>0.45</td>
<td>-0.51</td>
<td>0.62</td>
<td>0.63</td>
<td>0.36</td>
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<tr>
<td>11. WTP</td>
<td>57.83</td>
<td>43.06</td>
<td>-</td>
<td>0.06</td>
<td>0.12</td>
<td>0.00</td>
<td>0.22</td>
<td>0.26</td>
<td>-0.12</td>
<td>-0.15</td>
<td>0.24</td>
<td>0.17</td>
<td>-0.09</td>
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<tr>
<td>12. WTA</td>
<td>43.73</td>
<td>31.59</td>
<td>-</td>
<td>-0.03</td>
<td>0.09</td>
<td>-0.02</td>
<td>0.28</td>
<td>0.16</td>
<td>-0.17</td>
<td>0.13</td>
<td>0.45</td>
<td>0.03</td>
<td>0.20</td>
<td>0.54</td>
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</tbody>
</table>

Note. All correlation coefficients higher than 0.33 are significant at the 0.05 level.

\textsuperscript{a} Correlation between the two items was 0.41 ($p < .05$).
“Technology is nothing without wonderful people”

Can technologies amplify injustice and social hierarchy in the traffic?
Need to address...

…negative attitudes and aggressions towards cyclists in some cultures
Gender equality and women's participation in transport cycling

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Short communication

Cyclists as a minority group?

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… status and power

Feel free to take our booklet with our papers!
Final Event of EU projects on Traffic Safety of Vulnerable Road Users

Barcelona
12th October 2018
KEEP CALM AND XCYCLE