Why conducting In-Depth Naturalistic Riding Study... Examples from Rider Trainees and Novices in France

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1. Why iNRS?

- General aim of studies: to design counter measures towards road safety improvement

- Efficient measures: if and only if accepted by road users

- Accepted measures: acceptable by users (cf. real practices / corresponding to real needs...)

- Practices / real needs:

  Only the driver/rider can explain the motives that underlie his/her decision making process, and the elements of the context they manipulate

  observation # understanding
  NDS/NRS # iNDS/iNRS

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1. The SIM2CO project (2011/13)

- Supported by the French National Research Agency
- Partners: IFSTTAR, Universities, Private societies, Riders associations

- **Main goal**
  - Improving French motorcycle pre-test training

- **How?**
  - Identifying the typical hazardous situations of novices after licensing
    - Not only accidents (police actions required)
  - Assure that training integrate these problems

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2. Procedure

<table>
<thead>
<tr>
<th>Novices</th>
<th>H/F</th>
<th>Age</th>
<th>Context</th>
<th>Monitoring</th>
<th>Distance travelled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novice 1</td>
<td>H</td>
<td>33</td>
<td>Paris Region</td>
<td>11 weeks</td>
<td>3 680 km</td>
</tr>
<tr>
<td>Novice 2</td>
<td>H</td>
<td>26</td>
<td>Paris Region</td>
<td>11 weeks</td>
<td>4 100 km</td>
</tr>
<tr>
<td>Novice 3</td>
<td>H</td>
<td>24</td>
<td>Paris Region</td>
<td>11 weeks</td>
<td>2 450 km</td>
</tr>
<tr>
<td>Novice 4</td>
<td>H</td>
<td>29</td>
<td>Paris Region</td>
<td>8 weeks</td>
<td>300 km</td>
</tr>
<tr>
<td>Novice 5</td>
<td>F</td>
<td>26</td>
<td>Provinces</td>
<td>12 weeks</td>
<td>2 300 km</td>
</tr>
<tr>
<td>Novice 6</td>
<td>H</td>
<td>30</td>
<td>Provinces</td>
<td>11 weeks</td>
<td>1 600 km</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>64 weeks</strong></td>
<td><strong>14 430 km</strong></td>
</tr>
</tbody>
</table>

Longitudinal study 14 430 km / 64 weeks

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3. Data collection

- Logbooks
  
  • Identification of the risky situations for the rider
  • Need to explain the type of situations to be included

SITUATION 5

Date: 08/12/2011
Time: 18:00
Journey: Crayed to my work. The first traffic light after leaving my job.

Description of the situation: I am in the center of the two lanes at the red light. At the green light, the car which is at my right corner dangerously to me in the curve. I look at the driver but I am not sure he saw me. I had to swerve. I was very scared.
3. Data collection

• Camera instrumentation

- Rider face camera
- Forward camera
- Instrumented motorbike
- Data logger set in the top case
- Right camera
- Left camera

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3. Data collection

- Instrumentation in sensors/GPS

- Steering angle
- Front wheel turns
- Turn signal
- Data logger / GPS
- 3 axes accelerations and rotations
- Brake contact

240 hours of recordings

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3. Data collection

• Interviews
  1) Description of the situations reported in the logbook
  2) Self-confrontation interview based on the video

- Remote control. Used by the researcher and the rider to stop or wind back the video
- Footage of past riding activity
- Face and gesture of the rider during the interview

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4. Data processing

• Represent the riders’ activity in hazardous situations in activity graph thanks to logbooks, videos and interviews

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4. Data processing

- Objective data browsing tools: (a) sensor and GPS data, (b) interface for video recordings viewing
- These 2 applications are synchronised

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## 5. Results

### 1. Number of risky situations

<table>
<thead>
<tr>
<th>Participant</th>
<th>M/F</th>
<th>Age</th>
<th>Context</th>
<th>Monitoring</th>
<th>Distance travelled</th>
<th>Number of risky situations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>M</td>
<td>33</td>
<td>Paris region</td>
<td>11 weeks</td>
<td>3 680 km</td>
<td>35</td>
</tr>
<tr>
<td>N2</td>
<td>M</td>
<td>26</td>
<td>Paris region</td>
<td>11 weeks</td>
<td>4 100 km</td>
<td>48</td>
</tr>
<tr>
<td>N3</td>
<td>M</td>
<td>24</td>
<td>Paris region</td>
<td>11 weeks</td>
<td>2 450 km</td>
<td>50</td>
</tr>
<tr>
<td>N4</td>
<td>M</td>
<td>29</td>
<td>Paris region</td>
<td>8 weeks</td>
<td>300 km</td>
<td>24</td>
</tr>
<tr>
<td>N5</td>
<td>F</td>
<td>26</td>
<td>Provinces</td>
<td>12 weeks</td>
<td>2 300 km</td>
<td>47</td>
</tr>
<tr>
<td>N6</td>
<td>M</td>
<td>30</td>
<td>Provinces</td>
<td>11 weeks</td>
<td>1 600 km</td>
<td>44</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>64 weeks</td>
<td>14 430 km</td>
<td>248</td>
</tr>
</tbody>
</table>

- 4 risky situations per week in average
- 40 risky situations per novice in average

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5. Results

2. Dynamics of occurrence of the risky situations

Figure. Mean number of risky situations reported during the experiment
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3. Context of the risky situations

5. Results
### 5. Results

#### 4. Typical incident scenarios

<table>
<thead>
<tr>
<th>n°</th>
<th>Title of the scenario</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Near-miss during lane changing in dense traffic</td>
<td>38</td>
<td>15%</td>
</tr>
<tr>
<td>2</td>
<td>Near-miss when another user does not give way at an intersection</td>
<td>32</td>
<td>13%</td>
</tr>
<tr>
<td>3</td>
<td>Loss of control on a sharp bend</td>
<td>27</td>
<td>11%</td>
</tr>
<tr>
<td>4</td>
<td>Loss of control on a slippery road</td>
<td>25</td>
<td>10%</td>
</tr>
<tr>
<td>5</td>
<td>Near-miss after a lane change by a user in front of the rider</td>
<td>23</td>
<td>9%</td>
</tr>
<tr>
<td>6</td>
<td>Near-miss after an unanticipated slowing of the traffic</td>
<td>20</td>
<td>8%</td>
</tr>
<tr>
<td>7</td>
<td>Near-miss during an overtaking manoeuvre performed by the rider</td>
<td>18</td>
<td>8%</td>
</tr>
<tr>
<td>8</td>
<td>Near-miss when the rider does not give way at an intersection</td>
<td>17</td>
<td>7%</td>
</tr>
<tr>
<td>9</td>
<td>Near-miss during filtering when a user desires to turn left</td>
<td>17</td>
<td>7%</td>
</tr>
<tr>
<td>10</td>
<td>Near-miss while looking for a route in dense traffic</td>
<td>12</td>
<td>5%</td>
</tr>
<tr>
<td>11</td>
<td>Loss of control when turning after starting</td>
<td>7</td>
<td>3%</td>
</tr>
<tr>
<td>12</td>
<td>Near-miss when another user overtakes the rider on the wrong side</td>
<td>6</td>
<td>2%</td>
</tr>
<tr>
<td>13</td>
<td>Loss of control due to wind</td>
<td>6</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>248</td>
<td>100%</td>
</tr>
</tbody>
</table>
5. Identification of drivers’ near misses or falls

Audiovisual recordings data

Instrumented motorbike data

Selfconfrontation interview data

The trainer: “Go faster!”

Slalom

Half-turn

Slalom

Avoidance

Fall

“Here I am looking at my speedometer, I could not stop within the limits so I took too early the brake!”

“I was already afraid in the last attempt!”

“I felt that I arrived too fast, I cannot succeed!”

“I was glad to fall! I wanted to fall before licensing to know it!”

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To go further…

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