Is it reliable that speed-calming solutions as ISA can reach the drivers, who needed it most?

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PhD
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Agenda

• What is ISA
• ISA C
• ISA C results
• ISA and risky drivers
• National differences
• Changes over time
What is ISA?
Why ISA: Road safety and speed

- Speeding increases the road accident risk significant
- Intelligent Speed Adaptation (ISA) reduces speeding considerable
- Estimated 25-58% less road fatalities
- However, very limited results based on involuntary drivers
- Which effect can be expected among involuntary drivers?
Otto Mate 2 trials 2 trials 5 trials 1 trial 1 trial 1 trial 1 trial 1 trial
2 trials 1 trial 1 trial
UK 2001+ Spain 1997+ France 1997+
2 trials 2 trials 2 trials
Netherlands 1997+ Belgium 2002+ ORS
2 trials
Perth 2007+
2 trials
TAC/Vicroads 2007+

RTA
Wollongong 2009+

SpeedAlert
Sydney 2006+

TAC SafeCar
Melbourne 2003+

Speedshield
Melbourne 2005+

* Commercial products

Illustration by Michael Paine
ISA Commercial (ISA C)
ISA Commercial (ISA C)

• Informative and warning ISA connected with small incentives
• April 2007 to October 2008
• 26 commercial vehicles and 51 drivers in total
• Baseline in 2 months
• ISA in 6 two-months periods
**On Board Unit (OBU)**

- GPS-antenna behind the rear mirror
- Display and loudspeaker placed in the air nozzle
- GPS/GPRS unit with a stored digital speed limit map
- 30 – You are speeding
- Key ID

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NTSA 2014 – Oslo – TOI
Incentives

• Based on the no. of penalty point/distance driven
• Results available on a password-protected homepage

• Incentives:
  – Monthly: Gift basket (€40)
  – Final: A navigation unit to the 10 best drivers
  – Social control
    • Management
    • Colleagues
Data

• Two data sources: Floating Car Data (FCD) and questionnaires

• FCD
  – 391,000 km in total
  – 76% on 50 and 80 km roads
  – 65 million observations

• Two web based questionnaires
  – Baseline and after one year
  – 40 filled in the first one and 23 the second one (21 filled in both)
ISA C results
Measurement method

- The proportion of the distance driven above the speed limit + 5 km/h (PDA)
The use of key ID

<table>
<thead>
<tr>
<th>Key</th>
<th>ISA 1</th>
<th>ISA 2</th>
<th>ISA 3</th>
<th>ISA 4</th>
<th>ISA 5</th>
<th>ISA 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>With</td>
<td>65%</td>
<td>67%</td>
<td>49%</td>
<td>43%</td>
<td>33%</td>
<td>27%</td>
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<tr>
<td>Without</td>
<td>35%</td>
<td>33%</td>
<td>51%</td>
<td>57%</td>
<td>67%</td>
<td>73%</td>
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<tr>
<td>Speed limit</td>
<td>Key</td>
<td>Baseline</td>
<td>ISA 1</td>
<td>ISA 2</td>
<td>ISA 3</td>
<td>ISA 4</td>
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<tr>
<td>Total</td>
<td>With</td>
<td>15%</td>
<td>3%</td>
<td>4%</td>
<td>3%</td>
<td>4%</td>
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<td></td>
<td>Without</td>
<td></td>
<td>10%</td>
<td>10%</td>
<td>12%</td>
<td>12%</td>
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<tr>
<td>50 km/h</td>
<td>With</td>
<td>20%</td>
<td>5%</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
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<td></td>
<td>Without</td>
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<td>13%</td>
<td>14%</td>
<td>19%</td>
<td>15%</td>
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<tr>
<td>80 km/h</td>
<td>With</td>
<td>15%</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
<td>3%</td>
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<tr>
<td></td>
<td>Without</td>
<td></td>
<td>10%</td>
<td>8%</td>
<td>12%</td>
<td>11%</td>
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</tbody>
</table>
ISA and risky drivers
Attitudes to speed and risk

Estimate how dangerous it is:

- To drive 50 km/h on roads with a 50 km/h speed limit (50 km/h zone)
- To drive 60 km/h on roads with a 50 km/h speed limit
- To drive 70 km/h on roads with a 50 km/h speed limit
- To drive 80 km/h on roads with an 80 km/h speed limit (80 km/h zone)
- To drive 90 km/h on roads with an 80 km/h speed limit
- To drive 100 km/h on roads with an 80 km/h speed limit
- To drive 130 km/h on motorways with a 130 km/h speed limit (130 km/h zone)
- To drive 140 km/h on motorways with a 130 km/h speed limit
- To drive 150 km/h on motorways with a 130 km/h speed limit

The green dots represent harmless situations, while the red dots indicate dangerous situations.
Assessment of own driving style

Describe your driving style:

<table>
<thead>
<tr>
<th>Question</th>
<th>Intolerant</th>
<th>Tolerant</th>
<th>Risky</th>
<th>Safe</th>
<th>Impatient</th>
<th>Patient</th>
<th>Irritated</th>
<th>Calm</th>
<th>Reckless</th>
<th>Considerate</th>
<th>Inattentive</th>
<th>Attentive</th>
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<tbody>
<tr>
<td>Are you intolerant or tolerant in your own car?</td>
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<td>Are you intolerant or tolerant in company cars?</td>
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<td>Are you risky or safe in your own car?</td>
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<td>Are you irritated or calm in your own car?</td>
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<td>Are you reckless or considerate in your own car?</td>
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<td>Are you inattentive or attentive in your own car?</td>
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</table>

The green is lower. The red is higher.
Drivers’ estimated level of danger

*Estimate how dangerous you think it is to do the following activities:*

- To minimise headway to increase the speed of the car in front
- To do yellow light driving
- To do red light driving
- To overtake in a minimal time slot
- Not to give way for an out turning bus
- To do red light driving if you are alone in the area
- To race somebody
- Not to give way to pedestrians at a crossing
- To park illegal
- To drive through a turn with high speed
- To ignore the duty to give way in intersections
- To drive slalom between different lanes
- To drive without fasten seatbelt

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[Graph showing the estimated levels of danger for various driving activities, with green bars indicating harmless and red bars indicating dangerous.]
Drivers’ attitudes to various types of ISA

What is your attitude to:

- An accelerator pedal in your **private car**, which become heavier if speeding?
- An accelerator pedal in the **company car** you use, which become heavier if speeding?
- An accelerator pedal in your **private car**, which become hard if speeding?
- An accelerator pedal in the **company car** you use, which become hard if speeding?
- Having the ISA C system in your **private car**?
- Having the ISA C system in the **company car** you use?

![Graph showing attitudes to various types of ISA](image-url)
Green and red drivers

- All *green* drivers used the key ID while only a small, decreasing number of *red* drivers did.
- Most of the drivers who applied their key ID were *green* drivers. They kept a low level of speeding during the trial.
- **Basically no effect on red drivers**
National differences?
Are there national differences

• Yes – on the scale of speeding!
• Maybe different fines and sanctions?

<table>
<thead>
<tr>
<th>%&gt; speed limit</th>
<th>N</th>
<th>DK</th>
<th>FI</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural roads</td>
<td>45</td>
<td>72</td>
<td>64</td>
<td>51</td>
</tr>
<tr>
<td>Urban roads</td>
<td>46</td>
<td>61</td>
<td>-</td>
<td>61</td>
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</tbody>
</table>
Changes over time?
Changes over time

DK:

• Increased focus on speeding
• Still social acceptable
• Maybe deviation of environmental reasons affect road safety positively
  – More small cars
  – More eco awareness
Summary

• ISA has shown very high safety effects on voluntary drivers
• ISA has virtually no effect on involuntary drivers
• Other reasons are probably more crucial for the speed choice
• A significant effect of ISA can only be reached if ISA works mandatory – i.e. speeding is impossible
Thank you

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