

Fit to Drive

7th International Traffic Expert Congress
25th – 26th April 2013
Berlin



How to improve road traffic safety – The role of Psychology

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- TU Dresden

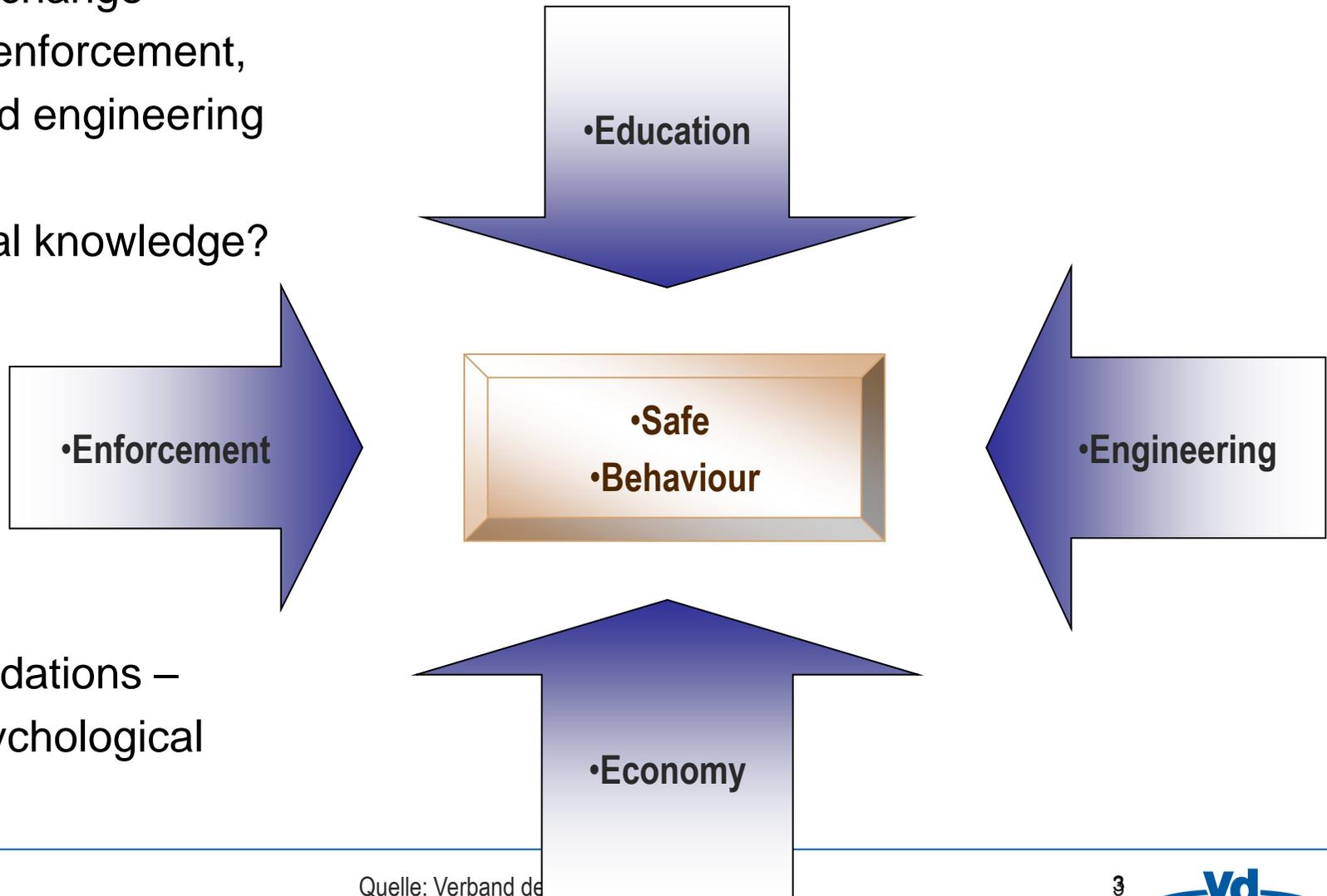


- Road traffic accidents not only are a global public health problem:
- WHO estimate for 2030: around 2,4 million road traffic deaths
- http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/
- On the other hand, we can identify countermeasures and strategies
- to reduce accidents and to enhance traffic safety effectively.
- Awareness of problems is growing, especially in most developed countries –
- but: Awareness of proven solutions? Of effective actions (and necessary funding)?
- **Use proven measures as a „brick“ in your traffic safety building!**



•4 E = 4 ways to influence human behaviour

- What would change
- if we adjust enforcement,
- economy and engineering
- according to
- psychological knowledge?



8 recommendations –
and their psychological
impact



1. Give clear and ambitious targets – as „Vision Zero“ or „Towards Zero“

Targets guide behavior.

- Make road safety a common concern: agenda setting,
- thus changing social norms and expectations,
- involve all stakeholders and make them share responsibility,
- set measurable targets and intermediate goals („shaping“),
which should be reached in 2 / 5 / 10 years by common efforts.

Safe Community - or Community Safety – programs (as in Skandinavian countries).

- Monitor continuously that agreed targets are met.

OECD/ITF: Towards Zero – Ambitious road safety targets and the safe system approach, 2008

<http://www.internationaltransportforum.org/jtrc/safety/targets/targets.html>

Psychology: How to convince people, change social norms, and moderate societal and political processes.



- 2. Make **Public Transport (PT)** and use of PT – as the safest alternative –
- most attractive, convince people of PT use.

•Psychology:

- TDM – Mobility management is a field psychologists did leave to economists,
- thus refraining from a genuine psychological field:
- Behaviour management.

- Mobility management** is a strong tool
- for improving traffic safety.





•3. People should use roads (and vehicles) the right way.

Educate them – but also: provide roads which make it easy to act the right way.

The build environment strongly influences behaviour. If we better understand how people act and why they do so, we get able to influence their perception and motivation by road design in a way that safer action results.

•Thus, one main starting point for engineers developing a safe system is to understand how people will use the road and the car:

•Develop *Human Factors Guidelines for Road Systems* to provide the best factual information and insight into the characteristics of road users to facilitate safe roadway design and operational decisions.

Psychology: Road design and construction (e.g., curvature, road width, alignment, signs) should be based on psychological knowledge of perception, decision and action processes.

Perceived road elements must set the appropriate cues and nudges for safe behaviour.

•Actually this is the most urgent missing link in interdisciplinary cooperation.



•4. But there are promising new ideas on the way.

One idea combining road design and psychology are **self-explaining roads (SER)**.

SER give clear advice which behaviour is appropriate and they punish offences by feedback, e.g., acoustic and haptic feedback by rumble strips („discomfort“).

Improve user compliance by adequate road design and feedback. Construct roads in a way that the road doesn't allow for speeding and gives uncomfortable feedback.

Self-explaining + self-enforcing roads = Self-organizing roads

See, e.g., results from the European research project RIPCORD-ISEREST:

<http://ripcord.bast.de/>

Psychology:

SER give an example how to adopt psychology in road design and construction, especially on rural roads. In cities the idea of Shared Space builds upon psychological knowledge.



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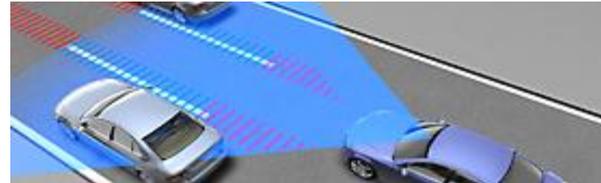
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•5. Promote safer vehicles – and their right use

•<http://www.bester-beifahrer.de/startseite/>



• Abstandsregler: ACC



•Spurhalteassistent / LDW



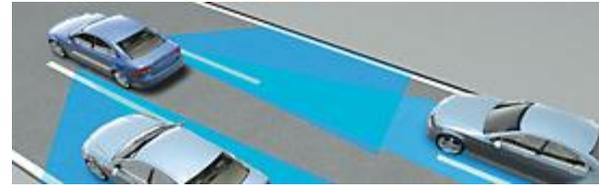
•Einparkassistent



•Nachtsichtassistent / VES und Innovative Lichtsysteme



•ESP; ABS



Spurwechselassistent: LCA Lane Change Assistent



Notbremsassistent – Zukunft: Predictive Collision Warning; Automatische Notbremse



•Verkehrszeichenbeobachter



- **Education and enforcement:** 2 recommendations follow

- Both belong to each other – and should be integrated with engineering and economic measures to guide behaviour.

- 2 kinds of norms regulating human behaviour:

- by law and enforcement: codified norms

- by informal social control: group norms and rules guiding everyday behaviour

- (see Jens Schade today).

- Both often are not in line with one another!





•6. Fight **speeding** as successful as drinking and driving (DWI)!

-Set speed limits according to road function, e.g., 30 km/h on urban roads (with exemptions for arterials), 80 km/h on most rural roads, and 130 km/h on motorways.

-Enforce in a way that offenders perceive a reasonable chance to be caught and expect a strong fine (E x V).

-Set the right incentives for obeying the rules, make it attractive. Speeding must have negative, obeying the rules must have positive consequences!

-Thus setting social norms against speeding, making correct behaviour socially expected and supported.

• -In Germany, speeding is seen differently as compared to drinking and driving (which in the public opinion is banned):

• People expect the police to be protected against drinking drivers – why not against speeding?



- 7. Education and enforcement, recommendation 2:
 - Implement a **Graduated Licensing** system for novices.
 - Young drivers are the highest risk group and for them road traffic accidents are the death cause no. 1. The countries which have introduced Graduated Licensing System for novices report accident resp. death reductions in this group between around 10 and 60%, thus being perhaps the most effective targeted single intervention.
 - Accompanied driving (Begleitetes Fahren) is a first important step.
 - Psychology:** Graduated Licensing builds upon psychological findings: Distributed learning is more effective than concentrated learning only at one time. And: Leaving young drivers alone after obtaining their license leads to trial and error learning, never appropriate in dangerous surroundings.
 - But: What must novices learn in later phases after they have learned how to handle a motor vehicle? A broader perspective to driver education will have to lead them from control of the vehicle to personal self-control: a case for driving instructors or for psychologists?



•8. Improve safety for vulnerable road users, for **motorcyclists and bicyclists**

•**Motorcycling is the** most dangerous way to move.

•Rural roads, young drivers, and motorcyclists –
•these are the 3 most dangerous groups resp. environments,
providing on the other hand highest potential for improvements.

•2 main problems have to be addressed:

- Risk behaviour and
- Conspicuity (lighting!).

•Both have to do with psychology:

- Risk motivation (of motorcyclists) as well as
- perception, attention and awareness
- (on the side of the other road users).





•Thank you for your attention!

•General references:

•WHO: Global status report on road safety. Time for action. 2009.

•http://www.who.int/violence_injury_prevention/road_safety_status/2009/en/index.html

•OECD/ITF: Towards Zero – Ambitious road safety targets and the safe system approach, 2008

•<http://www.internationaltransportforum.org/jtrc/safety/targets/targets.html>

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•R. Elvik, A. Høy, T. Vaa, M. Sørensen: The Handbook of Road Safety Measures. Oxford: Elsevier, 2009².

•Wissenschaftlicher Beirat beim BMVBS (Ahrens, Beckmann, Schlag u.a.): Sicherheit zuerst – Möglichkeiten zur Erhöhung der Straßenverkehrs-sicherheit in Deutschland. ZVS 56, 2010, 4, 171-194.

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