

GDE: Goals for driver education

- Why, how and what and what now

Esko Keskinen

Professor of traffic psychology (emeritus)
University of Turku Finland

Presented by
Jean-Pascal ASSAILLY
IFSTTAR

GDE-model (Goals for Driver Education)

(Hatakka, Keskinen, Glad, Gregersen, Hernetkoski, 2002)

	Knowledge and skills	Risk-increasing factors	Selfevaluation
Goals for life, skills for living (general)	Lifestyle, age, group norms, motives, self-control, personal values	Sensation seeking Group norms Complying to social pressure Use of alcohol	Risky tendencies Personal skills for impulse control Safety negative motives
Goals and context of driving (trip related)	Modal choice Choice of time Trip goals Social pressure	Alcohol, fatigue Purpose of driving Rush hours Extra motives: competing	Planning skills Typical goals Typical risky motives
Mastery of traffic situations	Traffic rules Observation Driving path Communication	Disobeying rules Information overload Unsuitable speed.	Awareness of personal strengths and weaknesses
Vehicle manoeuvring	Control of direction, position Tyre grip Physical laws	Unsuitable speed Insufficient automatism Difficult conditions	Strong and weak points of basic manoeuvring



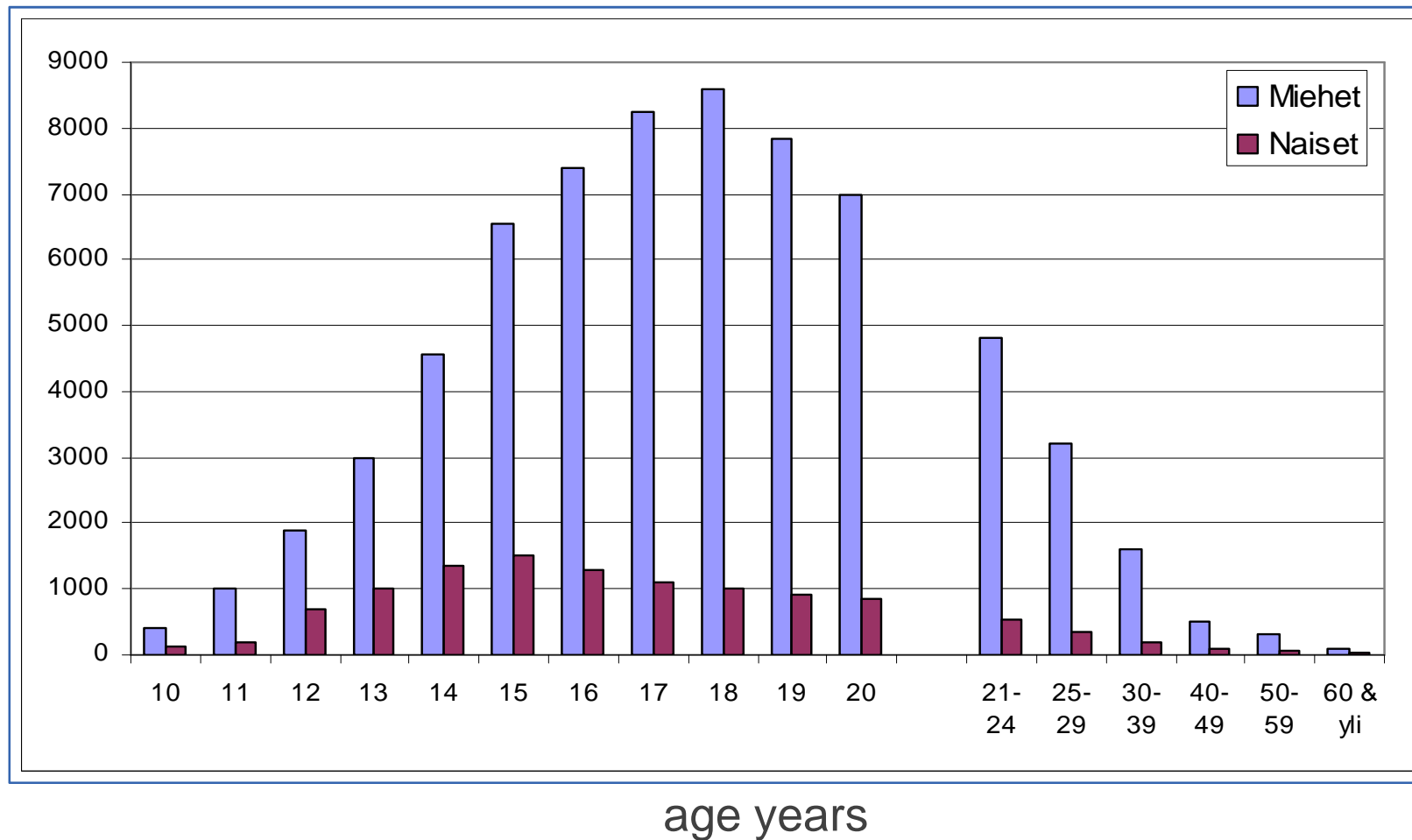
WHY

Short history of the GDE-matrix: WHY did it happen

Attempt to understand driving as a whole: The interest were

- 1 In the knowledge base of driving behavior (inner models)
- 2 In describing the motivational factors of driving behavior:
knowledge, skills and motivation
- 3 In understanding the interaction between the levels
- 4 The fifth level became necessary as we were looking young drivers'
decision making in groups: social aspect of driving

Punished acts against criminal law/100 000 inhabitants in age groups in England 1995



Criminal statistics, England and Wales, 1995. London:HMSO. In Trew, K., Kremer, J. (eds.)
1998. Gender & Psychology. Arnold:London. (Traffic psychology, Laapotti, S)

5 Development of cognitive psychology in west and in east

- Systems view of describing and understanding behavior
- Hierarchical description of behavior
- Goals as important controllers, directors and motivators of behavior
- Cognitive and emotional representations in controlling behavior

E.g. Neisser, Miller-Galanter-Pribram, Hacker



HOW

Short history of the GDE- model: HOW did it happen

LEVELS OF THE DRIVING BEHAVIOR

1) The theory of inner models in the control of driver behavior:

Three levels: vehicle maneuvering, mastery of traffic situations, goals and context of driving (Mikkonen, & Keskinen, (1980)

2) Extended model of internal models in driver behaviour:

Four levels: earlier + goals for life and skills for living (Keskinen, (1996). Why do young drivers have more accidents?

THREE CONTENTS OF EACH LEVEL

3) Goals of driver education from the psychological point of view). (Keskinen, 1998).

Knowledge and skills

Risk increasing factors

Self-evaluation (self assessment): needed as a tool in learning and a goal in all expert skills

4) GADGET: A **gadget** is a small [tool](#) such as a [machine](#) that has a particular function, but is often thought of as a [novelty](#). (Wikipedia)

Guarding Automobile Drivers through Guidance Education and Technology (1998-1999): Rainer Christ (KfV), Patricia Delhomme (INRETS), Alexander Kaba (KfV), Tapani Mäkinen (VTT), Fridulv Sagberg (TOI), Horst Schulze (BASt), Stefan Siegrist (bfu)

Hatakka, M., Keskinen, E., Gregersen, N. P., & Glad, A. (1999). Theories and aims of educational and training measures. (Bfu Report No. 40).



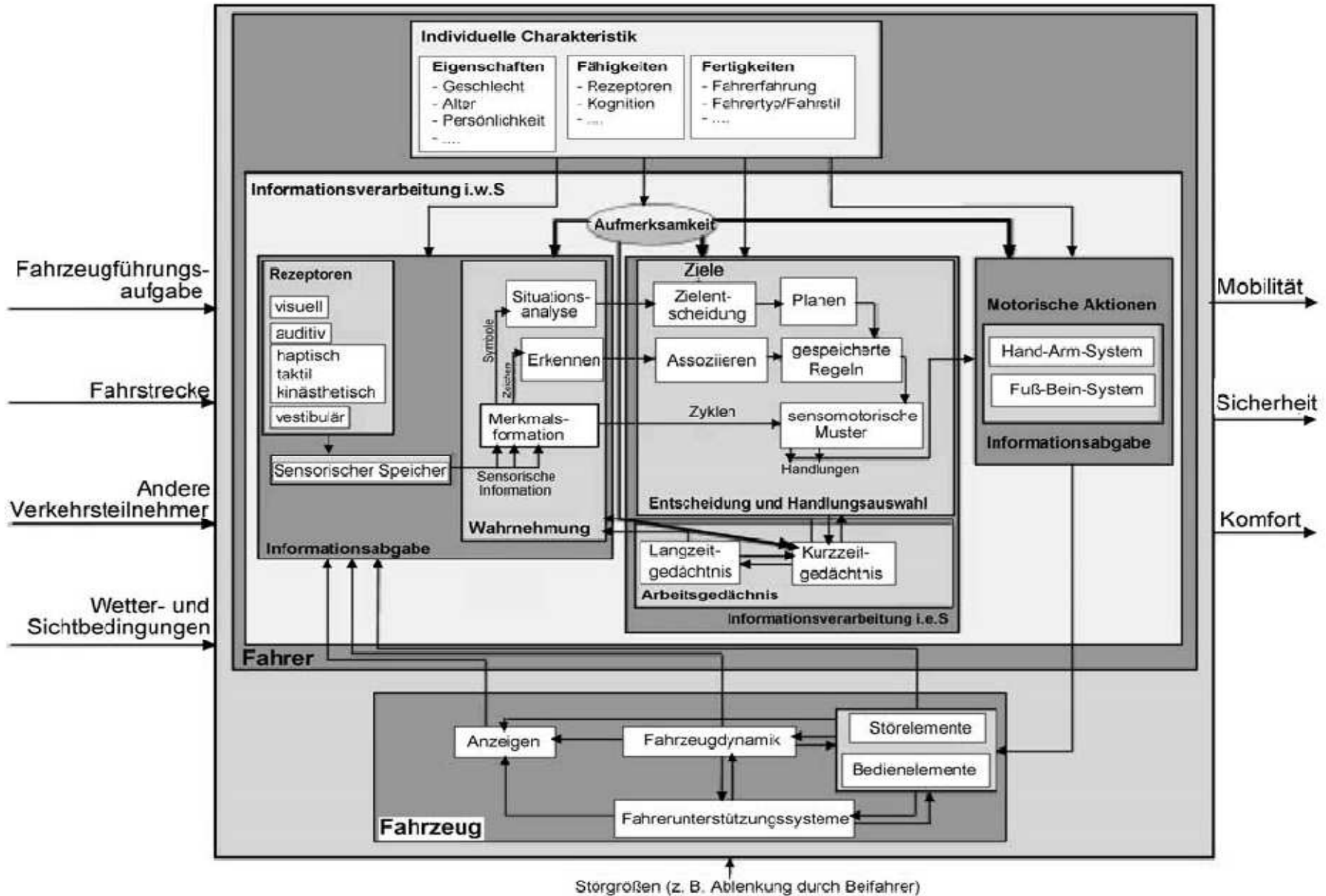
WHAT

GDE: WHAT is it, a theory, a model, a framework: where do we need it?

Purpose of theories and models

“No comprehensive model of driving behaviour has been developed, and, given the wide variety of driving situations and associated combinations of component skills, it is unlikely that one will soon emerge”. (Ranney 1994, 746).

The basic goal of the theory is to give tools to understand reality



Systemmodell Fahrer-Fahrzeug-Umgebung (Eichinger, 2009, nach ABENDROTH & BRUDER, 2009; S. 4)

Hierarchy

Hierarchy (system description)

1) ***Interaction of levels***: Higher levels “give tasks” or control lower ones but lower ones give feedback concerning the success of “the given task”

2) ***Leading level and automatisation***: There is a primary level of processing the information, where ***conscious attention*** is needed (level changes according to the subtask automation)

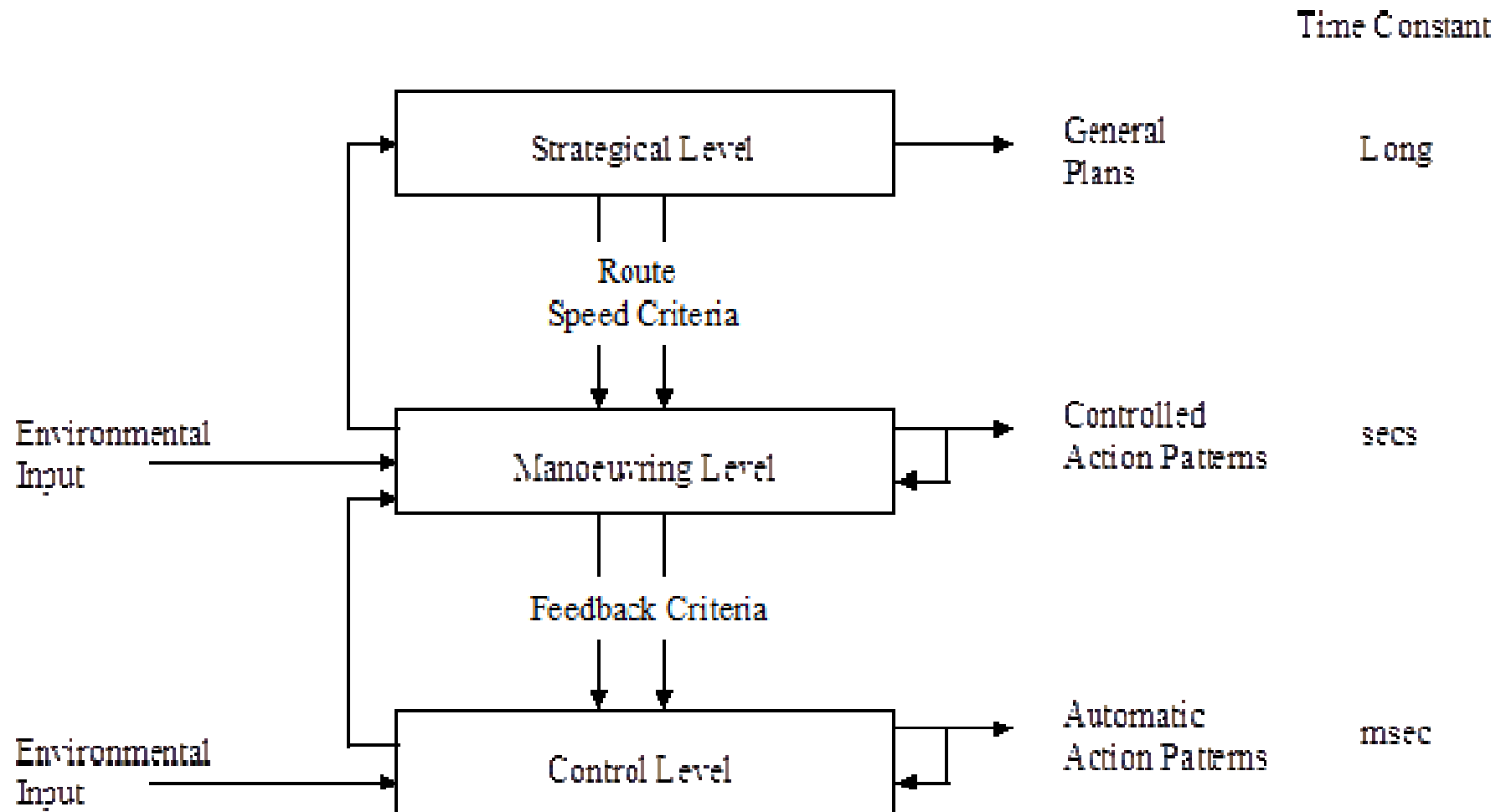


Figure 2. The hierarchical structure of the road user task. Performance is structured at three levels that are comparatively loosely coupled. Internal and external outputs are indicated (Michon 1985, after Janssen, 1979).

GDE-model (Goals for Driver Education)

(Hatakka, Keskinen, Glad, Gregersen, Hernetkoski, 2002)

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What are the hierarchical levels?

Level 1: Vehicle manoeuvring (specific task)

Basic knowledge and skills and risk increasing factors are tools to realize driving task

Self-evaluation (SE) is a tool used in assessing own skills and habits

What are the hierarchical levels?

Level 2. Mastery of traffic situations (specific situation)

Choices that are made on this second level follow from third level choices and fourth level preconditions.

What are the hierarchical levels?

Level 3: Goals and context of driving a journey: the plan and the execution

A journey and its conditions: for what purpose (just for fun, competing, going home or restaurant, taking child to kindergarten), when, where, with whom, what vehicle

SE is a tool to *identify* the nature of own behavioral tendencies, actions, own reasons, driving objectives, motives, own emotions in different driving situation etc.

Level 4 (goals for life and skills for living) gives the **motivation to the journey**

What are the hierarchical levels?

Level 4: Goals for life and skills for living

What general and specific **goals** a driver has in life: motives for behavior (sensation seeking, safety mindedness, personality etc.)

What are his/her **skills** to reach and fulfill these goals: personal behavioral models such as impulses, and the ability to control them, background motives for actions, values etc.

SE is a tool to understand own behavior and a tool to change it

The goal in driver education is to increase self-understanding (as a subject who makes the choices)

What we are talking about when talking of GDE-model

Some clarifications

- **Hierarchical levels do not mean steps in any meaning**
 - > Lower levels are tools for higher ones, necessary components for taking action
 - > All levels can be treated in education at the same time, there is no obligatory sequence for the levels to be learned (but remember conscious decisions and attention)
 - > Decisions on the higher level affect (= decrease) possibilities to select alternatives on all lower levels

•Higher cognitive processes do not mean higher levels in GDE model

> Higher cognitive processes are important in all levels of the model (self-evaluation)

> Higher cognitive processes are the ones which control lower processes (perception, action)

Higher cognitive processes in psychology: central executive processes, attention, assessment and control (self-, risk-, situational-), metacognition



WHAT NOW

Social environment

(e.g. culture, legislation, enforcement, subculture, social groups, group values and norms)

Personal goals for life, skills for living

(e.g. lifestyle, motives, values, self-control, habits, health)

Goals and context of driving

(e.g. trip related choices, goals, driving environment, company)

Mastery of traffic situations

(e.g. rules, observation, driving path, interaction)

Vehicle handling and manoeuvring

(e.g. gears, controls, direction, tyre grip, speed adjustment)

What are the hierarchical levels?

Level 5: Social environment

Forms the social environment which affects human behaviour (via identification) and which is affected (via personal selection).

Is the environment the person is experiencing. It consists of the values of peers, relatives and society, rolemodels, attitudes etc.

Offers goals and models for persons identification and social commitment.

Social environment is one of the strongest factors affecting human behaviour.

"Level 5"

- focus on the driver's social environment, culture, social networks, group goals and motives



"Level 4"

- focus on individual goals, motives, characteristics and competences



Møller & Haustein (2014). **Peer influence on speeding behaviour among male drivers aged 18 and 28.** (Accident Analysis & Prevention, 64, 92–99)

Expected peers' speeding was a key predictor of young male drivers' own speeding.

The discrepancy between own and expected peers' speeding decreases with age.

GDE-model in driver education: problems in application

In examination it is not possible to evaluate all the contents of GDE-model

Teachers' habits, beliefs and abilities are difficult to change
- e.g. from teachers to coaches

Students' expectations of what driving and driver education is and students' abilities affect motivation
- e.g. from turning the steering wheel and braking to assessing ones own habits and skills

The ability to recognize ones strenghts and weaknesses was most popular in post-training for both overconfidents and underconfidents (Molina, Sanmartin, Keskinen, 2013)

Spanish novice drivers' interests

Knowledge and skills: least prefered

Adapting the position of the driver and the car (seating, mirrors, headrests...) **xxxxx**

How other drivers and passengers can influence your own driving **xxx**

How our lifestyle can affect our driving style **xx**

Driving at appropriate speed according to traffic situations **xx**

Carrying out different types of manoeuvres (parking, reversing, ramps...) **xx**

Ability to recognize one's strengths and weaknesses : most prefered

Your ability to brake in different surface conditions **✓✓✓✓**

An ability to anticipate dangerous situations when driving **✓✓✓✓✓**

Controlling the car direction in complex situations (bends, slippery surfaces...) **✓✓✓✓✓**

Thank you

esko.keskinen@utu.fi

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