

Survival or deviance?

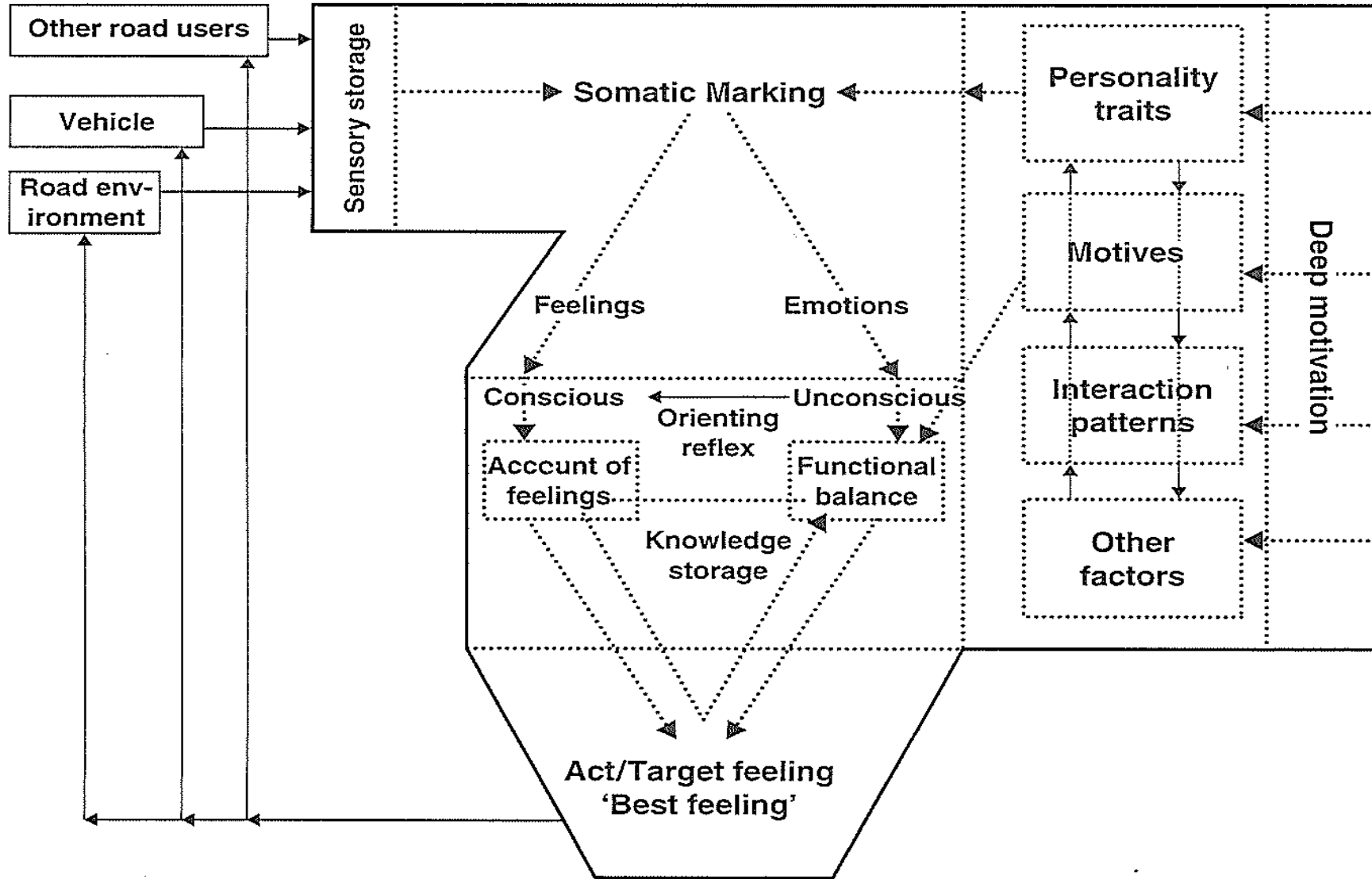
A discussion of motives governing driver behaviour

29th ICTCT Workshop in Lund, Sweden

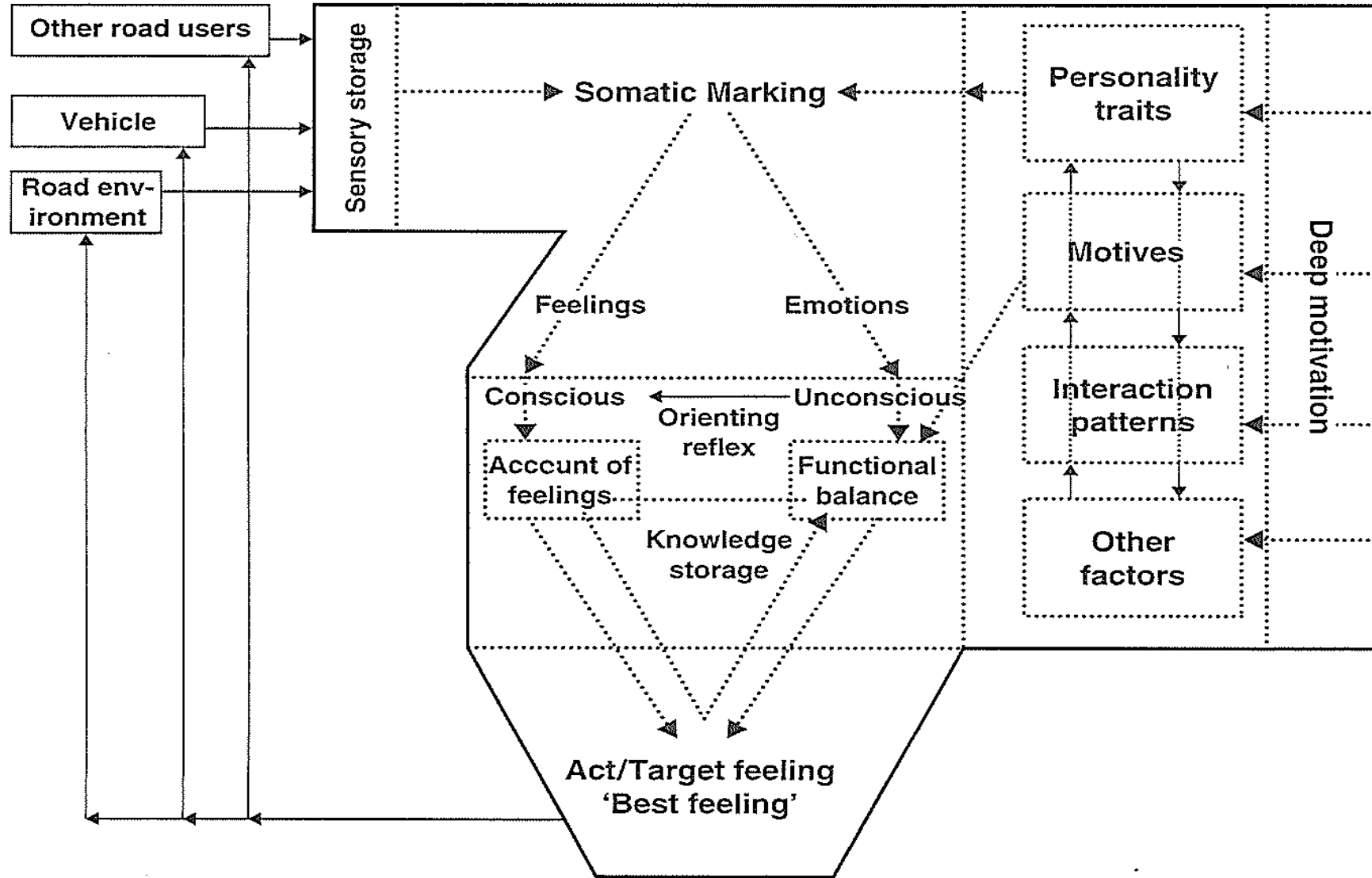
Lund University, Friday 21st October 2016

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1st starting point (2003): A model of driver behaviour



Survival or deviance ? ...why "survival"....?





*Antonio S. Damasio: "Descartes' Error:
Emotion, Reason and the Human Brain"(1994):*

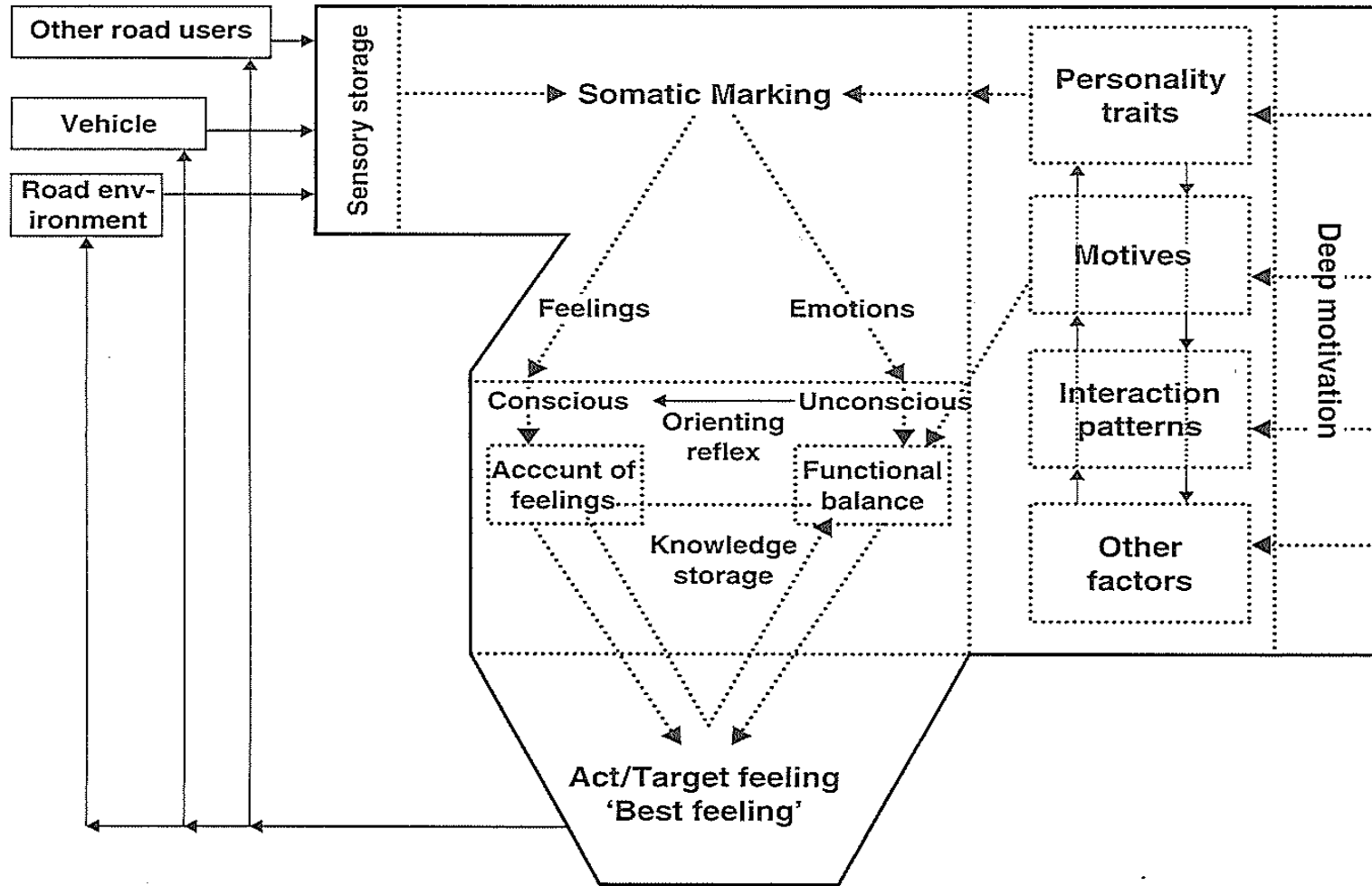
- *Axiom:* Man's deepest motive: Survival
- *Deduction:* We must have an organ, a risk monitor for detecting dangers that threaten survival

Evolution processes have developed:

⇒ The body is the risk monitor

Emotions and feelings are the tools

“Survival or deviance” ? ...why “deviance”....?





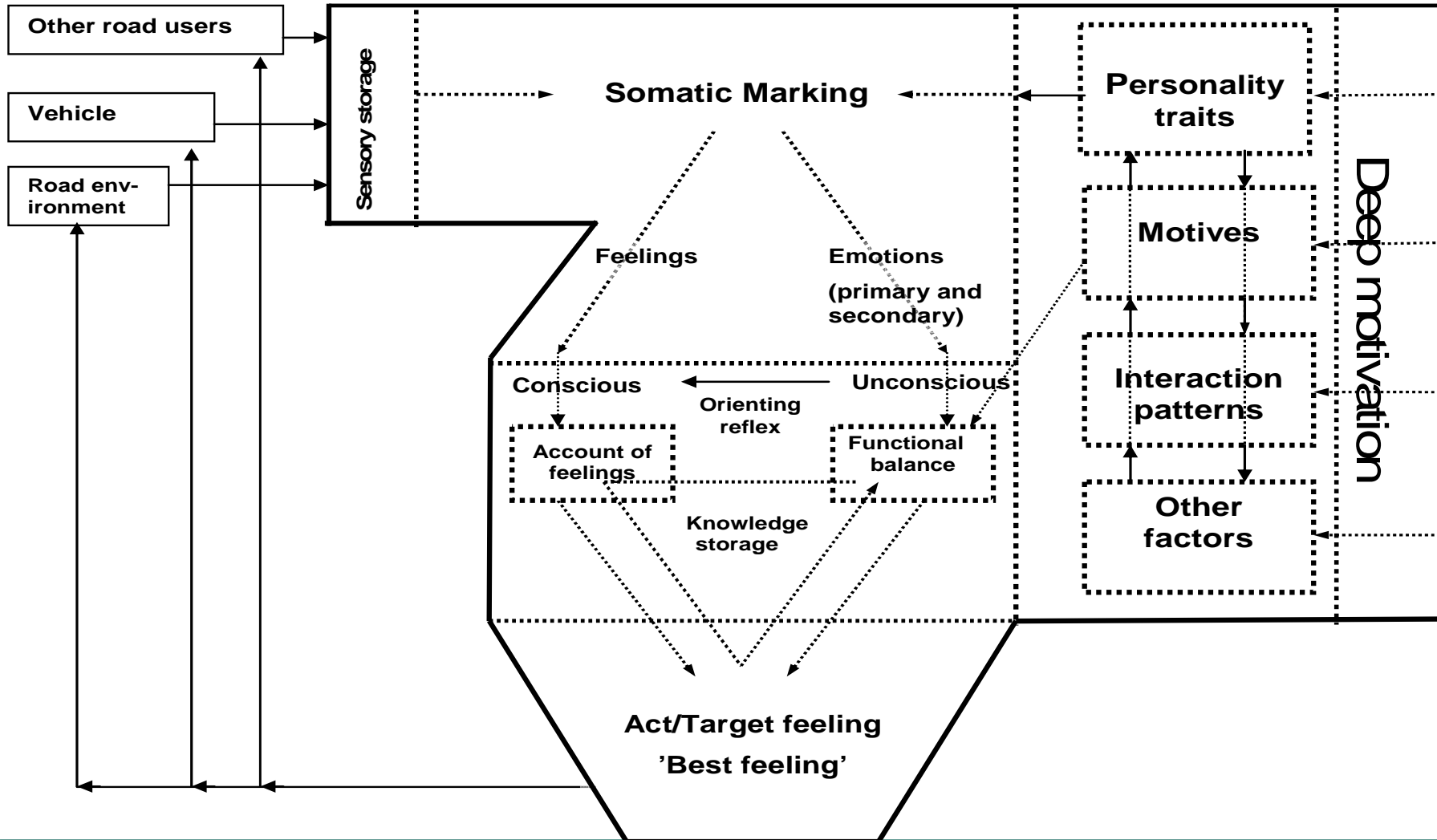
Ulleberg (2002): Subgroups of drivers “Big –5”:

Traits → Attitude → Motivation → Behaviour → Accidents

1. “Considerates”: Cooperate... < average risk
2. “Socially deviants”: Interaction conflicts > average risk
3. “Anxious”: Cautious, defensive < average risk
4. “Considerate sensation-seekers”: Cooperate, s-s when alone: Average risk
5. “Aggressive”: > Provoked/provocative, aggression triggered > average risk
6. “Adaptable, egoistic, economic man”: Control, selfish, but without much conflict – average risk

“The Survival Model” ? The Risk Monitor Model (RMM)

The Risk Monitor Model



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2016: “Survival or deviance” revisited

2nd starting point:

Statement from a member of CIT

CIT: Norwegian Crash investigation teams
In-depth investigation of all fatal accidents since 2005



Statement from a member of CIT

«When the number of accidents goes down, we, in the CIT, feel that the accidents we are left with, seem to be:

- more and more particular,
- more and more dependent on personality characteristics
- it is the outsiders who keep coming and kill themselves in these accidents

-it becomes evident that these people are beyond reach when considering our traditional way of thinking about road safety measures....»

-Who are they ? ≠ «The survivors»?

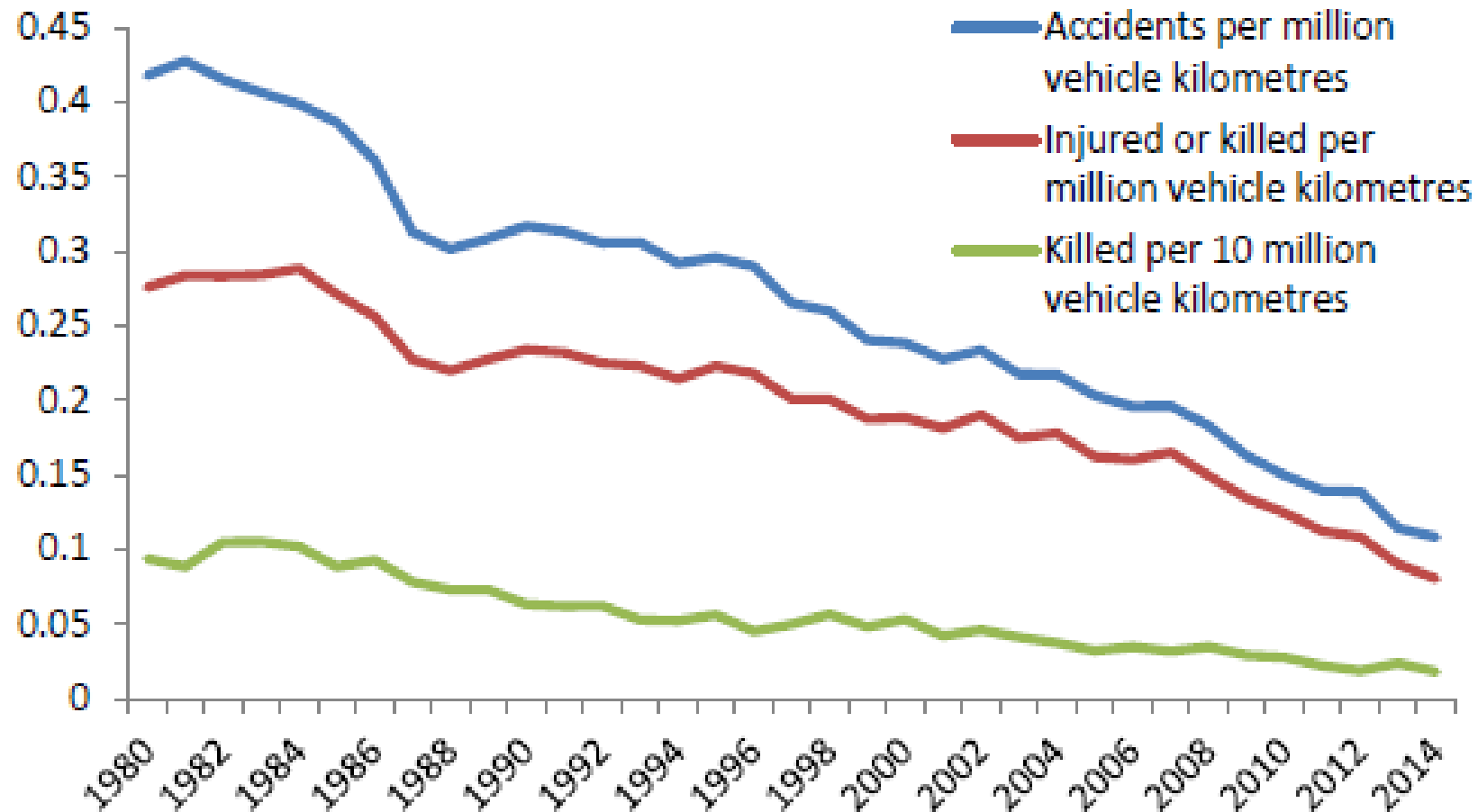


Figure S.2 Accident risk, injury risk and fatality risk in Norwegian road traffic 1980-2014.

Risk development 1980 -2014 (Bjørnskau 2015)

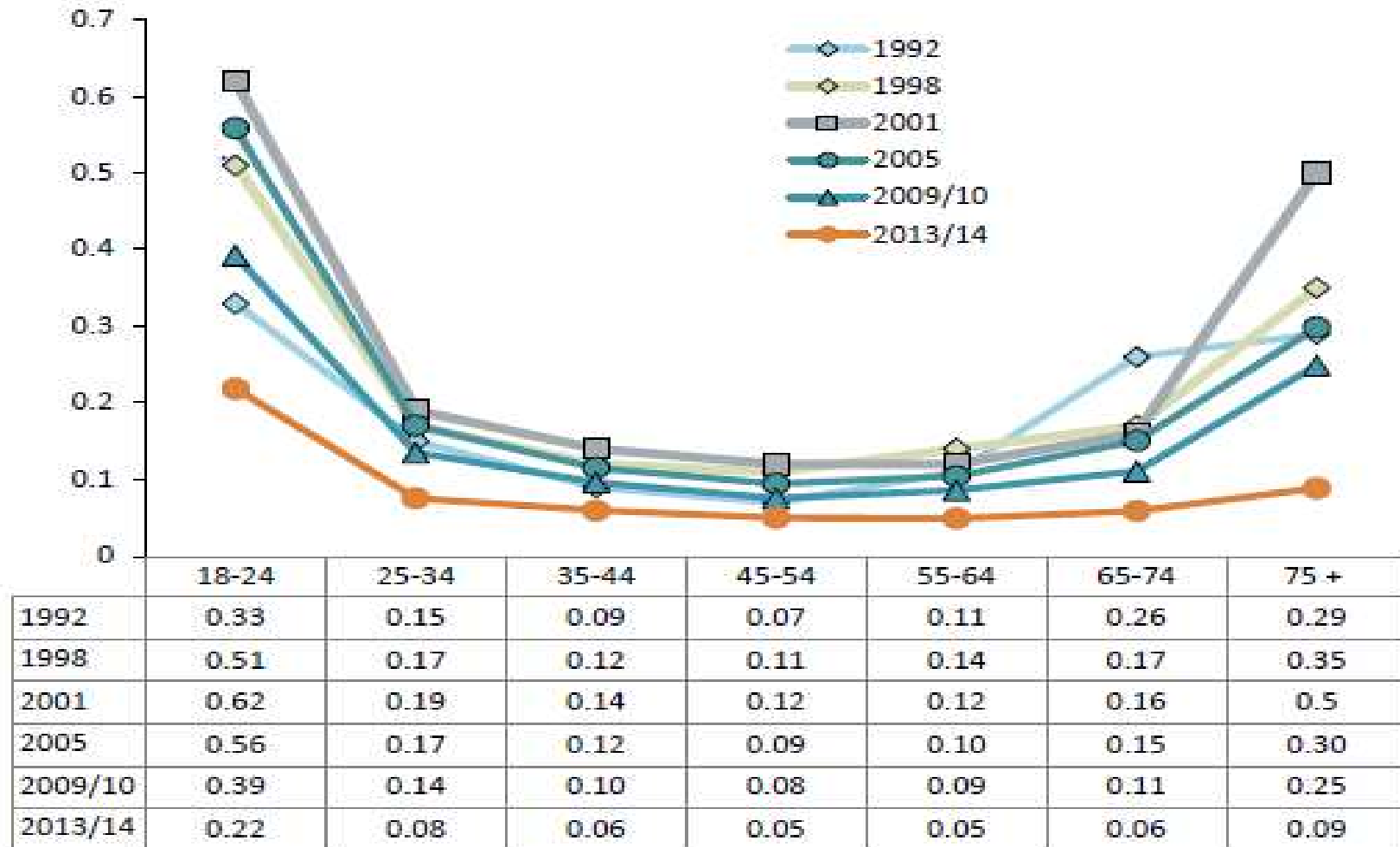


Figure S.5 Car drivers killed or injured per million person kilometres distributed by age in 1992, 1998, 2001, 2005, 2009/10 and 2013/14.

Risk development 1985 -2014 (Bjørnskau 2015)

	Car drivers	Car passengers	Pedestrians	Pedal cyclists (d+p)	Moped (d+p)	Light mc (d+p)	Heavy mc (d+p)
1985	0.19	0.19	0.64	1.43	2.12	4.23	4.20
1992	0.19	0.17	0.79	1.22	1.45	1.56	1.69
1998	0.17	0.17	0.68	1.23	1.22	1.48	1.33
2001	0.16	0.15	0.63	1.08	1.05	1.62	0.96
2005	0.14	0.14	0.47	0.82	1.30	2.43	0.79
2009/10	0.11	0.11	0.27	0.62	0.80	1.99	0.58
2013/14	0.07	0.06	0.26	0.54	0.51	1.85	0.46

■ 1985 ■ 1992 ■ 1998 ■ 2001 ■ 2005 ■ 2009/10 ■ 2013/14

t0i *Is it safe to drive in traffic ?*

■ **1998:**

- Approx 0,17 per mill km **≈ 1 accident/5,900,000 km**
- Suppose: Driver career from 18 – 83 yoa **= 65 yrs - 14,000 km/year**
- One driver "on the road": 65 yrs x 14.000 km **= 900.000 km**
- 5,900,000 km : 900.000 km: **≈ 6,5 drivers**
- ***1 personal injury accident per 425 driving years*** (80 – 90% minor injury)

● **2014:**

- Approx 0,07 per mill km **≈ 1 injury accident per 14.300.000 km**
-
- 1 personal injury accident per 1000 years (80 – 90% minor injury)
- 1 fatal accident per 37,593 years

toi The increase of road safety measures

The Handbook of Road Safety Measures:

1989 (2nd edition): 84
1997 (3rd edition): 124
2012 (4th edition): 142

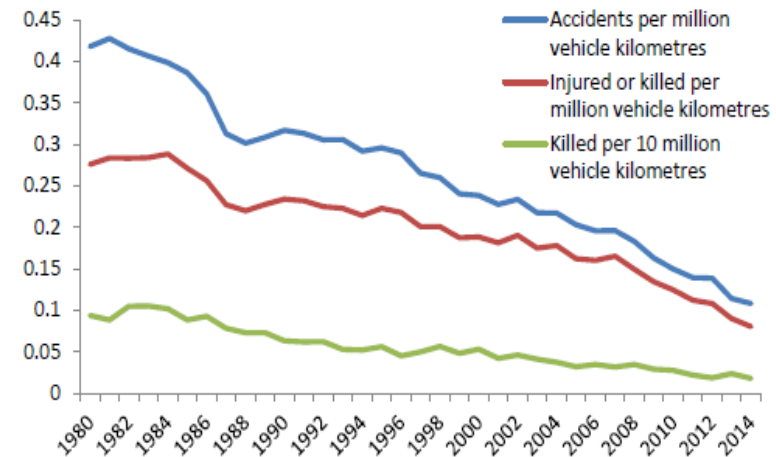


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The rational responses of drivers:

«It's all about learning»

Variable	V ₁	V ₂	V ₃
Lane width	X1		
Shoulder		X2	
Junction design			X3
Cross-section
Roadside			
Road alignment			
Sight distance			
Guardrail			
Road surface			
.....			
Vehicle parameters			
.....			
# of combinations			
$3^{12} = 1.594.323$			

«It's all about learning»

Operant conditioning: $S^D \rightarrow R \rightarrow S^R$

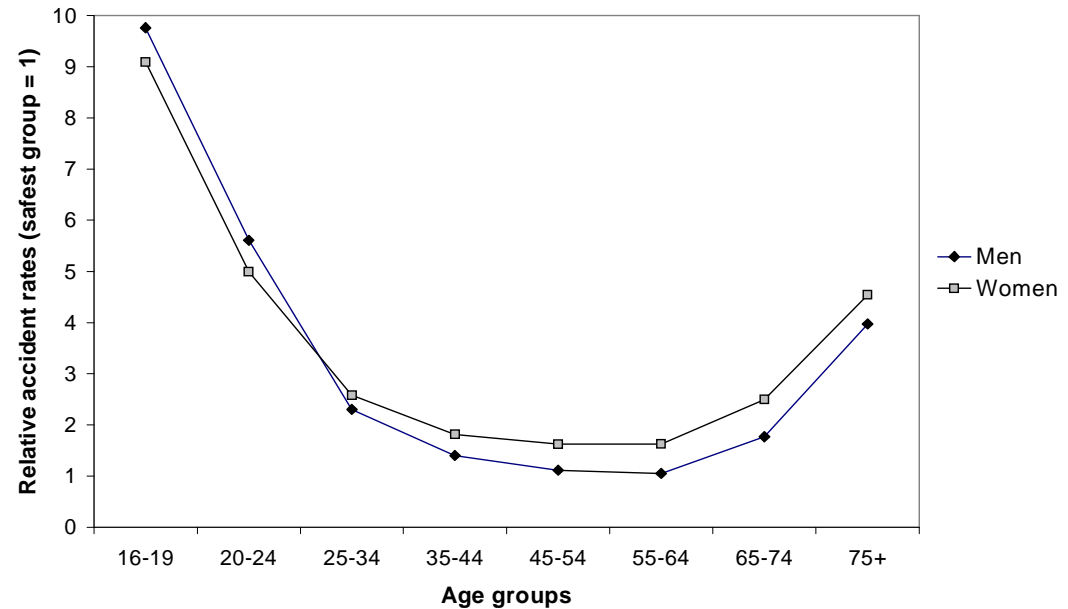
Implicit learning (emotions/schemes)»...»takes place largely independent of awareness of both the process of acquisition and the content of the knowledge so acquired»





«It's all about learning...»

**The novice driver:
“No scheme to warn you
about a sharp bend...”**

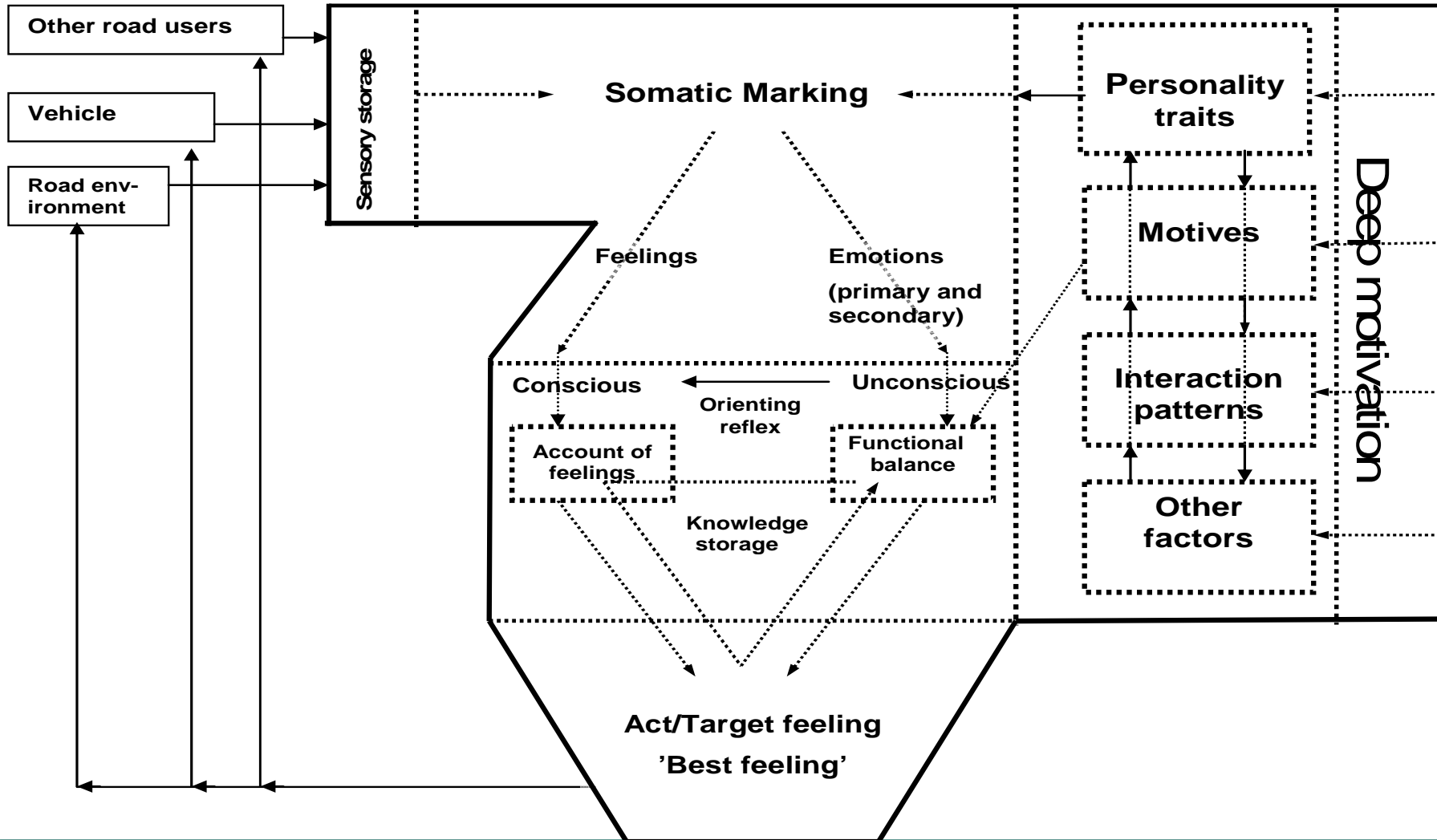


- **“Curriculum”:** Enormous ! # of combinations is astronomic....
 - **Time to complete the curriculum:** 7 years - 100.000 km
 - **Experience:** «..the schemes are there when you need them....»
-

Emotions: *Unconscious processes*

Feelings: *Conscious processes*

The Risk Monitor Model

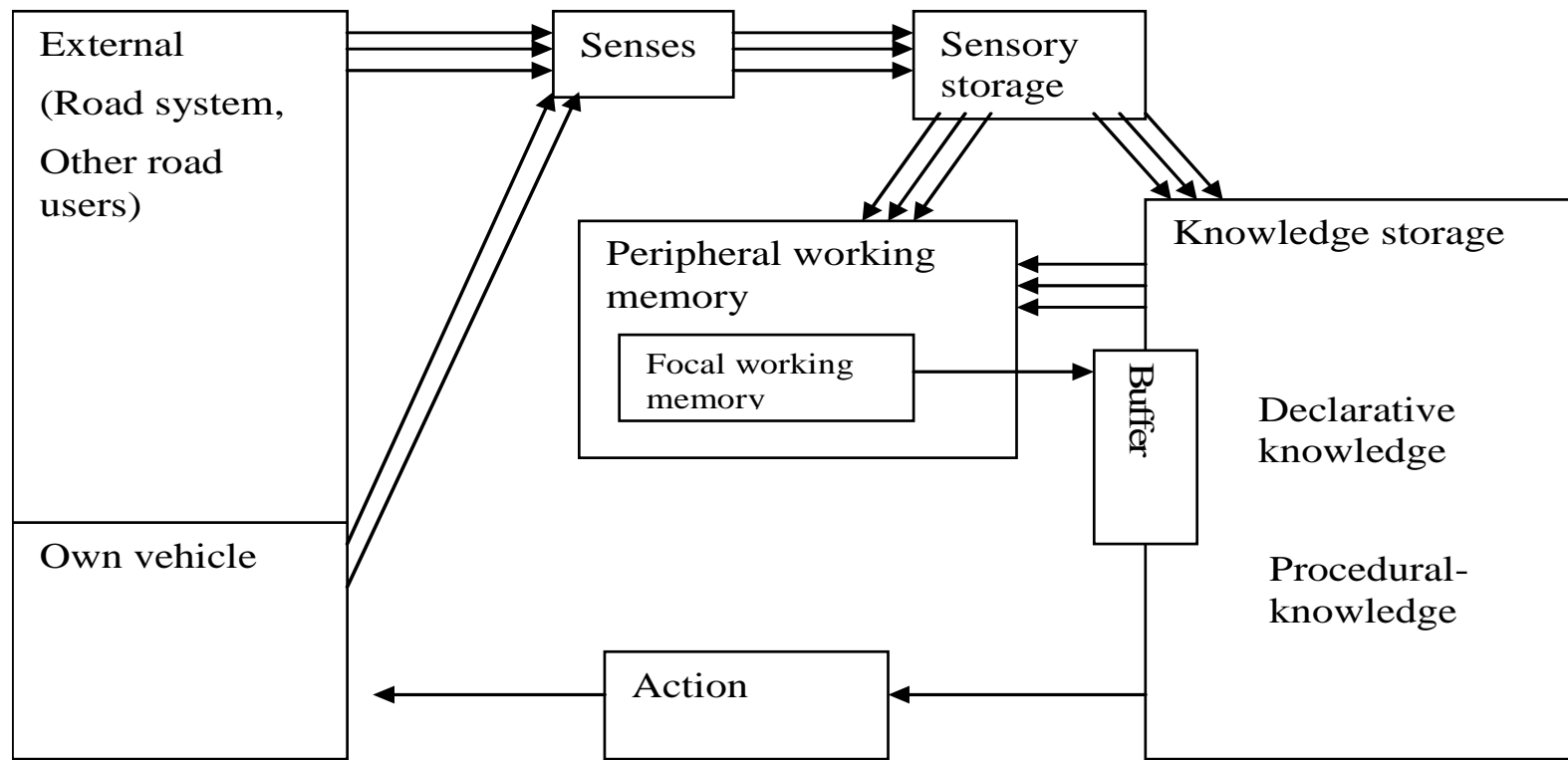


toi Ulleberg (2002): Subgroups of drivers

«BIG-5»: Extraversion, Neuroticism, Conscientiousness, Agreeableness Openness

1. **“Considerates”**: *Balanced, calm, low on anxiety/aggression: Caretaking, smooth interaction, avoiding conflicts, respecting law, low risk*
2. **“Socially deviants”**: *Normless, low on altruism, egoistic, self-confident, sensation-seekers, high risk*
3. **“Anxious”**: *High on altruism, low on stimuli-seeking, un-secure, avoiding conflicts and workload, low risk*
4. **“Considerate sensation-seekers”**: *S-Ss, high on altruism, moderate on normlessness, average risk*
5. **“Aggressive”**: *High on aggression, anxiety and driving anger. Low on altruism, high on sensation-seeking, hostile, high risk*
6. **“Adaptable, but egoistic”**: *Moderate all-over, low on sensation-seeking, altruism,, selfish, self-control, avoiding conflicts. (“economic man”?), average risk ?*

Reason (1990): Model of information processing and decision-making



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Reason's model (1990): "A fallible machine"

The importance of a complete "run":

Perception → information processing → decision-making → outcome

- *The principle of "similarity matching"*
- *The principle of "frequency gambling"*

t0i *Proposing organisation of motives :*

Hierarchy of motives:

1. Survival

- Personality traits → Organising motives*
- “Deep motivation” → Interaction propensities:*
- “Considerates” → Conflict solving*

2. Non – compliance:

- “Deviants/aggressive” → Conflict seeking rather than conflict solving?*
- “Deep motivation” aspects → Disrupt survival?*
- ”Deep motivation” aspects → Abort information-processing and decision-making ?*
- incomplete ?*
- increasing risk?*

Two trends:

Survival: Reduction

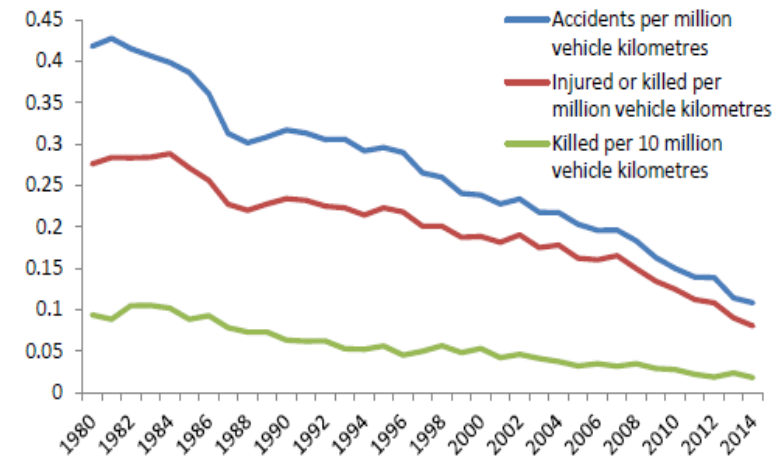


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Deviance - stable?

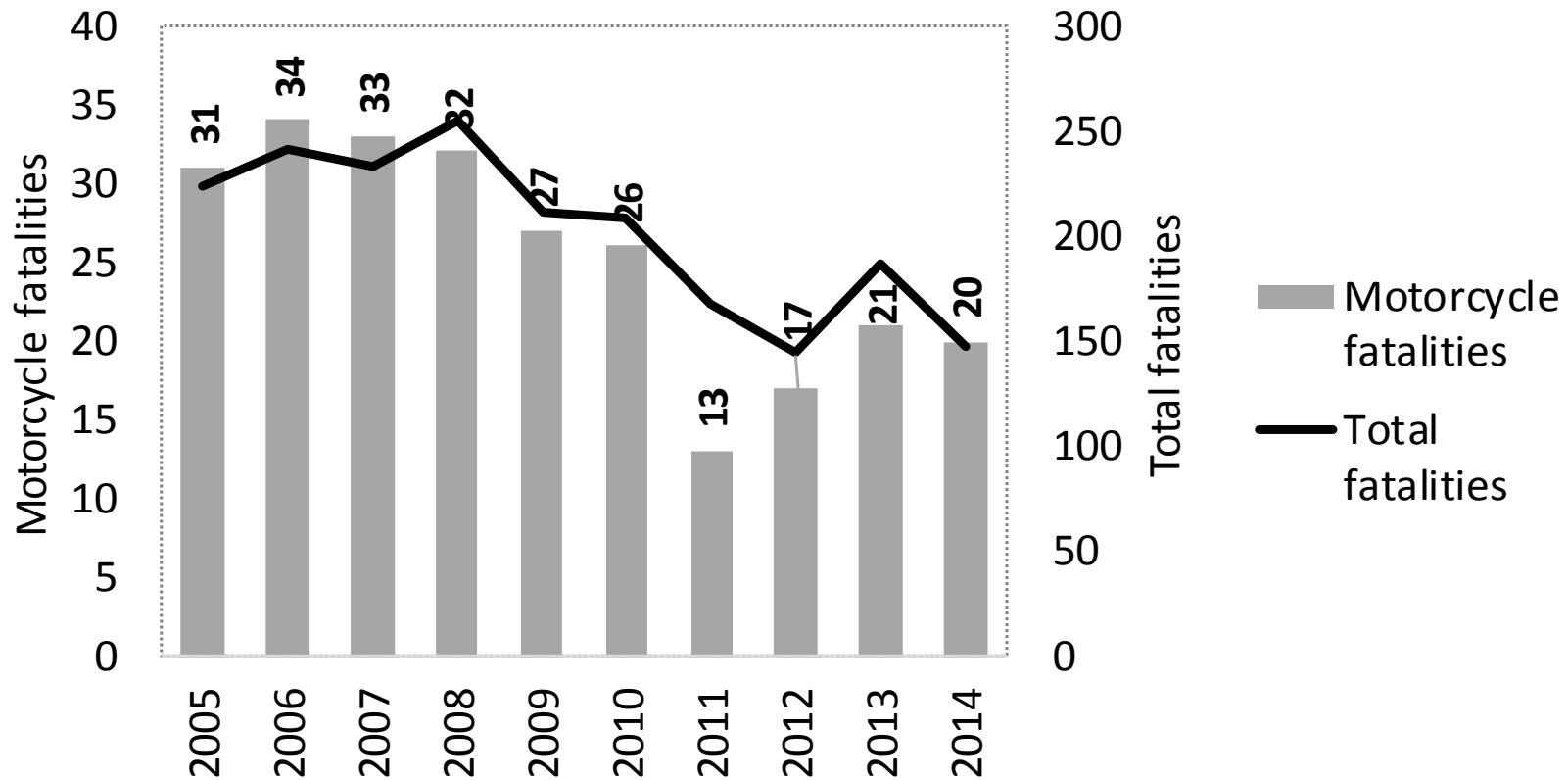
Fatal accidents - MCs



Motorcycle and total road crash fatalities in Norway (2005-2014).

2005-2009 vs 2010-2014: - 36%

of MCs: + 22%



CIT statistics 2016

Contributing causes (%)	2005 – 2015	2015
Driving skill impairment	52	48
High driving speeds (above limit)	40	34
DUI (any substance)	21	22
Fatigue/Falling asleep at the wheel	14	10
Illness	12	12
Suspected suicide	6	2



Fatal accidents in Norway 2015/2005 – 2015

CIT statistics 2016

Variables	2005 – 2009	2010-2014
Average driver age	35	41
Driving without helmet (%)	9	1
DUI (any substance) (%)	14	7
Excessive driving speeds (%)	29	19
ABS (%)	2	14

Drugs/medicine (no alc.) (%)	3	6
No (valid) driving license (%)	21	19
Extreme behaviour (%) (speed/DUI/no license/aggressive)	35	37
Reported speed (%)	36	32
Reported other (%) (violence, theft, narcotics)	34	31

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Statement from a CIT-member

«....it becomes evident that these people are beyond reach when considering

our traditional way of thinking about road safety measures....»