Expectationism: Key to a more safety-oriented culture?

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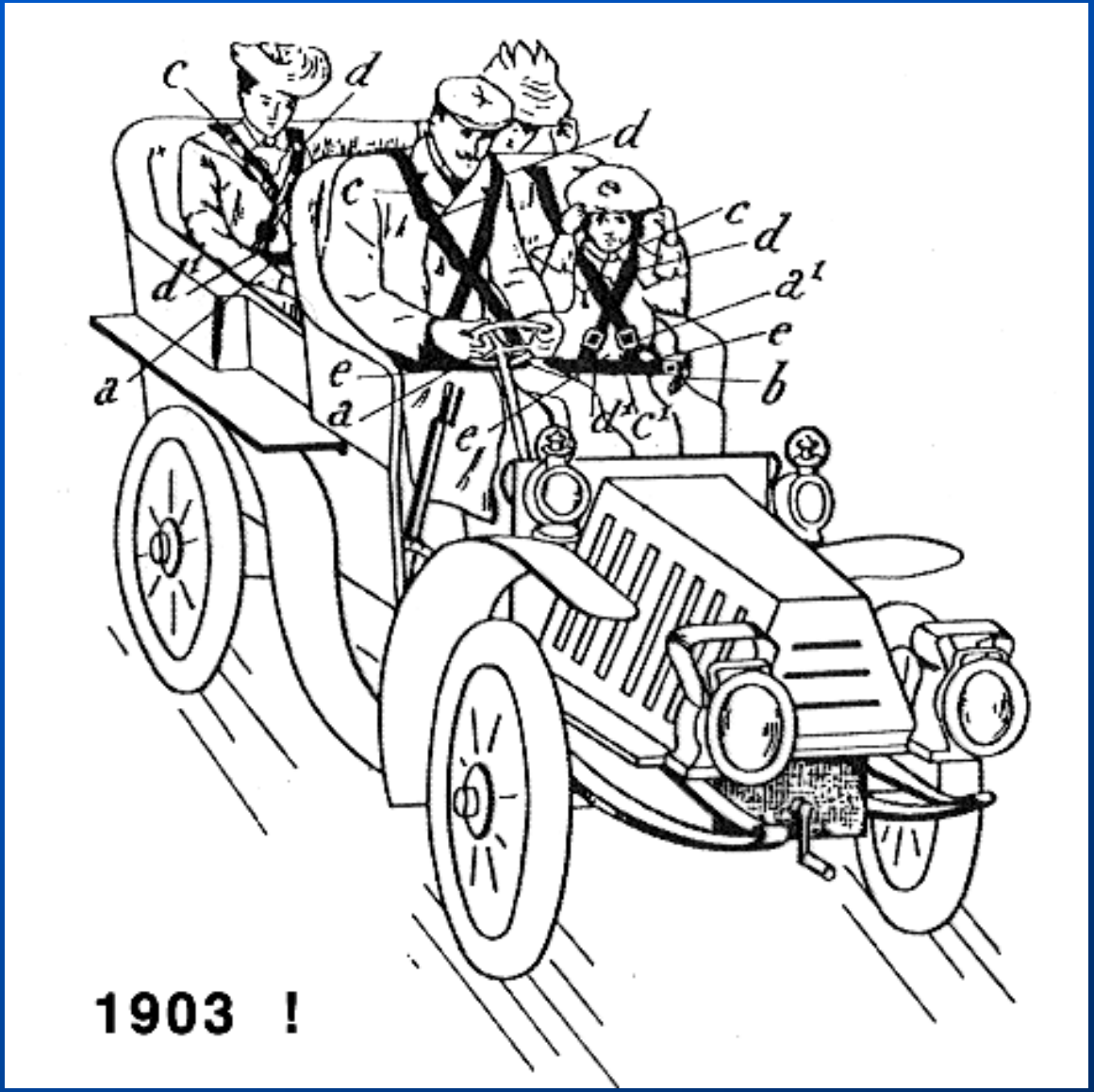
Presented at the NATIONAL RURAL SUMMIT ON TRAFFIC-SAFETY CULTURE, Big Sky, Montana, 2009.06.22

National Rural Summit on **TRAFFIC SAFETY CULTURE**




HERMAN
WE PROGRAMMED OUR NEW SUPER-COMPUTER TO DESIGN A SIMPLE SAFETY DEVICE FOR EVERY CAR AND TRUCK ON THE ROAD.


SOMETHING TO IMPROVE DRIVER ALERTNESS. A PREVENTION AGAINST CARELESS AND RECKLESS DRIVING, TAILGATING, DRUNK DRIVING, INATTENTIVENESS AND LAST-MINUTE BRAKING.


...INEXPENSIVE TO PRODUCE.


WHAT IS IT?


A NEW STEERING WHEEL.
RESEARCH

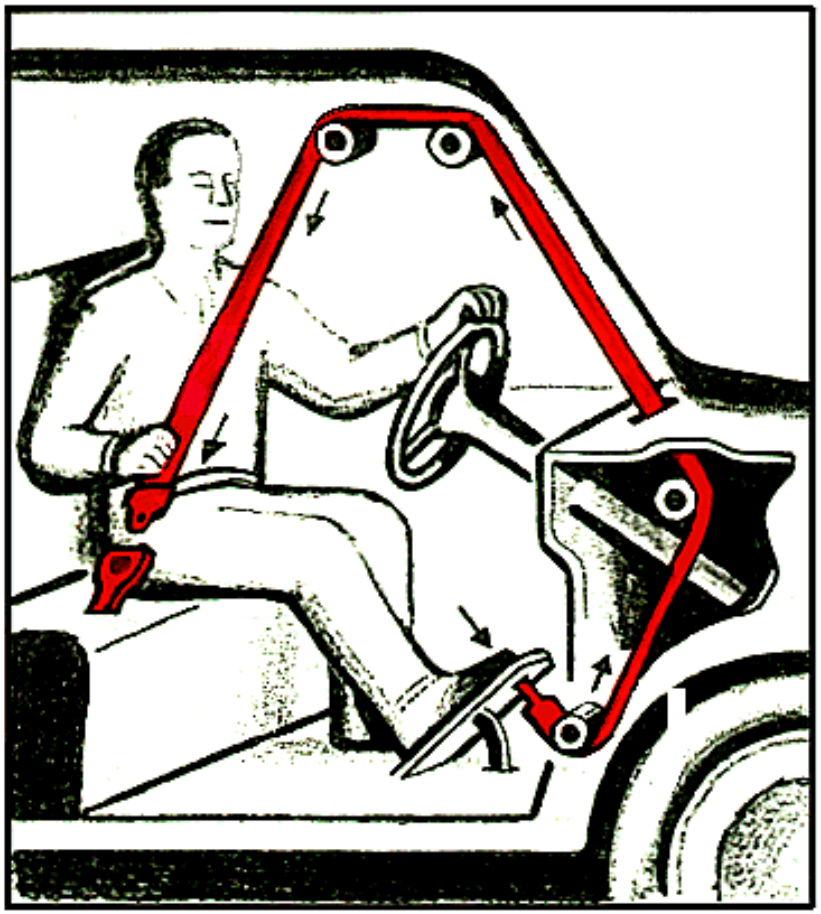
From *Psychology Today*, May 1986

CROSSTALK

PUBLIC SECTOR

DO SEAT BELTS KILL?

BY KEVIN KRAJICK



Accident rates : Basic distinctions:

per unit distance driven

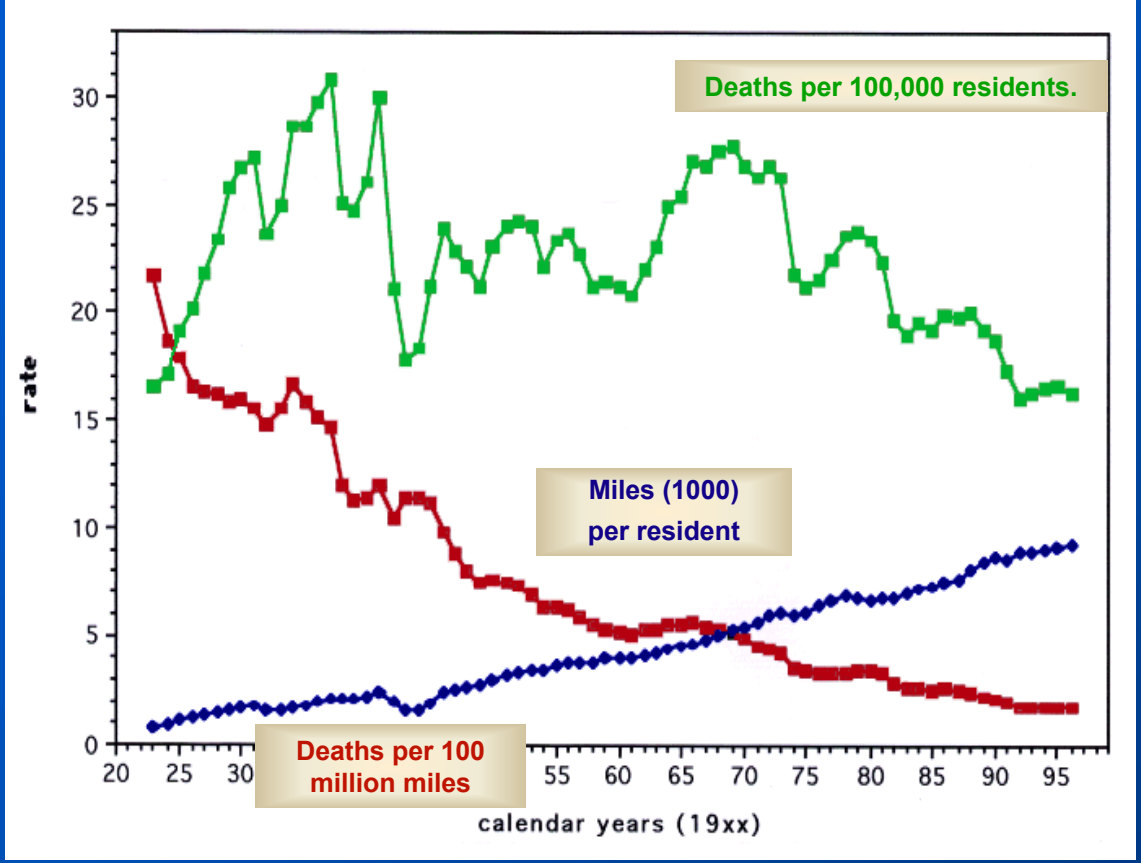
per hour of road use

per head of population per year

What is the *primary goal* of traffic accident prevention?

1. More mobility per traffic injury/death ?
(economic gain)

2. Fewer injuries/deaths per year?
(public health gain)



USA, 1923-1996:

1. Death rate per capita,

2. Death rate per mile driven,

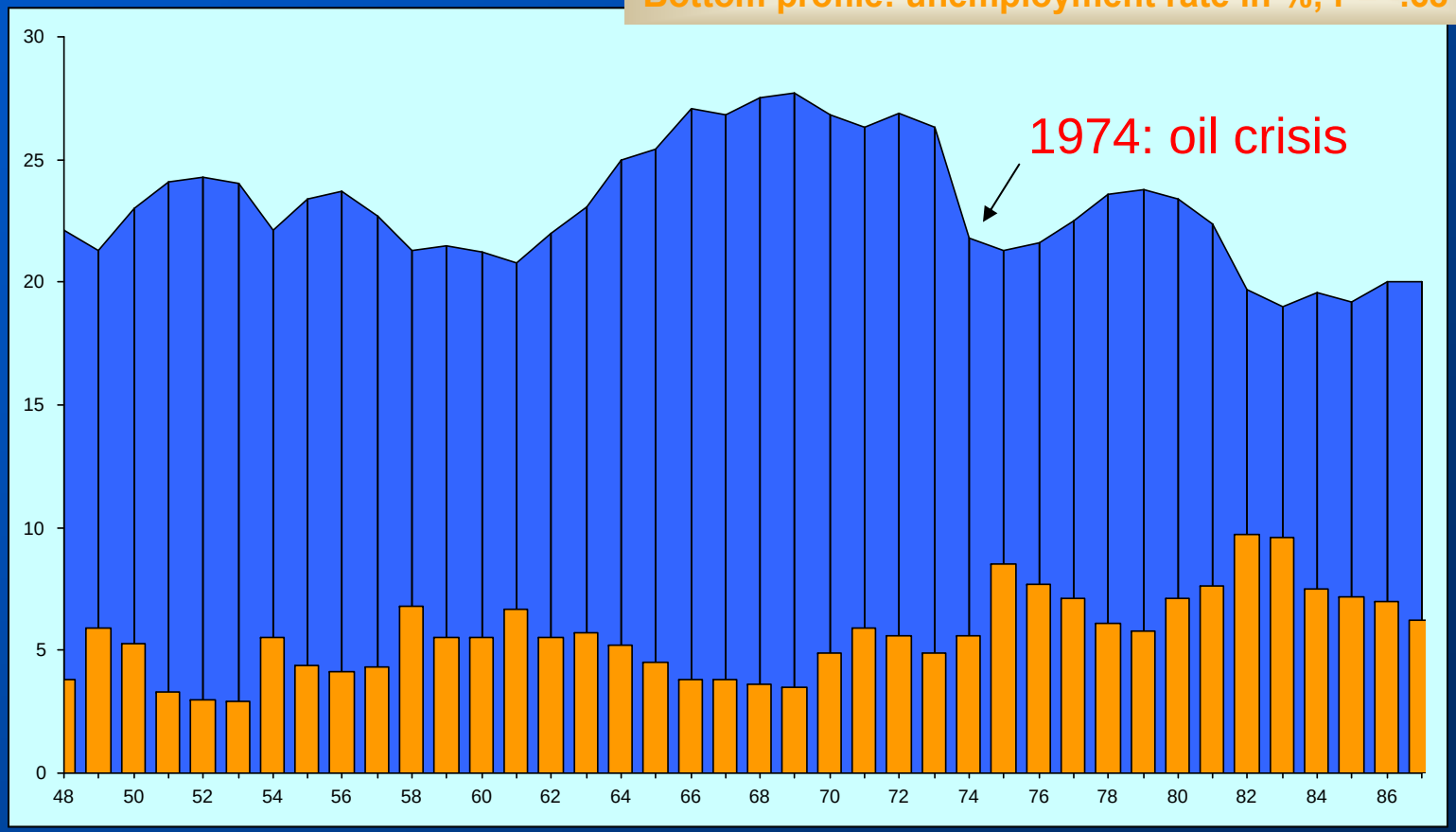
3. Mileage per capita

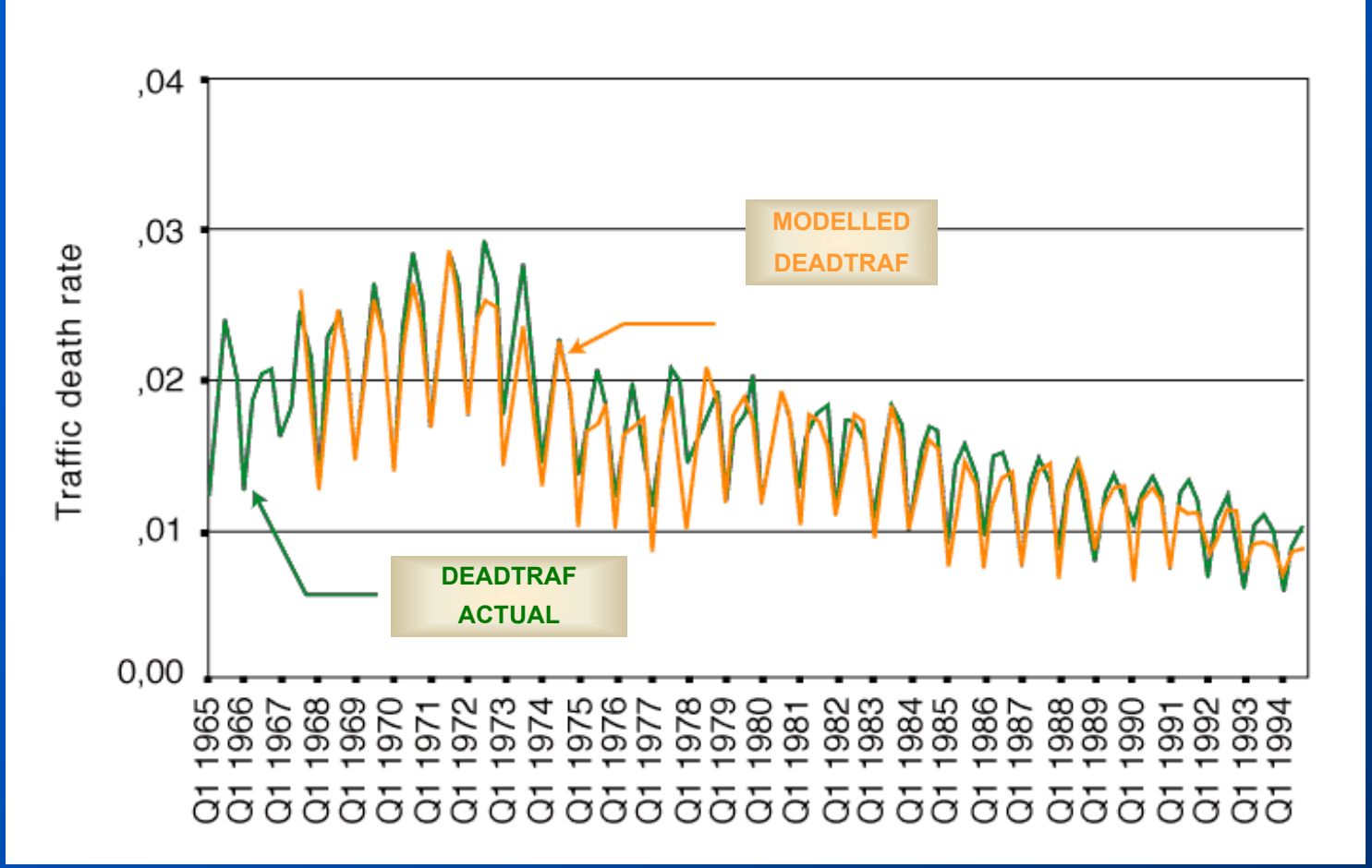
- In 1996 the per capita death rate was about the same as in 1923 (National Safety Council, Chicago, various years)
- In the absence of a dominant upward or downward trend in the course of the larger part of this century, there have, however, been **major fluctuations** in the annual traffic death rate per head of population; from a **low** of 16.1 per 100,000 residents to a **high** of 30.8

Annual variations in the unemployment rate and the traffic death rate per capita in the USA, 1948-1987.

top profile: traffic deaths per 100,000 inhabitants

Bottom profile: unemployment rate in %; r = -.68





Actual (DEADTRAF ACTUAL) and modelled (MODELLED DEADTRAF, i.e., predicted by the ARIMA procedure) traffic death rate per 100 residents in Switzerland on the basis of the ***index of industrial production***; quarterly data (from Wilde and Simonet, 1996)

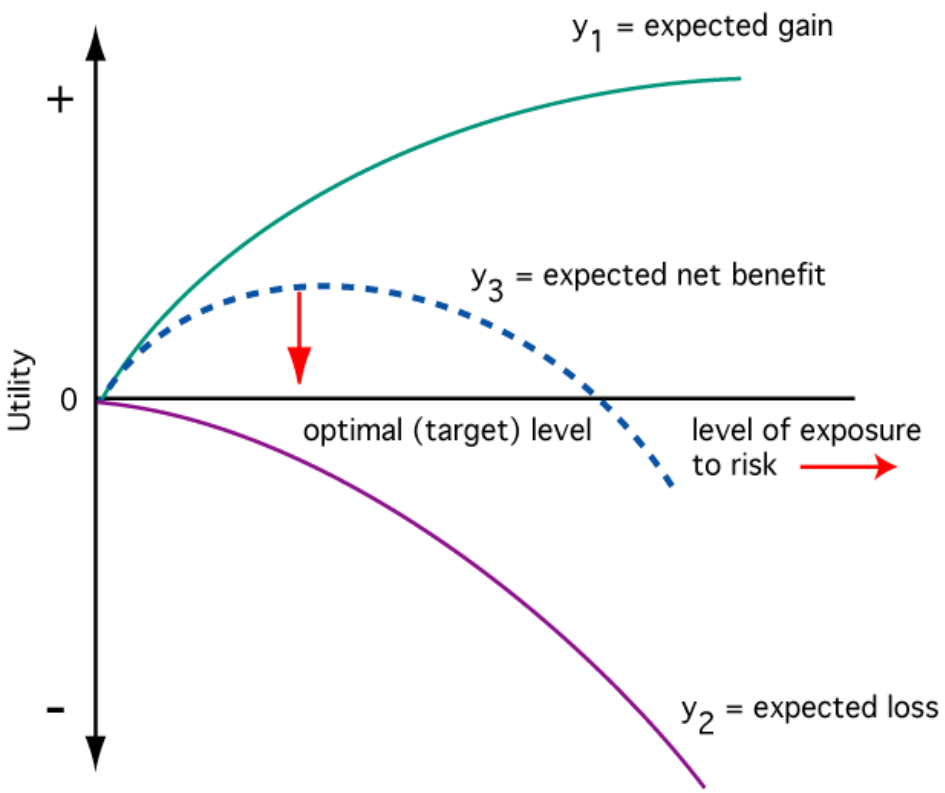
*The **Target Level of Risk***; Four Determining Factors:

1. ( ) Expected ***benefits of risky*** behaviour alternatives; examples: gaining time by speeding, making a risky manoeuvre to fight boredom, rush production to meet a deadline, trying to catch up after having been delayed.

2. (↓) Expected ***costs of risky*** behaviour alternatives; examples: automobile repair expenses after an accident, equipment wear and tear.

3. (↓) Expected ***benefits of safe*** behaviour alternatives; examples: insurance discount for accident-free driving, safety incentives, desiring to obtain a reputation of civic responsibility

4. ( ) Expected ***costs of safe*** behaviour alternatives; examples using an uncomfortable seatbelt, being called a wimp by one's peers, time loss on way to destination



Theoretical representation of road users as *net benefit* maximizers and thus as risk optimizers. They choose an amount and manner of mobility such that the associated level of subjective risk corresponds with the point at which the expected net benefit is maximal. <u>This is the smartest level of risk!</u> (Note that the curve y_3 has been drawn so that each y_3 value equals the corresponding value y_1 minus the corresponding value y_2 absolute.)

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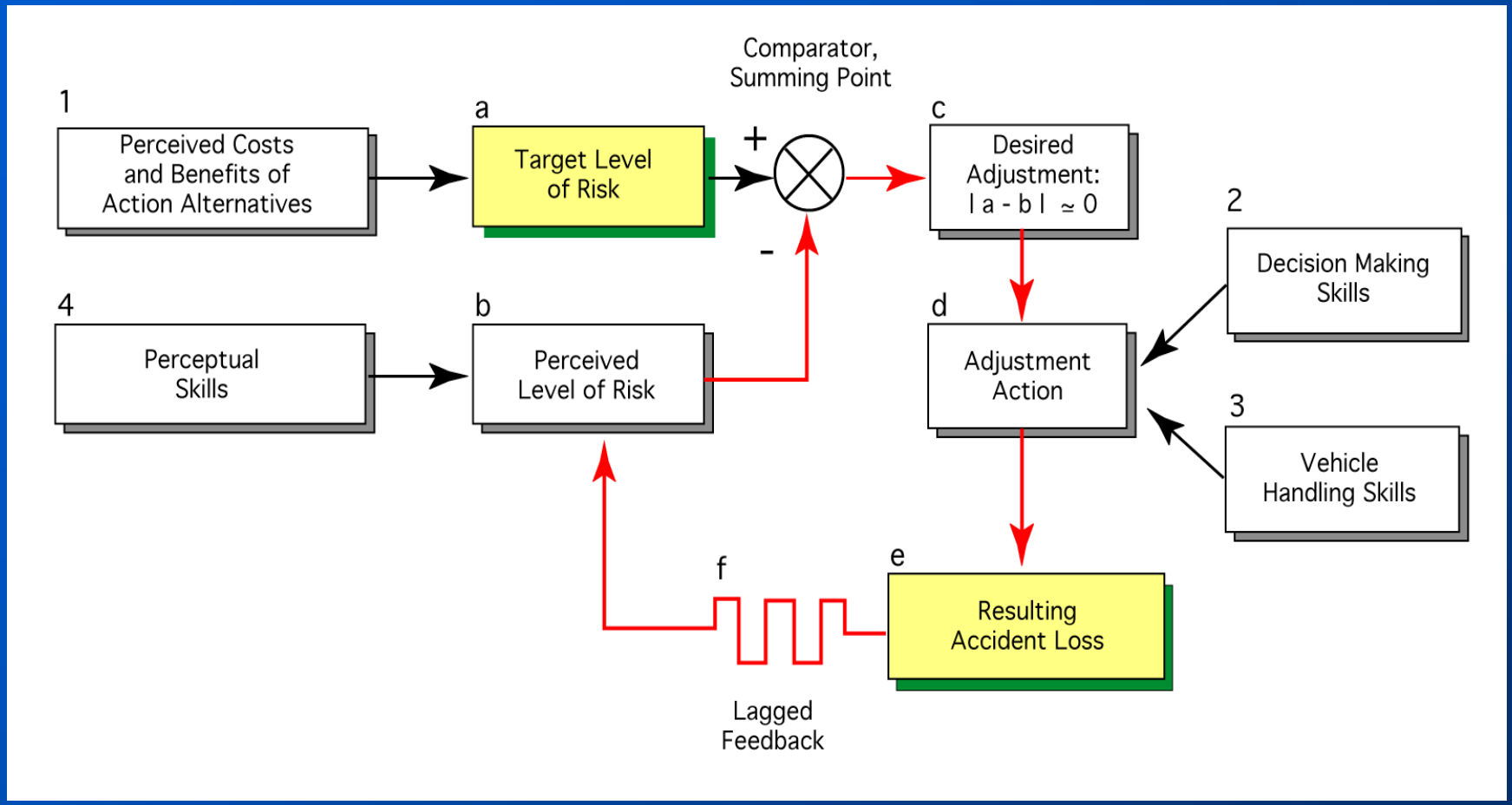
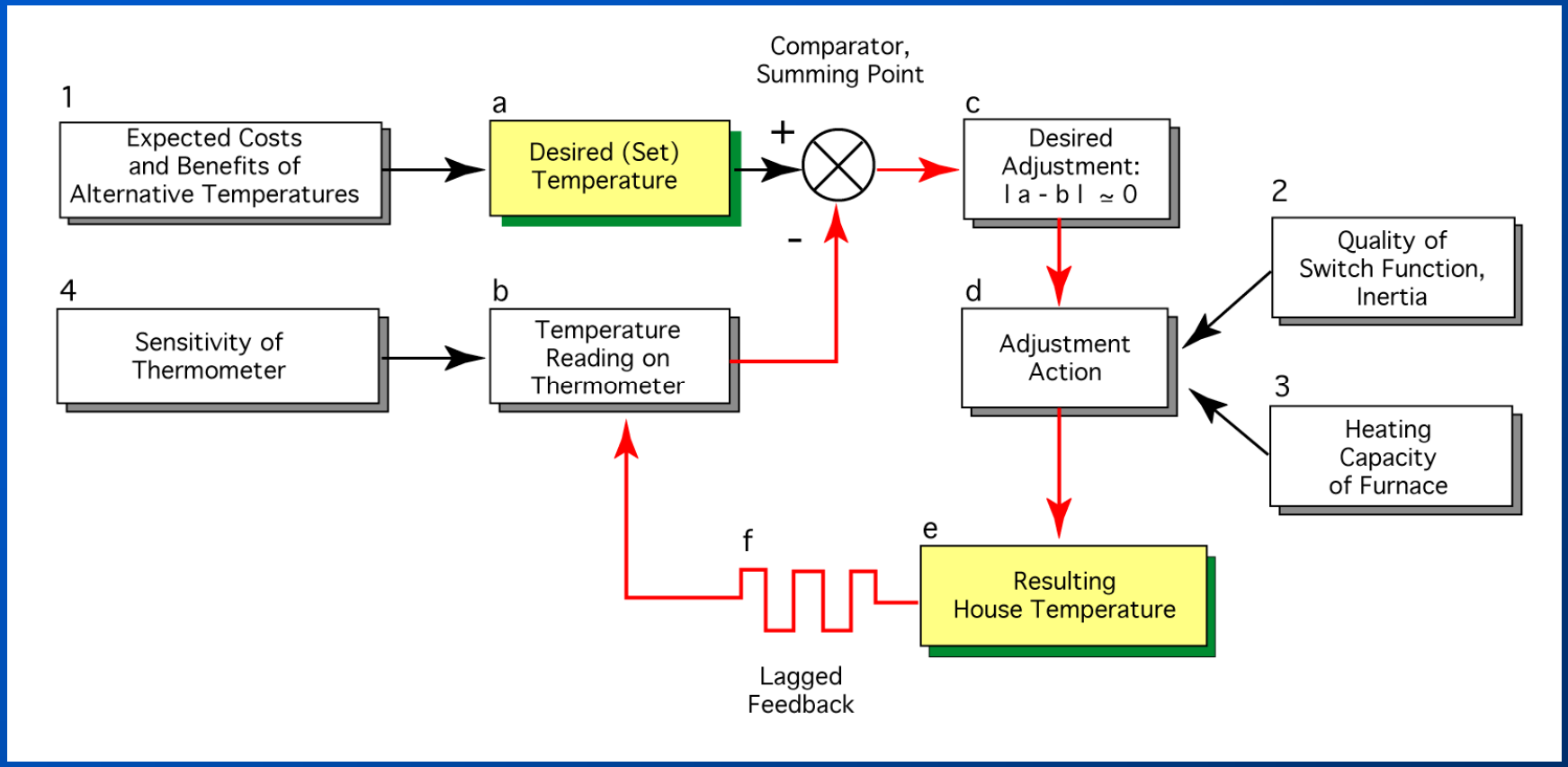
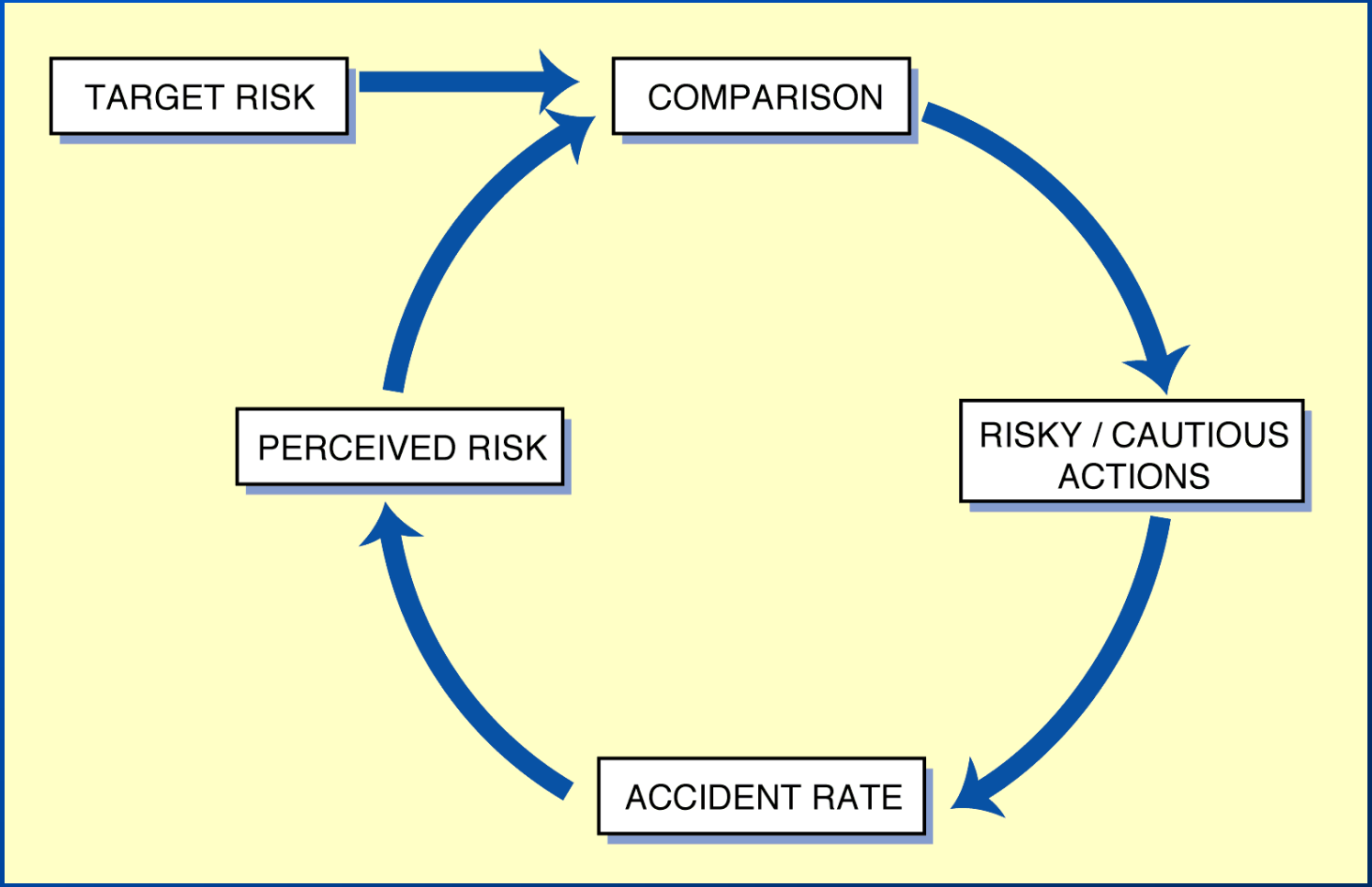


Homeostatic model relating the ***accident rate*** per head of population in a jurisdiction to the average level of caution in road-user behaviour and *vice versa*, with the average target level of risk as the *controlling* variable.

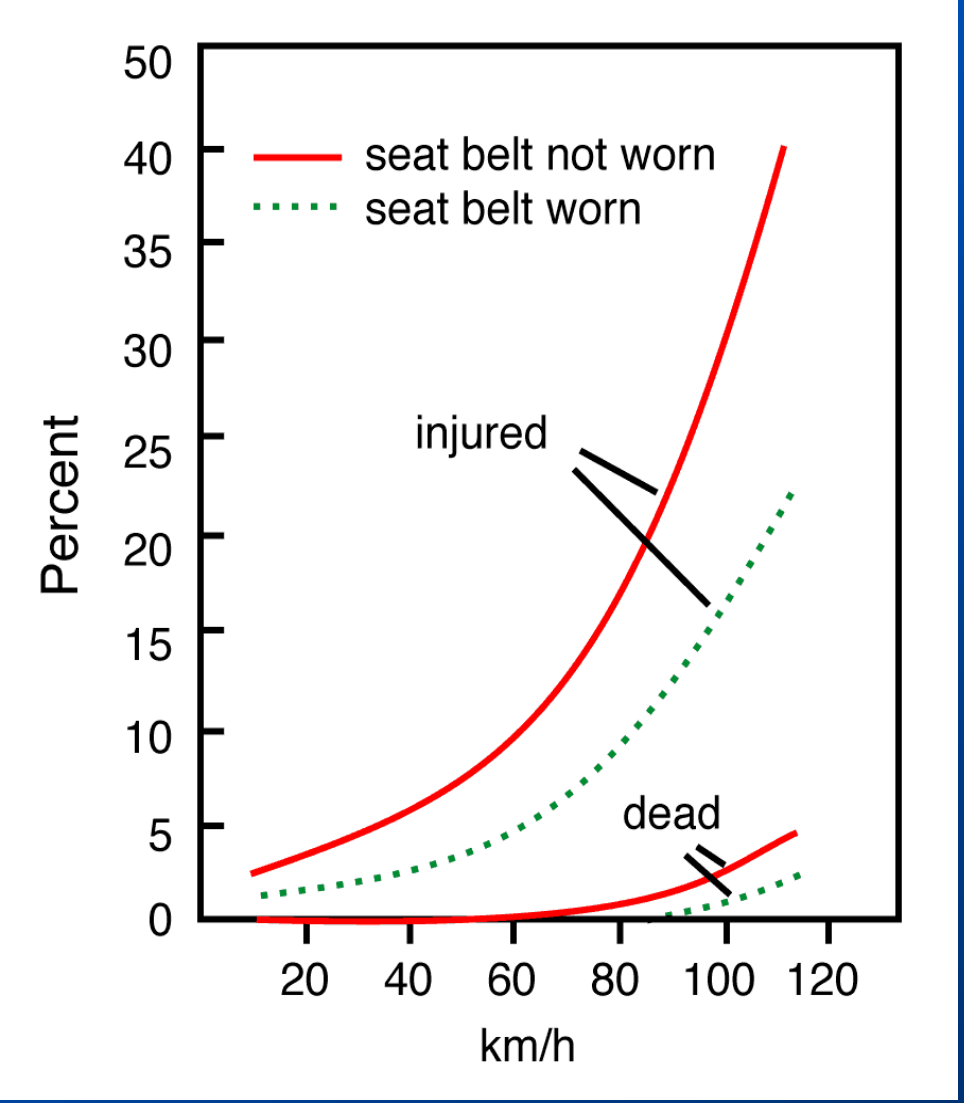


Homeostatic model relating house ***temperature*** to heating system activity and *vice versa*: relating heating system activity to house temperature, with the set-point (target) temperature as the *controlling* variable

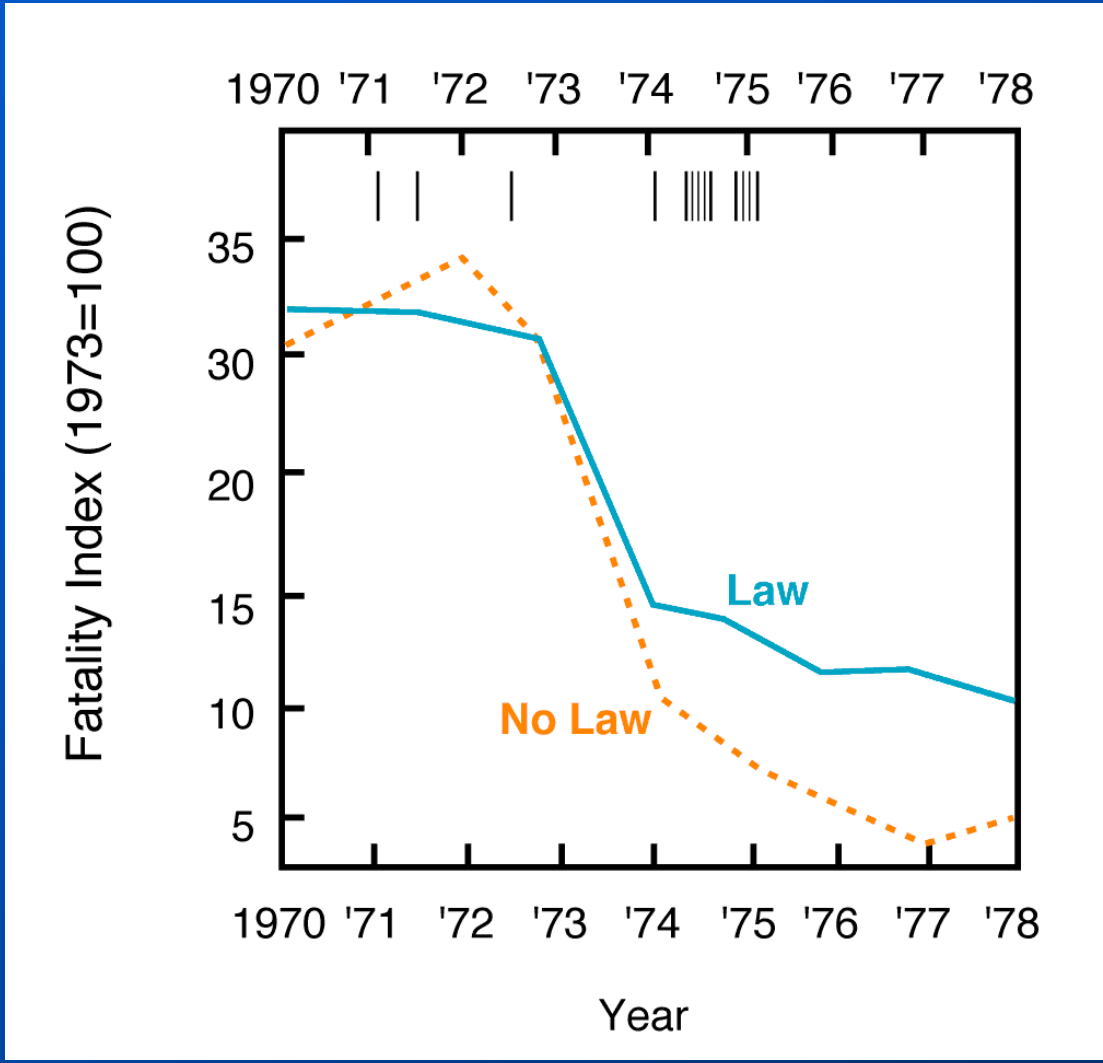
Accident Causation as a *Closed-Loop Control Process*



Note: (1) Sweden 1967 and (2) Iceland 1968



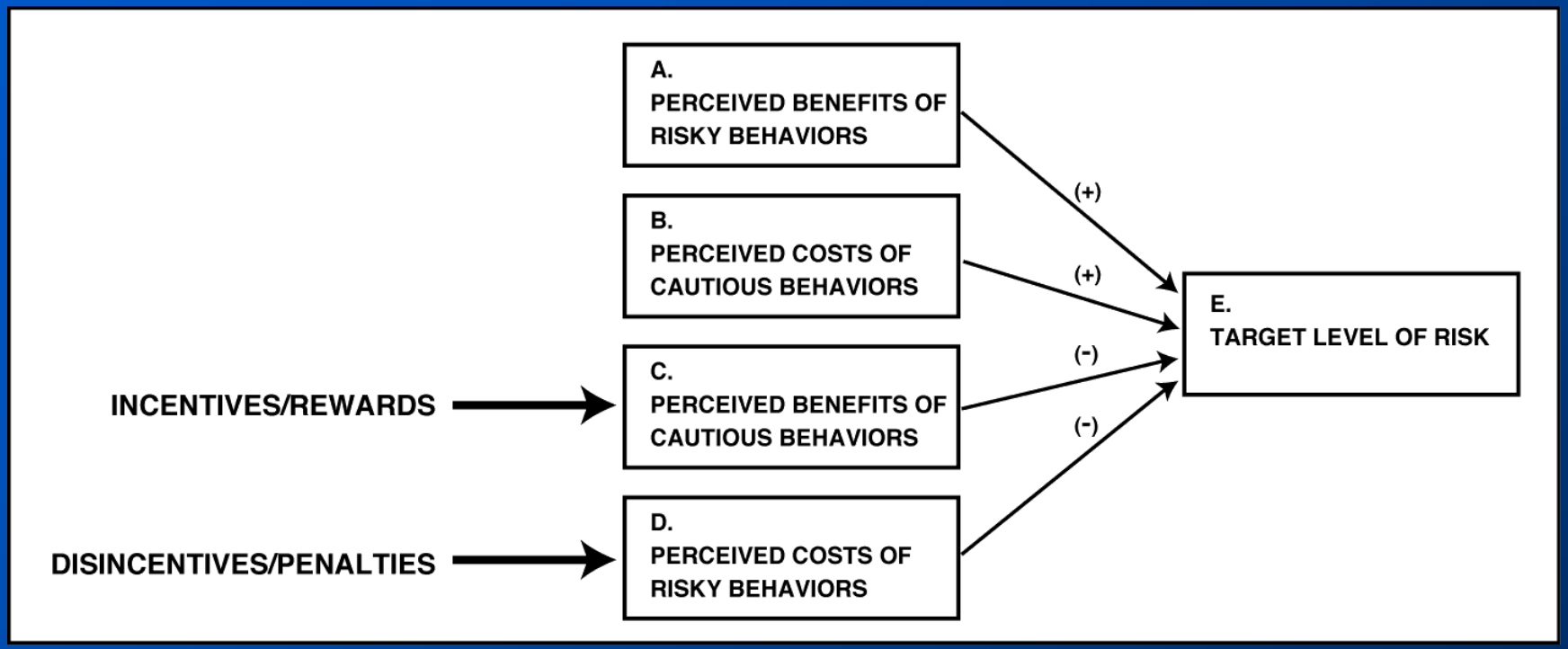
Graph showing the effect of *voluntary* seatbelt wearing in reducing driver fatalities and injuries at different impact speeds. Data base 28,870 accidents.



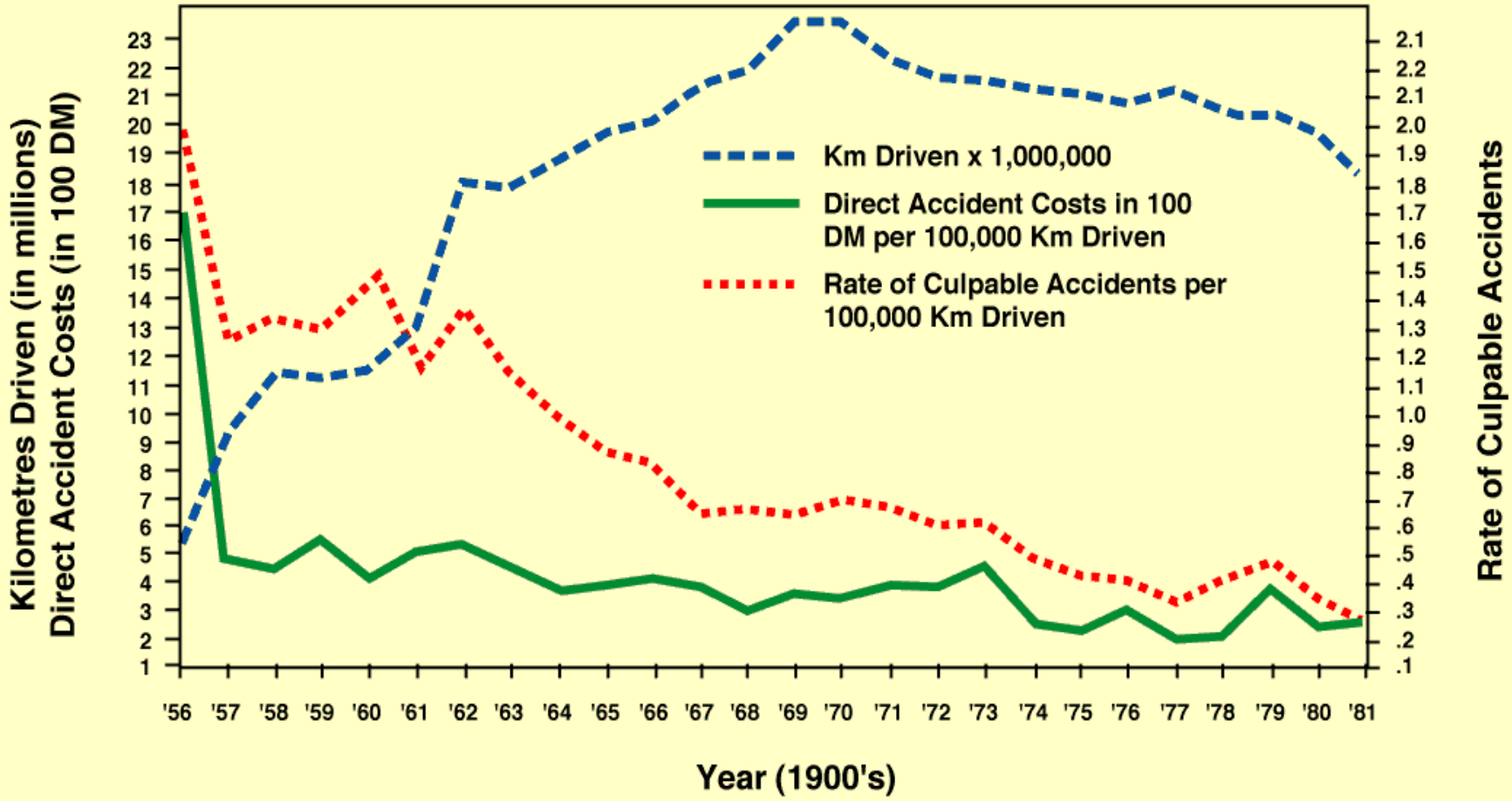
Bars at top indicate dates on which law came into effect in different countries. (Adams, 1985)

Further evidence for behavioural adaptation

1. US motorcycle helmet laws
2. Munich taxicab experiment with ABS
3. Dutch seatbelt wearing experiment
4. USA seatbelt wearing rate and accidents
5. Accident *migration* – German Autobahn
6. Accident *metamorphosis* – alcohol, BC
7. US flood protection and flood victims
8. Skydiver parachute ripcord
9. Michelangelo computer virus
10. Railway crossing visibility improvement



The four utility factors that determine the target level of risk.



Drop in accident rate and annual accident costs in a German trucking fleet after the institution of a safe-driving incentive programme initiated in 1956

Rationale for safety incentive programmes:

"To protect people from the negative consequences of risky behaviour is to encourage risky behaviour"

"To offer people positive consequences for cautious behaviour is to encourage cautious behaviour"

Sample features of safety incentive programmes

Target Group : Industrial employees, truck and van drivers, passenger car drivers, public transit bus drivers

Scope: workers/drivers only

workers, foremen, supervisors and middle management

Sample features of safety incentive programmes (continued)

Nature of bonus: cash, savings bonds, public praise, certificates of merit, merchandise, extra holidays, lottery tickets, insurance discounts/rebates, free driver's licence renewal, savings stamps for merchandise

Eligibility: individuals only, for team performance only, for a combination of both.

Sample features of safety incentive programmes (continued)

Condition for eligibility: being accident-free, displaying specified safety behaviours, a combination of both

Incubation period: One month, three months, six months, one year

Penalty for failure to report an accident: Yes/no

Sample features of safety incentive programmes (continued)

Implementations: incentive programme only,

or *combined* with other accident countermeasure (usually safety training/education)

Programme evaluation: sometimes high standard, sometimes weak methodology, sometimes absent

Some findings of effects of safety incentives in road traffic:

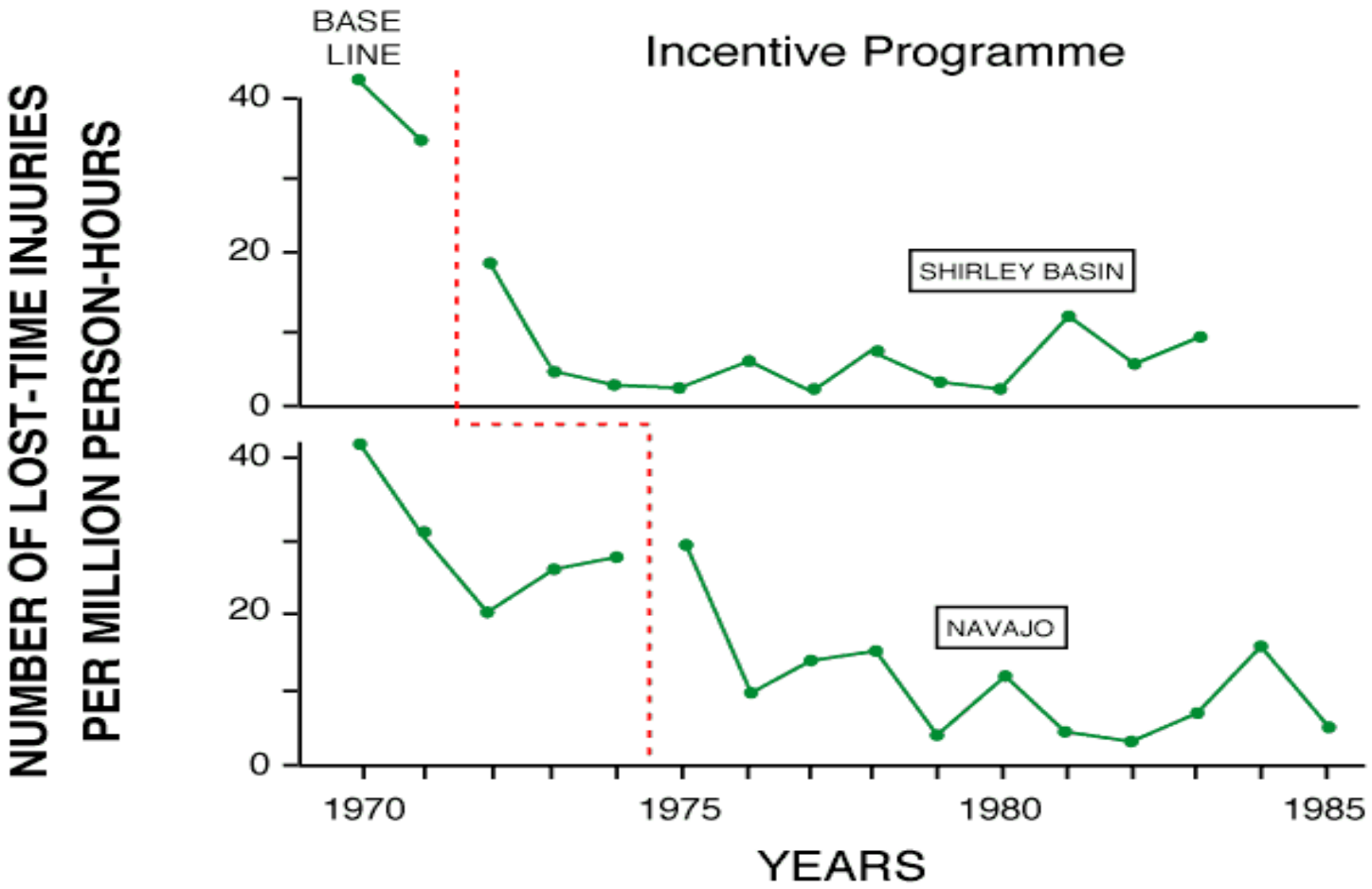
1. Truck drivers (Germany): approx. 80% reduction in accidents,

2. City transit drivers (USA): 25-35% reduction,

3. Passenger car drivers (California): 22-33% reduction; effect even greater in drivers under 25,

4. Novice passenger-car drivers (Norway): 35% reduction.

Date of intervention



The yearly number of work-related injuries, per million person-hours worked, requiring 1 or more days lost from work (open pit mining for coal and uranium).

Conditions favouring incentive effectiveness (1-5 of 16)

1. Managerial vigour and commitment

2. Programme designed *in cooperation* with the target group

3. Extend incentives to *multiple levels* in the organization

4. Keep rules simple

5. Provide *equitable* judgement of responsibility for culpable accidents (with an *appeal process* in place)

Conditions favouring incentive effectiveness (6-10 of 16)

6. Reward *accident-free performance*, not some particular safe behaviour

7. Choose rewards perceived as *attractive*

8. *Progressively* increasing rewards for longer periods of being accident-free

9. Make sure that reward is being perceived as *equitable*

10. Make sure that reward is being perceived as *attainable*

Conditions favouring incentive effectiveness (11-16 of 16)

11. Consider supplementing incentive plan with safety training

12. Discourage under-reporting of (minor) accidents

13. Strengthen *peer pressure* towards safe conduct

14. Keep incubation period reasonably short

15. Decide on what you want to maximize: net savings or the benefit/cost ratio

16. Provide for a research and evaluation component

General conclusions from incentive studies

1. Lost-day case rate or doctor's cases per 100,000 hours worked reduced to one-half or even 20%

2. Benefit-cost ratios usually at least 2 to 1; ratios as high as about 25 to 1 have been reported

3. Effectiveness usually does not dwindle over time. Some programmes have been in effect over some 30 years without losing effectiveness

4. A company can make money on its safety incentive programme! Who is paying for the added safety?

Side effects of incentive programmes

1. ***Negative*:** under-reporting of minor accidents

2. ***Positive*:** improved (company) morale, leading to more productivity and less personnel turn-over

Why are incentive programmes so effective?

Proposition:

Incentives (the promise of future awards enhance the expected value the future and *hence* the desire for safety and health.

"Expectationism"

People can be expected to be more careful with their health and safety:

1. as they rate the value of their future higher than the value of present time,
2. as they more actively plan for the future.

Future-orientedness, a self-report study

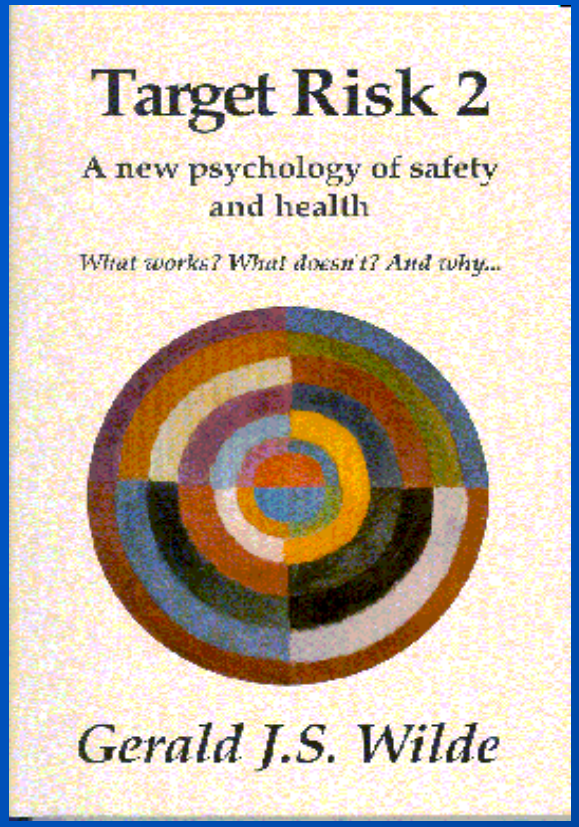
Participants: 628 undergraduate students at Queens' University (Björgvinsson and Wilde, 1998).

Health and safety habits under study:

1. Safe driving
2. Regular seatbelt use
3. Not smoking
4. Healthy diet
5. Regular exercise
6. Moderate drinking

These habits were found to be more common in people who:

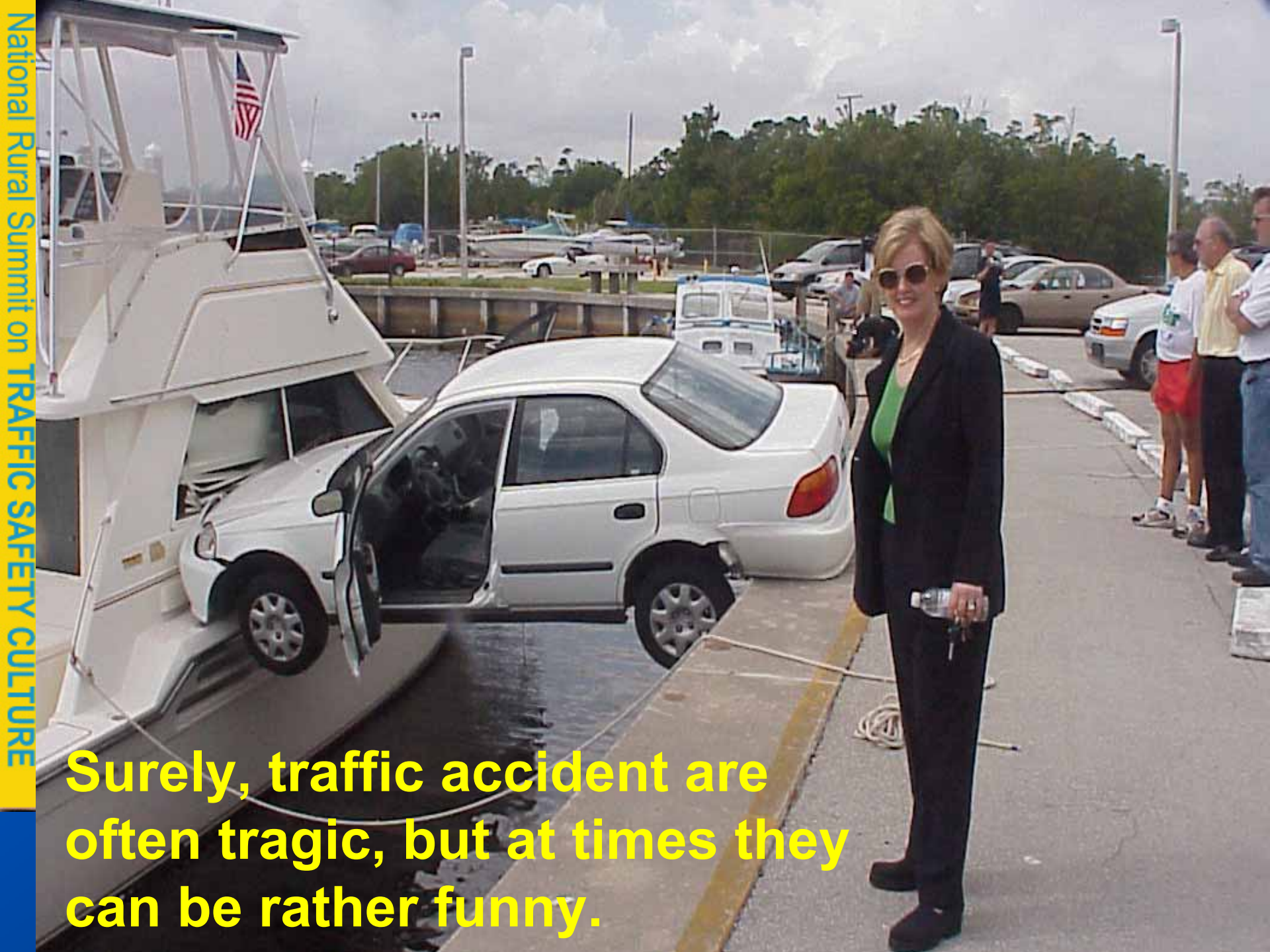
a. place less value in immediate gratification
b. place a higher value on future time, and
c. who have a stronger tendency towards future planning.



Target Risk 2 (2001) cover;

PDE Publications, Toronto;
available from:
pde@drivers.com

Inuit stop sign



Surely, traffic accident are often tragic, but at times they can be rather funny.

Good thing he is wearing a helmet