



Perception of risk & capability in drivers as a function of age & experience

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Agenda

- 1** Theoretical background to the PhD
- 2** Work planned
- 3** Work Package 1: Contributory factors patterns in STATS19
- 4** What are contributory factors?
- 5** Findings from the analysis
- 6** How good is the data?
- 7** Work Package 2: Simulator study
- 8** Discussion

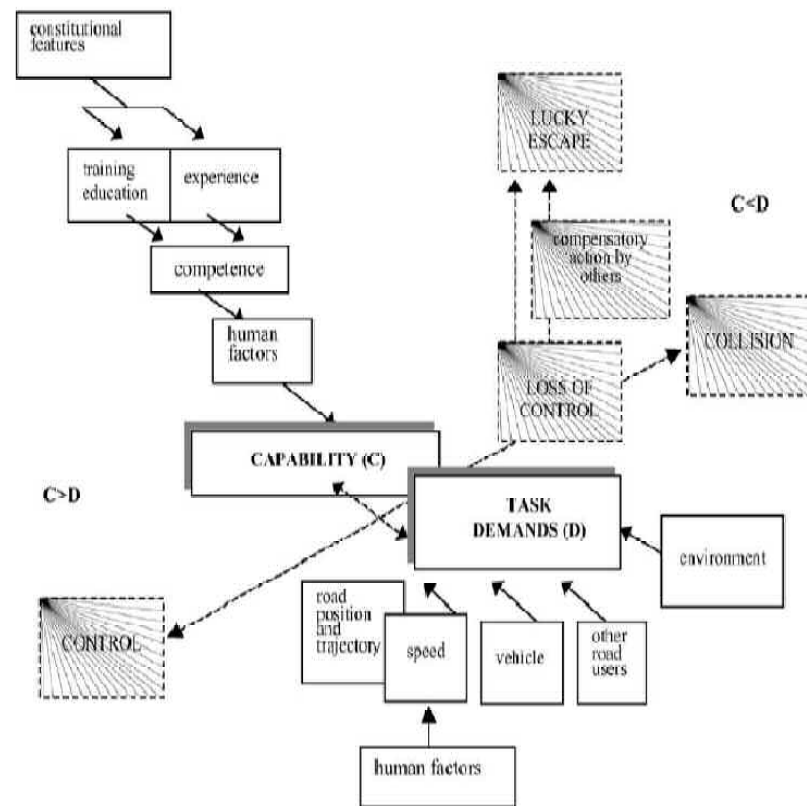
Theoretical framework of the PhD

- Theoretical framework: the Risk Allostasis Model (Fuller 2008), formerly known as Risk Homeostasis Model
- Definition “Allostasis” : Maintaining certain levels of biological conditions that vary according to an individual’s needs and circumstances (Kalat, 2008)
- For the driver: Changing influence of factors such as feelings of anger, competitiveness, thrill seeking, social influences, etc. on the level of task difficulty which drivers are prepared to accept



Theoretical framework of the PhD

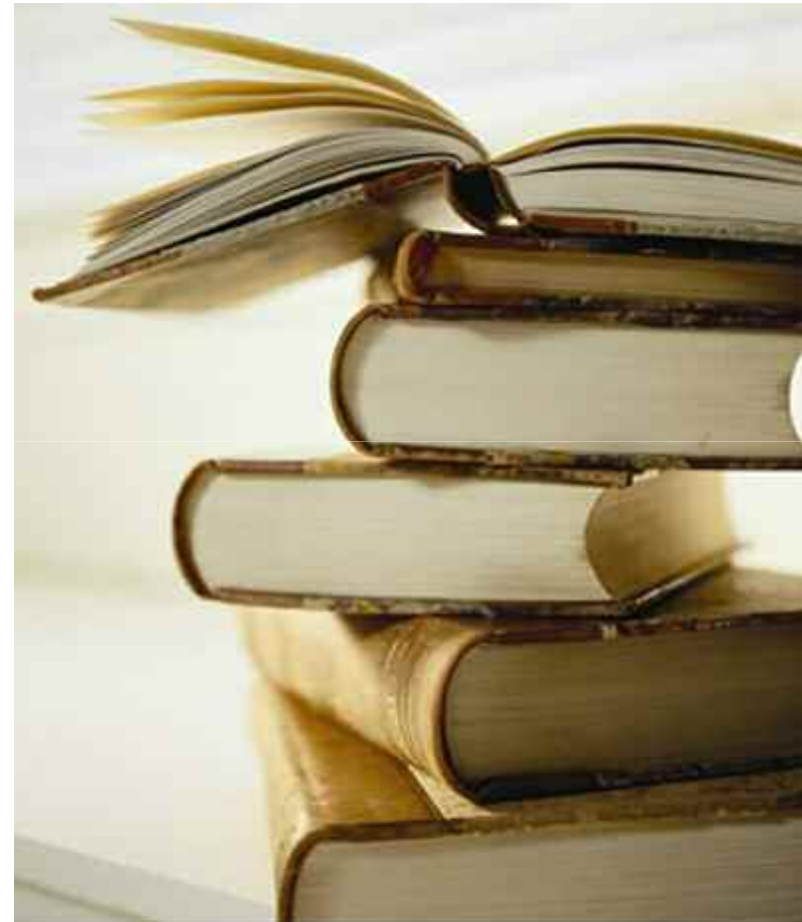
- Risk of collision not important in driver's decision making loop
- People drive to maintain task demand within a reference range; speed is main manipulator
- Task-difficulty closely linked to driver's feeling of risk. Preferred level of task-difficulty determined by:
 - Perceived capability
 - Effort motivation
 - Motivation for speed
- Risk calibration: ability to recognise the relationship between demands of driving task and one's own capability



Work plan

Proposed work packages:

- Literature review: older drivers, perception of risk, perception of change – **ongoing**
- Analysis of contributory factor patterns in injury accidents by age group - **completed**
- Simulator study on perception of risk as a function of age & experience – **in preparation**
- Simulator study on specific perceptual deficits, “situational blindness” – **to be discussed**



Contributory factor patterns

- STATS19 injury accident database of Great Britain; recording by police officer
- Data recorded since 2005; 2005 and 2006 data now available
- Nine groups of contributory factors (2 excluded)
- 77 contributory factors altogether
- Concerns about data reliability

44: NSREFO CONTRIBUTORY FACTORS Sep 2004

1. Select up to six factors from the grid, relevant to the accident.
 2. Factors may be chosen in any order, but an indication must be given of whether each factor is very likely (A) or possible (B).
 3. Only include factors that you consider contributed to the accident. (Do NOT include 'Poor road surface' unless relevant).
 4. More than one factor may, if appropriate, be related to the same road user.
 5. The same factor may be selected to relate to more than one road user.
 6. The participant should be identified by the relevant vehicle or casualty no. (e.g. 001, 002 etc.), preceded by 'C' if the factor applies to a vehicle, driver/rider or the road environment (e.g. V001) or 'U' if the factor relates to a pedestrian or passenger casualty (e.g. U001).
 7. Enter 0000 if the factor relates to an unreported pedestrian.

	101	102	103	104	105	106	107	108	109		
Road Environment/Contributed	Potholes or uneven road surface	Deposits or spillage on road (e.g. oil, snow, chippings)	Impoverished (overcrowded) road	Irregularly or unmarked signs or road markings	Distraction, traffic signals	Traffic calming (e.g. speed cushions and humpback chicanes)	Signposts and road signs (e.g. road works)	Road layout (e.g. bend, narrow, bad management)	Position of object or obstruction		
Vehicle/Traffic	201	202	203	204	205	206					
	Tyres illegal, defective or under inflated	Excessive loads or imbalance	Defective brakes	Headlamps missing or inappropriate	Distraction or inappropriate attention	Overloaded or poorly loaded vehicle or trailer					
Impaired/Action	301	302	303	304	305	306	307	308	309	310	
	Distraction, inattention, traffic signal	Unfocused 'stare' (e.g. 'stare' signs, mobile phone)	Distraction, mobile phone use	Distraction, pedestrian crossing, crossing	Speed limit or direction of travel	Excessive speed limit	Swerving into or over the road	Following too close	Following too close	Cyclist entering road from pavement	
Driver/Rider/Driver or Operator	401	402	403	404	405	406	407	408	409	410	
	Excessive speed	Excessive speed (overriding red light)	Excessive or inappropriate speed	Failed to signal or incorrectly signal	Failed to look properly	Failed to judge other person's path or speed	Following too close to conflict, close tailgate or pedestrian	Badly loading	Overcut	Swerved	
Impairment of Perception	501	502	503	504	505	506	507	508	509	510	
	Impaired or alcohol	Impaired by drugs (other than medicinal)	Impaired	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention	
Impairment of Competence	601	602	603	604	605	606	607				
	Impaired by alcohol	Impaired by drugs (other than medicinal)	Impaired	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention	Distraction, inadequate attention				
Vehicle (Affected by)	701	702	703	704	705	706	707	708	709	710	
	Distraction (e.g. mobile phone)	Impaired	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	
Participant Only (Casualty or Unreported)	801	802	803	804	805	806	807	808	809	810	
	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	Distraction (e.g. mobile phone)	
Special Codes	901	902	903	904						9999	
	Other vehicle	Other vehicle	Emergency vehicle on a call	Other vehicle						Other (Specify in Remarks)	

Factor in the accident

Which participant? (e.g. V001, U001, 0000)

Very likely (A) or Possible (B)

1st

2nd

3rd

4th

5th

6th

44: NSREFO Other, general details
 (Note: Only use if another factor contributed to the accident and include it in the text description of how the accident occurred)

Sample

- Car drivers only (drivers are cases, injured or uninjured)
- All age groups (17+)
- Non-professional drivers only
- 2005 (n= 241,775) and 2006 data (n= 230,676)
- Accident information, information on the driver, his/her vehicle
- Information on six contributory factors is collected

Average number of Contributory Factors by age

2x3 ANOVA

Year:

$F [1; 472450] = 45.65;$

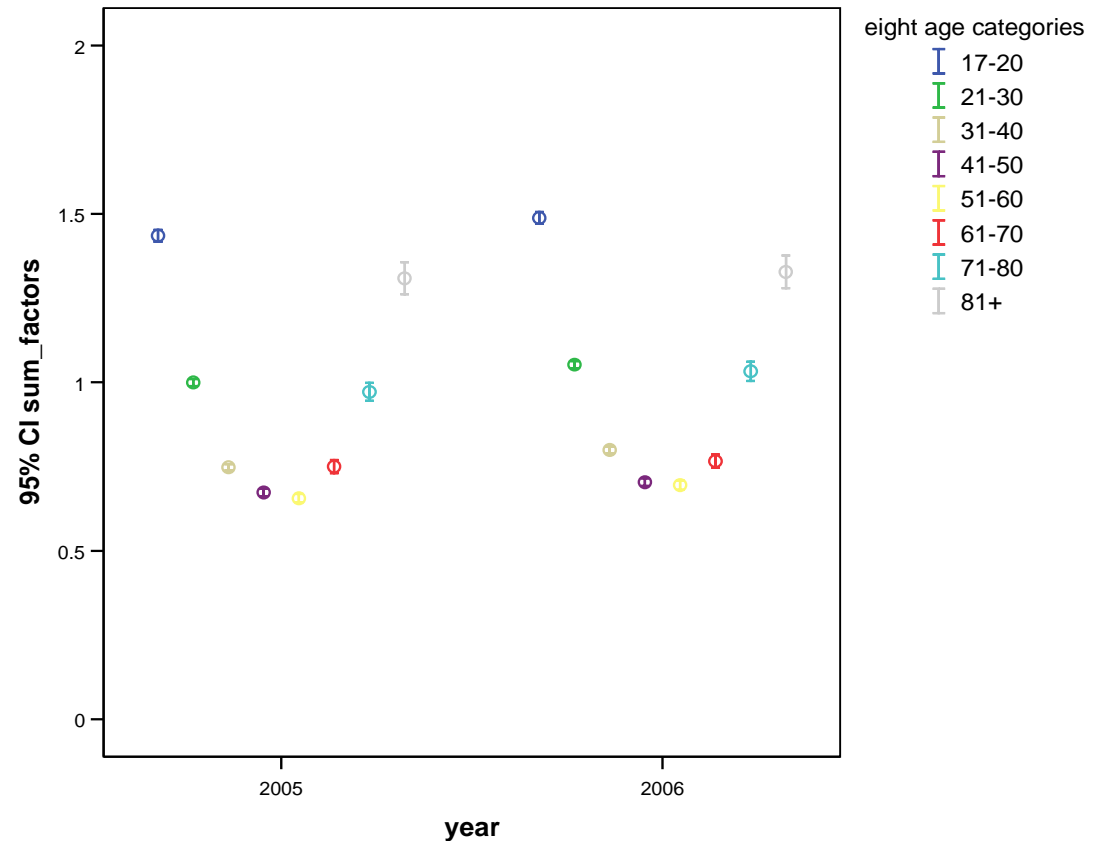
$p < .00;$ partial $\eta^2 = .00$

Age group:

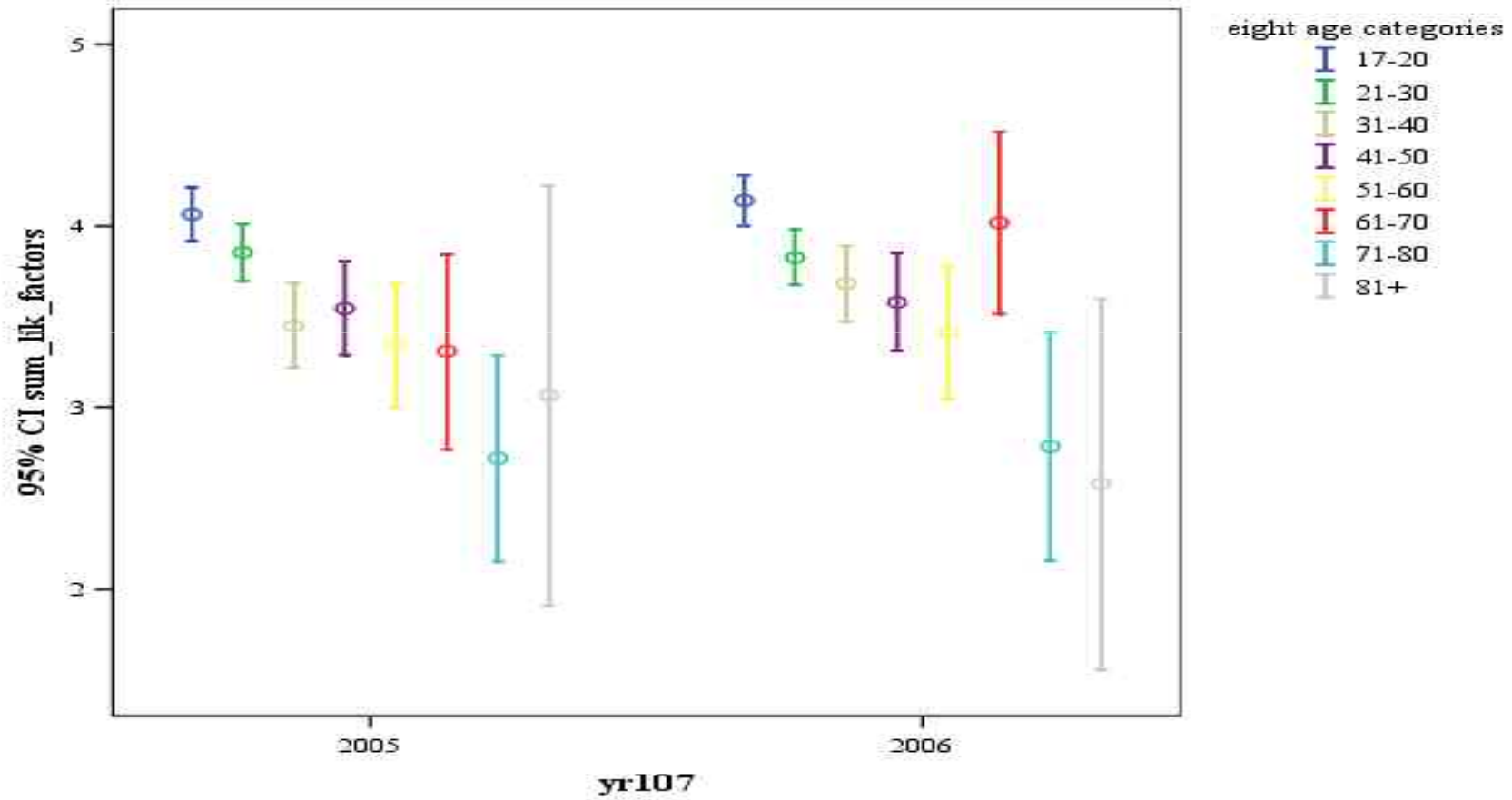
$F [7; 472450] = 2699.77;$

$p < .00;$ partial $\eta^2 = .038$

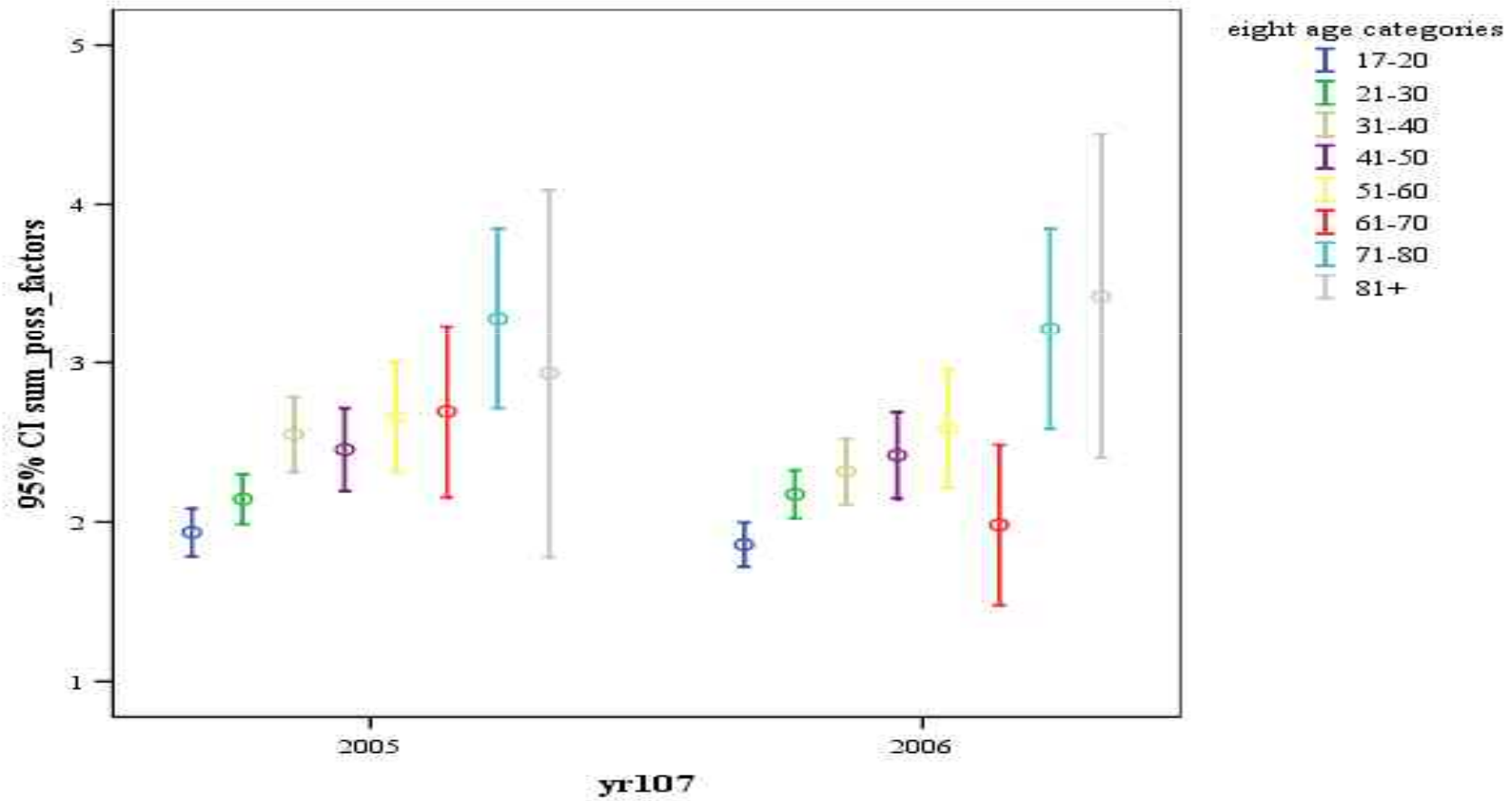
Interaction not significant



Very likely factors only



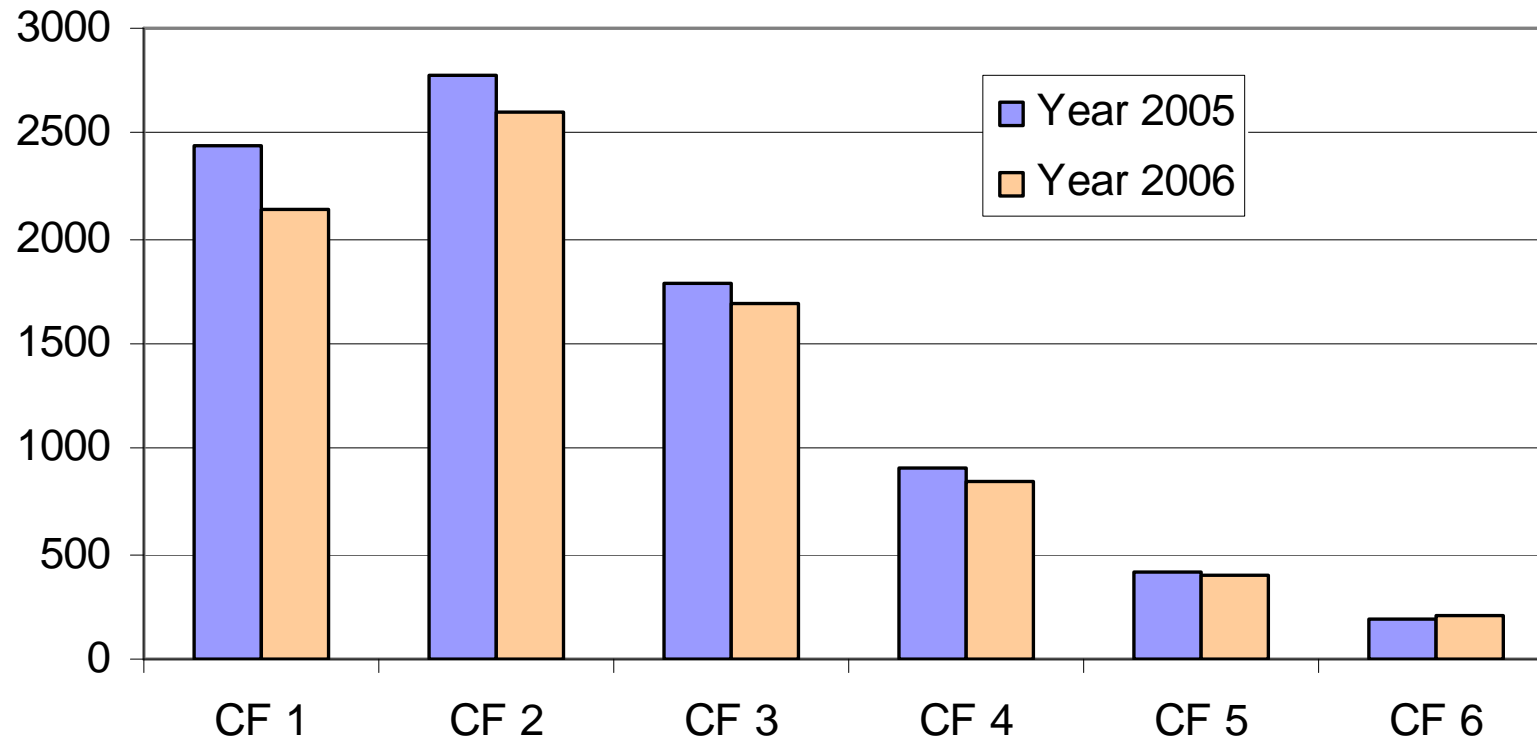
Possible factors only



Very likely CF patterns (%)	17-34	35-59	60+
Slippery road (due to weather) ↓	5.77	4.74	2.76
Disobeyed "give way" or "stop" sign or marking ↑	2.09	2.86	3.53
Travelling too fast for conditions ↓	6.43	3.99	1.99
Following too close ↓	3.27	3.68	2.58
Junction restart (moving off at junction) ↑	0.86	1.41	2.00
Poor turn or manoeuvre ↑	6.66	8.85	10.02
Failed to look properly ↑	15.47	22.35	25.59
Failed to judge other person's path or speed ↑	7.83	9.84	11.78
Passing too close to cyclist, horse rider or pedestrian ↑	0.30	0.60	0.99
Loss of control ↓	10.29	6.25	6.86
Impaired by alcohol ↓	4.06	3.47	1.01
Uncorrected, defective eye-sight ↑	0.01	0.02	0.36
Illness or disability, mental or physical ↑	0.23	0.80	2.90
Careless, reckless, or in a hurry ↓	8.52	7.8	5.98
Nervous, uncertain or panic ↑	0.52	0.44	1.10
Dazzling sun ↑	0.74	1.28	2.16

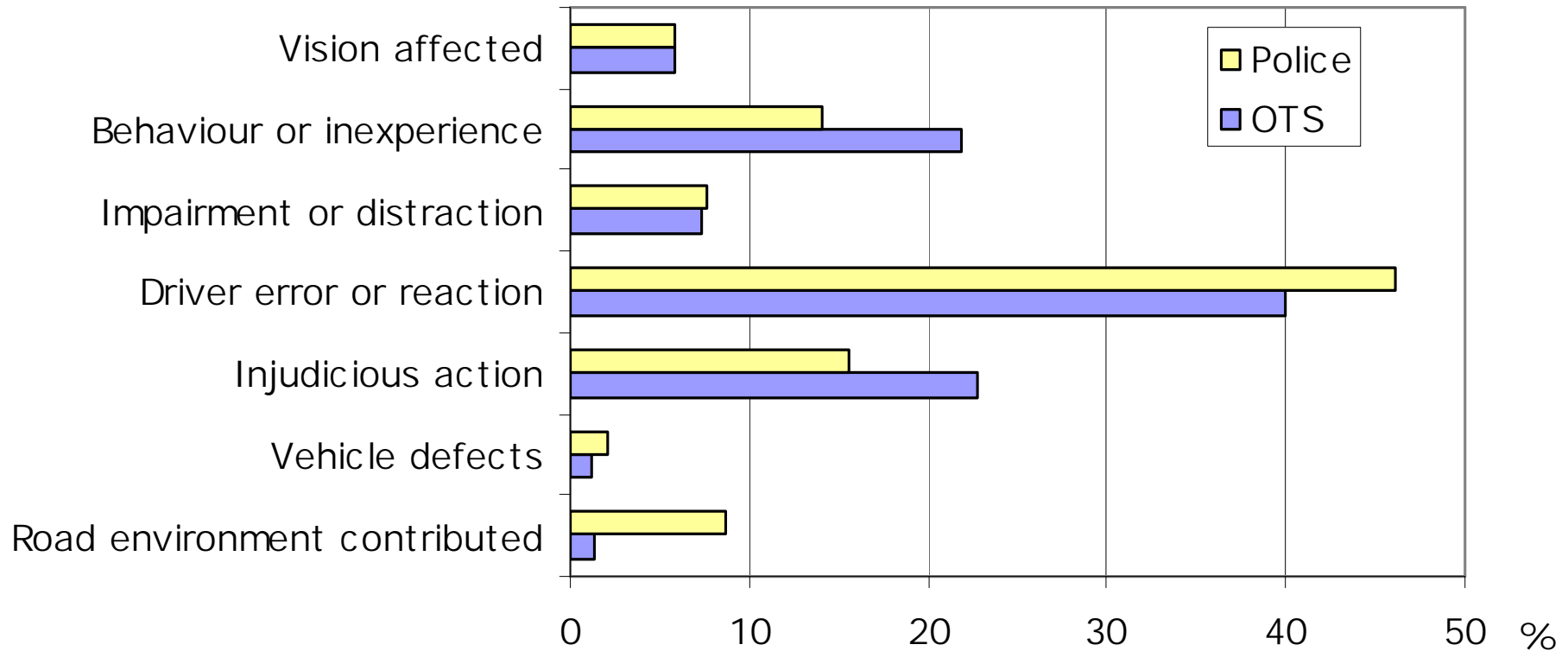
Data reliability

Number of incorrect codes



Data reliability

Comparison to the OTS database



Summary & conclusion

- No of erroneous codes between years ↓, No of CF between years ↑, good evidence for reliability of patterns
- Young drivers & old drivers have significantly more contributory associated with them than middle aged drivers → labelling?
- Driver error or reaction most frequently reported factor group for all age groups → value of categorisation?
- Specific pattern for “possible” & “very likely” CF; young driver CFs are allocated with more certainty
- Specific patterns between 3 age groups on 16 “very likely” CFs

Work package 2: Simulator study



Source: Kinnear, 2008

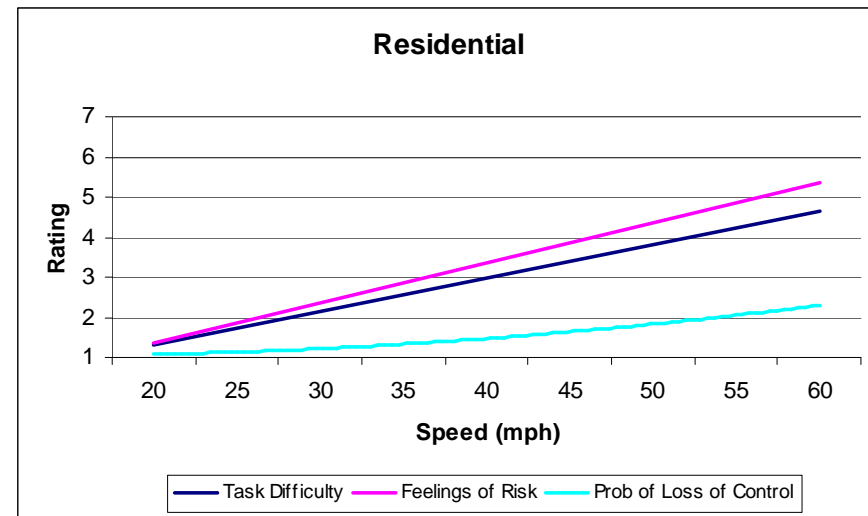
Ratings & Findings (Kinnear, 2008)

Ratings:

- How difficult to drive in this situation?
- How risky does it feel?
- How likely is it to have a collision in this situation?

Outcomes:

- Speed and difficulty closely related
- Objective risk isn't
- Experienced drivers' risk ratings lower





Do You
Have Any
Questions?

Thank you

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TRL color palette

Main TRL PowerPoint colour swatches



Additional colors: gray scale

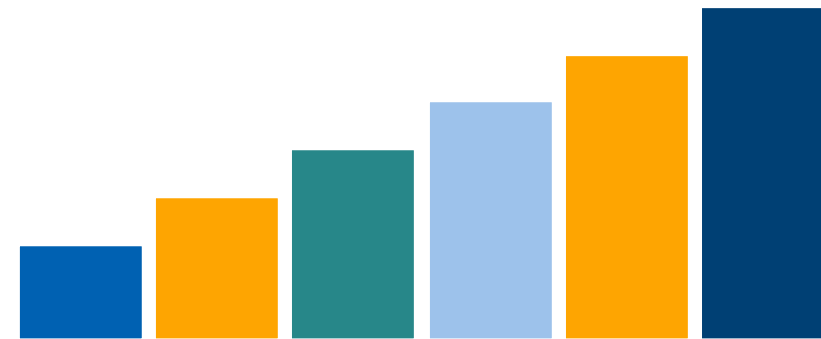


Diagram colors