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A comparison of hazard perception and responding in car drivers and motorcyclists

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Outline

- Aims, definition and theories
- Differences between novice riders and drivers
- Hazards for riders
- Crash patterns
- Hazard perception research
- Training and testing
- What has been learnt and where to now?
- Applicability to other jurisdictions

Study aimed to examine

- Differences between novice drivers and riders in Victoria, Australia in terms of:
  - age and car driving experience
  - hazard perception (HP) and responding
- Relevance to rider HP of car driver HP research, testing and training
- Implications for rider training programs
- Applicability of research to other countries

Definition of hazard

- "Any permanent or transitory, stationary or moving object in the road environment that has the potential to increase the risk of a crash.
- Hazards exclude characteristics of the rider or the vehicle, which are classed as modifying factors"

Modifying factors

- Can be long term characteristics (e.g., experience and skill)
- Can be transitory factors (e.g., travel speed, BAC level)
- Same object a hazard and modifying factor

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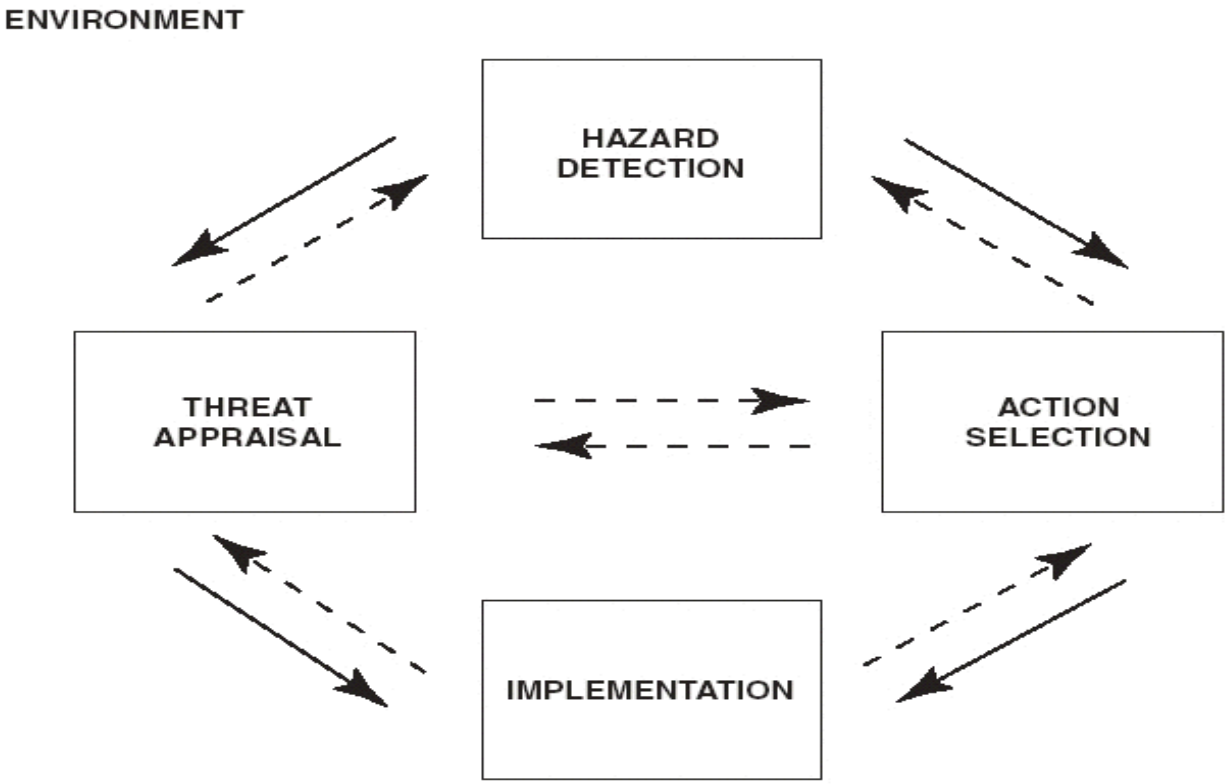
Four-component model of risk



Responding to risk (Grayson et al. 2003)

Novice riders and drivers

- Novice car drivers are both young and inexperienced in car driving
- Novice motorcyclists aren't all young and most are experienced car drivers
- So is hazard perception research relevant for riders?
- Is overseas research relevant to Victorian motorcycle research?
- Riders are not an homogeneous group
- Little is known about hazard perception for riders

Hazards for riders

Riders:

- Face same hazards as car drivers
- More susceptible to road based hazards
- Require different reactions to hazards than drivers
- More likely to be harmed than drivers

Road based hazards

- Feature in motorcycle crashes
- Road surface conditions
  - Permanent characteristics
  - Temporary characteristics
- Visual obstructions
- Road alignment characteristics

Behaviour of other road users

- Easier to identify in crash cause than road based hazards
- Failure of car drivers' hazard perception
- Other vehicle at fault in 55-75% serious multi-vehicle motorcycle crashes
- Rider at fault in most fatal motorcycle crashes

Crash patterns

- Police crash data of limited use in identifying road based hazards
- Crash scenarios reflect riding patterns
- Earlier crash research shows failures of responding

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Hazard perception and responding research

- Large number of car driver hazard perception and responding studies
- Few studies on motorcycle hazard perception and responding

Hazards reported by riders

- 3 different methods to assess drivers' perceptions of hazards
- 70% of hazards mentioned by car drivers with no riding experience arose from behaviour of other road users
- Car drivers with riding experience also identified road surface features

Armsby, Boyle & Wright (1989)

Rider performance on car driver HPT

- Compared 3 groups:
  - Car drivers with no riding experience
  - Riders responding as if riding
  - Riders responding as if driving
- HP measured using McKenna & Crick's (1994) car driver HPT which measures reaction time to detect hazards – not responding
- Riders responding as car drivers reacted fastest
- Riders have better HP ability than drivers?
- HPT disadvantage riders?

Horswill and Helman (2001)

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Visual scanning patterns of riders and drivers

- There is a difference in scanning behaviour between drivers and riders
- Studies disagree about the differences
- Do riders look more often at road and less into the distance or vice-versa?

Nagayama et al., 1980; Tofield & Wann, 2001

Rider training and testing

- Response component is more critical for riders but car driver hazard perception training and tests ignore it
- Tests focus on detection of hazard only and ignore rider specific hazards
- No computerised rider hazard perception test

What has been learnt and where to from here?

- Novice riders differ from car drivers in age and experience
- We know little about how age and experience (as a rider and as a driver) affect HP and responding
- Rider hazard perception research suggests:
  - road based hazards more important
  - difficulties for riders lie more in responding
  - current HPT not appropriate for riders
- Need to know more about motorcycle HP and responding before developing training and testing
- Stage 2 of research program

Applicability to other jurisdictions

- Relevance of our research to other jurisdictions important for developing tailored rider training programs
- Likely that riders in other developed countries also differ from car drivers
- But need to consider effects of laws and licensing policies
  - e.g. car and motorcycle/moped licensing ages, stringency of novice licensing restrictions