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The roles of subjective and objective risk in cycling safety

Narelle Haworth

Cycling Safety Forum, Perth, 3 November 2012

Centre for Accident Research & Road Safety - Queensland

CARRS-Q is a joint venture initiative of the
Motor Accident Insurance Commission
and Queensland University of Technology



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Outline

- Definitions
- Safety and participation
- Recent research in subjective risk
- Review of effects of safety treatments

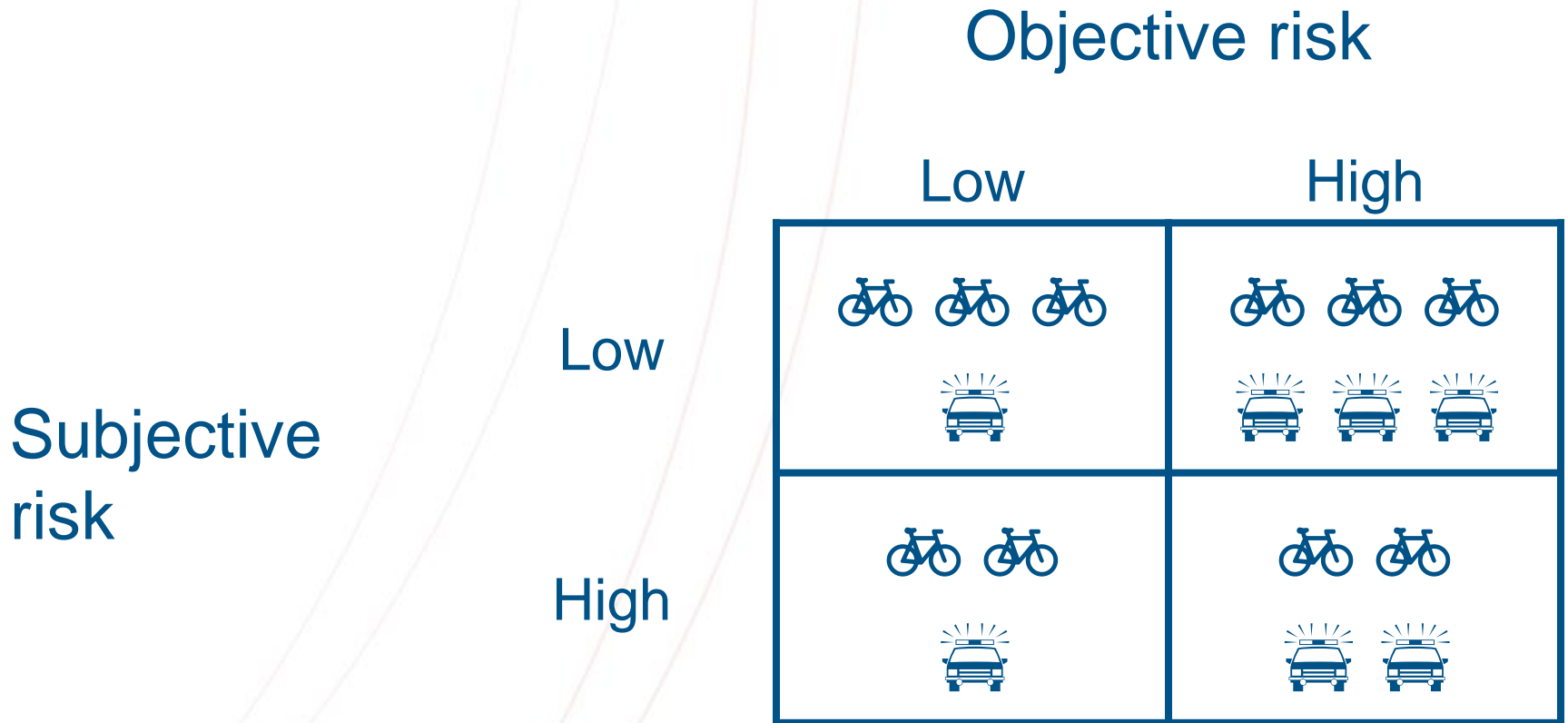
Definitions

- Subjective risk
 - the level of risk **perceived** or felt by the individual, or level of worry or anxiety about the activity
 - emotional and cognitive components
- Objective risk
 - the probability of a road crash or injury per unit of exposure (usually distance travelled)
- Subjective safety
- Objective safety

Safety and participation

- Subjective risk is a major factor in reducing participation, route choice and rider behaviour
- Objective risk is often not clear
- Not a lot is known about the interrelationships between them

Safety and participation outcomes



Influences on subjective risk

(Chaurand & Delhomme, 2012)

- French online survey of 92 non-cyclist car drivers and 336 experienced cyclists
- Level of crash risk perceived by car drivers and cyclists in 6 common cyclist crash situations
- Type of vehicle operated - **car**
- Type of interacting vehicle - **car**
- Experience - **decrease**
- Perceived control/responsibility – **decrease**
- Perceived skill - **decrease**

Self-reported bicycling injuries and perceived risk (Washington, Haworth & Schramm, 2012)

- Self reported data from 2,500 Queensland cyclists
- Perceived risk does not influence injury rates (per km)
- Injury rates do not influence perceived risks of cycling
- Riders who perceive cycling as risky
 - tend not to be commuters
 - do not engage in group riding
 - tend to always wear mandatory helmets and use front lights
- Lower perceptions of risk are associated with higher frequency of riding and increasing riding on bicycle paths
- Crash and non-crash injury rates decrease with higher frequency of riding

Effects of safety treatments for cyclists and pedestrians

(Sorensen & Mosslemi, 2009)

Objective safety

		+	-	?	Total
Subjective safety	+	78	16	10	104
	-	9	2	2	13
	?	6	1	1	8
	Total	93	19	13	125

“Problem” treatments

- Tracks for cycling
- Full or minor road channelisation at T-junctions
- Road widening at curves or transition curves
- Ordinary resurfacing of roads or improving evenness
- More winter maintenance of tracks
- Speed-reducing raised intersections
- Wide edge lines or shoulder rumble lines
- Delineator posts with reflectors
- One-way streets
- Cycle equipment, spokes reflectors

Improved objective safety, poorer subjective safety

- Roundabouts with mixed traffic
- Road re-design to improve gradient or sight distance
- Interchanges instead of cross-roads
- Passing lanes
- Improved road alignment
- Stop and Give Way signs

Conclusions

- Understanding of subjective and objective risk is relevant for improving cycling safety and participation
- Relevance for infrastructure, behaviour and promotion
- Mismatches between the two may result in poorer outcomes

References

- Chaurand, N. & Delhomme, P. (2012). Cyclists and drivers in road interactions: A comparison of perceived risk. *Accident Analysis & Prevention*, available electronically.
- Sorensen, M. & Mosslemi, M. (2009). Subjective and objective safety. The effect of road safety measures on subjective safety among vulnerable road users. TOI report 1009/2009. Oslo: Institute of Transport Economics.
- Washington, S., Haworth, N. & Schramm, A. (2012). Relationships between self-reported bicycling injuries and perceived risk among cyclists in Queensland, Australia. Accepted for publication in *Transportation Research Record*.

Questions?

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