Why does everyone think motorcyclists arrive late?

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Responsibility for our own behaviour

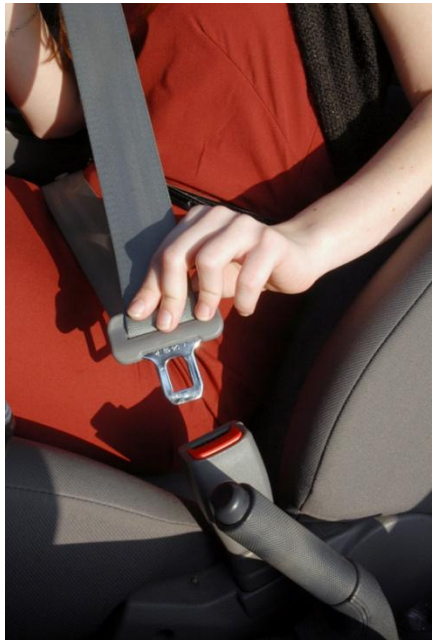
- Consider this cyclist…
  - No helmet…
  - No hands…
  - Texting…
  - Drinking…
  - Approaching a corner on the wrong side of the road…

But…

- Quiet residential road
- No through-road
- Middle of the afternoon
- Appraisal of risk?
- Or just oblivious?

Public health?

- Information
- Legislation
- Behaviour change
- Public health improvements take time!



"Looked but failed to see" collisions

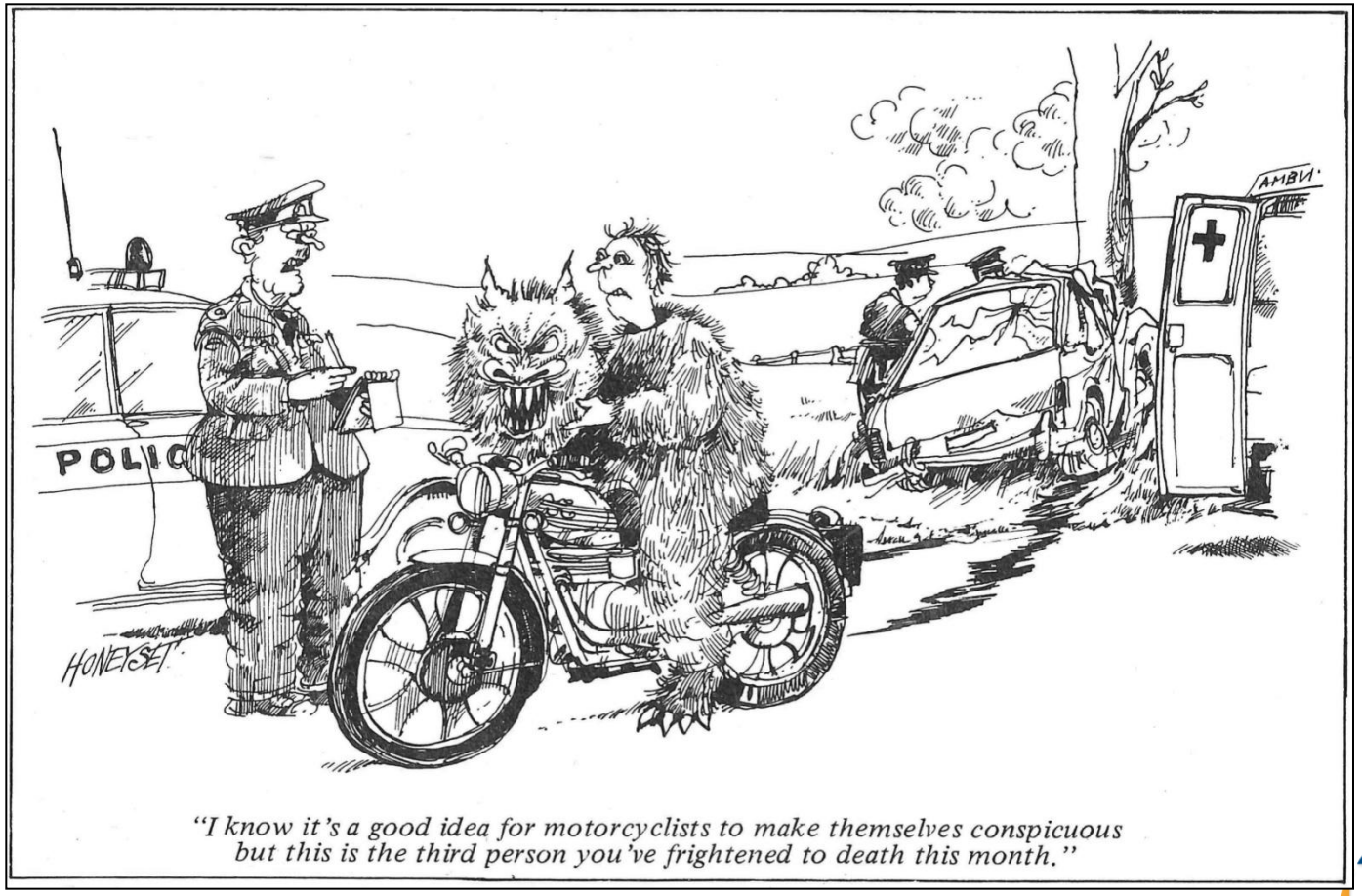
- Collision statistics show that a car driver violating a rider's right of way at a junction is a very common accident scenario (e.g. Herslund & Jørgensen, 2003)

"Sorry mate, I just didn't see you"

- Calls for increased conspicuity of motorcyclists are common (e.g. Williams & Hoffman, 1979; Olson, Hallstead-Nussloch & Sivak, 1981; Hole, Tyrrell & Langham, 1996; Rößger, Hagen, Krzywinski & Schlag, 2011)

But what is conspicuity?

- "The extent to which an object stands out from its surroundings" (Lesley, 1995, cited in Langham and Moberly, 2003)



"I know it's a good idea for motorcyclists to make themselves conspicuous but this is the third person you've frightened to death this month."

Different types of conspicuity

- Visibility = “Can you see the motorcycle here?”

- Cognitive conspicuity = Expectation

- Search conspicuity = “Where is the motorcycle?”
- Attention conspicuity = “What do you see?”

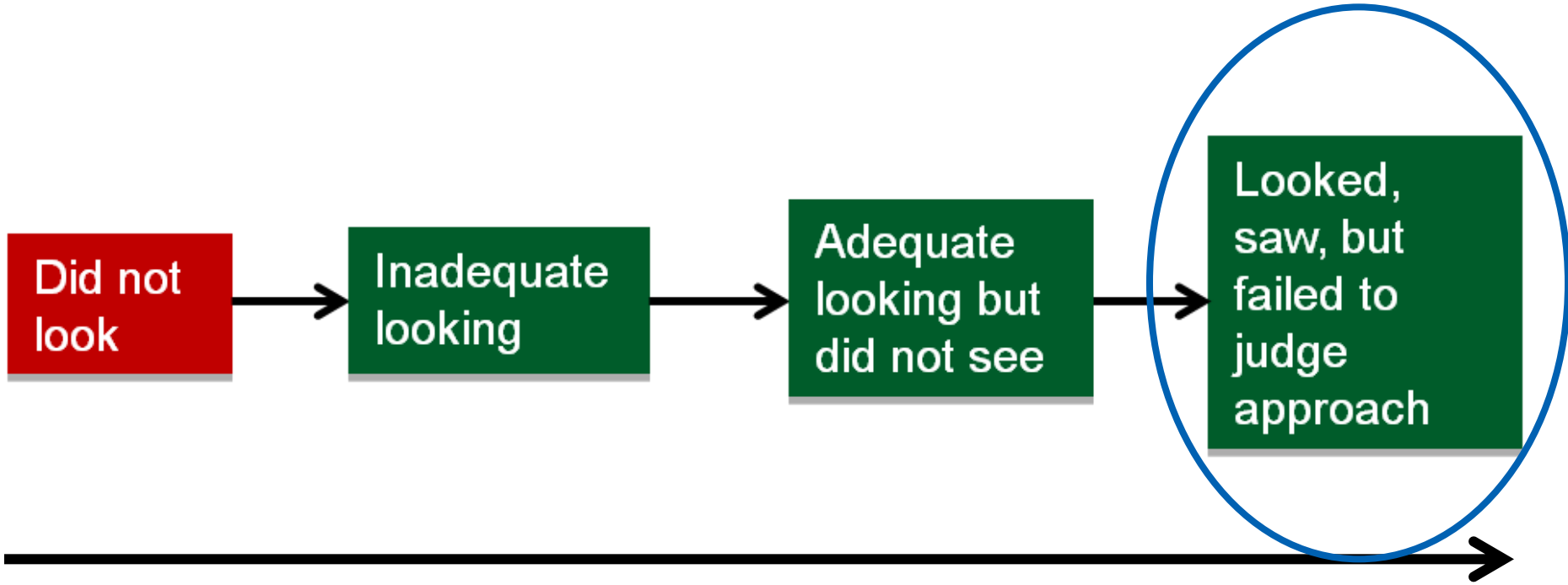
Key messages about conspicuity 1

- Conspicuity is different to visibility
- Drivers at junctions are unlikely to be looking for motorcyclists
  - They are actually looking for… GAPS
- Remember that contrast with surroundings is key – yellow vests don't always work!

Key messages about conspicuity 2

- People fail to see the most extraordinarily conspicuous things…

What does LBFTS mean?



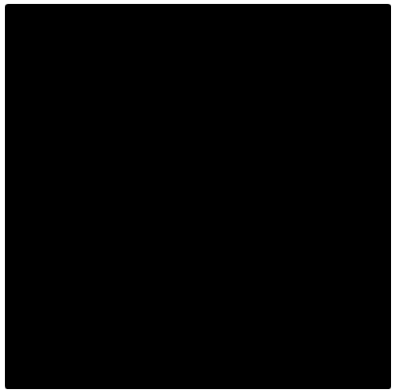
Idiots

People genuinely ‘undone’ by limitations of the human visual system

Time to contact

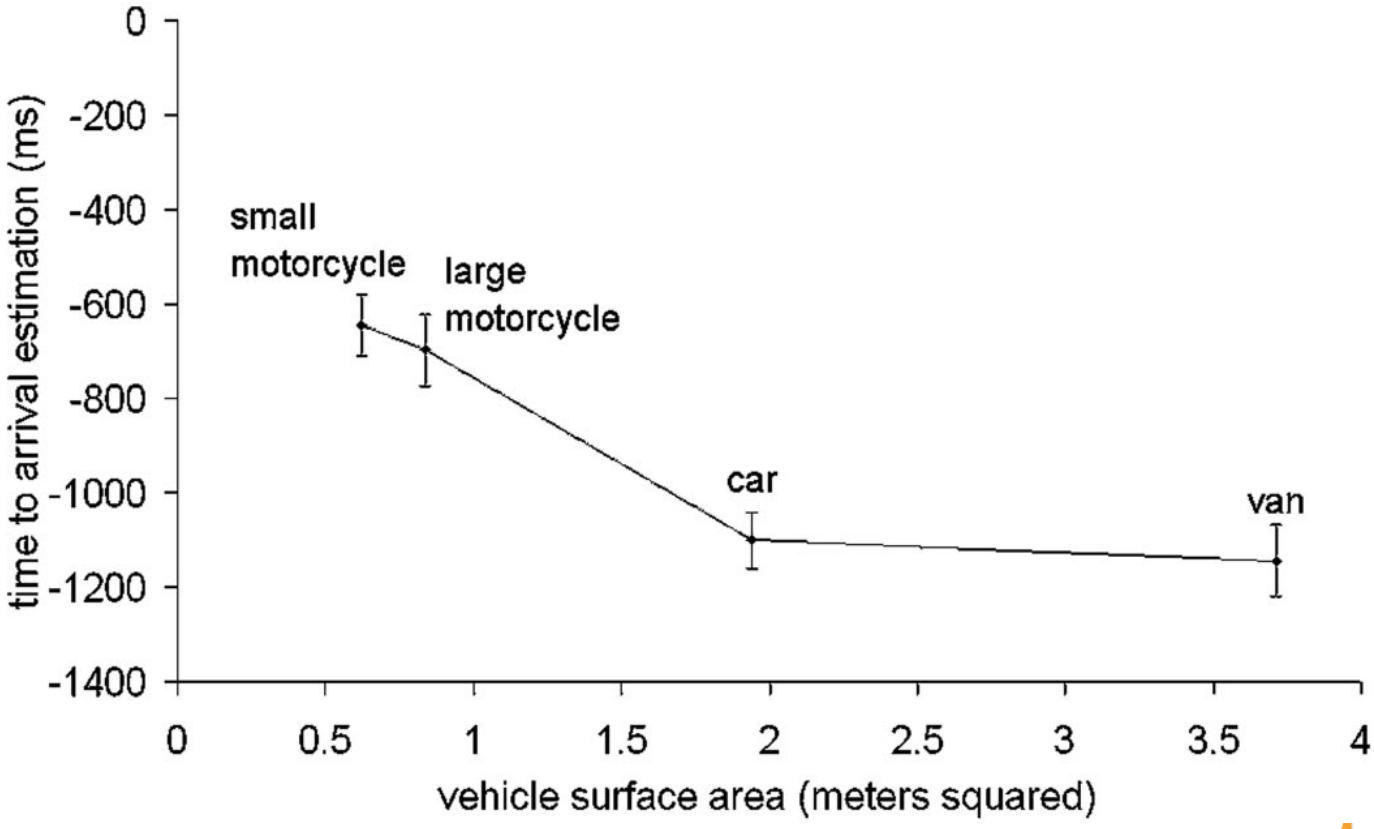
Time to contact

Time to contact



Judging time to arrival and speed

- Time to arrival overestimated for small objects – this has implications for motorcyclists approaching junctions (Horswill, Helman, Ardiles & Wann, 2005)



Judging time to arrival and speed

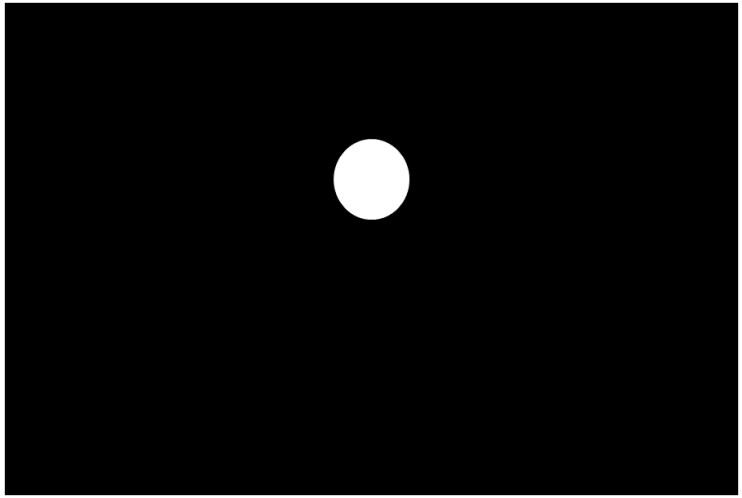
- The important thing to remember for later:

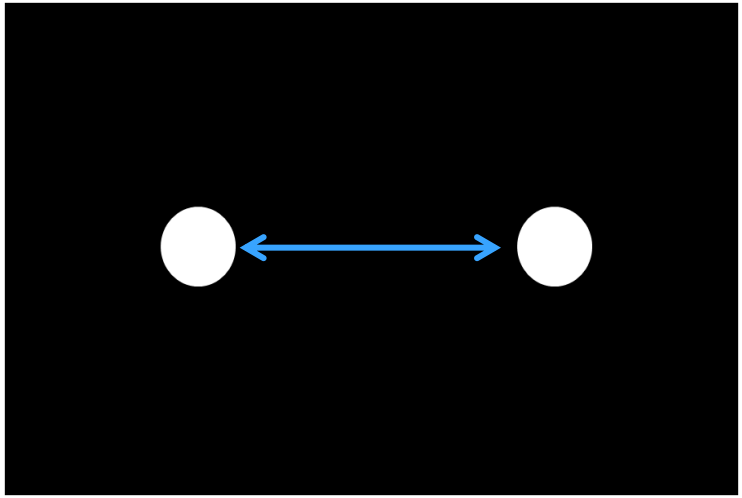
"Things can be small because they are small, or because they are further away "

The problem of night-time

- Things are even worse for motorcyclists at night…

The problem of night-time

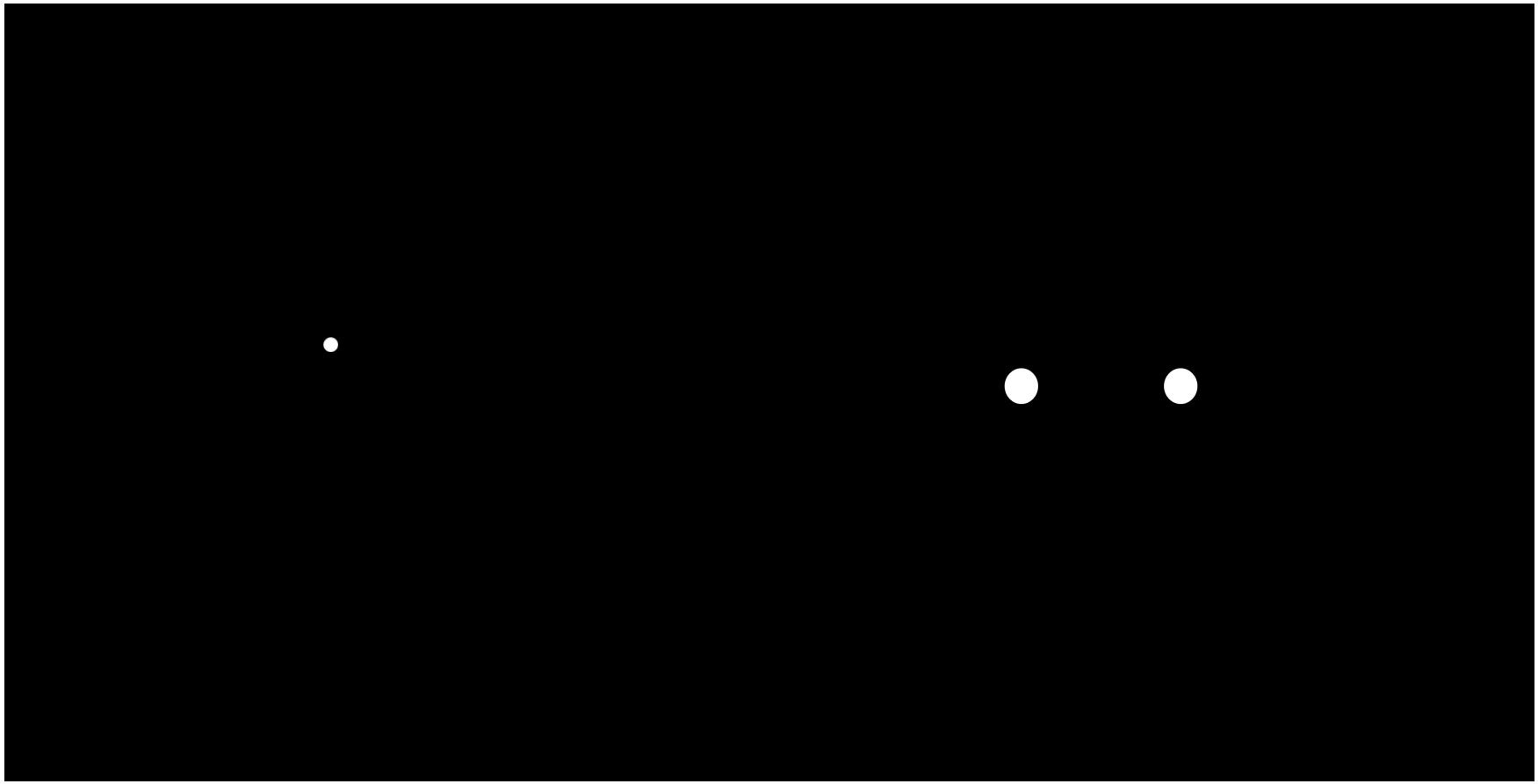




- Motorcycle-car collisions are over-represented at night relative to daylight hours (Pai et al., 2009)

The problem of night-time

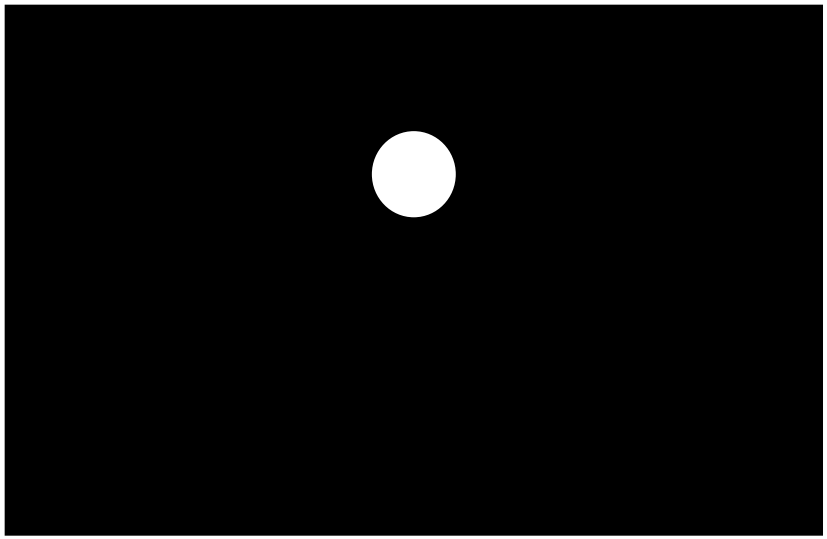
- So even if they are detected…

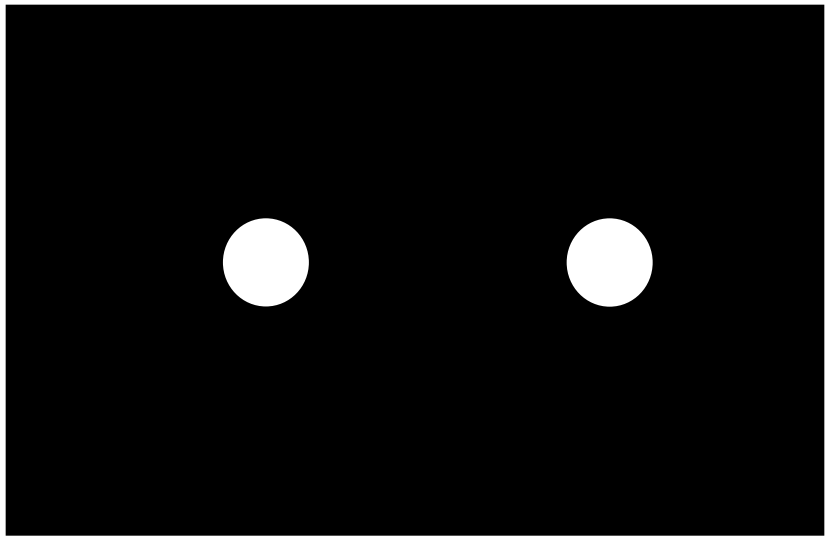


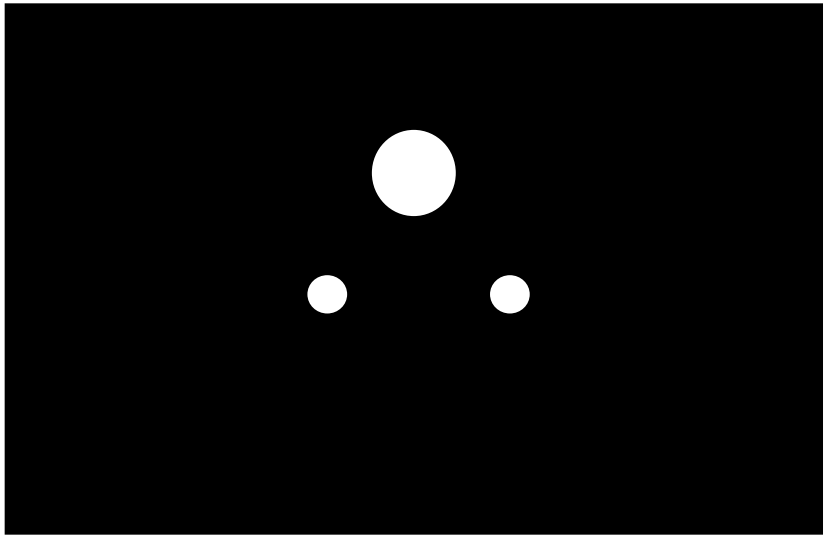
Night time time to contact/speed estimation

- If car drivers wish to pull out safely in front of a motorcycle they have detected, they need to estimate its time to contact
- Part of this is estimating its speed
- At night, there is simply less information available
- We ran a study to examine this issue, and to see if a novel lighting configuration could assist in the estimation of the speed of oncoming motorcycles

A novel motorcycle lighting configuration



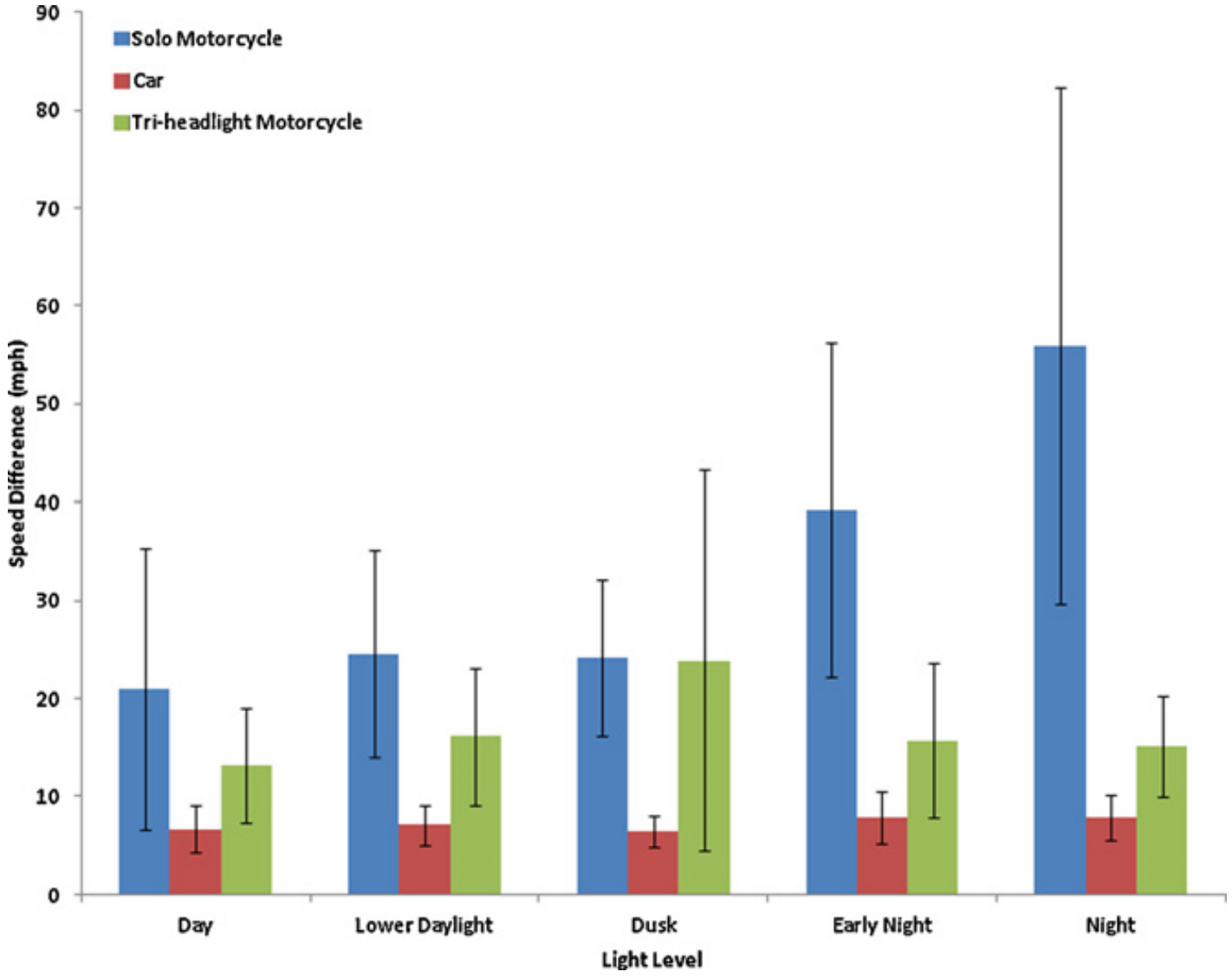




Method (Gould et al., 2012)

- Participants viewed bikes or cars in simulated scenes under different lighting conditions – brief presentations
  - Reference vehicle was car travelling at 30mph with 4 second time to contact
  - Probe vehicle was car, motorcycle (single headlight), or motorcycle (tri headlight), -20mph to +180mph relative to reference vehicle
- Task was to detect which vehicle (reference or probe) was travelling faster

Findings


Solo Motorcycle
Car
Tri-headlight Motorcycle
Speed Difference (mph)
90
80
70
60
50
40
30
20
10
0
Day
Lower Daylight
Dusk
Early Night
Night
Light Level

Findings

- In the night condition, motorcycles travelling at up to 85mph were perceived as travelling at the same speed as a car at 30mph
  - Because the motorcycles travelling faster are further away, and therefore are small (they are also small because they are small)

- If a driver was looking for a four-second gap, this error would lead to them accepting a gap of below two seconds

- The use of the tri-headlight formation reduced this effect substantially

Conclusions

- LBFTS accidents are not only to do with ‘conspicuity’
- Limitations of the human visual system in judging time to contact also play a role
- A simple engineering solution (tri-headlight) could make a difference to this limitation
- But remember what we said about about public health improvements taking time?
  - What can we do about this right now?

There is something motorcyclists can do now…

- Slow down, so that…
  - …with a four-second time to contact you are closer …
  - …and therefore bigger…
  - …and therefore it is easier for car drivers to judge your speed and time to contact
- We know that motorcyclists actually travel slightly faster than surrounding traffic, e.g.
  - Walton and Buchanon (2012) – Motorcyclists observed to ride on average 10% faster than cars in observations at motorcycle accident 'black-spots' (but no account for demographics)
  - Horswill and Helman (2003) – Motorcycles observed to ride faster in real-world observations (gender and age controlled)
- The problem is…

Car drivers cannot detect this!

So in other words…

- An ex-colleague of mine once told me that I should ride with the following attitude:

"Assume that drivers cannot see you – that you are invisible to them"

- It turns out that with respect to your approach speed this is **sometimes literally true**

Do You Have Any Questions?

Thank you

Why does everyone think motorcyclists arrive late?

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