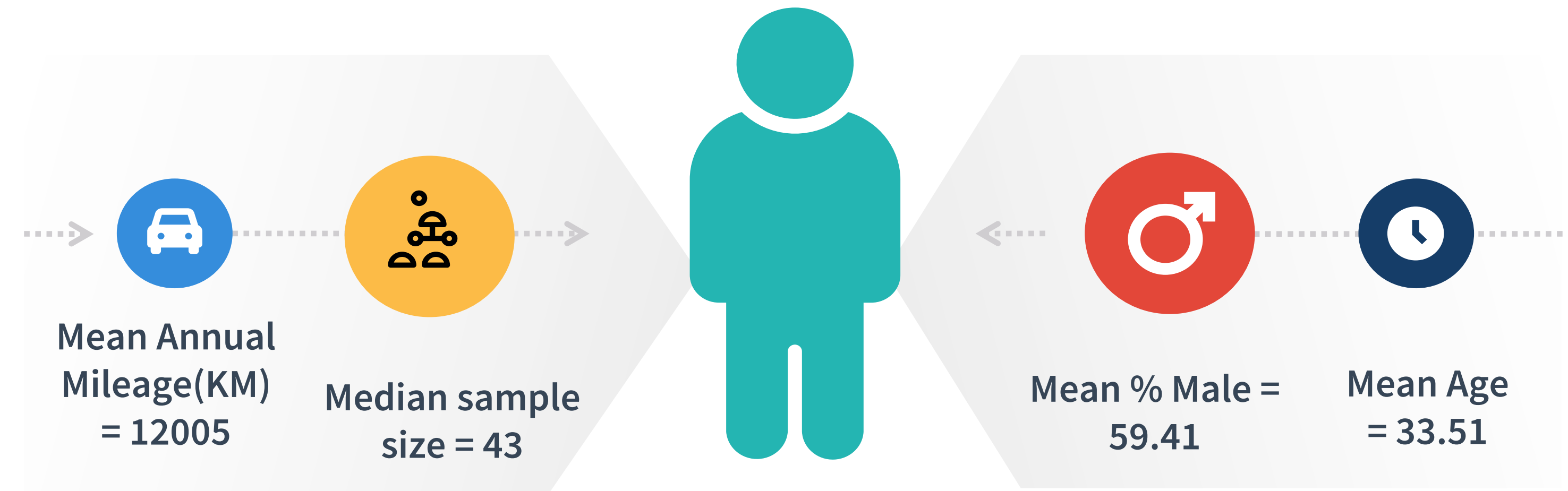


A Rapid Evidence Review of Methods: Autonomous Vehicle Security and Human Behaviour

Cranfield University and Lancaster University

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Participant Descriptives



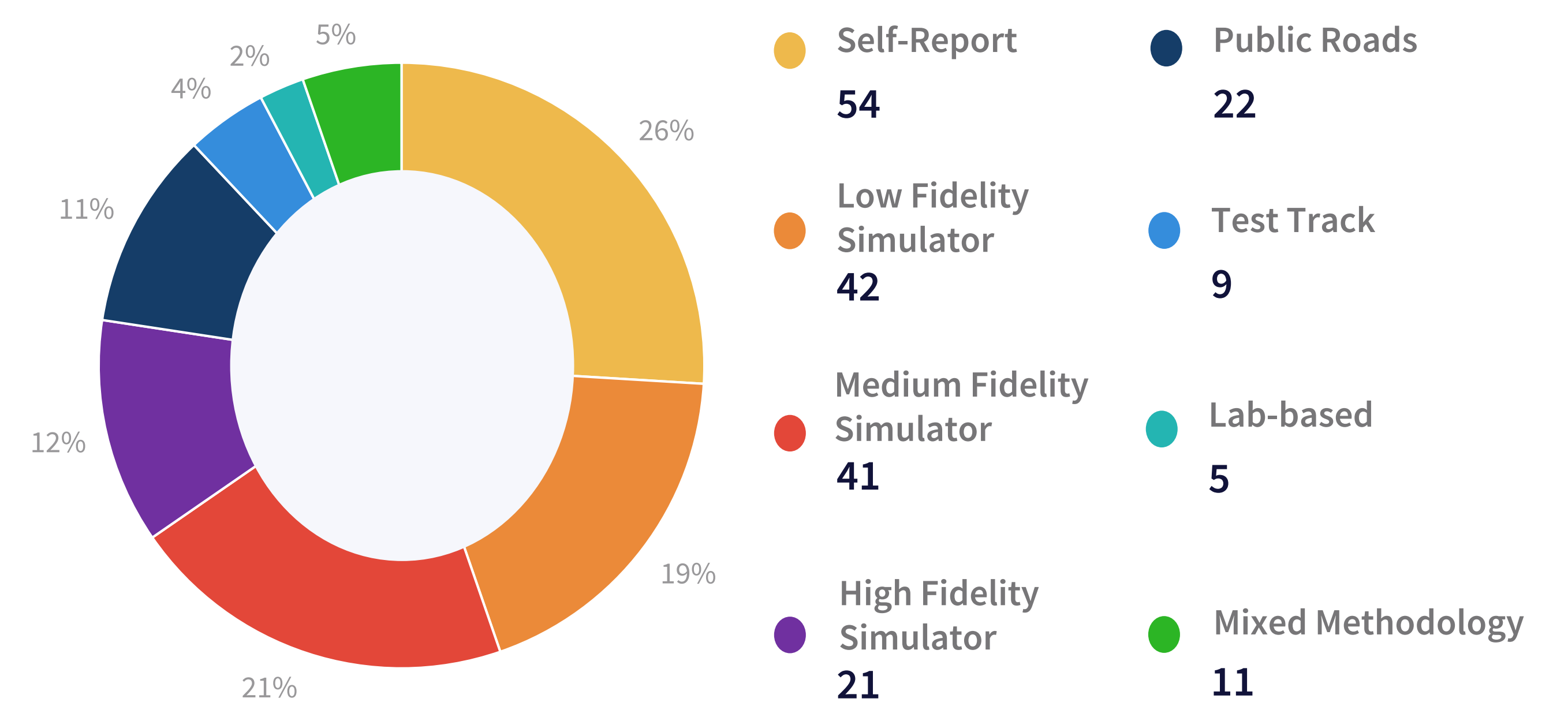
Introduction

- Aim: Identify methods for investigating behavioural change in autonomous vehicles and how this may compromise security
- Authorship expertise in socio-technical aspects of security, human factors, librarianship, psychology and driver behaviour
- A modified Cochrane HSSS used: Academic Search Ultimate, PsycInfo, SOCindex, ACM Digital, IEEE Xplore, Science Open, Scopus, Web of Science
- Protocol followed systematic review and PRISMA reporting guidelines

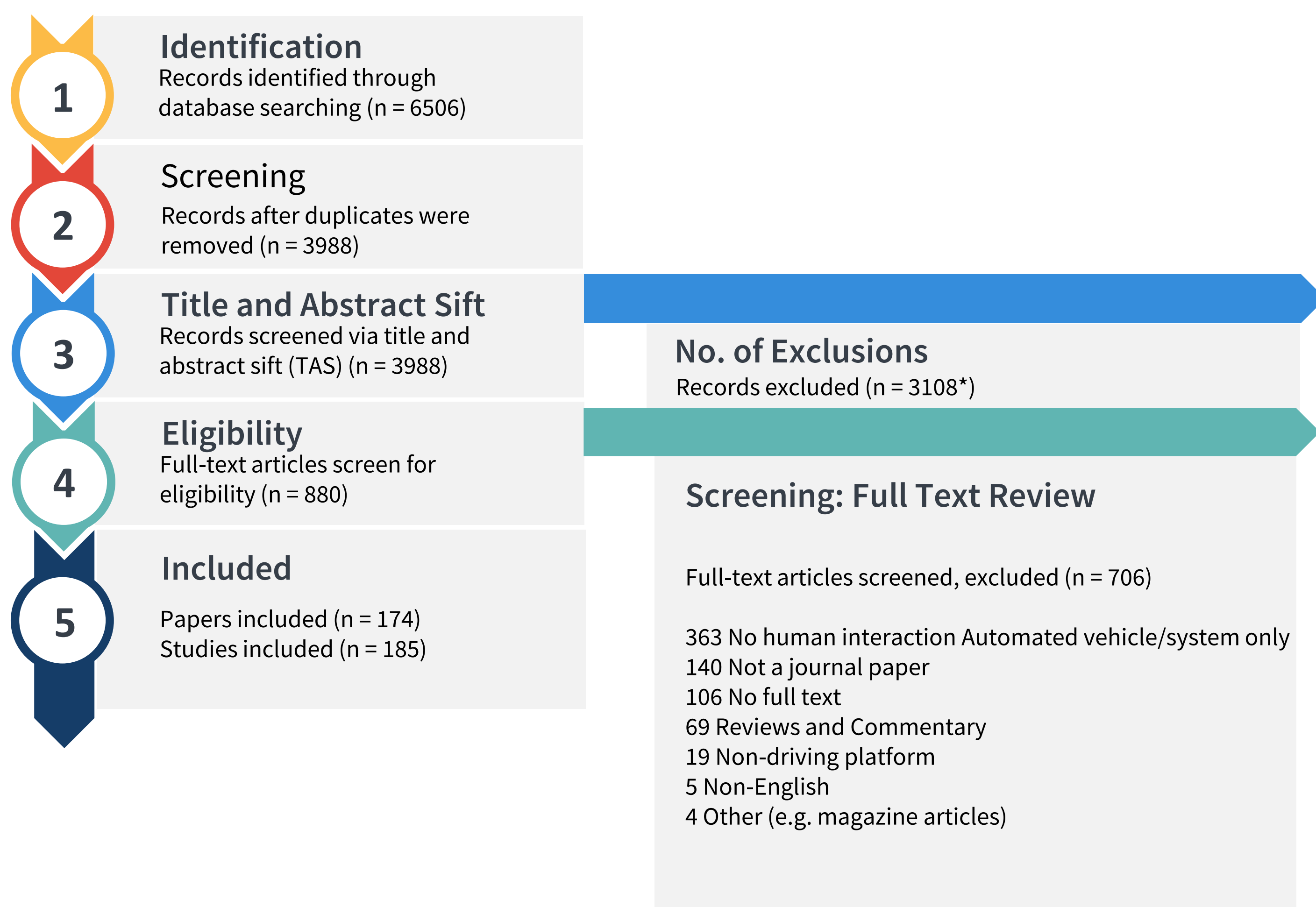
Research Questions for Search Strategy:

- What are the mental models that guide how humans interact with Autonomous Systems (AS)?
- What specific behaviours change as humans adapt to AS?
- What are the main ways that Behavioural Adaptation (BA) to AS has been measured?
- What are the environmental and social factors that influence the development of negative BA in response to AS?
- How does BA to warning systems influence AS security?

Results: Research Methods

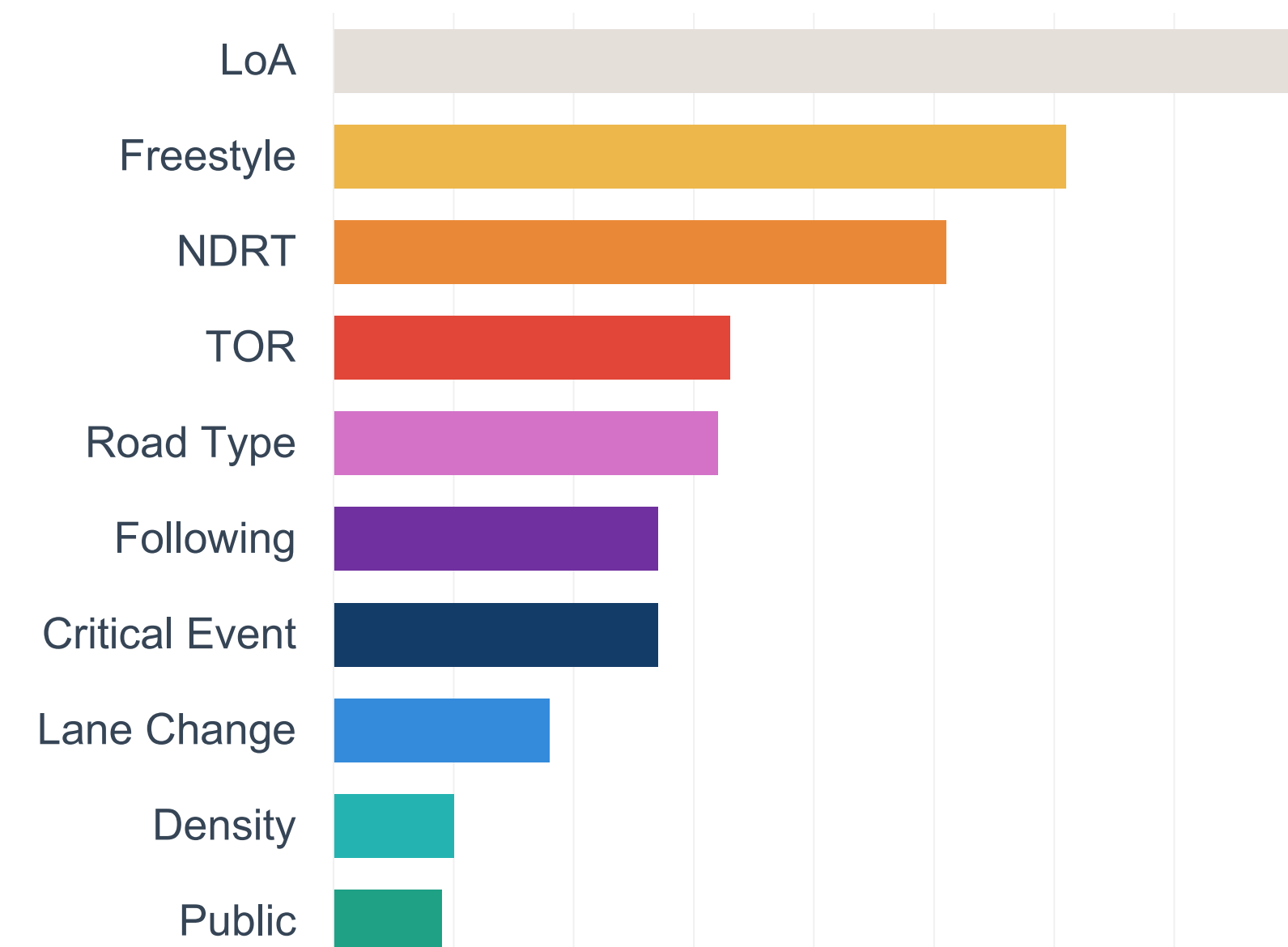
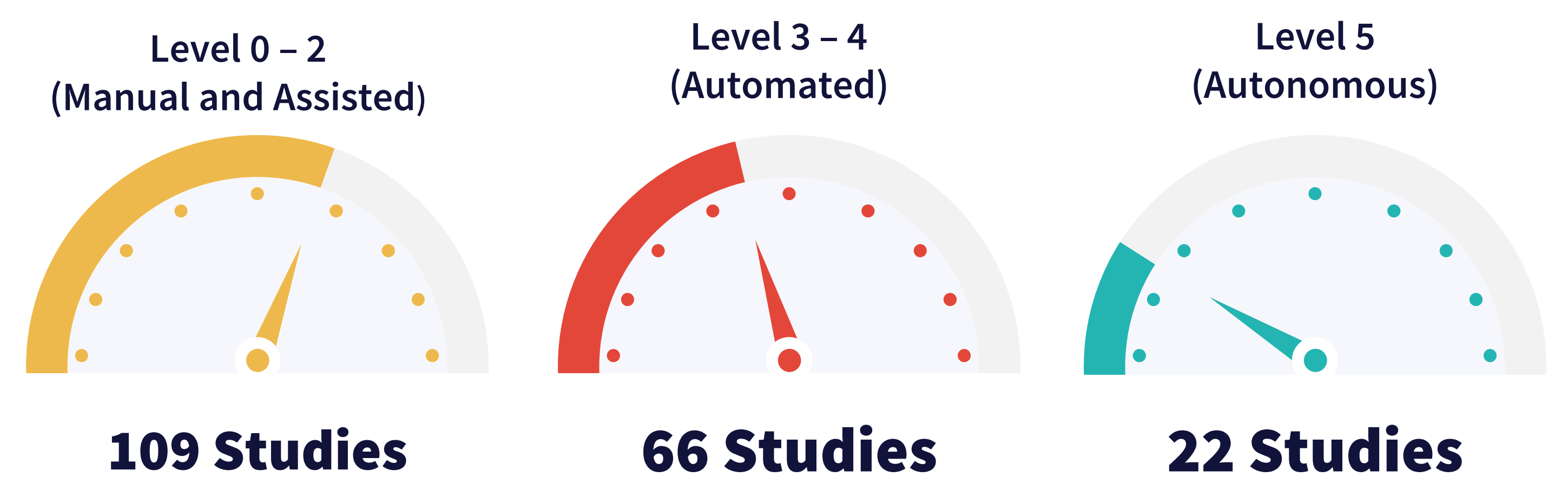


Methodology



* A single review approach by two raters reached an interrater reliability of >.80 on a base set (n=796)

Results: Driving Scenarios



Driving Scenario	Number of Studies
Automation Level Comparison	82
Freestyle Driving	61
NDRT/Secondary Tasks	51
Take Over	33
Road Type	32
Following	27
Critical Event	27
Lane Change	18
Traffic Density	10
Public Interaction	9

Conclusions: Research Gaps

- Narrow studies employing self report or low/medium simulator-based methods with small younger male samples
- Handful of studies investigate human behaviour for non-AV platforms
- Most studies compare responses to different levels of vehicle automation
- Relatively few studies investigate human behaviour in fully autonomous vehicles
- Limited number of studies on behavioural adaptation in response to automation
- No studies on how human behaviour can compromise security at any level of automation or platform