Institution: Heriot-Watt University

Unit of Assessment: 4: Psychology, Psychiatry and Neuroscience

Title of case study: Road Safety Policy and Standards

1. Summary of the impact (indicative maximum 100 words)

The impact of the research during the assessment period has been in its contributions to the development of public road safety policy in the UK and in Scotland, particularly affecting young people; the development of ISO standards for safety evaluation; the dissemination of its results to industry and other stakeholders; and public education about the dangers of driver distraction.

2. Underpinning research (indicative maximum 500 words)

The case study is underpinned by a programme of research carried out over the past 15 years, initially at the Transport Research Laboratory, and then from 2001 until the present at Heriot-Watt University (in the Psychology group of the School of Life Sciences from 2005 onwards). The key researcher is Dr Terry Lansdown, a senior lecturer with a network of UK and international research collaborators such as Transport Canada, with whom there is a long term collaborative research relationship on policy development and TUV Rhineland, with whom Lansdown's group worked on a European Evaluation project.

Over the last 15 years, Lansdown has undertaken projects applying theoretical knowledge about attentional allocation to the reduction of driver distractions. In psychology and cognitive neuroscience, attentional control refers to individuals' capacity to choose what they pay attention to and what they ignore. Safe allocation of the driver's attention is influenced by the vehicle (and other equipment used), the environmental conditions (e.g., the design and quality of the road and prevailing weather), and the capabilities of the driver (e.g., their skill level or sensory resources). When considering driving, attention may be allocated strategically to a specific task or demanded by some external stimulus.

Within this framework, Dr Lansdown has undertaken a programme of empirical research to further understand the relationships between voluntary allocation of attentional resources and inappropriate (and potentially dangerous) distractions. The research has used two complementary methods; the experimental measurement of effects of distracters on accuracy of vehicle control in a driving simulator, and survey methods to determine the real-life impact of these distracters on road safety. For example, in 2009 Dr Lansdown undertook a comprehensive questionnaire survey seeking to determine real world levels of engagement with distracting behaviours. The study revealed a frequent engagement with highly distracting activities in the vehicle, many of which are illegal in the UK. Both youth and extraversion, which tends to be manifested in outgoing, talkative, energetic behaviour, were found to predict engagement with distracting activities, e.g., texting while driving.

Dr Lansdown's research plan has been conducted in collaboration with UK, European and International partners (e.g., GEC Marconi on information beacons at the roadside, Jaguar Cars on speech interface and Mercedes Benz), and has gained funding worth over £1m. Dr Lansdown previously worked in both of the largest transport research organisations in the UK, the Motor Industry Research Association (1996-1998, Post-doctoral researcher) and the Transport Research Laboratory (1998-2000, Post-doctoral research fellow), before joining Heriot-Watt University.

3. References to the research (indicative maximum of six references)

Lansdown, T. C., & Stephens, A. N. (2013). Couples, contentious conversations, mobile telephone use and driving. Accident Analysis & Prevention, 50, 416-422. DOI: http://dx.doi.org/10.1016/j.aap.2012.05.015

Lansdown, TC, Saunders, SJ (2012). Driver performance, rewards and motivation: A simulator study. Transportation Research F-Traffic Psychology and Behaviour, 15, 65-74. DOI: http://dx.doi.org/10.1016/j.trf.2011.11.004

Lansdown, TC (2012). Individual differences and propensity to engage with in-vehicle distractions – a self-report survey. Transportation Research F-Traffic Psychology and Behaviour, 15, 1-8. DOI: http://dx.doi.org/10.1016/j.trf.2011.09.001

Mann H, Lansdown T (2009). Pre-driving adolescent attitudes: can they change? Transportation Research F-Traffic Psychology and Behaviour, 12(5), 395-403. DOI: http://dx/doi.org/10.1016/j.trf.2009.05.003

Lansdown, TC, Burns, PC, Parkes, AM (2004) Perspectives on occlusion and requirements for validation. Applied Ergonomics, 35(3), 225-232. DOI: http://dx.doi.org/10.1016/j.apergo.2003.11.013

Lansdown, T, Brook-Carter, N, Kersloot, T (2004) Distraction from multiple in-vehicle secondary tasks: vehicle performance and mental workload implications. Ergonomics, 47(1), 91-104. DOI: http://dx.doi.org/10.1080/00140130310001629775

Grants

Lansdown, T. McGuigan, NM. Gardner, P. Visual preference survey. Sustrans. 1 year, 2010. £10,000.

Lansdown, T. Scotsim: design, audit and evaluation (sub contract). Scottish Government. 1 year, 2006. £7000.

Lansdown, T. Analysis of driver and vehicle data collection metrics. EPSRC. 3 years, 2001-2004. £95,000.

Lansdown, T. Design and data analysis. Transport Research Laboratory. 1 year, 2004. £4,000.

Graham, R. Fowkes, M. Lansdown, TC. Speech Ideas. EPSRC Innovative Manufacturing Initiative. £28,000.

4. Details of the impact (indicative maximum 750 words)

The Impact of Lansdown's work is in two broad areas. The development of updated ISO standards for safety evaluation (and its application by industry) and the development of public road safety policy in the UK and in Scotland, particularly affecting young people and dissemination of the messages.

His on-going work in establishing and developing definitions for consistent measurement of driver visual behaviour has been applied through the International Standards Organisation mechanism. For example, ISO 15007 (Road vehicles — Measurement of driver visual behaviour with respect to transport information and control systems) was revised in 2011 based upon changes in measurement technologies. Dr Lansdown's provided definitions and metrics describing the measurement of driver visual behaviour, and providing updated models to apply to the man machine interface. This has resulted in a common adoption of terminology across industry and application of common standards in training and induction for Road Haulage companies. [2] ISO15007 promotes safe and efficient driving. Lansdown is member of BSI (British Standard Institute) committee EPL-278-23, which deals with human factors in transportation, and had represented the UK in the ISO, technical committee 22/SubCommittee 13/Working group 8 on transportation man-machine interactions.

Dr Lansdown participated in an International Multi-Laboratory study to test the updated draft ISO standard. His role was to examine the data and make recommendations on the validity of the study and recommend alternative data, which was incorporated in the final standard. The study involved contributors from Europe (BMW, Daimler Benz, Heriot-Watt, and INRETS), North America

(Dynamic Research Inc., Ford, and Transport Canada) and Japan (JARI).BMW developed an evaluation tool in conjunction with a German University designed to test the standards in the ISO, which they circulated to the ISO working group. This went to a panel of Academics, and ultimately was tested by the International-Multi Laboratory for validity as an evaluation method. He has actively contributed to other pertinent work items in ISO guidelines, for example, the Driver Occlusion evaluation standard and the Lane change evaluation task

Lansdown has been active in linking research findings to the development of UK policy. In 2008, he was invited to join the core group of the Department for Transport's Scoping Study of Driver Distraction. This comprised six of the most influential UK experts research-active in the scientific area of driver distraction to define policy requirements for driver distraction in the UK. The Government's Department for Transport published the report summarising on-going work and identifying gaps in understanding (Basacik and Stevens 2008, http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/report95.pdf), which provides the basis for refinement of policy on hand held phone devices and in-car distractions such as entertainment systems. Lansdown's 2002 paper Individual differences during driver secondary task performance: verbal protocol and visual allocation findings. Accident Analysis and Prevention, 34(5), 655–662. cited as a reference that informed the findings of the scoping study.

As part of the ScotSim Project, Lansdown worked on the design and development of this innovative simulated training package. Participants in the project were pioneering individuals and organisations testing the technological solutions aimed at delivering one of the future solutions for truck driver training. The project was designed to meet the challenge of the European Parliament's mandate in 2003 that, by 2009, drivers who transport freight in the states of the European Union must obtain certificates of professional competence and undergo periodic training. This has had an impact on how road haulage companies recruit and train their staff [3].

A special interest group concerning driver information systems was established under the auspices of the EPSRC professional networks programme. The aim of the interest group is to promote human factors research to improve road safety. Lansdown is a steering group member and has contributed actively to collaboration within the UK via this group. Appropriate dissemination of documents and findings to stakeholders has been effective via, for example, several events sponsored by I.Mech.E.

As indicated above, Lansdown can evidence impact with the general public via interaction with the media. He has participated in numerous interviews with radio, television and published media, most recently about his 2009 work on real world levels of engagement with distracting behaviours during driving BBC, 27/9/09 Mail on Sunday, 2009). Lansdown was an invited speaker at the 2011 Brake Conference, 'Youth, Gender and Road Risk - 9th Road Safety Forum International Congress'. This event demonstrates his recognition as subject expert, and provided an opportunity to disseminate recent findings on young driver risk factors, to an audience that will represent policy makers, road safety practitioners, academics, and the general public.

On 8th February 2011 the Transport, Infrastructure and Climate Change Committee of the Scottish Parliament convened a special session on young driver road safety (Scottish Parliament 2011). Lansdown was invited to give evidence as an expert witness to the committee. http://www.scottish.parliament.uk/s3/committees/ticc/or-11/tr11-0301.htm . Lansdown was one of a panel of three experts that informed the Committee in how to develop Scotland's Road safety Framework 2020. The meeting further substantiates his reputation as an academic whose research is having an impact on the development of improved road safety in the UK, as the findings of the committee fed in to the regular review of Scotland's Road Safety Framework 2020.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[1] **Road Haulage Association Director for Scotland and Northern Ireland** who will verify that

the ScotSims project has had a direct impact on how hauliers train their staff

[2] **Senior Specialist in Safety Analysis and Human Factors Volvo Research** in Gothenburg can confirm that they apply standard ISO15007 extensively.