VISION IN VEHICLES – IV

Edited by

A. G. GALE
Queen's Medical Centre
Nottingham, U.K.

Co-edited by

I. D. BROWN
MRC Applied Psychology Unit
Cambridge, U.K.

C. M. HASLEGRAVE
University of Nottingham
Nottingham, U.K.

H. W. KRUYSSE
Leiden University
Leiden, The Netherlands

S. P. TAYLOR
Melson Wingate
Bournemouth, U.K.
CONTENTS

Preface v
Welcome vii

1: KEYNOTE ADDRESS

Safety Relevance of Vision Research and Theory
M.J. Koornstra 3

2: DRIVER'S VISION

The Development of Visual Standards in the UK
C.G.F. Munton 17

Traffic Accident Analyses and Perceptual Issues
R. Schanderson 27

Changes in Refractive Error under Night-time Driving Conditions
K. Chauhan and W.N. Charman 35

Survey of Problems Experienced by Drivers at Night:
Pilot Study
M.C.M. Dunne, E.K. White and G. Griffiths 45

Study of Visual Discomfort Caused by the Use of
Flashing Lights
G. Gratia, J-L. Paumier, M. Colomb and J. Dore 53

3: VEHICLE GLAZING AND LIGHT TRANSMISSION

Effects of Various Transmission Levels in Windshields
on Perception
H. Derkum 63
Light Diffusion Characteristic and Visibility
   Interferences in Automobile Windshields
F.R. Keßler

After-Market-Film on Passenger Car Windows and Light Transmission
G.R. Cunningham

4: VISUAL PERCEPTION AND VEHICLE CONTROL:
   COLLISION AVOIDANCE

Individual Differences in Driving Distance Headway
H. Ohta

Visual Cues for the Detection of Impending Collision
   at Crossroads: The Case of Curvilinear Self-Motion
C. Berthelon and D. Mestre

The Influence of Sight Distance on Subjects' Lateral Control: A Study of Simulated Driving in Fog
L. Harms

5: VISUAL PERCEPTION AND VEHICLE CONTROL:
   VEHICLE SIGNALLING SYSTEMS

An Evaluation of Rear Lighting Equipment for Vehicles
M. Fowkes and H.S. Storey

Rear Light Configurations: The Removal of Ambiguity by a Third Brake Light
S.P. Akerboom, H.W. Kruysse and W. La Heij

6: VISUAL PERCEPTION AND VEHICLE CONTROL:
   VISUAL INFORMATION ACQUISITION

Task Simulator for Evaluating Driver Information Acquisition
J.J. Collins and M. McDonald

Visual Search of Traffic Scenes: On the Effect of Location Expectations
J. Theeuwes and M.P. Hopause
7: TRAFFIC SIGNS

Traffic Sign Meaning: Designer Intent vs User Perception
A.A. Thieman and L.L. Avant 161

Effects of Delay on Recall of Road Signs: An Evaluation of the Validity of Recall Method
J. Luoma 169

Driver Detection of Local and Non-Primary Destinations on Direction Signs
M.C.M. Dunne and P.B. Linfield 177

8: MEASUREMENT AND MODELLING

Traffic Relevant Behavior Monitored by the Electro-oculogram (EOG) as a Psychophysical Measuring Instrument
N. Galley 189

A Tool for System Oriented Analysis of In-Vehicle Experimental Data
S. Becker, E. Bruckmayr, J. Sonntag and A. Steinel 197

The Measurement of Road Environment Appreciation with a Multi-Scale Construct List
F.J.J.M. Steyvers 203

Variable Visual Acuity for a Driver Model
T. Juergensohn and T-M. Wolter 213

9: TELEROBOTIC CONTROL OF VEHICLES

Human Engineering Experiments Using a Telerobotic Vehicle
K-P. Holzhausen, F.D. Pitrella and H-L. Wolf 223

Visuo-Cognitive Aspects of Navigation in Remote-Control Situations
E.A. Lapin and P. Peruch 231

Visual Interfaces in Driving Remote-Controlled Vehicles
P. Peruch, D. Mestre, J. Pailhous and A. Savoyant 237
10: IN-VEHICLE DISPLAYS: EFFECT ON VISUAL WORKLOAD

In-Vehicle Displays, Visual Workload and Usability Evaluation
S.H. Fairclough, M.C. Ashby and A.M. Parkes

Exploring Mental Workload via TLX: The Case of Operating a Car Stereo whilst Driving
P.W. Jordan and G.I. Johnson

Feedback Modality for Nontransparent Driver Control Actions: Why not Visually?
M.M. Popp and B. Faerber

An Initial Model of Visual Sampling of In-Car Displays and Controls
W.W. Wierwille

11: IN-VEHICLE DISPLAYS: EFFECTS OF DISPLAY TYPE AND LOCATION

A Comparison of the Effects of an Analog Versus Digital Speedometer on Driver Performance in a Task Environment Similar to Driving
R.J. Kiefer and L.S. Angell

Visual Detection of In-Car Warning Lamps as a Function of Their Position
G. Labiale

In-Vehicle Displays: Head-Up Display Field Tests
A. Sprenger

The Driving Simulator: An Aid for Ergonomic Design of Car Interiors
I. Guyard

Breaking up Open-Loop Steering Control Actions: The Steering Wheel as an Active Control Device
J. Schumann, H. Godthelp, B. Farber and H. Wontorra
12: POSTERS AND WORKSHOP REPORT

Perception, Activation and Driving Behaviour during a Ride on a Motorway
M. Jessurun, F.J.J.M. Steyvers and KA. Brookhuis 335

A Safety Integrated Fishing Vessel
J.A. Stoop 339

The Reduction of Driver’s Visual Load Using New Control Technologies
B. Faerber, B. Faerber and H Schweiker 343

Workshop: Assessing the Visual Parameters of Safe Monitoring and Providing a Fair International Standard for Drivers
P.A. Smith 351

Author Index 353

Subject Index 361