THE RELATIONSHIP BETWEEN THINKING AND DRIVING STYLES AND THEIR CONTRIBUTION TO YOUNG DRIVER ROAD SAFETY

THIS THESIS IS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF

DOCTOR OF PHILOSOPHY IN MANAGEMENT

UNIVERSITY OF CANBERRA

JUNE, 2011

LUCIENNE KLEISEN

M.A. (Linguistics) (Tilburg University)
ABSTRACT

This thesis explores the relationship between thinking and driving styles and their contribution to young driver road safety. In doing so, it aspires to strengthen the focus on road safety instead of road unsafety. Although the majority of literature on traffic safety concentrates on crashes, crash risk, and aberrant driving behaviour, this research concentrates on people and safe driving styles. In other words, this study is undertaken from a positive point of view, and it presents and uses the first positive definition of road safety.

Young drivers are overrepresented in traffic fatalities, and they have been at the centre of many crash focused studies. However, although the number of young driver deaths has been reduced in the past decade (Chen, Ivers, Martiniuk, Boufous, Senserrick, Woodward, Stevenson and Norton 2010a), young drivers still represent 25% of the road related deaths, but make up only 15% of the licensed drivers (Department of Infrastructure Transport Regional Development and Local Government 2009). It seems that past research, the majority of which is negatively focused on crashes and aberrant driving behaviour, has not yet led to a satisfactory improvement of young driver road safety. This study, therefore, focuses on young drivers’ safety from a positive perspective.

Mixed methodology is used to find an answer to the main research question Can knowledge of thinking and driving styles contribute to young driver road safety?, using self-report questionnaires and group interviews with young drivers. The thesis examines the relationship between young drivers’ thinking and driving styles, emphasising patient and careful driving. The traffic safety literature and the parallel literature on thinking styles is used to get a better understanding of the construct of driving style, and what driving style means to young drivers themselves. It argues that thinking and driving styles can both be regarded as intellectual styles and a model for the development of driving styles is proposed. The findings from this research have implications for driver training content as well as for driver training execution.
ACKNOWLEDGEMENTS

Working on a PhD thesis is a perilous undertaking because it confronts the candidate with several of their hidden fears, anxieties, and worries, and unveils the enormous amount of things one does not know. At the same time it unleashes lots of creativity, stimulates the brain, breeds stamina, and opens up whole new worlds of knowledge. This makes the road to completion a rocky one, with high highs and low lows. I did not go this road alone and I would like to take this space to acknowledge the people who travelled with me; the ones who were there for shorter periods, and especially the ones who went with me all the way.

My heartfelt gratitude goes out to Monica Kennedy, my primary supervisor, who was willing to take me on as a student when I felt completely lost. Ever wise, nurturing, listening, and encouraging, she helped me to get back on track and she played a crucial role in me completing this thesis. Her genuine interest in me as both a student and a person, and her delight in my research undertakings and outcomes will guide me in the future whenever I am dealing with students myself.

I was very lucky that in addition to my excellent primary supervisor, I had two other outstanding academics on my supervisory panel; Deborah Blackman and Kathryn Moyle. Both have provided me with invaluable advice and encouragement during the course of my research and which kept me going on the road to completion. I cannot thank them enough for their knowledge shared, interest shown, and time spent on my behalf.

This seems the right place to mention Hugo Verdaasdonk. Hugo still remembered me from when I did my Masters study with him 20 years ago, wrote me a reference for my PhD application, and suddenly passed away before I could let him know I was accepted into the program. Thanks Hugo, I will not forget. Nor will I forget Susan Nicholls, my other referee, who encouraged me from the start and cheered me on all the way.

I thank the participants of this study for their time and contributions. I would also like to thank the University of Canberra and the Canberra Institute of Technology for allowing me access to their students. I want to acknowledge the contribution of my stipend from the NRMA-ACT Road Safety Trust and my Research Training Scholarship from the University of Canberra, and the Faculty of Business and Government which supported my research in many ways.
I would like to mention a few of my PhD buddies who have walked this road with me for longer or shorter stretches: Penny Hanley, Doug Jackman, Ribaun Korm, Irmina Nahon, Diane Phillips, and Brian Weir. I especially want to thank Fiona Buick, with whom I have shared the most while walking around the UC campus whenever I could drag her away from her desk. You all rock!

I wish to thank my mum Margreet van ‘t Wel, who always encouraged me to follow my dreams, even if it meant living on the other side of the world to do it (and Skype does not quite make up for a real hug). I am indebted to many of my Canberra friends who kept pestering me at every occasion with the question “Are you a doctor yet?”, making me all the more determined to get to the end! A special thanks to Joelle Vandermensbrugghe and Rob Schaap for their continuous belief in me, and lots of coffee moments a.k.a. pep talks.

Finally, because he hates to be the centre of attention, I want to thank my fantastic husband Nik van den Brink for all his support during these student years. You have made my life so much more joyful for the past 16 years and I know you will keep walking with me beyond this dissertation road, until the very end.
PRESENTATIONS IN THE PROGRESS OF THE THESIS


# TABLE OF CONTENTS

1 Introduction .................................................................................................................................1  
  1.1 Background to the study .................................................................................................1  
  1.2 Purpose of the study .......................................................................................................6  
  1.3 Aims and approach .........................................................................................................7  
  1.4 Significance of the study ...............................................................................................7  
  1.5 Dissertation overview ....................................................................................................8  
  1.6 Summary .........................................................................................................................9  

2 Literature review .......................................................................................................................11  
  2.1 Thinking style research .................................................................................................11  
    2.1.1 The threefold model of intellectual styles ............................................................14  
    2.1.2 Thinking and driving ............................................................................................15  
    2.1.3 The theory of mental self-government .................................................................16  
  2.2 Road safety research .......................................................................................................18  
    2.2.1 Theories and models of driving .............................................................................23  
      2.2.1.1 Zero-risk model ..........................................................................................23  
      2.2.1.2 Risk homeostasis theory ..........................................................................24  
      2.2.1.3 Threat avoidance theory ...........................................................................25  
      2.2.1.4 Task-capability interface model .................................................................25  
      2.2.1.5 Theory of planned behaviour ....................................................................27  
      2.2.1.6 Conceptual framework of safe driving behaviour ......................................28  
    2.2.2 Young driver behaviour models ............................................................................30  
    2.2.3 The hierarchical nature of driving .........................................................................32  
  2.3 Driving styles ....................................................................................................................35  
  2.4 Initial framework current study ......................................................................................38
5 Qualitative results ........................................................................................................................................ 119

5.1 The constructs of thinking and driving style .............................................................................. 120

5.1.1 Thinking style construct ........................................................................................................ 120

5.1.2 Driving style construct .......................................................................................................... 124

5.2 Group interview data compared to questionnaire results ..................................................... 126

5.2.1 Thinking styles ...................................................................................................................... 126

5.2.2 Driving styles ........................................................................................................................ 127

5.2.3 The relationships between thinking and driving styles ...................................................... 129

5.3 Emerging themes from the group interviews ........................................................................ 134

5.3.1 Safe driving .......................................................................................................................... 135

5.3.2 Driving context ...................................................................................................................... 139

5.3.3 Driver training ....................................................................................................................... 146

5.4 Summary ..................................................................................................................................... 149

6 Discussion of findings .................................................................................................................... 151

6.1 Theoretical research questions ............................................................................................... 151

6.1.1 Are driving style and thinking style both intellectual styles? .............................................. 151

6.1.2 Is a driving style a preferred or habitual way of driving? ...................................................... 154

6.1.3 How can road safety be defined in a positive way? ............................................................... 156

6.2 Applied research questions ....................................................................................................... 157

6.2.1 What are young drivers’ thinking styles? ............................................................................. 158

6.2.2 What are young drivers’ driving styles? ............................................................................... 163

6.2.2.1 Driving style clusters ...................................................................................................... 169

6.2.3 Is there a relationship between young drivers’ thinking and driving styles? ......... 172

6.2.4 Can thinking styles predict driving styles? .......................................................................... 177

6.3 Proposed theoretical models of driving style ........................................................................... 184

6.3.1 Emerging theoretical framework for this study ................................................................. 187
6.4 Implications for driver training ................................................................. 188
6.5 Summary ................................................................................................. 190

7 Conclusion ............................................................................................... 193

7.1 Research questions .................................................................................. 193
7.2 Contributions .......................................................................................... 196
7.3 Further research ...................................................................................... 197
7.4 Final remarks .......................................................................................... 198

8 References .................................................................................................. 199

Appendix A: Ethics approval .......................................................................... 217
Appendix B: Information sheet questionnaires ............................................. 220
Appendix C: Information sheet group interviews ....................................... 222
Appendix D: Questionnaires ......................................................................... 224
Appendix E: Group interview discussion guide .......................................... 230
### TABLES

Table 2-1: Key characteristics of the MSG thinking styles .................................................................17
Table 2-2: MSG thinking styles according to type .............................................................................18
Table 2-3: GDE framework ..................................................................................................................34
Table 2-4: Key characteristics of the MDSI eight driving styles .......................................................36
Table 3-1: TSI-R thinking styles .........................................................................................................44
Table 3-2: Comparison Cronbach’s alpha current study with previous research ..............................45
Table 3-3: Factor analysis TSI-R ...........................................................................................................47
Table 3-4: The MDSI driving styles according to driving domains ....................................................48
Table 3-5: Comparison of Cronbach's alpha with previous research .............................................49
Table 3-6: Comparing Cronbach's alpha driving style domains to previous research ..................50
Table 3-7: Cronbach's alpha for three driving style domains fitting present data .........................50
Table 3-8: Factor analysis MDSI ..........................................................................................................51
Table 4-1: Interscale Pearson correlations TSI-R thinking styles ....................................................64
Table 4-2: Sex differences Interscale Pearson correlations 13 thinking styles ...............................65
Table 4-3: Sex differences in legislative and hierarchic thinking ....................................................66
Table 4-4: Means according to sex .....................................................................................................67
Table 4-5: Field of study in relation to hierarchic thinking ...............................................................67
Table 4-6: Means hierarchic thinking style and field of study ..........................................................68
Table 4-7: Relationship between drivers licence and hierarchic thinking .....................................68
Table 4-8: Means for hierarchic thinking in relation to drivers licence .........................................69
Table 4-9: Means for hierarchic thinking and type of drivers licence for males .............................69
Table 4-10: Pearson correlations for licence type - 13 thinking styles ............................................70
Table 4-11: Relationship between legislative thinking and driving years .......................................70
Table 4-12: Means for the factor years of driving and legislative thinking .....................................71
Table 4-13: Correlations between exposure (hours/week) and thinking styles ...............................72
Table 4-14: Means for two thinking styles in relation to exposure ...............................................72
Table 4-15: Pearson intercorrelations MDSI driving styles .............................................................73
Table 4-16: Pearson intercorrelations MDSI driving styles split for sex ........................................74
Table 4-17: Pearson intercorrelations MDSI driving style domains ...............................................75
Table 4-18: Pearson interscale correlations MDSI driving style domains, split for sex ...............75
Table 4-19: Pearson interscale correlations emerging driving style domains .................................................. 76
Table 4-20: Pearson interscale correlations for emerging domains, split for sex ........................................ 76
Table 4-21: 1-way ANOVAs for MDSI driving styles and sex ........................................................................ 77
Table 4-22: Driving style means according to sex ......................................................................................... 78
Table 4-23: 1-way ANOVAs for MDSI driving style domains and sex .......................................................... 79
Table 4-24: Means for driving style domains according to sex ................................................................. 79
Table 4-25: 1-way ANOVAs for emerging driving style domains and sex .................................................. 80
Table 4-26: Means for emerging driving style domains and sex ................................................................. 80
Table 4-27: Pearson's correlations for age and driving styles ..................................................................... 81
Table 4-28: Pearson’s correlation for driving styles and field of study (males) .......................................... 83
Table 4-29: Pearson’s correlation for driving styles and type of licence (sample) ................................. 83
Table 4-30: Pearson’s correlations driving styles and years driving (sample) ....................................... 84
Table 4-31: One-way ANOVA for exposure (hrs/wk) in relation to driving styles ....................................... 85
Table 4-32: Means for driving styles in relation to exposure (Hrs/wk) ........................................................ 86
Table 4-33: 1-way ANOVAs for four driving style domains and exposure ................................................ 87
Table 4-34: Means for exposure and driving style domains ....................................................................... 87
Table 4-35: Pearson correlations for eight driving styles and exposure .................................................. 88
Table 4-36: Pearson's correlations for 13 thinking styles and eight driving styles ................................. 89
Table 4-37: Pearson's correlations for thinking and driving styles for males ......................................... 91
Table 4-38: Pearson’s correlations for thinking and driving styles for females ..................................... 92
Table 4-39: Pearson’s correlations for thinking styles and driving style domains .................................. 93
Table 4-40: Pearson’s correlations thinking styles and driving style domains (males) ......................... 95
Table 4-41: Pearson’s correlations thinking styles - driving style domains (females) .......................... 96
Table 4-42: Pearson’s correlations between thinking and driving styles, controlling for sex and age 97
Table 4-43: Pearson’s correlations between thinking styles and driving style domains, controlling for sex and age ......................................................................................................................... 98
Table 4-44: Model summary for risky driving .............................................................................................. 100
Table 4-45: Coefficients for predictors of risky driving ........................................................................... 100
Table 4-46: Model summary for angry driving .......................................................................................... 101
Table 4-47: Coefficients for predictors of angry driving ........................................................................... 101
Table 4-48: Model summary for high-velocity driving ............................................................................. 102
Table 4-49: Coefficients for predictors of high-velocity driving .............................................................. 103
Table 4-50: Model summary for patient driving................................................................. 104
Table 4-51: Coefficients for predictors of patient driving..................................................... 105
Table 4-52: Model summary for careful driving................................................................. 105
Table 4-53: Coefficients for predictors of careful driving..................................................... 106
Table 4-54: Model summary for anxious driving............................................................... 107
Table 4-55: Coefficients for predictors of anxious driving.................................................. 108
Table 4-56: Model summary for distress reduction driving.................................................. 109
Table 4-57: Coefficients for predictors of distress reduction driving.................................... 109
Table 4-58: Model summary for dissociative driving.......................................................... 110
Table 4-59: Coefficients for predictors of dissociative driving.......................................... 110
Table 4-60: Model summary for reckless and careless domain.......................................... 111
Table 4-61: Coefficients for predictors of reckless and careless domain............................. 112
Table 4-62: Model summary for patient and careful domain............................................. 113
Table 4-63: Coefficients for predictors of the patient and careful domain.......................... 114
Table 4-64: Model summary for anxious domain............................................................. 115
Table 4-65: Coefficients for predictors of anxious domain............................................. 116
FIGURES

Figure 2-1: Influences on young driver behaviour.................................................................21
Figure 2-2: Framework of safe driving behaviour.................................................................29
Figure 2-3: Young drivers’ crash involvement....................................................................31
Figure 2-4: Initial theoretical framework for this study ....................................................38
Figure 3-1: Comparison males-females by age.................................................................56
Figure 3-2: Driving experience in years...........................................................................57
Figure 3-3: Participants according to field of study.........................................................57
Figure 6-1: Incorporating driving style into framework of safe driving behaviour........185
Figure 6-2: Model for the development of driving styles.................................................186
Figure 6-3: Refined theoretical model for this study.......................................................188
EXAMPLES

Example 5-1: What young drivers think about while driving................................................................. 120
Example 5-2: The right frame of mind for driving.................................................................................. 121
Example 5-3: Thinking styles as states.......................................................................................... 122
Example 5-4: Young drivers constructing hierarchic thinking .............................................................. 123
Example 5-5: Driving described in a contextual framework.................................................................. 124
Example 5-6: Flexibility in use of driving styles.................................................................................... 125
Example 5-7: The importance of experience in driving.......................................................................... 128
Example 5-8: Influence of experience on change in driving style.......................................................... 128
Example 5-9: Not-thinking while driving............................................................................................ 130
Example 5-10: Time pressure causing distracted driving..................................................................... 131
Example 5-11: Emotions and mood causing dissociative driving......................................................... 132
Example 5-12: Parents distracting participants with backseat driving.................................................. 134
Example 5-13: Fear of other drivers’ behaviour reason to drive safely................................................. 135
Example 5-14: Enforcement of road rules............................................................................................ 137
Example 5-15: Effect of law enforcement on driving style choice....................................................... 137
Example 5-16: Crash involvement influencing driving style................................................................. 138
Example 5-17: Ignoring knowledge on safe driving............................................................................... 139
Example 5-18: Safe speeding................................................................................................................ 139
Example 5-19: Not adapting to other drivers’ behaviour ...................................................................... 140
Example 5-20: Young male passengers impact on driving.................................................................... 141
Example 5-21: Car quality influences driving style................................................................................ 142
Example 5-22: Females cannot multitask while driving (and men can).................................................. 143
Example 5-23: Stereotyping P-platers.................................................................................................. 144
Example 5-24: Adapting to traffic context ............................................................................................. 145
Example 5-25: Thinking and feeling in relation to driving.................................................................... 145
Example 5-26: Learning to drive in the country ..................................................................................... 147
Example 5-27: Learning to drive safely.................................................................................................. 147
Example 5-28: Parent as driving teachers............................................................................................. 148
Example 5-29: Role models for driving............................................................................................... 149
ABBREVIATIONS AND GLOSSARY

**ACT**: Australian Capital Territory.

**L-plater**: a driver holding a learner permit.

**L-plates**: Australia has a graduated licensing system for drivers. Drivers on a learner’s permit have to be accompanied by a fully-licensed driver and display L-plates at the rear and front of their car.

**MDSI**: Multi-dimensional Driving Style Inventory (Taubman - Ben-Ari, Mikulincer and Gillath 2004).

**MSG**: theory of mental self-government (Sternberg 1997).

**Negative view on road safety**: a focus on crashes, crash risk, and aberrant driving behaviour (e.g. angry driving, risky driving)/(Lehtimäki 2001).

**Negative definition of road safety**: safety defined as a lack of something (e.g. crashes) (Lethimäki 2001).

**Positive definition of road safety**: safety defined as some harmonious circumstances that so far have not been explicated further (Lethimäki 2001).

**Positive view on road safety**: a focus on people, and normal safe driving behaviour or driving styles (e.g. patient driving, careful driving) (Kleisen 2009).

**P-plater**: a driver holding a provisional licence (intermediate).

**P-plates**: Australia has a graduated licensing system for drivers. Drivers on a provisional licence must display P-plates on the rear and front of their car.

**TSI-R**: Thinking Style Inventory-Revised (Sternberg, Wagner and Zhang 2003).

**Young drivers**: male and female drivers between 18-25 years of age.