Safety Awareness For Elderly Drivers (SAFE):
The development and evaluation of an educational intervention on age-related driving
issues and safe driving behaviours for older drivers

by

Wendy Lindstrom-Forneri
B.Sc., Lakehead University, 2001
M.A., Lakehead University, 2003

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in the Department of Psychology

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Supervisory Committee

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Abstract

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Maintaining independence is a primary reason that many older drivers continue to drive. Safety, however, is a growing concern for all older drivers. Numerous studies have noted that many older drivers lack an awareness of their driving abilities and driving safety issues for older adults. Identifying the awareness level of older drivers from a theoretical standpoint is important. The current educational interventions for older drivers show promising results and suggest that educational programs can impact older driver knowledge, self-reported awareness, and behaviours. However, rarely have older drivers with cognitive deficits been included. This research study fills a gap in the current literature regarding the utility of a theoretically-based intervention program to increase older driver awareness, improve attitudes towards driving, and increase behaviours around older driver safety. The purpose of this research study was to develop, pilot, and examine the effectiveness of a novel, theoretically based, in-class education program entitled “Safety Awareness for Elderly Drivers” (SAFE) for older drivers both with and without cognitive impairment. The SAFE education program was based on five relevant models/theories: 1) Driving as an Everyday Competence, 2) Hierarchical Awareness Theory, 3) Toglia & Kirk’s Awareness Model, 4) Theory of Planned Behaviour, and 5) Transtheoretical Model. A convenience sample of 47 current older drivers aged 70 years
or older currently contemplating changing their driving behaviours and their passengers were recruited and randomly assigned. Participants in the intervention group received the group education session, while those in the treatment as usual control group received a copy of the Insurance Board of British Columbia’s “Roadsense for Driver’s” handbook. We measured general knowledge, awareness of individual driving abilities, attitudes, intention to change driving behaviours, driving behaviours, and readiness to change before, immediately after the intervention (intervention group only), and at 2-month follow-up. Results indicated that the “Safety Awareness for Elderly Drivers” education program was well received by older drivers. The education program demonstrated immediate impacts, such as increased knowledge of older driver safety issues (general level awareness), increased individual awareness, and some changes in attitude and intentions toward changing driving behaviours. Older drivers with mild cognitive impairment showed similar benefits from the education program. However, the program did not appear to be more effective than the review of a drivers handbook available though ICBC in follow-up, with most follow-up measures being similar to baseline. Implications of this research and further research suggestions for older drivers are discussed.
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Dedication

This dissertation is dedicated to the four most important people in my life. First, to my amazing parents, Bob and Allane, who have always encouraged me to follow my dreams and who have supported me, not only in obtaining my Ph.D., but in every aspect of my life. I cannot thank you enough and would not have achieved this without your unconditional love and support. To my loving and amazing husband, Casey, for all of his sacrifices, support, and encouragement. You encouraged me to follow my dreams, even when it meant living so far apart, and through it all you were amazing. I could not have done this without you by my side. And, to Bailey, my wonderful step-daughter, for her support and understanding through out this journey.
Chapter 1: Introduction

Study Background and Rational

The elderly population represents one of the fastest growing segments of the population. According to Statistics Canada, in 2004 persons 65 years of age and older represented 17.6% of the population. Between 2001 and 2004 the number of persons aged 65 and older increased by 4.6% ("Statistics Canada," 2005). As the elderly population increases, the number of elderly drivers in turn increases. Maintaining independence is a primary reason that many older drivers continue to drive. Safety, however, is a growing concern for all older drivers.

Many older drivers appear to lack an awareness of their driving abilities and driving safety issues for older adults (e.g., crash risk, health related issues, etc.; Dobbs & Dobbs, 2000; Marottoli, et al., 1998; McCarthy, 2005). However, no previous study has used a theoretical basis to test older driver awareness of driving issues (see literature review section). Identifying the awareness level of older drivers is important, as without adequate knowledge it is difficult for older drivers to make informed decisions and choices regarding their driving habits and safety.

Effective interventions that can increase awareness and facilitate changes in attitudes and readiness to change behaviours have the potential to increase appropriate decision-making. This, in turn, may impact on-road driver safety. By having adequate awareness of older driving issues and by changing attitudes toward older driver safety, older drivers may implement more compensatory strategies at both the strategic (e.g., planning ahead, restricting driving, driving cessation) and tactical (e.g., speed choice, awareness of changing road conditions) levels. Using compensatory strategies may lead
to fewer negative driving events such as getting lost, traffic violation tickets, and crashes. Compensatory strategies may allow older drivers to stay on the road longer and have increased mobility.

Despite projections that there is likely to be approximately 100,000 drivers with dementia in Ontario by 2028 (Hopkins, Kilik, Day, Rows, & Tseng, 2004), currently there is no information regarding the impact of driving interventions among older drivers with cognitive impairment. Although research has indicated that measures of overall mental status have been found to be associated with on-road driving performance (Odenheimer, et al., 1994), older adults with dementia have been shown to have an increased crash risk (Bieliauskas, 2005; Tuokko, Tallman, Beattie, & Cooper, 1995), and increased severity of dementia is related to poorer overall driving abilities (for an in-depth review see Brown & Ott, 2004), the fact remains that dementia alone is not sufficient to determine driving abilities. Thus, as with other older drivers, it is important to determine if drivers with cognitive impairment can benefit from educational driving programs. Case studies from this research will inform future intervention research as to possible approaches to consider when working with older drivers with dementia. This research study was approved by the Human Research Ethics Board at the University of Victoria and by UVic/VIHA Joint Research Ethics Sub-Committee.

**Purpose of the Study**

This research study fills a gap in the current literature regarding the utility of a theoretically-based intervention program to increase older driver awareness (both at the general and individual levels), improve attitudes towards driving, and increase behaviours around older driver safety. Due to the lack of theoretically based driver education
interventions for older adults, this research study had two primary purposes. First, to create a novel educational intervention for older drivers, who are contemplating changing their driving behaviours, with a focus on the impact of awareness of driving related issues on the attitudes and driving behaviours of older drivers. Second, to evaluate the educational intervention developed in the first stage of the study on various driving related issues.

Given the two interrelated aspects of this research project the study was divided into two studies. Study 1, the pilot for Study 2, involved: (1) compiling the Driving Awareness Questionnaire (DAQ) to ascertain older drivers levels of awareness regarding older driver safety issues and further exploration of older drivers’ awareness of their driving abilities, (2) development of the Safety Awareness for Elderly Drivers (SAFE) intervention program that focused on older driver safety and issues surrounding safe driving strategies (e.g., restriction, cessation, alternative transportation), and (3) piloting the DAQ and SAFE education programs. Study 2 involved: (1) evaluating the effectiveness of the SAFE education program based on the three primary objectives listed below, (2) exploration of the progression of older drivers currently within the contemplation TTM stage of change at the 2-month follow-up, and (3) exploration of the TPB constructs as predictors of intentions to engage in self-reported safe driving behaviours. The inquiry into the benefit of the SAFE educational intervention for older drivers with cognitive impairments has been neglected in the current driving literature. Therefore, this study also conducted a novel examination of the impact of an educational intervention on older drivers with mild cognitive impairment using a single-case study approach. Case study approaches have previously been used for interventions for those
with dementia in neuropsychology (Clare, Wilson, Carter, & Hodges, 2003; Wilson, 1987). Case examples from this study will help to inform the field on older drivers with dementia and mild cognitive impairment.

**Study 1 (Pilot Studies)**

Two pilot studies were conducted as part of Study 1. The purpose of the first pilot study in Study 1 was to develop and pilot the SAFE education program to obtain feedback from people similar to those who would be involved in the intervention phase (Study 2) of the project. Using this information to revise the intervention ensured adequate time for material to be presented and questions to be asked, clarity of presented information, and clarity of handout materials. The purpose of the second pilot study under Study 1 was to compile and pilot the Driving Awareness Questionnaire and obtain feedback from older drivers and their passengers to ensure the questions were clear and easily understood. The results of this second pilot study can be found in Appendix B. To ensure the participants were similar to those who would be participating in Study 2, all participants in both pilot studies met the inclusion criteria for Study 2.

**Study 2**

The study focused on the following *primary objectives*:

**Objective #1**

To ascertain the effectiveness of the SAFE education program on older driver safety issues and safe driving strategies for older drivers with regard to (a) increasing awareness of older driver safety issues both at the general population (knowledge) and individual levels, (b) changing attitudes toward driving safety, (c) improving self-
perceptions of driving abilities, (d) increasing the intention to change driving behaviours, and (e) increasing self-reported safe driving behaviours (e.g., restriction) by examining the differences both within the intervention group immediately following the intervention and between the intervention group and treatment as usual control group at follow-up. The benefit of the intervention was examined within the context of a control group to determine if any benefits were derived from completing the questionnaires and treatment as usual without participating in the SAFE education program.

**Objective #2**

To determine if any psychosocial or demographic factors (e.g., age, gender, educational status, average driving time, current restrictions, etc.), including cognitive status (determined by a cognitive screen), were associated with (a) awareness of older driver safety issues both at the general population and individual levels, (b) attitudes toward driving safety, (c) self-perceptions of driving abilities, (d) intention to change driving behaviours, (e) self-reported safe driving behaviours (e.g., restriction) at baseline and follow-up for older drivers.

**Objective #3**

To ascertain which Theory of Planned Behaviour (TPB) constructs best predict intention to change and self-reported safe driving behaviours both at baseline and post-intervention.

Assuming the SAFE education program was beneficial, to determine whether changes in the following were predictive of self-reported safe driving behaviour change at the 2-month post-intervention follow-up: (a) awareness of older driver safety issues both at the general population and individual levels, (b) attitudes toward driving safety,
and/or, (c) self-perceptions of driving abilities are predictive of self-reported safe driving behaviour change at 2-month post-intervention follow-up. This determined which factors were most important in leading to change in self-reported driving behaviours.

The secondary objectives for the proposed study are:

**Secondary Objective #1**

To examine the Transtheoretical Model (TTM) stages of change and ascertain if the SAFE education program leads to any significant movement across the stages of change.

**Secondary Objective #2**

To determine the effectiveness of the SAFE education for people with mild cognitive impairments using a case study approach. This involved describing the individual cases and exploring their post-intervention outcomes, both immediately following the intervention and at the 2 month follow-up, relative to their baseline scores on the various measures.

**Hypotheses: Study 2**

The hypotheses for each of the objectives were as follows:

**Objective #1**

The initial hypotheses were:

1) The SAFE education group would not differ from the treatment-as-usual control group at baseline. The SAFE education group would differ from the control group at follow-up such that the education group would demonstrate: a) increased awareness of older driver safety issues both at the general population and individual levels, b) more positive attitudes toward driving safety, c) more conservative ratings of their own driving
abilities, d) greater intentions to change their driving behaviours, and e) report an increase in safe driving behaviours. Whereas;

2) The control group would not show any significant changes in the outcome measures of: (a) awareness of older driver safety issues, both at the general population and individual levels, (b) attitudes towards driving safety, (c) self-perceptions of driving abilities, (d) intention of older drivers to change their driving behaviours with respect to implementing more self-restrictions or other safe driving behaviours, or (e) safe driving behaviours (e.g., restriction).

3) Relative to baseline, the SAFE education group would demonstrate: a) increased awareness of older driver safety issues both at the general population and individual levels, b) more positive attitudes toward driving safety, c) more conservative ratings of their own driving abilities, and d) greater intentions to change their driving behaviours immediately following the education program.

4) Passenger ratings for the SAFE education group would indicate better driving performance and an increase in the use of safe driving strategies at follow-up, relative to the control group.

**Objective #2**

It was hypothesized that cognitive status will be significantly associated with the outcome variables. Specifically, lower cognitive screening scores will be associated with: (a) less awareness of older driver safety issues, (b) higher rating of themselves as better drivers, (c) fewer intentions to change their driving habits, and (d) fewer self-reported changes in safe driving habits.
It was hypothesized that driving more frequently and restricting driving behaviours less would be predictive of: (a) less intention to change driving behaviours, and (b) less self-reported safe driving behaviours (e.g., restriction) at baseline.

**Objective #3**

Regarding the TPB factors, based on previous literature it was hypothesized that instrumental attitude and subjective norm would be the best predictors of intention to change and self-reported safe driving behaviours both at baseline and post-intervention.

Assuming the intervention was beneficial, it was hypothesized that each of the following would be predictive of greater self-reported safe driving behaviour change at 2-month post-intervention follow-up: (a) a greater increase in awareness of older driver safety issues both at the general population and individual levels, (b) the greater change towards more positive attitudes regarding driving safety, and (c) the more negative self-perceptions of driving abilities.

**Secondary Objective #1**

It was hypothesized that older drivers who participated in the intervention would show movement towards a higher stage of change following the SAFE education program (e.g., from contemplation stage to preparation stage).

**Secondary Objective #2**

The case study analyses of older drivers with cognitive impairment (based on a cognitive screen or self-report diagnosis) were hypothesized to indicate that older drivers with mild cognitive impairment would benefit from the SAFE education program, and show similar trends to the other older drivers with respect to changes in awareness,
attitudes, intentions, safe driving behaviours, and progression from contemplative to preparation stage of change, based on the TTM, at the 2-month follow-up.
Chapter 2: Literature Review

Driving is one of the most important ways for older adults to remain independent. Independence, however, must be balanced with safety both for the older driver and for the public. The risk of older drivers to be in a motor vehicle crash has been extensively researched. While older drivers account for a lower proportion of crashes as a group compared to the whole driving population (De Raedt & Ponjaert-Kristofferen, 2001; Retchin & Anapolle, 1993), when distance driven is taken into account, older drivers and younger drivers are disproportionately involved in crashes compared to middle-aged drivers (Irwin, 1989; McKnight & McKnight, 1999; Mori & Mizohata, 1995; Retchin & Anapolle, 1993; Ryan, Legge, & Rosman, 1998; Stamatiadis & Deacon, 1995; Stutts & Martell, 1992). In addition to being disproportionately involved in crashes, older drivers are often responsible for the crashes. When crashes involving older drivers occur, the older drivers are more likely than middle-age drivers to be at fault (Cooper, 1990; McGwin & Brown, 1999; Stutts & Martell, 1992). Within Ontario, 34 000 older adults with dementia continued to drive in 2000 with a projected increase to 100 000 in 2028 (Hopkins, et al., 2004). While most older drivers remain safe drivers (Hunt, Morris, Edwards, & Wilson, 1993; Hunt, et al., 1997), some older drivers with cognitive impairment such as Alzheimer’s disease (AD) may be at increased risk for motor vehicle crashes or impaired performance on road tests (Duchek, et al., 2003). Tuokko, Tallman, Beattie, Cooper, and Weir (1995) examined crash rates and found that older drivers with dementia had approximately 2.5 times the number of traffic crashes compared to a matched non-demented control group. A recent review by Man-Son-Hing and colleagues (2007) noted caregiver-reported crashes for those with dementia indicated 2.5 – 8 times
greater risk of crash compared to healthy controls. Older drivers with dementia appear to show better retention of driving skills in the early stages (Hunt, et al., 1993; Hunt, et al., 1997; Rebok, Keyl, Bylsma, Blaustein, & Tune, 1994; Rizzo, McGehee, Dawson, & Anderson, 2001). However, greater dementia severity is associated with poorer driving abilities (Adler, Rottunda, & Dysken, 2005; Brown, et al., 2005).

In general, older drivers are more susceptible to serious injuries or fatalities due to crashes (Bédard, Guyatt, Stones, & Hirdes, 2002; Brorsson, 1989; Lam, 2002; Lilley, Arie, & Chilvers, 1995; McKnight & McKnight, 1999; Mortimer & Fell, 1989; Ryan, et al., 1998). Zhang and colleagues (2000) reported that drivers aged 75 – 79 involved in an accident with a medical/physical condition were five times more likely to be fatally injured than drivers of the same age without a medical/physical condition. In 1998, older adults represented 18% of all those fatally injured in vehicle crashes and, given the current trends, this figure is projected to reach 27% by 2015 (Bédard, Guyatt, Stones, & Hirdes, 2001). Given the susceptibility of serious injuries or fatalities, safe driving practices are a concern for the older adult population.

Despite the increased risk of a crash and subsequent injury, retrospective research indicates that only 5-21% of older adults who stopped driving reported crashes as influencing their decision regarding driving cessation (Carr, Shead, & Storandt, 2005; Charlton, et al., 2006; Dellinger, Sehgal, Sleet, & Barrett-Connor, 2001; Keeffe, Jin, Weih, McCarty, & Taylor, 2002; Persson, 1993). Older drivers report an internal locus of control, believing they could influence whether or not they were involved in an accident (Rabbitt, Carmichael, Shiling, & Sutcliffe, 2002; Tuokko, McGee, Gabriel, & Rhodes, 2007). Tuokko et al. (2007) reported 79% of older drivers believed they were less likely
to be involved in an accident compared to younger drivers. Older adults may lack an awareness regarding crash risk data and thus may minimize the risk when assessing their own driving abilities. Older drivers have reported that, if they became aware of unsafe driving habits, changing driving behaviours could reduce the risk of an accident (Tuokko, McGee, et al., 2007).

While crash risk and rates are important considerations in older driver safety, other factors impact older drivers’ ability to remain safe on the road. Aging, both normal and pathological, is associated with declines in cognitive, physical, and sensory/perceptual abilities that may influence one’s ability to drive safely (Anstey, Wood, Lord, & Walker, 2005; Eby, Trombley, Molnar, & Shope, 1998). Whether or not older drivers choose to change their driving habits may be related to their beliefs and perceptions about how a range of factors (physical, cognitive, sensory, emotional, social, history of crashes) influences driving abilities and independence.

The importance of driving to older adults is clearly echoed in the literature. Driving has been related to independence and a sense of freedom and control over one’s life (Gardezi, et al., 2006; Persson, 1993; Rabbitt, et al., 2002; Ralston, et al., 2001; Rudman, Friedland, Chipman, & Sciortino, 2006; Yassuda, Wilson, & von Mering, 1997). Driving is viewed by older adults as bringing a sense of belonging to the larger community (Eisenhandler, 1990), and a sense of control over one’s life (Ralston, et al., 2001), and giving up car ownership is perceived as impossible for someone with a spouse or relative with mobility needs (Rabbitt, et al., 2002).

Older drivers have equated not driving with imprisonment and believe that driving cessation is associated with decreased social contact, depression, physical
decline, and a negative affect on one’s sense of self (Gardezi, et al., 2006; Johnson, 2002; Rudman, et al., 2006). Some of these concerns have been supported in the literature.

Driving cessation has been associated with decreased out-of-home activity, (Marottoli, et al., 2000), increased depressive symptoms (Fonda, Wallace, & Herzog, 2001; Marottoli, Mendes de Leon, Glass, & Williams, 1997; Ragland, Satariano, & MacLeod, 2005), limited independence and mobility (Harrison & Ragland, 2003; Marottoli, et al., 2000; Ragland, et al., 2005), and lowered self-esteem (Horowitz, Boerner, & Reinhardt, 2002). Older adults have also reported positive aspects of driving cessation including reduced stress and costs, increase in physical activity, and freedom from responsibilities (Rabbitt, et al., 2002; Rosenblum & Corn, 2002). Older current drivers report negative aspects of driving including expense, stress (Rudman, et al., 2006), apprehension about driving, operational difficulties due to poor health, difficulties navigating traffic, and difficulties getting in and out of the car (Gardezi, et al., 2006). There have been fewer studies looking at the beliefs of older drivers with dementia. Adler, Rottunda, Bauer, & Kuskowski (2000) found that older male drivers with dementia were less likely to report driving as important and were less concerned regarding the mobility inconveniences if they were to stop driving.

Although the majority of older adults appear to believe that medical and health reasons impact driving abilities (Rudman, et al., 2006; Tuokko, McGee, et al., 2007), not all older adults with serious health concerns restrict or stop driving. Stewart et al. (1993) found that 68% of older drivers who previously experienced a brief loss of vision did not stop driving. Similarly, 37.8% of older women who reported at least one illness or symptom that may impair driving ability (e.g., cataracts, epilepsy, chest pain) continued
driving (Siren, Hakamies-Blomqvist, & Lindeman, 2004). Older drivers with dementia and their caregivers noted that a diagnosis of dementia alone should not preclude driving (Perkinson, et al., 2005). Drivers with dementia did not believe cognitive impairment affected their own driving (Perkinson, et al., 2005) and would not necessarily cause them to stop driving (Adler, et al., 2000).

Older drivers’ beliefs and attitudes regarding alternative transportation (e.g., taxis, buses) may influence decisions regarding driving behaviours. The majority of older drivers have unfavourable attitudes toward public transportation, viewing it as inaccessible, expensive, inconvenient, unsafe, and unreliable (Allan & McGee, 2003; Gardezi, et al., 2006). Older drivers expressed lack of information regarding available resources as a barrier to using alternative transportation. Former drivers indicated they rely primarily on friends and family for transportation even though they do not like being dependent on other people (Gardezi, et al., 2006). Older adults respond favourably to alternative transportation if it is convenient, flexible, inexpensive and provides social contact (Glasgow & Blakely, 2000).

Many older drivers believe the decision to change driving behaviour should remain with the drivers, although they acknowledge the influence of family and physicians, and acknowledge that changes in driving behaviours are associated with decreased comfort levels (Rudman, et al., 2006). Tuokko et al. (2007) reported 60% of older drivers would change driving when and where possible. However, 40% indicated change is not possible due to lifestyle or inability to use public transportation. Several older drivers believe that stopping driving is impossible for those with mobility impaired
spouses and believe cessation will cause them to let down others who depend on them (Rabbitt, et al., 2002).

While 84% believed avoiding challenging situations makes them feel protected against accidents, only 29% reported actively engaging in compensatory behaviours (Tuokko, McGee, et al., 2007). The majority of older drivers believe they should be allowed to drive whenever they want (Tuokko, McGee, et al., 2007) and intend to drive until they are physically unable to drive (Gardezi, et al., 2006; Rudman, et al., 2006). The reasons for not considering compensatory strategies to maximize driving safety may be related to strong beliefs regarding the importance of driving, the barriers to not driving, and may reflect an unawareness of their own driving abilities. For drivers with dementia failure to appreciate the need for driving restrictions and/or cessation is often due to a lack of awareness (Wild & Cotrell, 2003).

Awareness has been suggested as a key motivator in compensatory behaviour for general everyday competencies (Diehl, 1998) and specifically for modifications to driving behaviours (Ball, et al., 1998; Stalvey & Owsley, 2000). Older adults, with and without cognitive impairment, may lack awareness of their actual driving abilities (Freund, Colgrove, Burke, & McLeod, 2005; Marottoli, et al., 1998; Pachana & Petriwskyj, 2006; Wild & Cotrell, 2003). Evidence from non-cognitively impaired older drivers indicates mixed findings, with some studies indicating older drivers accurately predict driving abilities (Irwin, 1989) while others show discrepancies between self-ratings and driving evaluation (Freund, et al., 2005; Marottoli, et al., 1998). Freund et al., (2005) evaluated older drivers without dementia referred for a driving evaluation, comparing self-ratings with driving simulator performance. Sixty-six percent rated their
driving abilities as better than others their age. Higher self-ratings of driving abilities were associated with increased risk of unsafe driving, as determined by a poorer performance on the driving simulator. Although all fell within the normal range on a cognitive screening measure, those determined to be unsafe had significantly lower cognitive scores. Marottoli et al. (1998) found 100% of 125 older drivers rated themselves as average or above average, despite some having a history of adverse driving events. Of those completing an on-road evaluation, 27% performed below average. Brown et al. (2005) found similar results, with all older drivers rating themselves as safe, while 26% were rated as marginal on an on-road evaluation.

Awareness deficits in persons with dementia are well established (Clare, 2004a, 2004b), yet the behavioural consequences of impaired awareness is largely unexplored (Wild & Cotrell, 2003). A longitudinal study indicated older drivers with mild AD showed a decline in on-road driving abilities, especially for awareness of the driving environment (Duchek, et al., 2003). While not all persons with cognitive impairments are incompetent drivers, (Hunt, et al., 1993) drivers with mild dementia have been shown to be poorer predictors of their own driving abilities (Dobbs, 1997; Hunt, et al., 1993; Wild & Cotrell, 2003). Cotrell & Wild (2003), in a longitudinal study, reported that drivers with AD who had greater awareness of their driving abilities tended to restrict their driving (e.g., avoid unfamiliar routes) whereas those with poor awareness of their driving abilities did not restrict. Awareness deficits were also associated with driving cessation. Drivers with AD demonstrated greater awareness, as their self-ratings were more consistent with their caregivers’ ratings of their driving abilities, in comparison to non-drivers with AD, whose self-ratings were more discrepant from their caregiver’s ratings.
of their driving ability. A more recent study noted that drivers with AD showed greater discrepancies between their self-ratings and those of caregivers and trained evaluators than did control subjects. Drivers with AD also showed greater variability between general awareness of remote memory and driving specific awareness (e.g., scoring low on general awareness did not mean they would score low on driving specific awareness; Wild & Cotrell, 2003).

Awareness of deficits is clearly a key component to self-regulating driving behaviours and varies within and between older drivers. Although there appears to be greater variability in older drivers with AD, many of these drivers self-restrict and therefore display behaviours suggestive of intact awareness. Older drivers have been found to have greater awareness of physical, visual, and cognitive changes than pre-seniors (55 – 64 years), as well as greater self-regulation of their driving behaviours and environments (e.g., avoidance of night driving) to maintain an acceptable level of comfort. While inter- (i.e., comments from family) and intrapersonal (i.e., declining health) factors impact awareness, both awareness and environmental influences (i.e., alternative transportation) reportedly influence self-regulation of driving behaviours (Rudman, et al., 2006). Older drivers who do not restrict may be aware of general deficits that impact driving (e.g., sensory, cognitive), however may be unaware of the consequences of these deficits for their own driving.

On the other hand, despite an awareness of their level of driving competence, older drivers may consciously choose not to adapt their driving behaviours due to social commitments (e.g., caring for someone else with mobility needs), or to maintain a level of independence and self-efficacy. Recent findings indicate the driving abilities of older
adults are not related to overall driving avoidance (Ballock, Mathias, McLean, & Berndt, 2006). However, ability is related to avoidance of specific situations (e.g., night driving, driving in the rain). Older adults appear to self-regulate, but only for easily avoidable situations that do not interfere with their independence and lifestyle (Ballock, et al., 2006). Thus, older drivers’ level of safe driving behaviours may be moderated by their beliefs regarding driving, their awareness of deficits, and their ability to self-regulate and self-monitor driving capacity.

**Driving Interventions**

Research on older drivers has emphasized the need for interventions to increase older driver safety. Increasing awareness has been a key suggestion for older driver interventions (Dobbs & Dobbs, 2000; Marottoli, et al., 1998; McCarthy, 2005; Rudman, et al., 2006). However, very few interventions have been proposed and explored. In addition to enhancing awareness, the current research has suggested that older drivers need educational programs to enhance knowledge regarding alternative transportation, health-related factors (Gardezi, et al., 2006; Tuokko, McGee, et al., 2007), teach compensatory strategies (De Raedt & Ponjaert-Kristoffersen, 2000), and enhance proactive planning (Marottoli et al., 1998; Rudman et al., 2006).

Despite the numerous studies on older adult driving behaviour (e.g., crash type, restriction, cessation) and safety risks (e.g., fatalities, crashes), there have been only a handful of studies examining various driving courses and interventions for older drivers. A recent systematic review of older driver training programs found limited evidence that physical retraining and visual perception interventions improve driving related skills among older drivers. Moderate evidence was found indicating educational programs
improve driver awareness and driving behaviour, but do not reduce crash rates (Kua, Korner-Bitensky, Desrosiers, Man-Son-Hing, & Marshall, 2007).

Several studies have examined post-intervention changes in on-road driving performance of older drivers (Ashman, Bishu, Foster, & McCoy, 1994; Bédard, Isherwood, Moore, Gibbons, & Lindstrom, 2004; Bédard, et al., 2008; Marottoli, Allore, et al., 2007; McCoy, Tarawneh, Bishu, Ashman, & Foster, 1993; Ostrow, Shaffron, & McPherson, 1992; Roenker, Cissell, Ball, Wadley, & Edwards, 2003) and crash rates (Janke, 1994; Owsley, McGwin, Phillips, McNeal, & Stalvey, 2004; Owsley, Stalvey, & Phillips, 2003). However, fewer studies have examined changes in awareness, attitudes, and driving habits (Eby, Molnar, Shope, Vivoda, & Fordyce, 2003; Owsley, et al., 2004; Owsley, et al., 2003).

Assessing changes in awareness, attitudes, and driving behaviours is important as these factors may influence safe driving habits of older drivers. A retrospective study of the in-class educational 55 Alive Program in British Columbia (based on the American Association of Retired Persons program) found that 1.5 – 4 years post-intervention most older drivers retained information regarding the importance of increased awareness and vigilance and the most common behaviour change was being more alert while driving. Less than 33% reported avoidance of hazardous conditions (Nasvadi, 2007). The author recognized the need for objective tests of knowledge, attitudes, and skills before and after the intervention. The authors suggested that future interventions normalize driving restriction and emphasize the effects of aging on driving to help older adults internalize this information and increase safe driving behaviours.
Eby, Molnar, Shope, Vivoda, and Fordyce (2003) evaluated the Driving Decision Workbook, which was designed as a first tier assessment and a self-study tool to promote self-awareness of the effects of aging among older drivers. Immediately following completion of the workbook, 75% of older drivers reported becoming more aware of changes that can impact driving and 14% discovered changes in themselves they had not been aware of prior to completing the workbook. Forty percent reported that completing the workbook made them consider taking a refresher course and 33% stated that they would have a physician check their cognitive, psychomotor, and visual abilities. Unfortunately, there was no follow-up reported to determine if drivers made any behavioural changes or followed through regarding physician visits.

The KEYS (Knowledge Enhances Your Safety) program is a theoretically based educational program designed to promote awareness of visual impairments and the adoption of self-regulation behaviours in older drivers with visual acuity or processing difficulties (Owsley, et al., 2003). The program is delivered in one-on-one sessions and consists of an initial 2 hour session which includes an informational component and a confidence building component, both based on Social Cognitive Theory (Bandura, 1977, 1986), and a skill-building component based on the Principles of Self-Regulation (Bandura, 1977). Motivational principles based on the Transtheoretical Model (TTM; Prochaska, DiClemente, & Norcross, 1992) were also utilized in delivering the educational information. Owsley, Stalvey, and Phillips (2003) reported that, on initial follow-up, older drivers in the KEYS program reported: a greater level of perceived vision deficits, more knowledge regarding the impact of vision on driving, more perceived benefits to self-regulation, and were closer to the TTM stages of preparation.
and action. Drivers reported decreased travel time without reporting greater dependency on others for transportation. Similar trends for decreased travel time were found at a 2-year follow-up. There were no significant differences in crash rates between the KEYS group and the treatment-as-usual group (Owsley, et al., 2004). While the KEYS program appears to be beneficial to drivers with specific visual deficits, the program is not necessarily useful for all older drivers or those with other specific health problems.

The current educational interventions for older drivers show promising results and suggest that educational programs can impact older driver attitudes, beliefs, knowledge, awareness, and behaviours. However, rarely have older drivers with cognitive deficits been included. A review of the literature revealed no previous interventions focused on older drivers with dementia or with mild cognitive impairment.

**Theoretical Frameworks**

While interventions grounded in theory do not guarantee success, a theoretical model provides insights into why and how a program is developed, how information can be communicated to participants, and sets parameters for evaluating program success and determining how program components influence behaviour change. It may be that more than one theoretical framework is needed to address all the elements required in an intervention aimed at enhancing older driver safety. In the sections to follow, information from four different orientations/perspectives is presented. It will be argued that the integration of these four perspectives provides a comprehensive framework for fostering attitude and behaviour change among older drivers.
Driving as an Everyday Competence (DEC)

The Driving as an Everyday Competence model for older adults was recently developed as a comprehensive model of driving (Lindstrom-Forneri, Tuokko, Garrett, & Molnar, in press). The DEC model integrates both individual and environmental factors and goes beyond previous driving models (Anstey, et al., 2005; Fuller, 1984, 2005; Ranney, 1994) by incorporating sociocultural, social influences, beliefs, and awareness of both individual abilities and environmental influences. Furthermore, this model demonstrates how driving competence (what one is capable of) leads to driving performance (what one does). By focusing interventions on the factors that influence driving performance, over and above driving competence, it may be possible to alter older driver behaviours.

The DEC model suggests that one’s beliefs, awareness, and self-monitoring impact the strategic level driving processes (i.e., the decisions one makes prior to driving). Thus, altering older adults’ beliefs, increasing awareness, increasing self-monitoring, and teaching various strategic level compensatory behaviours would be expected to impact driving performance. This provided the general conceptual framework for the proposed intervention in this study. The DEC model provided a broad overview of why certain factors impact driving performance. However, to explain how to influence each of these factors (awareness, beliefs, self-monitoring), it was important to examine various theories of behaviour change. The DEC model is shown in Figure A-1 (See Appendix A). The section of the DEC model being examined in this study has been emphasized in grey print.
Levels of Awareness

Awareness has been defined as “the capacity to perceive the ‘self’ in relatively ‘objective’ terms while maintaining a sense of subjectivity” (Prigatano & Schacter, 1991). Self-awareness is a higher-order, multifaceted ability, and influences a wide range of functions within the person’s life. Awareness becomes increasingly difficult to precisely define and measure when taking into account the observations that people can be aware of some aspects of their deficits and self (e.g., behavioural changes) and not be aware of other deficits or changes in self (e.g., cognitive deficits). Crosson and colleagues (1989) model of awareness describes a hierarchical pyramid of three interdependent levels of awareness; intellectual, emergent, and anticipatory.

The first level is intellectual awareness, which is the individual’s ability to understand that a particular function is impaired in relation to normal levels. Intellectual awareness is composed of three sub-levels; a) recognizing a specific ability has declined (e.g., vision), b) understanding that the activities the individual has difficulties with all have something in common (e.g., require visual processing), and c) understanding the implications of one’s deficits (e.g., one is at increased risk when driving because of decreased vision). The second level is emergent awareness, the individual’s ability to recognize a problem when it is actually occurring. This recognition must occur without unusual feedback from others. If individuals do not recognize a problem when it is occurring, they are unlikely to compensate. The third level is anticipatory awareness, the individual’s ability to predict that a problem is going to happen due to some deficit (e.g., predicting the inability to drive safely at night as visual problems increase glare). Within this pyramid model, intellectual awareness is proposed as the foundation on which all
other types of awareness are based. A deficit at the foundation level, intellectual awareness, implies deficits at all three levels, which impacts on decision-making. Psychological denial (e.g., minimizing the implications) is noted to be another barrier to awareness, although it is not directly included in the model. According to the hierarchical model of awareness, one needs to have a minimal level of awareness in order to recognize and make decisions around an activity.

It is apparent from the hierarchical model that knowledge is a key factor and the cornerstone of awareness. For change in behaviour to occur, one must be aware of the need for change.

**Transtheoretical Model of Behaviour Change (TTM)**

To address the impact that awareness may have on behaviour change, Stalvey & Owsley (2003) considered the *Transtheoretical model of behaviour change* (TTM; Prochaska, et al., 1992; Prochaska & Velicer, 1997) when developing and assessing their educational intervention for high-risk older drivers. In the TTM model, the transitional nature of beliefs in relation to behaviour change are explicitly addressed. Generally, five stages of change are identified: 1) pre-contemplation (no plans to change in next 6 months; may be uninformed or under informed of consequences), 2) contemplation (considering changing sometime in the near future), 3) preparation (experiments with new behaviour with intent to change in the immediate future), 4) action (performs new behaviour on a routine basis), and 5) maintenance (behaviour continues for at least 6 months; Prochaska & Velicer, 1997).

The TTM also included 10 processes of change that include covert and overt activities to describe how people progress through each of the stages of change. The 10
processes, which have received empirical support across various health behaviours, include: 1) Consciousness raising (increasing awareness about the causes, consequences, and cures), 2) Dramatic relief (produces an initial increased emotional experience followed by reduced affect if appropriate action is taken; e.g., discomfort reduced when change night driving behaviours), 3) Self-re-evaluation (with and without the unhealthy behaviour), 4) Environmental re-evaluation (assessment of how one’s personal habits affect one’s social environment), 5) Self-liberation (belief that one can change and the commitment to act on that belief), 6) Social liberation (increase in social opportunities or alternatives), 7) Counter-conditioning (learning of healthier behaviours), 8) Stimulus control (removes cues for unhealthy behaviour), 9) Contingency management (provides consequences for taking action in a particular direction), and 10) Helping relationships (social support for new behaviour; Prochaska & Velicer, 1997). In addition to these 10 processes, Prochaska and Velicer (1997) included the importance of decisional balance (weighing pros and cons), self-efficacy (situation-specific confidence that one can cope without relapsing into high risk behaviours), and temptation (urges to engage in a specific habit during a difficult situation).

Prochaska and Velicer (1997) noted that behaviour change is a process and that each stage is both stable and open to change. Therefore, it is possible for a person to move between stages and to regress back to previous stages. Driving is a complex behaviour and safe driving practices do not mean performing one specific action. Therefore, an older driver may be in the action stage for one safe driving behaviour (e.g., not speeding) and in the contemplative stage for another safe driving behaviour (e.g., quitting driving at night). It has been suggested that interventions may be most effective
when the content is matched to the stage of the individual (Prochaska & Velicer, 1997). For example, an intervention for contemplators may emphasize their beginning thoughts regarding change and focus on what the first steps may be to help them move into the preparation phase. The TTM has been recognized as not accounting for all of the variance in a specific behaviour change. It has been noted that a more comprehensive model may emerge (Prochaska & Velicer, 1997) and will likely be better able to account for the complexities of behaviour change.

**Theory of Planned Behaviour (TPB)**

Evans, Norman, Rutter & Quine (2002) used the *Theory of Planned Behaviour* (TPB; Ajzen, 1991) to develop and assess an intervention plan aimed at increasing road safety awareness. TPB examines how a person’s attitude toward the behaviour (i.e., assessing driving abilities) influences the person’s intention to perform that behaviour. According to the TPB behaviour is guided by three types of beliefs: 1) behavioural beliefs, which are beliefs about and the evaluations of the outcomes of the behaviour, 2) normative beliefs, which are beliefs about the normative expectations of others and the motivations to comply to these norms, and 3) control beliefs, which are beliefs about the presence of factors that may help or hinder the performance of the behaviour and the perceived impact of these factors. Each of these sets of beliefs respectively lead to the three predictive motivational antecedents of intention: 1) attitude towards the behaviour, 2) subjective norm, and 3) perceived behavioural control.

The first variable, attitude towards the behaviour, is the degree to which a person has a favourable or unfavourable affective (e.g., driving is pleasurable) or instrumental (e.g., driving is important) evaluation of the behaviour. While attitude toward the
behaviour combines both affective and instrumental attitudes within the original TPB model, research has demonstrated that the two distinct constructs better characterizes attitude (Ajzen, 1991; Armitage & Conner, 2001; Rhodes & Courneya, 2003). The second variable, subjective norm, refers to the perceived injunctive (e.g., my friends think I shouldn’t drive) and descriptive (e.g., all of my friends still drive) social pressures to perform (or not perform) the behaviour. The third variable, perceived behavioural control, refers to the degree to which the person believes in their ability to perform the behaviour and is assumed to reflect factors that may hinder or facilitate performance of the behaviour (Ajzen, 1991).

Intention captures the behavioural motivation to engage in the behaviour (Ajzen, 1991). Intention thus mediates the relationship between the motivational antecedents and behaviour. There has been debate within the literature on the ‘intention-behaviour’ gap. It has been noted that medium-to-large effects on intention are needed in order to produce small-to-medium effects on behaviour (Webb & Sheeran, 2006). Within this literature, it has been noted that the TTM and the stages of change within the TTM have been suggested as a possible way to explain how intention bridges into action (Sniehotta, Scholz, & Schwarzer, 2005).

TPB has been utilized with various road safety behaviours (e.g., traffic violations) and has consistently shown robust relationships between the TPB factors and the identified road behaviour (Rothengatter, 2002). A recent study used a TPB based questionnaire on driving to explore older driver safety among healthy older drivers (Lindstrom-Forneri, Tuokko, & Rhodes, 2007). The study found that intention to change driving was significantly related to older drivers’ attitudes and motives regarding driving.
A structural equation model explained 30% of the variance in the intention to change driving behaviours. The findings from this study suggest that both perceived social pressures (subjective norm) and the perceived benefits of driving (instrumental attitude; i.e., maintaining independence) influence older driver’s intentions to alter their driving behaviours. The TPB has not previously been used with drivers who have mild cognitive impairment.

**Integration of the Theories**

The DEC model proposed that individual and environmental (e.g., social contexts) factors impact beliefs, awareness, and self-monitoring, which are important constructs that determine what decisions older drivers make prior to driving (strategic decisions). While the DEC model is important for understanding older driver performance and determining areas where interventions may be possible, it does not demonstrate how to intervene to promote change. For this, it is important to examine specific models of behaviour change.

While the TPB and the TTM share some conceptual similarities, the TPB model appears to be a more comprehensive and sophisticated model for explaining why people change (i.e., based on their attitudes, subjective norms, and PBC). It is, however, the processes of change from the TTM that demonstrate how to help people change. Each of the 10 processes of change may moderate the TPB constructs of attitude, subjective norm, and PBC, which, in turn, mediate intention to change behaviour, which leads to a particular stage of change (e.g., action). This has been demonstrated in research on exercise behaviour for 7 of the 10 processes of change. In addition, it has been shown that the TPB constructs moderately mediated the relationship between processes of change...
and intention (Courneya & Bobick, 2000). Courneya and Bobick (2000) noted that certain processes of change were important for understanding specific TPB constructs.

Consciousness raising (one of the processes of change) can be further explored regarding how to increase awareness by using the hierarchical model of awareness. From the literature on beliefs of older drivers, numerous studies have noted the importance of increasing awareness and knowledge (Marottoli, et al., 1998; Rudman, et al., 2006; Tuokko, McGee, et al., 2007). Many older drivers believe they are within or above the average range of driving skill, despite their demonstrated driving ability or driving record. Therefore, it appears that a first line of intervention would be to target intellectual awareness. It is also possible that older drivers may be aware of basic deficits that may impact driving safety but are unaware of the consequences for their own driving. Thus, it would also be important to address emergent and anticipatory awareness as part of consciousness-raising.
Chapter 3: Study 1 Pilot Study - SAFE Education Intervention

In this chapter the method and results from Study 1 (pilot study) are presented first, followed by the method and results for Study 2 in Chapter 4. Note that, although the pilot for the Driving Awareness Questionnaire was an aspect of Study 1, the methods and results for that pilot study can be found in Appendix B.

Method

Purpose

The purpose of the pilot was to obtain feedback from people similar to those who would be involved in the intervention study (i.e., Study 2) and use this information to revise the SAFE education program to ensure adequate time for material to be presented and questions to be asked, clarity of presented information, and clarity of handout materials.

Participants

The SAFE education program was piloted with 5 older drivers (3 males, 2 females) who met inclusion criteria for Study 2. Participants were recruited from an existing participant list generated through previous research activities where people voluntarily put their name on a contact list to be called for involvement in any future older driving based studies. All participants had to: 1) be 70 years of age or older, 2) hold a valid driver’s license, 3) currently drive, 4) be contemplating changing their driving habits, 5) have an adult passenger who was familiar with their driving and drives with them at least once a week, and 6) be fluent in English.
Design

Participants were contacted via telephone and interested participants were scheduled to attend the SAFE education program at the Centre on Aging at the University of Victoria (See Appendix E for telephone script). Written informed consent was obtained by all participants prior to participation in the pilot of the SAFE education program (See Appendix E for consent form).

Safety Awareness For Elderly Drivers (SAFE) Intervention

As part of the study the Safety Awareness For Elderly Drivers (SAFE) educational intervention was developed based on principles of the Theory of Planned Behaviour (TPB) and the Transtheoretical Model (TTM) of behaviour change. The TTM aspect of the program included the focus on matching the intervention to the contemplation stage and using the processes of change (e.g., knowledge on the effects of cognitive decline on driving). The TPB based aspects of the program focused on attitudes, beliefs, and perceptions toward driving safety (e.g., pros and cons of driving and driving restriction).

The SAFE education program was conducted over two consecutive days, with a two-hour session on each day presented in a group format and administered by a trained researcher. The two, 2-hour session format was selected to allow for enough time to cover the material and to help ensure that participants were able to process the information without becoming fatigued. Other older driver training programs, such as the 55 Alive program, have used a 2-session format and appeared to be well tolerated by older adults (Bédard, et al., 2004; Tuokko, McGee, et al., 2007). As part of the SAFE education program, participants received a handbook entitled “Drive S.A.F.E.: Safety
"Awareness For Elderly Drivers Education Session Handbook” of the main points discussed during the educational course, which included worksheets to facilitate the application of general knowledge to their own situation (e.g., financial worksheet, goals sheet), and a Passport To Drive pocket size brochure of the main points (see Appendix L for the SAFE education program materials).

The SAFE education program consisted of 4 main components: 1) Knowledge/Informational, 2) Awareness Stops for self-reflection, 3) Compensatory Strategies, and 4) Overcoming Obstacles.

1. Knowledge/Informational Component

The informational component focused on providing current information regarding older driver safety and issues. According to the TPB, to facilitate change faulty salient beliefs must be decreased and new beliefs must be introduced to produce change in intentions (Ajzen, 2006). Identification of beliefs that impact intention is important. Previous research (see literature review above) has indicated that older drivers hold specific beliefs regarding their likelihood of being involved in a crash, the importance of driving, the impact of health on driving abilities, the inconvenience and cost of alternative transportation, and perceived social pressures.

The informational component addressed various driving issues and consequences for the older driver. In accordance with the Hierarchical model of awareness, the informational session would help older drivers at the intellectual awareness level. The information presented may help older drivers become more aware of how age-related changes relate to their driving. Anticipatory awareness may also be impacted as older
drivers learn about changes that occur with aging, which they may not be currently experiencing, but that may impact their driving at some point in the future.

Based on the literature review and previous research, the information component included 4 main components: 1) Crash risk, 2) Impact of health changes (physical, cognitive) on driving safety, 3) Alternative transportation, and 4) Financial awareness.

**Crash Risk**

The crash risk component focused on crash rates for older drivers, the most common types of crashes, and the consequences of being involved in a crash (e.g., lengthy recovery time for physical injury, fatalities). This component utilized the TTM process of change principles of consciousness-raising. It is likely that dramatic relief may have played a role in this component, as older drivers with beliefs that are incongruent with the presented information may have an affective reaction to becoming aware of the crash rates and risks.

**Impact of Health Changes on Driving**

The health changes component focused on normal and pathological cognitive, sensory, and physical changes that occur with aging and how these impact on driving abilities. The health changes were broken down into individual sections on; a) hearing and vision, b) physical abilities, and c) cognitive abilities, with each section containing the knowledge, awareness stop, compensatory strategies, and overcoming obstacles sections. Older drivers may be aware of the general issues regarding health changes and the impact on driving, however, they may be less aware of the consequences of their own personal health changes. A part of this component focused on the health changes currently being experienced by the group members, through voluntary discussion and
self-reflection in order to help facilitate the TTM process of consciousness raising, and self-re-evaluation.

**Transportation Alternatives**

The literature indicated that the use of alternative transportation contributes to older drivers decision to reduce their driving (Charlton, Oxley, Fildes, Oxley, & Newstead, 2003; Stutts, Wilkins, Reinfurt, Rodgman, & Heusen-Causey, 2001). Older drivers who participated in an educational driving program indicated the need for more information regarding alternative transportation (McGee & Tuokko, 2003). Recent qualitative literature on older drivers with dementia indicated that increased knowledge regarding alternative transportation may facilitate driving restriction and cessation (Perkinson, et al., 2005). This component focused on local resources for alternative transportation for older adults including, buses, taxies, seniors driving seniors programs, delivery programs, walking, and other programs to enhance senior mobility, and on the consequences of using these alternatives (e.g., increased safety, ability to be mobile during times when older drivers generally restrict driving such as at night). The alternative transportation component used the TTM process of consciousness raising, self-re-evaluation, social liberation, and counter conditioning.

**Financial Awareness**

The financial awareness component specifically addressed the financial obligations associated with driving and the financial impact of driving cessation (e.g., using alternative transportation that has a fee for service). The format for determining cost of driving was based on previous literature (CAA, 2007). This component was selected as previous literature indicated that the cost of driving may influence the
decisions older drivers’ make regarding their driving behaviours (e.g., Charlton, et al., 2003; Dellinger, et al., 2001). Discussing financial obligations had been suggested as a means of discussing driving issues with older adults (Hartford, 2003). This component utilized the TTM process of consciousness raising and self-re-evaluation.

2. Awareness Stops

The Awareness Stops were included after the knowledge/informational component of each section. The Awareness Stops were designed in order to help facilitate the TTM process of consciousness raising and self-re-evaluation. At each Awareness Stop the participants were asked to complete a few brief questions regarding their own functioning in the respective area (e.g., crash risk, vision, physical abilities, thinking abilities, cost of driving, alternative transportation). By completing this section is helped older drivers internalize the information and reflect on their own driving, rather than on other older drivers.

3. Compensatory Strategies

The compensatory strategies component focused on behaviours that the older driver can control and changes that can be made to help facilitate older driver safety. Suggestions were made for using strategic and tactical compensatory strategies. Strategic compensation included strategies such as planning routes, restricting when and where one drives, and beginning to think about and plan for driving cessation. Tactical compensation strategies focused on speed choice, leaving appropriate distance between cars, and being aware of environment and changes to road conditions. Drivers who use strategic and tactical compensatory strategies have been found to have fewer accidents without a reduction in mobility (De Raedt & Ponjaert-Kristofferen, 2000). The use of
compensatory strategies would impact on older drivers’ perceived behavioural control over their ability to drive safely. This component utilized TTM processes of consciousness raising, self-re-evaluation, environmental re-evaluation, and counter conditioning.

To help facilitate the use of new strategies, older drivers were provided a “My Driving Safety Plan” worksheet where they could identify areas impacting their driving, record strategies to increase their driving safety, and identify rewards for themselves for implementing these strategies. This tool was based on the TTM process of contingency management and self-liberation.

4. Overcoming Obstacles

The TTM and the TPB both emphasize the need for people to weigh the pros and cons of driving behaviour. One of the cons to utilizing safe driving practices is the perceived barriers in being able to implement these strategies. This component focused on generating discussion around the barriers people perceive regarding using various strategies and how best to overcome these obstacles. One of the TTM processes of change is stimulus control, in which one changes cues or causes that trigger the problem behaviour (e.g., unsafe driving practices). Overcoming obstacles may include buying bus passes in advance so you do not have to rely on having the correct change, having telephone numbers for alternative transportation to increase accessibility, or letting family and friends know you do not want to drive during certain times to help facilitate being able to say ‘no’ to requests for rides. To help facilitate problem solving regarding potential obstacles, after each Awareness Stop, there was time for discussion regarding potential obstacles. Examples of potential problems and solutions were provided, as well
as space for people to enter their own problems and solutions. This component utilized the TTM processes of self-re-evaluation and counter conditioning.

Results

Participants ranged in age from 76 – 89 years and they were well educated with 4 out of 5 having college or university level education. They all rated their health as good and their vision as similar to others their own age. All participants were driving at the time of the study. Eighty percent drove 7 days/week and 60% reported averaging less than 30 minutes per trip (each way). Forty percent of participants used at least one form of alternative transportation (e.g., taxi, bus, and bicycle).

All participants attended both 2-hour sessions of the SAFE education program and received a copy of the pilot version of the SAFE education program handbook. Participants were encouraged to ask questions and make comments regarding the program at any point during the education sessions. At the end of the SAFE education program all participants completed a feedback questionnaire (see Appendix D). The responses on the feedback questionnaires indicated that all participants believed the program was the right length. Two participants commented that having the education sessions occur over two days allowed them to better assimilate the information. No participants reported becoming fatigued during the SAFE education program. During the program all participants noted that they appreciated having a 10-15 minute refreshment break during each session.

All participants found the videos and handbook helpful and found the slides and the handbook easy to read and understand. One participant noted the yellow words on the slides were “washed out”, as thus the colour on the slides was changed to a darker shade
of yellow with orange undertones. When asked to indicate the most useful topics covered, between all five participants, each topic was endorsed at least once as being most useful. All participants endorsed the Warning Signs and Financial topics as most useful, while 4/5 endorsed the information on crash risk, how thinking skills impact driving, and the Awareness Stop sections. When asked about the least useful topics 80% of participants indicated they found none of the topics to be the least useful, while one participant indicated the Financial and the Alternative Transportation sections to be the least useful.

When asked specifically about the handbooks, 2/5 participants noted the handbooks needed page numbers, which were added to the handbook for the final version. A few typos were noted and corrected. No other suggestions or critiques were made regarding the handbooks. When asked what they liked the best about the handbooks, participants indicated they found the handbooks to be clear, easy to read, and well sequenced. Participants indicated they felt the handbook had been well thought out and covered topic areas that they had not previously thought about with respect to their driving. Two participants also noted that the Awareness Stops helped focus their attention to the topic of discussion.

Overall the SAFE education program was well received. All participants were satisfied with the program and stated they found the program useful. All participants indicated that the SAFE education program made them more aware of changes that can affect their driving. One participant noted that the SAFE program “helped me come to terms with where I am in terms of my driving ability”. Another participant noted the program “highlights things we take for granted and suggests reflection, thought, and change”, and another participant commented that the program “brought out aspects of my
driving I had started to ignore or not pay sufficient attention to”. One participant noted that including an on-road driving assessment would be helpful. However, an on-road assessment would require a dual control car and an experienced driving assessor, which are costly and beyond the scope of this study. Based on this suggestion, I contacted BCAA and was informed that the BCAA older driver self-assessment, that involves an older driver traveling with a passenger, was available free online and that BCAA encouraged distribution of the self-assessment to older adults. Thus the BCAA self-assessment was made available as an additional handout to anyone interested in it during Study 2. Another participant suggested that there be more emphasis on encouraging participants to be honest with themselves. Based on this feedback, we noted the importance of being honest with one’s self at each Awareness Stop, as this is where participants were asked to reflect on their own abilities and actions for each topic covered. All participants indicated that they thought the information provided by the program could be useful for helping older adults talk about driving concerns with their families, and 100% stated they would recommend the program to another older adult who drives.
Chapter 4: Study 2 Methods and Results

Methods

Participants and Recruitment

A convenience sample of 47 current older drivers aged 70 years or older currently contemplating changing their driving behaviours were recruited. Older drivers were recruited through senior centres, local media, clinics, and clinicians in the Greater Victoria Area (See Appendix G for recruitment materials). Clinics and clinicians were used to increase the probability of recruiting older drivers with mild cognitive impairments for the case study aspect of the research project. Power analyses based on a medium effect size and two groups (for within subjects repeated measures ANOVA analyses) and three predictors (for multiple regression analyses) indicated sufficient power of .80 (Erdfelder, Faul, & Buchner, 1996).

Inclusion Criteria

All participants had to: 1) be 70 years of age or older, 2) hold a valid driver’s license, 3) currently drive, 4) be contemplating changing their driving habits, 5) have an adult passenger who was familiar with their driving and drove with them at least once a week, and 6) be fluent in English. All inclusion criteria were determined by asking participants about each of these areas when they phoned to inquire about participating in the study (See Appendix G for the telephone script). For example, participants were asked if they had recently thought about or were considering changing their driving habits, to determine if they met criteria 4. These inclusion criteria were chosen to: 1) increase the chances of recruiting participants who may be beginning to experience difficulties with their driving, 2) ensure participants were currently driving, as the SAFE
education program was developed for older drivers, 3) to ensure all participants were in the contemplation stage of the TTM, as the education program focused on individuals in this stage of change, 4) to ensure the other person rating their driving abilities was familiar with their driving, and 5) to ensure all participants were able to understand the questionnaires and intervention materials, which were all delivered in English.

Participants were considered to be cognitively impaired if they scored less than 77 on the Modified Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975) or self-reported a diagnosis of mild cognitive impairment or dementia on the background questionnaire. A cutoff score of 77 to determine severity of impairment was selected as this has been shown to have high sensitivity and specificity for classifying older adults as non-cognitively impaired or as cognitively impaired (Tombaugh, McDowell, Kristjansson, & Hubley, 1996).

Participants meeting this criterion were selected for use as case studies. All participants, regardless of cognitive status, were included in the main analyses to examine the three main objectives and first secondary objective. However, only participants meeting the criteria for cognitive impairment were partitioned out for further exploration.

**Design**

The study was a quasi-experimental design using a sample of convenience (See Figure A-6 in Appendix F). Participants voluntarily contacted the researchers and completed a telephone screen to ensure they met the inclusion criteria (See Appendix G for telephone script). During the telephone screen, participants were given information regarding the study including time commitment, ability to withdraw at any time, and risk and benefits. If the participant and their passenger agreed to continue in the study, they
were both scheduled to come in to the Centre on Aging at the University of Victoria to complete the consent form (See Appendix H for Consent Forms). Participants were reimbursed the $2 parking fee at the Centre on Aging. The driver also completed the Modified Mini-Mental State Examination (3MS; a cognitive screening tool) and the first set of questionnaires. This first set of questionnaires for the older driver included: a) Demographics and Background Questionnaire, b) Driving Awareness Questionnaire – Driver Version, c) Attitudes and Beliefs questionnaire, d) Readiness to Change questionnaire, and e) Current Driving Habits questionnaire. The passenger also completed a Background and Demographic questionnaire, and the Driving Awareness Questionnaire – Passenger Version (See Appendix I for all Study 2 questionnaires).

Participants (drivers) were assigned to either the SAFE education group or the control group and the groups were matched on gender and cognitive status. During the assignment process some participants were placed into the SAFE education group based on time availability, to ensure their participation in the study. Following the completion of the first set of questionnaires, participants in the control group were given the standard booklet provided to drivers preparing for licensing entitled “Roadsense for Drivers” and were asked to review the booklet over a one week period. Roadsense for Drivers is a free, 148 page reference and study manual about driving available to all motorists in British Columbia and is provided by Insurance Corporation of British Columbia (ICBC). The Roadsense for Drivers handbook contained information regarding the rules of the road as well as illustrations of road signs, maneuvers and other driving tips. Participants in the SAFE education group were given further information regarding the time and location of the education sessions. It should be noted that at the beginning of the session
at the Centre on Aging some passengers (who met the inclusion criteria as a driver) asked if they could also participate in the study as a driver. In each instance the original participant (driver) also satisfied the criteria to be the passenger for this new participant. Thus, both participants completed both consent forms, all questionnaires, and the cognitive screen. Both participants were put into the same group (either SAFE education or control group) to avoid contamination of data (e.g., one participant informing the other participant about what their group was learning or allowing them to read their perspective handbook).

Next, participants in the intervention group completed the SAFE educational intervention (two, 2-hour sessions) and the initial follow-up questionnaires. The initial follow-up questionnaire package included: a) Driving Awareness Questionnaire –Driver Version, b) Attitudes and Beliefs questionnaire, c) Readiness to Change questionnaire, and d) Feedback questionnaire regarding the SAFE education program and were completed at the end of the second day of the SAFE education program.

Two months following the completion of the SAFE education program participants were mailed a follow-up questionnaire package to be completed and mailed back to the researchers in a pre-paid and addressed envelope. The follow-up questionnaire package included: a) Cover Letter (See Appendix J), b) Driving Awareness Questionnaire – Driver Version, c) Attitudes and Beliefs questionnaire, d) Readiness to Change questionnaire, e) Current Driving Practices questionnaire, and f) 2-month Feedback questionnaire. The passenger who rated the participant during the first session also received a mail-back package that included a cover letter and the Driving Awareness Questionnaire – Passenger Version. A two-month follow-up was selected to give
participants time to apply any new information they acquired through the intervention or control phase to their own driving. After completing the follow-up questionnaires, participants in the control group were contacted by telephone and given an opportunity to participate in the SAFE education program.

Participants in the case study group were part of the larger study, thus case studies followed a simple AB design with measurements at baseline and after the intervention. Case study participants had baseline measures for multiple factors (e.g., Driving Awareness questionnaire, Attitudes and Beliefs questionnaire, Readiness to Change questionnaire) pre-intervention, then received the SAFE education program, had measures taken immediately following the intervention, and then had a 2-month period with no intervention and follow-up measurements at the end of the 2-months.

Measures

Cognition

The level of cognitive impairment was based on the 3MS (Teng & Chang Chui, 1987). The 3MS has been utilized by the Canadian Study of Health and Aging (Canadian Study of Health and Aging1994) and has Canadian norms (Tombaugh, et al., 1996). The reliability and sensitivity of the 3MS has consistently been shown to be higher than that of the Mini-Mental State Examination (MMSE; Folstein, et al., 1975; McDowell, Kristjansson, Hill, & Hebert, 1997). Clinical diagnoses were recorded if the person self-reported having obtained a diagnosis of dementia or mild cognitive impairment from a qualified health care provider.
**Background and Demographic Questionnaire**

A brief set of questions was compiled to gather a) background driving (e.g., how long have you been driving, do others rely on you to drive them places), b) health (e.g., have you been diagnosed with any of the following: arthritis, diabetes, Alzheimer’s disease etc., have any of the following problems been identified by a physician: memory problems, concentration, confusion, etc., overall you would say your health is excellent, good, fair, poor), and c) demographic information (e.g., age, gender, education level) from participants. See Appendix I for the complete questionnaire. The questions were based on previous research with older drivers (Tuokko, McGee, & Rhodes, 2006; Tuokko, Rhodes, & Dean, 2007).

**Driving Awareness Questionnaire**

A self-report questionnaire regarding awareness of older driver safety issues was developed and compiled. Knowledge has been noted to be the key component and cornerstone of awareness (Sohlberg & Mateer, 2001). Therefore, it is important to determine what level of knowledge and awareness older drivers have regarding older driver safety.

The awareness questionnaire is reflective of two theoretical models. The Hierarchical Model of Awareness (Barco, Crosson, Bolesta, Werts, & Stout, 1991; Crosson, et al., 1989) has been widely referred to within the rehabilitation literature and proposes three levels of awareness: 1) Intellectual awareness, which is the ability to understand a function is impaired from previous levels of ability and includes both the recognition that a specific function has declined and an understanding of the implications of one’s own deficits, 2) Emergent awareness, which is the ability to recognize the
problem when it is actually occurring, and 3) Anticipatory Awareness, which is the ability to predict that a problem is going to occur due to some deficit. Tolgia and Kirk (2000) expanded on the Hierarchical Model and proposed two overarching types of awareness: 1) Metacognitive Knowledge, which exists prior to the task and includes both knowledge and self-knowledge and beliefs (intellectual awareness), and 2) On-line Awareness, which is activated within the task and includes both emergent and anticipatory awareness. Research in traumatic brain injury rehabilitation has demonstrated that Metacognitive knowledge and on-line awareness are two separate constructs (O’Keeffe, Dockree, Moloney, Carton, & Robertson, 2007).

As both of these models were designed to account for an individual’s awareness, it is not possible to transfer all aspects to a group intervention. Therefore the driving awareness questionnaire for this study was based on, but not a direct application of, these models. Measuring on-line awareness (both emergent and anticipatory) requires evaluating someone doing the task. Emergent awareness is generally measured by asking a person to indicate when they believe they have made an error versus actual-errors (O’Keeffe, et al., 2007). Anticipatory awareness is generally measured using a self-prediction versus actual performance discrepancy score (Cramer, Tuokko, Mateer, & Hultsch, 2004; O’Keeffe, et al., 2007; Toglia & Kirk, 2000). However, as noted in Study 1, an on-road component was not feasible and beyond the scope of this study. It has been noted by others that questionnaires and interviews can evaluate only intellectual awareness (Fleming, Strong, & Ashton, 1996).

Therefore, the Driving Awareness Questionnaire (DAQ), focused on capturing metacognitive awareness. To capture the various levels of metacognitive awareness, the
questionnaire included questions to capture both a) knowledge, by asking questions regarding general awareness and understanding of driving safety related issues and, b) intellectual awareness, by asking questions about individual factors that may impact driving safety.

Knowledge was measured by assessing older drivers’ awareness of general risk factors and driving safety issues. Questions regarding driving safety were chosen based on the current literature and include the following areas: a) the impact of health symptoms on driving, b) crash risk for older drivers, c) impact of environmental factors on driving safety, and d) methods to increase driving safety. A previous study identified risk factors from the literature to assess older adults’ awareness of fall risk (Wiens, Koleba, Jones, & Feeny, 2006). The Falls Risk Awareness Questionnaire (FRAQ) used a multiple-choice format and included “distracter” items (non-risk factors) to avoid spurious positive responses. The FRAQ has shown good preliminary construct validity and demonstrated variability between older adults who had experienced a fall and those who had not experienced a fall, thus indicating the measures ability to capture adequate variance within the target population (Wiens, et al., 2006).

The general knowledge aspect of the awareness questionnaire for this study was based on the FRAQ. However, items were rated on a 5-point Likert scale from strongly disagree to strongly agree rather than using the multiple-choice format. Distracter items were utilized to reduce the likelihood of spurious positive responses. Items were scored such that higher scores indicated better awareness of older driver safety issues.

The individual intellectual awareness aspect of the awareness questionnaire for this study was assessed using a discrepancy scores between participants’ self-rating and a
significant others rating of their driving-related deficits and their driving abilities. The intellectual awareness piece of this questionnaire focused on the ability of the older adult to a) recognize that a driving-related ability has declined (e.g., vision) and the implications this deficit on their driving, and b) recognize their own driving abilities. Driving-related abilities were measured by a two part question: 1) a dichotomous Yes/No format regarding if they have an impairment for a particular driving-related ability (e.g., In general, do you experience any problems with your vision (e.g., glare, cataracts)?), and 2) a four point Likert scale to measure the amount of difficulty this deficits causes while driving (e.g., How much difficulty do these problems with your vision cause when you are driving?).

Previous research has used self-report/other rater discrepancies to examine awareness of driving abilities in older adults (Wild & Cotrell, 2003). Part C of the DAQ – Driver Version (Part B on DAQ – Passenger Version), which examined driving abilities, was composed based on previously developed questionnaires found in the older driver literature (e.g., Irwin, 1988; Marottoli et al., 1998; Stavely & Owsley, 2000; Wild & Cotrell, 2003). As with previous self-report and rater-report questionnaires, a 5-point Likert scale was used ranging from “very poor” to “very good”. See Appendix I for the complete questionnaire.

The Driving Awareness Questionnaire was piloted with five older drivers and their passengers to ensure the questions were clear and easily understood (See Appendix B for the pilot study and Appendix C for the original DAQ questionnaire). Feedback from the pilot study participants was used to amend the DAQ prior to the first wave of Study 2.
Attitudes and Beliefs toward Driving

Older drivers’ beliefs, attitudes, and perceptions toward driving were measured using a modified version of the Attitudes and Beliefs Questionnaire. The Attitudes and Beliefs Questionnaire was developed based on the TPB (Lindstrom-Forneri, et al., 2007). The modified version of this questionnaire contained 29 items assessing attitudes towards driving. Responses to each statement regarding opinions toward driving were made using a 5-point scale (1 = strongly agree to 5 = strongly disagree). The Attitudes and Beliefs Questionnaire provided five scales in accordance with the Theory of Planned Behaviour (Ajzen, 1985, 2002): Affective Attitude, Instrumental Attitude, Subjective Norm, Perceived Behavioural Control (PBC), and Intention. For each scale the responses to the statements were aggregated and then divided by the number of statements, thus each scale has a maximum score of five. See Appendix I for the complete questionnaire.

Driving Behaviours

Stage of change, based on the TTM, was measured using a modified version of the Readiness to Change questionnaire presently in development (Tuokko, et al., 2006). This questionnaire was developed based on the TTM to identify what stage older drivers’ were in by examining thoughts regarding changing one’s driving behaviours. Additional questions were added to ensure actual driving restriction and cessation was captured to help identify older drivers in the preparation and action phase of the TTM. The 2-month follow-up version of the Readiness to Change questionnaire was modified slightly to determine if any drivers had stopped driving since completing the first set of questionnaires. See Appendix I for the complete questionnaires.
Current driving behaviours were assessed by a self-report questionnaire entitled *Current Driving Habits*. The questions were based on previous literature addressing current driving practices of older adults (Lindstrom-Forneri, et al., 2007; Tuokko, et al., 2006; Tuokko, Rhodes, et al., 2007) and on the safe driving practices that were included in the SAFE education program. Questions for the *Current Driving Habits Questionnaire* included items regarding: a) time spent driving (i.e., length of most driving trips each way (< 30 mins, over 30 mins, over 60 mins), on average how many days a week do you drive), b) types of alternative transportation used, c) how often alternative transportation is used using a 5-point Likert scale, d) unsafe driving incidents (e.g., near-miss, accidents, getting lost), e) current driving restrictions (e.g., times when you prefer not to drive), f) how often strategic safe driving strategies are used (i.e., how often to do plan your route prior to driving) rated on a 5-point Likert scale, and g) how often tactical driving strategies are used (i.e., how often to do you check your mirrors regularly while driving) rated on a 5-point Likert scale. See Appendix I for the complete questionnaire.

**Feedback Questionnaires**

Brief feedback questionnaires were composed and consisted of both quantitative and qualitative questions to allow older drivers to indicate how useful they found the SAFE education program. Quantitative questions were developed using either a 5-point Likert scale or a forced-choice. The first feedback questionnaire, *Drive SAFE Feedback Questionnaire*, was used to allow older drivers to indicate how useful they found the SAFE education program. The second set of feedback questionnaires, *Drive SAFE Feedback Questionnaire: 2-month follow-up for the Education Group*, and, *Drive SAFE Feedback Questionnaire: 2-month follow-up for Group 2*, allowed participants to indicate
what types of changes, if any, they had made as a result of either attending the SAFE education program or as a result of reading the “RoadSense Review” booklet. See Appendix I for the complete questionnaires.

**Safety Awareness For Elderly Drivers (SAFE) Educational Intervention**

As part of this research, the Safety Awareness For Elderly Drivers (SAFE) educational intervention was developed based on principles of the Theory of Planned Behaviour (TPB) and the Transtheoretical Model (TTM) of behaviour change. The SAFE education program consisted of 4 main components: 1) Knowledge/Informational, 2) Awareness Stops for self-reflection, 3) Compensatory Strategies, and 4) Overcoming Obstacles. See Study 1 for details on development and piloting. As part of the SAFE education program all participants received a handbook entitled “*Drive S.A.F.E.: Safety Awareness For Elderly Drivers Education Session Handbook*” of the main points discussed during the educational course, which included worksheets to facilitate the application of general knowledge to their own situation (e.g., financial worksheet, goals sheet), and a Passport To Drive pocket size brochure of the main points. See Appendix L for the SAFE education program materials.

**Results**

**Characteristics of the Older Drivers**

Of the forty-seven older drivers who were recruited, forty-five participants completed the entire study, with all forty-seven participants completing the first stages of the study. One participant was lost from each of the SAFE education and the control group at follow-up. All participants in the SAFE education group attended both education sessions. All participants from the treatment-as-usual control group reported having
reviewed the “Roadsense for Drivers” handbook over an average of 8 days (M = 8.14, SD = 4.77).

The following characteristics of the older drivers were based on N = 47, as some analyses examined only the first two stages of Study 2 (N = 47), and removal of the two participants lost at the 2-month follow-up did not significantly impact the analyses of the older driver participant characteristics. Of the 47 participants, 22 were in the SAFE education group (11 females, 11 males) and 25 participants were in the treatment as usual control group (13 females, 12 males). The ages of the older drivers ranged between 70 and 88 years old (M = 76.87 years, SD = 4.68). The sample was well-educated. Over half of the participants (55.3 %) had College or University education, while 96.3 percent had at least a High School education. Scores on the 3MS (max = 100) ranged from 75 to 100 (M = 95.19, SD = 5.57). Independent sample t-tests revealed that the SAFE education group did not significantly differ from the treatment as usual control group in terms of age (t (45) = -2.45, p > .05). A 2 (group) X 2 (gender) Chi-square analysis revealed no significant gender differences between the groups, χ² (1) = .02 , p >.05). Another 2 (group) X 2 (level of education) Chi square analysis revealed that the two groups also did not differ in level of education, χ² (1) = .47, p >.05. An independent t test revealed that the groups did not differ in the number of years the participants had been driving, t (45) = -.222, p >.05. However, the SAFE education group had lower overall cognitive abilities, based on 3MS scores (t (45) = -2.63, p < .05). Table 1 presents basic demographic information for the drivers in the SAFE education group and the treatment as usual control group (hereafter referred to as the control group).
At baseline, the majority of drivers (100% education group; 88% control group) rated their own general health as good or excellent. Three drivers from the control group rated their health as fair. All drivers rated their vision as the same or better than their peers. Regarding driving, all drivers stated that continuing to drive was at least moderately important to them. Only one driver (control group) reported having had an accident within the past year, while 8.5% (2 education group; 2 control group) reported having backed into an object other than a vehicle, and 14.5% (2 education group, 5 control group) reported a near-miss experience in the past year. Twenty-five percent of drivers (7 education group; 5 control group) reported getting lost while driving in the past year. Three drivers from the education group and one driver from the control group noted that within the past year someone had suggested to them that they limit or stop driving.

When asked about changes to their driving habits, 59.1% of the education group and 76% of the control group reported driving less now than they did 10 years ago, while the rest of the drivers reported driving the same amount as they had 10 years ago. One driver, from the control group, reported driving more now than 10 years ago. A 2 (group) × 2 (amtdrive10yrs) Chi-square analysis revealed no significant differences between the groups in their change in driving habits relative to 10 years ago, $\chi^2 (1) = 1.54$, $p >.05^1$.

Interestingly, when asked about changes to their driving in the past year, 63.5% of people in the education group and 56% of people in the control group stated they had made changes to their driving habits in the past year. Another 2 (group) × 2 (changedriving1yr) Chi-square analysis revealed no significant differences between the groups in their change in driving habits in the past year, $\chi^2 (1) = .283$, $p >.05$. With regard to previous driving

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1 To satisfy the assumption in Chi-Square analyses that all expected frequencies should be greater than five, Amount of Driving 10 year ago as dichotomized into less than 10 years ago and the same or more than 10 years ago. This was used to compare the two groups on level of change in driving in the past 10 years.
courses, 40.9% of the education group and 60% of the control group had taken a previous driving course ($\chi^2 (1) = 1.70$, $p > .05$), with most drivers (66.5%) having taken a course at least 10 years ago. There were 3 drivers in the education group and 5 drivers in the control group who had taken a driving course in the last 3 years. Of those who had taken a previous driving course, an independent t-test indicated that the groups did not differ in time since the driving courses, $t (21) = -.234$, $p > .05$.

Table 1: Basic Demographic Characteristics of the Older Drivers by Group

<table>
<thead>
<tr>
<th></th>
<th>Education</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>N=22</td>
<td>N=25</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>M 76.55</td>
<td>77.16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 4.217</td>
<td>5.129</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range 70-85</td>
<td>70-88</td>
<td></td>
</tr>
<tr>
<td>Level of Education†</td>
<td>N (%)</td>
<td>N (%)</td>
<td>.49</td>
</tr>
<tr>
<td>Elementary School</td>
<td>4(18.2)</td>
<td>2(8.0)</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>7(31.8)</td>
<td>8(32.0)</td>
<td></td>
</tr>
<tr>
<td>College/University</td>
<td>11(50.0)</td>
<td>15(60.0)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>N (%)</td>
<td>N (%)</td>
<td>.89</td>
</tr>
<tr>
<td>Male</td>
<td>11(50)</td>
<td>13(52.0)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11(50)</td>
<td>12(48.0)</td>
<td></td>
</tr>
<tr>
<td>3MS</td>
<td>N = 22</td>
<td>N = 25</td>
<td>.012*</td>
</tr>
<tr>
<td></td>
<td>M 93.05</td>
<td>97.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 7.121</td>
<td>2.691</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range 75-100</td>
<td>89-100</td>
<td></td>
</tr>
<tr>
<td>Years Driving</td>
<td>N = 22</td>
<td>N = 25</td>
<td>.82</td>
</tr>
<tr>
<td></td>
<td>M 55.55</td>
<td>56.04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 8.285</td>
<td>6.967</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range 35-73</td>
<td>37-70</td>
<td></td>
</tr>
</tbody>
</table>

†To satisfy the assumption in Chi-Square analyses that all expected frequencies should be greater than five, Education was dichotomized into High School or less and College/University. This was used to compare the two groups on level of education.
**Characteristics of the Passengers**

The following characteristics of the passengers was based on N = 47, as some analyses examined only the first two stages of Study 2 (N = 47). Three passenger participants were lost at the 2-month follow-up. Of the 47 participants, 22 were in the SAFE education group (12 females, 10 males) and 25 participants were in the treatment as usual control group (17 females, 8 males). The ages of the passengers ranged between 49 and 85 years old (M = 74.66 years, SD = 8.20). The sample was well-educated. Over half of the participants (57.4 %) had College or University education, while 88.2 percent had at least a High School education. The majority (87.2%) of the passengers rated their own health as good or excellent, with 5 passengers rating their health as fair, and one rating their health as poor. Two passengers self-reported having a diagnosed neurological condition and two passengers self-reported having a diagnosis of dementia or mild cognitive impairment.

Two-thirds of the passengers had known the older driver for more than 28 years, with 2 years being the least amount of time the passengers (N=2) had known the older driver. Thirty-seven (78.7%) of the passengers currently drove. Over half (62.7%) of the passengers rode with the older driver at least twice a week. Independent sample t-tests revealed that the passengers associated with older drivers in the education group did not significantly differ from the passengers associated with older drivers control group in terms of age (t (45) = 1.34, p > .05), how long they had known the older driver (t (45) = -1.06, p >.05), or how often they were a passenger (t (45) = .525, p >.05). A 2\( ^\text{(group)} \) X 2\( ^\text{(gender)} \) Chi-square analysis revealed no significant gender differences between the groups,
\(\chi^2 (1) = .896, p > .05\). Another \(2^{(\text{group})} \times 2^{(\text{level of education})}\) Chi square analysis revealed that the two groups also did not differ in level of education, \(\chi^2 (1) = .046, p > .05\). Table 2 presents basic demographic information for the passengers associated with the drivers in the SAFE education group and the control group.

Almost all passengers (95.7%) indicated that it was at least somewhat important to them that the older driver continues to drive. Most passengers (68.1%) indicated that it was very or extremely important that the older driver continue to drive, while only 2 passengers (one from each the control and education groups) indicated it was not important that the older driver continue to drive.

### Table 2: Basic Demographic Characteristics of the Passengers by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Education</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>N=22</td>
<td>N=25</td>
<td>NS</td>
</tr>
<tr>
<td>M</td>
<td>76.36</td>
<td>73.16</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>5.278</td>
<td>9.978</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>66-85</td>
<td>49-85</td>
<td></td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td>N (%)</td>
<td>N (%)</td>
<td>NS</td>
</tr>
<tr>
<td>Elementary School</td>
<td>5(22.7)</td>
<td>1(4.0)</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>4(18.2)</td>
<td>10(40.0)</td>
<td></td>
</tr>
<tr>
<td>College/University</td>
<td>13(59.1)</td>
<td>14(56.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>N (%)</td>
<td>N (%)</td>
<td>NS</td>
</tr>
<tr>
<td>Male</td>
<td>10(45.5)</td>
<td>8(32.0)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12(54.5)</td>
<td>17(68.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Years Known Driver</strong></td>
<td>N = 21</td>
<td>N = 24</td>
<td>NS</td>
</tr>
<tr>
<td>M</td>
<td>36.33</td>
<td>42.71</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>21.61</td>
<td>18.70</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>2-58</td>
<td>5-79</td>
<td></td>
</tr>
<tr>
<td><strong>Times as Passenger/Week</strong></td>
<td>N = 22</td>
<td>N = 25</td>
<td>NS</td>
</tr>
<tr>
<td>M</td>
<td>3.71</td>
<td>3.28</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>2.61</td>
<td>2.937</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>1-10</td>
<td>1-14</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)To satisfy the assumption in Chi-Square analyses that all expected frequencies should be greater than five, Education was dichotomized into High School or less and College/University. This was used to compare the two groups on level of education.
Objective #1: Effectiveness of the SAFE education program

The purpose of the first set of analyses was to determine whether the SAFE education program was effective at (a) increasing awareness of older driver safety issues both at the general population and individual levels, (b) changing attitudes toward driving safety, (c) increasing the intention to change driving behaviours, (d) improving self-perceptions of driving abilities, and (e) increasing self-reported safe driving behaviours (e.g., restriction) between the groups. Awareness of individual driving abilities consisted of 3 scores: 1) the older driver’s self rating, 2) the passenger’s rating of the older driver, and 3) the discrepancy between the older driver and the passengers’ ratings. Discrepancy scores have been used in the awareness and driving literature to discern an individual’s level of awareness (Prigatano, 2005; Wild & Cotrell, 2003). For the Between Group analyses, scores between the SAFE education group (pre-test and post-test scores) and the control group (pre-test and post-wait period tests) were analyzed using Repeated Measures ANOVAs. As only the SAFE education group had 3 scores, baseline (pre-test), immediately post-intervention, and the 2-months post-test, Within Group Repeated Measures ANOVAs were conducted to examine the immediate effects of the SAFE education program.

Awareness of older driver safety issues

Awareness of older driver safety issues was measured based on the Driving Awareness Questionnaire (DAQ) and via self-report from the Feedback Questionnaires.

Driving Awareness Questionnaire Based Awareness Analyses

Knowledge of older driver safety issues at a general level was examined using the total correct score for Part A of the DAQ-Driver Version (DAQ-DV). As the original
scale was a Likert Scale the scores were recoded, such that any answer in the correct
direction was scored 1 (e.g., if the statement was correct, both Strongly Agree and Agree
were scored 1), and any answer in the incorrect direction was scored 0 (e.g., if the
statement was correct, both Strongly Disagree and Disagree were scored 0). Don’t know
responses were scored as 0, as these responses also indicated a lack of knowledge. The
total score was the sum of all 23 responses, with a maximum score of 23 for the
Knowledge measure. Individual intellectual awareness was examined through the
measures Self-Reported Problems, Self-Reported Difficulties, and Self-Rated Driving
Performance. The Self-Reported Problems measure reflects the number of driving-related
abilities to which the respondent indicated “Yes”, there is a problem with that particular
ability (maximum score = 10). The Self-Reported Difficulties measure reflects the
aggregate of the respondents’ ratings regarding the level of difficulty with driving relative
to the driving-related ability, with a maximum score of 30. When no driving-related
ability problem was identified, a zero was entered to indicate no difficulty with driving
related to that area. When a driving-related problem was identified, respondents rated the
level of difficulty on a Likert scale to indicate either “no difficulty”, “a little difficulty”,
“some difficulty”, or “a lot of difficulty”, which were scored as 0 – 3 respectively. See
Table 3 for a summary of the DAQ scores.

There were four missing data points for the Knowledge section of the 2-month
follow up on the DAQ-DV. For each of these missing items, the response the participant
had given at time 1 was entered as no change between baseline and follow-up was
assumed. This allowed for the preservation of the number of participants, without biasing
the results in the direction of a change in knowledge. The same procedure was used for
the three data points missing under the self-rating of driving abilities. There were 14 data points missing from the DAQ-Passenger Version at the 2-month follow-up. The missing data for the passengers was entered as zero to signify a “don’t know” response.

### Table 3: Summary of Scores on the Driving Awareness Questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driver Version</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of Older Driver Safety Issues (max. = 23)</td>
<td>10</td>
<td>20</td>
<td>16.06</td>
<td>2.00</td>
</tr>
<tr>
<td>Self-Reported Problems (max. = 10)</td>
<td>0</td>
<td>7</td>
<td>1.74</td>
<td>1.72</td>
</tr>
<tr>
<td>Level of Difficulty Driving due to Problems (max = 30)</td>
<td>0</td>
<td>12</td>
<td>1.38</td>
<td>2.29</td>
</tr>
<tr>
<td>Self-Rated Driving Performance (max = 95)</td>
<td>59</td>
<td>95</td>
<td>78.36</td>
<td>10.11</td>
</tr>
<tr>
<td><strong>Passenger Version</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problems (max. = 10)</td>
<td>0</td>
<td>8</td>
<td>1.68</td>
<td>1.81</td>
</tr>
<tr>
<td>Level of Difficulty Driving due to Problems (max. = 40)</td>
<td>0</td>
<td>8</td>
<td>1.30</td>
<td>1.79</td>
</tr>
<tr>
<td>Driving Performance Rating (max. = 95)</td>
<td>53</td>
<td>95</td>
<td>79.38</td>
<td>11.19</td>
</tr>
</tbody>
</table>

An initial one-way ANOVA was used to determine between group differences at baseline on the awareness measures. The groups did not significantly differ at baseline in their knowledge of facts regarding older driver safety \((F(1, 45) = .162, p > .05)\), their self-rating of the number of problems they had with driving-related abilities (i.e., vision) \((F(1, 45) = 2.62, p > .05)\), their self-rating of the difficulties with driving they have due to these problems \((F(1, 45) = .47, p > .05)\), or their ratings of their own driving abilities \((F(1, 45) = .066, p > .05)\). The groups did not differ significantly on passenger ratings of the driver’s a) performance \((F(1, 45) = .04, p > .05)\), b) problems with driving-related abilities \((F(1, 45) = 1.70, p > .05)\), or c) difficulties with driving \((F(1, 45) = .55, p > .05)\).
**Between Group Analyses – Driver and Passenger Ratings**

Between groups repeated measure ANOVAs indicated no significant interaction between *Group* (SAFE education vs. control) and *Knowledge* (baseline vs. 2 month post-test). There was also no significant interaction between *Group* and *Self-Rated Driving Performance*, number of *Self-Rated Problems*, or amount of *Self-Rated Difficulties* (baseline vs. 2 month post-test). Between groups repeated measure ANOVAs indicated no significant interaction between *Group* and *Passenger-Rated Driving Performance*, number of *Passenger-Rated Problems*, or the amount of *Passenger-Rated Difficulties* (baseline vs. 2 month post-test). Effect sizes for the between group analyses were negligible (Partial $\eta^2$ Range = .00 to .071). See Table 4 for descriptive characteristics and analyses.

Passengers were also asked a single question regarding changes in the older driver’s driving ability in the past 2-months, with driving ability being defined as the person’s performance on various driving tasks (e.g., making turns, navigating traffic, handling bad road conditions), at both baseline and follow-up. High scores indicated more improvement in ability. The groups did not differ significantly on baselines scores to this question, $F (1, 45) = .48, p = .48$. Between group ANOVA indicated a significant *Group* interaction, $F (1, 45) = 5.12, p = .03$. Paired t-test analyses indicated no significant difference between baseline ($M = 3.10, SD = .44$) and 2-month follow-up ratings ($M = 3.05, SD = .50$) for the SAFE education group ($t (20) = .57, p = .57$); however a significant decline in ability was observed between baseline ($M = 3.43, SD = .73$) and the follow-up rating ($M = 2.96, SD = .37$) for the control group, $t (22) = 2.90, p = .008$. 
Table 4: Between Group Repeated Measures ANOVAs (Control vs. Treatment) for Driving Awareness Questionnaire

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Group (SAFE education vs. Control)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driver Self-Ratings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge (max = 23)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.67 (1.88)</td>
<td>16.37 (2.04)</td>
<td>3.30</td>
<td>.08</td>
</tr>
<tr>
<td>16.86 (1.98)</td>
<td>16.46 (2.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Performance (max = 95)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77.95 (11.52)</td>
<td>78.46 (9.33)</td>
<td>.50</td>
<td>.48</td>
</tr>
<tr>
<td>Driving Performance 2M</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77.81 (10.59)</td>
<td>79.46 (9.85)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Problems (max = 10)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.33 (1.56)</td>
<td>2.12 (1.87)</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Self-Rated Problems 2M</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.12 (1.87)</td>
<td>2.12 (1.70)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Difficulties (max = 30)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.14 (2.61)</td>
<td>1.67 (2.08)</td>
<td>.71</td>
<td>.40</td>
</tr>
<tr>
<td>Self-Rated Difficulties 2M</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.81 (1.21)</td>
<td>1.83 (2.56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Passenger Ratings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Performance (max = 95)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td>.002</td>
<td>.96</td>
</tr>
<tr>
<td>80 (12.52)</td>
<td>80.83 (8.79)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Performance 2M</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td>.14</td>
<td>.71</td>
</tr>
<tr>
<td>80.33 (10.87)</td>
<td>81.26 (9.48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Problems (max = 10)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td>.13</td>
<td>.72</td>
</tr>
<tr>
<td>1.33 (1.50)</td>
<td>1.91 (1.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Problems 2M</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.81 (1.47)</td>
<td>1.52 (1.83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Difficulties (max = 30)</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10 (1.54)</td>
<td>1.39 (1.94)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Difficulties 2M</td>
<td>$M_1$ (SD) $M_2$ (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.95 (1.85)</td>
<td>1.39 (2.04)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$M_1$ (SD) indicates the 2-month follow-up of the questionnaire

$M_2$ (SD) represents the mean and standard deviation for the intervention group (Driver N = 21; Passenger N = 21)

$M_2$ (SD) represents the mean and standard deviation for the control group (Driver N = 24; Passenger N = 23)

Within Group Analyses: SAFE education group

As the SAFE education group also had an immediate post-intervention time, within group repeated measures ANOVAs were conducted for this group looking across all three time points (baseline, immediately post-intervention, and 2-month follow-up). Where appropriate Greenhouse-Geisser values, with adjusted degrees of freedom (df) for violation of the sphericity assumption, are reported. Effect sizes for these within group analyses were small (Partial Eta$^2$ Range = .18 to .34). The within group ANOVA for Knowledge indicated a significant effect, $F (2, 19) = 10.42, p < .001$. A series of three paired t-tests were used to indicate if any change had occurred in Knowledge between
baseline and immediate post-intervention. Using a Bonferroni corrected p-value of .017 (.05/3), the t-tests indicated a significant increase in Knowledge between baseline and immediate post-intervention, t (21) = -5.134, p < .001, and a trend between baseline and 2-month follow-up, t (20) = -2.53, p = .02, although the difference between immediately post-intervention and 2-month follow-up was not significant, t (20) = -5.134, p = .08. This series of t-tests indicates a trend towards an increase in knowledge of older driver safety issues following the SAFE education. See Figure 1.

![Figure 1: SAFE Education Group General Knowledge Scores Across Time](image)

There was also a significant within group effect for Self-Rated Driving Performance, F (1.38, 19) = 5.34, p = .019. A series of three paired t-tests, using a Bonferroni corrected p-value of .017, indicated a trend towards a decrease in Self-Rated Driving Performance between baseline and immediately post-intervention, t (21) = 2.51,
p = .02, followed by a significant increase in *Self-Rated Driving Performance* between the intervention and 2-month follow-up, t (20) = 2.74, p = .013, with no significant difference between baseline and 2-month follow-up, t (20) = -1.18, p = .86. This series of t-tests indicates a trend towards the predicted decrease in *Self-Rated Driving Performance* following the SAFE education, although this did not continue at the 2-month follow-up. See Figure 2.

![Figure 2: SAFE Education Group Driving Performance Scores Across Time](image)

The within group ANOVA for *Self-Reported Problems* indicated a significant effect, F (2, 19) = 3.79, p = .03. A series of paired t-tests, using a Bonferroni corrected p-value of .017, indicated a significant increase in *Self-Reported Problems* between baseline and immediately post-intervention, t (21) = -2.81, p < .011, and a trend towards a decrease in *Self-Reported Problems* between the intervention and 2-month follow-up,
t (20) = 2.03, p = .055, with the *Self-Reported Problems* at baseline and 2-month follow-up being identical, t (20) = .000, p = 1.0. This series of t-tests indicates a trend towards an increase in self-reported driving related problems immediately following the SAFE education, although this is not maintained at the follow-up. See Figure 3. The within group ANOVA for *Self-Reported Difficulties* due to self-reported problems, indicated a significant effect, F (2, 19) = 3.28, p = .04. A series of paired t-tests, using a Bonferroni corrected p-value of .017, indicated the same pattern of results as with *Self-Reported Problems*. There was a significant increase in *Self-Reported Difficulties* between baseline and immediately post-intervention, t (21) = -2.63, p = .016, and a trend towards a decrease in *Self-Reported Difficulties* between the intervention and 2-month follow-up, t (20) = 2.05, p = .054, resulting in no significant differences between baseline and 2-month follow-up, t (20) = .77, p = .45. This series of t-tests indicates a trend towards an increase in *Self-Reported Difficulties* with driving due to problems with driving-related abilities immediately following the SAFE education, although this is not maintained at the follow-up. See Figure 4.
Figure 3: SAFE Education Group Number of Problems Reported Across Time

Figure 4: SAFE Education Group Level of Driving Difficulties Across Time
**Discrepancy Scores (Passenger-Driver)**

Discrepancy scores between self-ratings and passenger-ratings have been used in previous research to determine level of awareness, with a greater discrepancy indicative of less awareness. Discrepancy scores were calculated for problems with a driving-related ability (*Awareness of Problems*) and level of difficulty the deficits cause while driving (*Awareness of Difficulty Level*) by subtracting the driver rating from the passenger rating. Discrepancy scores for driving performance (*Awareness of Driving Performance*) were calculated by subtracting the passenger rating from the driver rating. Therefore, a negative score on any measure would indicate the driver rated themselves as having fewer problems, fewer driving difficulties related to these problems, and a better driving performance than the passengers rating, all suggestive of poorer awareness into their driving abilities. A univariate ANOVA indicated no between group differences in the discrepancy scores (see Table 5), suggesting that the groups did not differ in level of awareness at baseline or at follow-up.

**Table 5: Summary of Descriptive characteristics for Discrepancy Scores**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Group (SAFE education vs. Control)</th>
<th>M₁ Range</th>
<th>M₂ Range</th>
<th>M₁ (SD)</th>
<th>M₂ (SD)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of Problems</td>
<td></td>
<td>-2 to 4</td>
<td>-4 to 4</td>
<td>0 (1.19)</td>
<td>.12 (1.90)</td>
<td>.06</td>
<td>.80</td>
</tr>
<tr>
<td>Awareness of Difficulty Level</td>
<td></td>
<td>-3 to 7</td>
<td>-5 to 4</td>
<td>.05 (1.81)</td>
<td>.12 (2.22)</td>
<td>.02</td>
<td>.90</td>
</tr>
<tr>
<td>Awareness of Driving Performance</td>
<td></td>
<td>-28 to 25</td>
<td>-28 to 16</td>
<td>1.77 (12.35)</td>
<td>.39 (12.25)</td>
<td>.15</td>
<td>.70</td>
</tr>
<tr>
<td>Awareness of Problems 2M</td>
<td></td>
<td>-3 to 3</td>
<td>-3 to 6</td>
<td>.52 (1.25)</td>
<td>.61 (1.95)</td>
<td>.03</td>
<td>.87</td>
</tr>
<tr>
<td>Awareness of Difficulty Level 2M</td>
<td></td>
<td>-3 to 3</td>
<td>-5 to 12</td>
<td>-.14 (1.53)</td>
<td>.43 (3.17)</td>
<td>.57</td>
<td>.45</td>
</tr>
<tr>
<td>Awareness of Driving Performance 2M</td>
<td></td>
<td>-19 to 20</td>
<td>-16 to 17</td>
<td>2.52 (11.29)</td>
<td>1.57 (9.13)</td>
<td>.10</td>
<td>.76</td>
</tr>
</tbody>
</table>

2M indicates the 2-month follow-up of the questionnaire
M₁ (SD) represents the mean and standard deviation for the intervention group
M₂ (SD) represents the mean and standard deviation for the control group
An examination of the passenger ratings for driving-related abilities (Problem-Related Problems) revealed numerous “Don’t Know” responses. “Don’t Know” responses for each of the driving-related abilities measured ranged from approximately 2% (memory) to 15% (depth perception) of the sample. The measure of relevant driving difficulties (Passenger-Rated Difficulty Level) is therefore also missing important passenger ratings, as difficulty level was not rated for “don’t know” responses. Therefore, it was felt that these scores did not reflect awareness as well as the driving performance discrepancy score and were not used in subsequent analyses.

Between groups repeated measure ANOVAs indicated no significant interaction between Group and Awareness of Driving Performance, F (1, 42) = .13, p = .72. Given the distribution of awareness scores, and that a score close to zero represents better awareness, the scores were transformed using the absolute values of the driving performance discrepancy scores. Using this distribution a lower score (closer to zero) indicated better awareness and a higher score indicated poorer awareness (Baseline: SAFE education group M = 9.57, SD = 8.12, control group M = 9.65, SD = 5.34). Between groups repeated measure ANOVAs indicated no significant interaction between Group and the absolute Awareness of Driving Performance scores, F (1, 42) = .54, p = .47.

To help address limitations that may occur due to ceiling effects, a statistical technique described by Whitlatch, Zarit & von Eye (1991) was used. Based on this procedure, data is grouped by quartile. Each participant was then classified as improvers or non-improvers, based on the procedure described by Whitlatch et al. (1991). The top quartile represents ceiling level performance and takes into account the fact that there is
little room for change. Therefore, for this distribution a \( \frac{1}{2} \) standard deviation upward would be considered significantly worse while greater downward change (i.e., one standard deviation) is needed to indicate positive change. This was also true for scores in the lowest quartile where there is little room for scores to change, so a \( \frac{1}{2} \) standard deviation change would be considered stable while a greater upward change (i.e., one standard deviations) is needed to indicate worse performance. See Whitlatch, Zarit, and von Eye (1991) more detailed description of this procedure. Due to small cell sizes group differences within quartiles could not be examined. Descriptively, it was notable that 40% (\( N = 9 \)) of the participants in the SAFE education group and 16% (\( N = 4 \)) participants in the control group were in the lowest quartile, indicating good awareness at baseline. Table 6 shows the number of improvers versus non-improvers between the groups. A \( \chi^2 \) (group) \( \times \) 2 (improvement) Chi-square analysis indicated no significant difference in the number of participants who improved between groups, \( \chi^2 (1) = .36, p = .55 \).

**Table 6: Summary of Improvement on Awareness of Driving Performance**

<table>
<thead>
<tr>
<th>Group</th>
<th>Improved</th>
<th>Did not Improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFE education group</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Control group</td>
<td>10</td>
<td>13</td>
</tr>
</tbody>
</table>

**Feedback Questionnaire: Awareness Analyses**

The SAFE education group was asked to comment on their awareness of changes that can affect one’s driving both immediately after the intervention and at the 2-month follow-up. At both points in time, 95% of the older drivers indicated that as a result of attending the SAFE education program they were more aware of changes that could impact their driving. Only one participant indicated they did not become more aware immediately post intervention; however, by the 2-month follow up they noted they were
more aware. Conversely, one participant who had indicated an increase in awareness immediately following the intervention indicated no increase in awareness at the 2-month follow-up. Immediately following the SAFE education program, 63.6% of participants indicated that as a result of attending the SAFE program they had discovered changes in themselves of which they had not been previously aware, indicating an increase in individual level awareness.

**Attitudes and Intentions toward driving**

Older drivers’ beliefs, attitudes, and perceptions toward driving were measured using a modified version of the Attitudes and Beliefs Questionnaire. The Attitudes and Beliefs Questionnaire provided five scales based on the Theory of Planned Behaviour (TPB); *Affective Attitude, Instrumental Attitude, Subjective Norm, Perceived Behavioural Control (PBC)*, and *Intention to Change*. Each scale has a maximum score of five, with a higher score indicating more of the attitude/belief, with the exception of intention to change driving habits in which a higher score indicated less intention to change and more intention to continue driving as usual.

An initial one-way ANOVA was used to determine between group differences at baseline on the TPB constructs. The groups did not significantly differ at baseline in *Intention to Change* driving habits (F (1, 45) = .41, p = .52), *Affective Attitude* (F (1, 45) = .43, p = .52), *Instrumental Attitude* (F (1, 45) = .03, p = .87), *Subjective Norm* (F (1, 45) = .025, p = .87), or *Perceived Behavioural Control* (F (1, 45) = .29, p = .59).

Between groups repeated measure ANOVAs indicated no significant interaction between *Group* and any of the five attitudinal scales from the Attitudes and Beliefs
Questionnaire (baseline vs. 2 month post-test; See Table 7). Effect sizes for these between group analyses were negligible (Partial Eta\(^2\) Range = .007 to .036).

Table 7: Between Group Repeated Measures ANOVAs for Attitudes and Beliefs Questionnaire

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Group (SAFE education vs. Control)</th>
<th>M(_1) (SD)</th>
<th>M(_2) (SD)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Attitude</td>
<td></td>
<td>3.37 (.51)</td>
<td>3.44 (.49)</td>
<td>.29</td>
<td>.59</td>
</tr>
<tr>
<td>Affective Attitude 2M</td>
<td></td>
<td>3.57 (.51)</td>
<td>3.69 (.44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental Attitude</td>
<td></td>
<td>4.52 (.45)</td>
<td>4.19 (.69)</td>
<td>.311</td>
<td>.58</td>
</tr>
<tr>
<td>Instrumental Attitude 2M</td>
<td></td>
<td>4.41 (.41)</td>
<td>4.14 (.69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective Norm</td>
<td></td>
<td>4.04 (.56)</td>
<td>4.01 (.40)</td>
<td>59</td>
<td>.45</td>
</tr>
<tr>
<td>Subjective Norm 2M</td>
<td></td>
<td>3.98 (.52)</td>
<td>4.02 (.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td></td>
<td>3.75 (.47)</td>
<td>3.81 (.44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC 2M</td>
<td></td>
<td>3.74 (.29)</td>
<td>4.68 (.29)</td>
<td>.09</td>
<td>.77</td>
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<tr>
<td>Intention to Change</td>
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<td>3.76 (.53)</td>
<td>3.82 (.38)</td>
<td>1.61</td>
<td>.21</td>
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<tr>
<td>Intention to Change 2M</td>
<td></td>
<td>3.84 (.56)</td>
<td>3.75 (.48)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2M indicates the 2-month follow-up of the questionnaire
M\(_1\) (SD) represents the mean and standard deviation for the SAFE education group (N=21)
M\(_2\) (SD) represents the mean and standard deviation for the control group (N=24)

Within Group Analyses: Attitudes and Beliefs Questionnaire

Within group repeated measures ANOVAs were conducted for the SAFE education group looking across all three time points (baseline, immediately post-intervention, and 2-month follow-up). Where appropriate Greenhouse-Geisser values, with adjusted df for violation of the sphericity assumption, are reported. Effect sizes for these within group analyses were negligible to small (Partial Eta\(^2\) Range = .033 to .170). The within group ANOVA for Affective Attitude indicated a significant effect, F (2, 40) = 4.10, p = .024. A series of paired t-tests, using a Bonferroni corrected p-value of .017 (.05/3), indicated no significant change in Affective Attitude between baseline and immediate post-intervention, t (21) = -.72, p = .48, and between post-intervention and 2-month follow-up, t (20) = -1.86, p = .078. There was a significant difference between baseline and 2-month follow-up, t (20) = -2.89, p = .009. A series of t-tests indicated a
more positive affective attitude of driving (e.g., driving is more pleasurable) following the SAFE education program. However, as the between group ANOVA was non-significant, this likely does not represent a direct effect of the SAFE education program.

The within group ANOVA for Instrumental Attitude indicated a significant effect, F (2, 40) = 3.85, p = .03. A series of paired t-tests, using a Bonferroni corrected p-value of .017 (.05/3), indicated a significant decline in Instrumental Attitude between baseline and immediate post-intervention, t (21) = 2.61, p = .016, with no significant change between post-intervention and 2-month follow-up, t (20) = -1.40, p = .18 nor between baseline and follow-up, t (20) = 1.57, p = .13. This series of t-tests indicates that immediately after the intervention participants felt driving was less important, although this was not maintained over time.

The within group ANOVA for Subjective Norm (F (2, 40) = 1.84, p = .32), Perceived Behavioural Control F (1.35, 26. 97) = .59, p = .50), and Intention to Change (F (2, 40) = 1.58, p = .22), were all non-significant.

**Self-reported safe driving behaviours (e.g., restriction)**

The Current Driving Habits questionnaire was examined to determine self-reported driving behaviours at baseline and at 2-month follow-up. The Current Driving Habits questionnaire provided information on: 1) how many days per week the participant drove, 2) what type and how often the driver used alternative transportation, 3) the number of vehicular incidents in the preceding month, 4) situations in which the driver prefers not to drive (driving restrictions), 5) use of strategic safe driving strategies, and 6) use of tactical safe driving strategies. A composite score was also calculated to examine the total use of safe driving strategies. This Total Safe Driving Behaviours score
is the aggregate of the number of driving restrictions, the use of strategic approaches, and the use of tactical strategies. These three strategies were chosen as they have been shown in the literature to be associated with safe driving and lower crash risk (Caragata Nasvadi & Wister, 2009; De Raedt & Ponjaert-Kristofferen, 2000). A one-way ANOVA indicated a significant difference between the groups on how often they reported using alternative transportation, $F(1, 45) = 5.20, p = .027$. A comparison of the means indicated that the SAFE education group ($N=22$) self-reported using alternative transportation more frequently ($M = 28.18, SD = 3.45$) than the control group ($N= 25, M = 26.28, SD = 2.19$). All other current driving habits did not differ significantly between the groups at baseline.

Between groups repeated measure ANOVAs indicated a significant interaction between Group and Strategic Approaches ($F(1, 43) = 5.10, p = .029$), and between Group and Total Safe Driving Behaviours ($F(1, 43) = 4.15, p = .048$). Paired t-tests indicated a significant increase in the self-reported use of strategic approaches in the control group between baseline and the 2-month follow up ($t(23) = -2.16, p = .04$). There was no significant change in self-reported use of Strategic Approaches in the SAFE education group between baseline and the 2-month follow up ($t(20) = 1.06, p = .30$). The same pattern was found for Total Safe Driving Behaviours, with significant increase in Total Safe Driving Behaviours in the control group between baseline and the 2-month follow up ($t(23) = -2.60, p = .016$), and no significant change in Total Safe Driving Behaviours in the SAFE education group ($t(20) = .417, p = .68$). Additional between group repeated measure ANOVAs indicated no significant interactions between Group and any of the other five self-reported driving habits from the Current Driving Habits.
questionnaire (See Table 8). Effect sizes for these between group analyses were negligible (Partial Eta\(^2\) Range = .00 to .106).

On the 2-month follow-up feedback questionnaire, both groups were asked if they made any changes to their driving habits or behaviours (i.e., are now using new strategies) as a result of either attending the SAFE education program (intervention group) or as a result of reviewing the “Roadsense for Drivers” handbook (control group). The groups did not differ significantly on this measure of behaviour change ($\chi^2 (1) = .62$, $p > .05$), with 65% of the SAFE education group and 64% of the control group indicated that they had made changes to their driving habits or behaviours. The control group provided qualitative responses that consisted of themes around being more aware when driving and being more cautious; unfortunately qualitative data was not available for the SAFE education group.
Table 8: Between Group Repeated Measures ANOVAs for Current Driving Habits Questionnaire

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Group (SAFE education vs. Control)</th>
<th>M₁ (SD)</th>
<th>M₂ (SD)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days Driven Past Week (max = 7)</td>
<td></td>
<td>4.76 (1.81)</td>
<td>5.17 (2.12)</td>
<td>.003</td>
<td>.96</td>
</tr>
<tr>
<td>Days Driven Past Week 2M</td>
<td></td>
<td>4.86 (1.74)</td>
<td>5.29 (1.75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative Transportation (types) (max. = 7)</td>
<td></td>
<td>1.00 (.70)</td>
<td>1.13 (.85)</td>
<td>.03</td>
<td>.85</td>
</tr>
<tr>
<td>Alternative Transportation (types) 2M</td>
<td></td>
<td>.76 (.70)</td>
<td>.83 (.81)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative Transportation (often) (max. = 35)</td>
<td></td>
<td>28 (3.43)</td>
<td>26.25 (2.23)</td>
<td>3.98</td>
<td>.052</td>
</tr>
<tr>
<td>Alternative Transportation (often) 2M</td>
<td></td>
<td>31.00 (1.64)</td>
<td>30.96 (1.23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicular Incidents (max. = 4)</td>
<td></td>
<td>.19 (.40)</td>
<td>.04 (.20)</td>
<td>.20</td>
<td>.65</td>
</tr>
<tr>
<td>Vehicular Incidents 2M</td>
<td></td>
<td>.10 (.30)</td>
<td>.00 (.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Restrictions (max. = 11)</td>
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<td>2.57 (1.72)</td>
<td>1.88 (1.39)</td>
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<td>.62</td>
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<tr>
<td>Driving Restrictions 2M</td>
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<td>2.43 (1.96)</td>
<td>1.92 (1.21)</td>
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<td></td>
</tr>
<tr>
<td>Strategic Approaches (max = 75)</td>
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<td>57.43 (5.92)</td>
<td>55.58 (6.29)</td>
<td>5.10</td>
<td>.029*</td>
</tr>
<tr>
<td>Strategic Approaches 2M</td>
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<td>56.38 (7.54)</td>
<td>57.67 (5.61)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tactical Strategies (max = 35)</td>
<td></td>
<td>28.38 (2.61)</td>
<td>28.17 (2.63)</td>
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<td>.90</td>
</tr>
<tr>
<td>Tactical Strategies 2M</td>
<td></td>
<td>29.05 (2.22)</td>
<td>28.92 (2.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Safe Driving Behaviours</td>
<td></td>
<td>88.38 (7.94)</td>
<td>85.62 (8.17)</td>
<td>4.15</td>
<td>.048*</td>
</tr>
<tr>
<td>Total Safe Driving Behaviours 2M</td>
<td></td>
<td>87.86 (8.09)</td>
<td>88.50 (7.14)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2M indicates the 2-month follow-up of the questionnaire
M₁ (SD) represents the mean and standard deviation for the SAFE education group (N=21)
M₂ (SD) represents the mean and standard deviation for the control group (N=24)

Passenger-rated safe driving behaviours

Passenger ratings of older driver safe driving strategies were also examined, based on responses from the Additional Questions section of the DAQ – Passenger version.

Questions used to measure strategic approaches and tactical strategies were identical to the older driver questions on the Current Driving Habits questionnaire and calculated in the same manner. There was also one additional question asking about changes to the
older driver’s habits in the past two months. This question was measured on a Likert Scale ranging from 1 to 5, with a higher score reflecting more improvement. A one-way ANOVA indicated that passenger-ratings on the older driver’s use of, a) strategic approaches, b) tactical strategies, and c) changes in driving habits did not differ between the groups at baseline.

Between groups repeated measure ANOVA indicated no significant group interaction for either use of *Passenger-rated Strategic Approaches* (F (1, 42) = 2.21, p = .14) or *Passenger-rated Tactical Strategies* (F (1, 42) = 2.30, p = .14). The interaction between *Group* and *Change in Driving Habits* approached significance, F (1, 42) = 4.04, p = .051. Using a Bonferroni correct p-value = .025 (.05/2), paired t-tests indicated no change in ratings of *Driving Habits* for the SAFE education group (M = 3.05), t (20) = 0.00, p = 1.0. While the ratings in *Change in Driving Habits* for the control group between baseline (M = 3.00, SD = .52) to follow-up (M = 3.39, SD = .66), approached significance, t (23) = 2.24, p = .036.

**Objective #2: Multiple Regression Analyses**

The purpose of this set of analyses was to investigate the potential relationship between psychosocial or demographic factors (i.e., age, average driving time), including cognitive status, and (a) awareness of older driver safety issues both at the general population and individual levels, (b) attitudes toward driving safety, (c) intention to change driving behaviours, (d) self-perceptions of driving abilities, and (e) self-reported safe driving behaviours (e.g., restriction) at baseline and for change scores (post-test minus pre-test). Psychosocial and demographic variables were mainly assessed based on
the Background and Demographic questionnaire, with amount driven being assessed on the initial Current Driving Habits questionnaire (See Appendix I for questionnaires).

It was determined a priori, based on the objectives of the study and the literature review, to specifically examine the impact of age and cognitive status, as measured by the 3MS, for all dependent outcome variables. It was also determined that the use of six predictor variables, instead of the originally proposed 3 variables, assuming a medium effect size, would result in 74% Power for the baseline regressions. The addition of baseline scores in the change regressions (see below) would maintain power at 73.6%. However, the addition of these variables would allow for the exploration of the main psychosocial areas. Four other psychosocial variables: 1) amount drive in one week, 2) health status, 3) changes made to driving in the past year, and 4) number of people the driver spoke to about their driving, were also used in the regression analyses. These predictor variables were chosen because of the correlations with the various dependent variables, the variables encompassed the main psychosocial aspects reviewed in the literature, and there were no significant correlations between the predictor variables.

With regard to individual awareness, as with Objective #1, only the difference score for ratings of driving performance was examined as the passenger ratings for driving-related abilities (Passenger-Rated Problems) and relevant driving difficulties (Passenger-Rated Difficulty Level) did not reflect awareness as well as the driving performance discrepancy score. Additionally, due to the large range in the awareness discrepancy scores, and that numbers closer to zero represented better awareness, awareness of driving ability was evaluated using the absolute values of the Awareness of Driving Performance measure. Change score for awareness of driving ability was
calculated using the absolute values of the *Awareness of Driving Performance* discrepancy scores (e.g., Absolute *Awareness of Driving Performance* 2M – Absolute *Awareness of Driving Performance* at baseline).

**Psychosocial Predictors of Baseline Scores.**

As the one-way ANOVAs from analyses in Objective #1 indicated no significant group differences for any of the dependent variables at baseline, the groups were collapsed for these analyses and all 47 participants were utilized.

For these analyses, age and cognitive status were entered into the regression first. Additional psychosocial factors (i.e., amount driven, having made changes to their driving in the past year, talking to others about their driving, and self-rated overall health) were entered into the models next using the stepwise procedure to create the most parsimonious model.

Table 9 displays the regression models for the dependent variables at baseline. Some of the models to predict the baseline scores, including individual awareness of driving performance and total safe driving behaviours, had only age and cognitive status as variables, neither of which were significantly predictive of these baseline scores. Regarding general awareness for knowledge of older driver safety issues (*Knowledge*), the model had only age and cognitive status as predictive variables, with only cognitive status significantly contributing to the model and accounting for 9% of the overall variance of *Knowledge*. Adding the psychosocial factors did not improve the predictability of these models.

The model to predict *Intention to Change* included age, cognitive status, self-report changing of driving habits in the past year, and the amount driven in a week,
although age did not contribute significantly to the model. This model accounted for 39% of the variance in *Intention to Change*.

When looking at *Affective Attitude*, both self-report changing of driving habits in the past year and the amount driven in a week significantly contributed to the model, accounting for an increase in the adjusted $R^2$ by 11% and 8%, respectively.

The model for *Instrumental Attitude* explained 25% of the variance, with amount driven in a week and self-report overall health status contributing significantly to the model.

The model for *Subjective Norm* included cognitive status, and the number of people the driver talked to about their driving as significant predictors, which accounted for an increase in the adjusted $R^2$ by 6%.

The model for *PBC* included cognitive status, self-report changing of driving habits in the past year, and overall health status as significant predictors, accounting for 38% of the variance in PBC.

The model for *Self-rated Driving Performance* included overall health status and self-report changing of driving habits in the past year as significant predictors, with the overall model accounting for 23% of the variance in self-rated driving performance.
Table 9: Regression models for baseline scores

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Predictors</th>
<th>Beta</th>
<th>p</th>
<th>(^{1}R^2) Change</th>
<th>Adj. (^{1}R^2)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Age</td>
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<td>.52</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>3MS</td>
<td>.34</td>
<td>.02</td>
<td>.13</td>
<td>.09</td>
<td>3.25</td>
<td>.048</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness of Driving Performance (Difference Score)</td>
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<td>.09</td>
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<td>Intention to Change</td>
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<td></td>
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<tr>
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<td>3MS</td>
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<td>.14</td>
<td>.10</td>
<td>3.61</td>
<td>.035</td>
</tr>
<tr>
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<td>6.97</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Amount Drive</td>
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<td>.001</td>
<td>.11</td>
<td>.39</td>
<td>8.25</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Affective Attitude</td>
<td>Age</td>
<td>.22</td>
<td>.10</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>3MS</td>
<td>.08</td>
<td>.56</td>
<td>.04</td>
<td>1.96</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change 1yr.</td>
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<td>.02</td>
<td>.12</td>
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<td>3.63</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Amount Drive</td>
<td>.31</td>
<td>.02</td>
<td>.09</td>
<td>.23</td>
<td>4.40</td>
<td>.005</td>
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<td>Instrumental Attitude</td>
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<td>Amount Drive</td>
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<td>.16</td>
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<td>.016</td>
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<td>.01</td>
<td>.11</td>
<td>.25</td>
<td>4.92</td>
<td>.002</td>
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<tr>
<td></td>
<td>Talk to Others</td>
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<td>.03</td>
<td>.08</td>
<td>.26</td>
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<td>.001</td>
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<td>.036</td>
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<tr>
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<td>.23</td>
<td>.32</td>
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<td>.03</td>
<td>.07</td>
<td>.38</td>
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<td>Self-Rated Driving Performance</td>
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<td>.19</td>
<td>.15</td>
<td></td>
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<tr>
<td></td>
<td>Health</td>
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<td>.01</td>
<td>.16</td>
<td>.17</td>
<td>3.84</td>
<td>.016</td>
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<td>.03</td>
<td>.08</td>
<td>.23</td>
<td>4.43</td>
<td>.004</td>
</tr>
<tr>
<td>Total Safe Driving Behaviours</td>
<td>Age</td>
<td>-.01</td>
<td>.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3MS</td>
<td>.07</td>
<td>.63</td>
<td></td>
<td>.04</td>
<td>.138</td>
<td>.87</td>
</tr>
<tr>
<td></td>
<td>Talk to Others</td>
<td>.32</td>
<td>.04</td>
<td>.10</td>
<td>.04</td>
<td>1.65</td>
<td>.19</td>
</tr>
</tbody>
</table>

\(^{1}R^2\) Change only reported if associated with a significant F Change p < .05

**Psychosocial Predictors of Change Scores.**

Change scores were calculated by subtracting the baseline score from the follow-up score for all of the dependent variables (e.g., Knowledge\(2M\) – Knowledge = Change in
Knowledge). As with the baseline scores, the one-way ANOVAs (see Table 10) were utilized to determine significant group differences for the dependent variables at the .05 level. The change score for *Strategic Approaches* was significant, $F(1, 43) = 5.10, p = .029$, as was the change score for *Total Safe Driving Behaviours*, $F(1, 43) = 4.15, p = .048$. Therefore, all other change scores were collapsed across the groups for these analyses and all participants were utilized ($N = 45$).

### Table 10: One-way ANOVA for Change Scores

<table>
<thead>
<tr>
<th>Change Scores (2M – Baseline)</th>
<th>Group (SAFE education vs. Control)</th>
<th>Range</th>
<th>M₁ (SD)</th>
<th>Range</th>
<th>M₂ (SD)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td>-2 - 6</td>
<td>1.19 (2.16)</td>
<td>-4 - 3</td>
<td>.08 (1.93)</td>
<td>3.30</td>
<td>.08</td>
</tr>
<tr>
<td>Awareness of Driving Performance</td>
<td></td>
<td>-17 – 18</td>
<td>-.57 (7.93)</td>
<td>-14 – 15</td>
<td>-2.09 (5.70)</td>
<td>.54</td>
<td>.47</td>
</tr>
<tr>
<td>Self-Rated Driving Performance</td>
<td></td>
<td>-9 - 8</td>
<td>-.14 (3.67)</td>
<td>-13 - 12</td>
<td>1.0 (6.58)</td>
<td>.50</td>
<td>.48</td>
</tr>
<tr>
<td>Intention to Change</td>
<td></td>
<td>0 – 2</td>
<td>.08 (.47)</td>
<td>-1 - 0</td>
<td>-.07 (.31)</td>
<td>1.60</td>
<td>.21</td>
</tr>
<tr>
<td>Affective Attitude</td>
<td></td>
<td>-.33 -.83</td>
<td>.20 (.31)</td>
<td>-.33 - 1.5</td>
<td>.26 (.40)</td>
<td>.29</td>
<td>.59</td>
</tr>
<tr>
<td>Instrumental Attitude</td>
<td></td>
<td>-.75 -.50</td>
<td>-.11 (.31)</td>
<td>-.75 - .75</td>
<td>-.06 (.34)</td>
<td>.31</td>
<td>.58</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td></td>
<td>-.65 -.25</td>
<td>-.06 (.27)</td>
<td>-.44 - .33</td>
<td>.01 (.36)</td>
<td>.59</td>
<td>.45</td>
</tr>
<tr>
<td>PBC</td>
<td></td>
<td>-.44 -.33</td>
<td>.01 (.18)</td>
<td>-.44 - .78</td>
<td>.08 (29)</td>
<td>1.14</td>
<td>.29</td>
</tr>
<tr>
<td>Strategic Approaches</td>
<td></td>
<td>-4 – 6</td>
<td>-1.05 (4.53)</td>
<td>-3 – 3</td>
<td>2.08 (4.72)</td>
<td>5.10</td>
<td>.03*</td>
</tr>
<tr>
<td>Tactical Strategies</td>
<td></td>
<td>-8 – 7</td>
<td>.67 (2.65)</td>
<td>-5 - 7</td>
<td>.75 (1.80)</td>
<td>.02</td>
<td>.90</td>
</tr>
<tr>
<td>Driving Restrictions</td>
<td></td>
<td>-2 – 2</td>
<td>-.14 (1.19)</td>
<td>-3 - 3</td>
<td>.04 (1.27)</td>
<td>.25</td>
<td>.62</td>
</tr>
<tr>
<td>Total Safe Driving Behaviours</td>
<td></td>
<td>-11 – 12</td>
<td>-.52 (5.76)</td>
<td>-5 - 13</td>
<td>2.88 (5.42)</td>
<td>4.15</td>
<td>.048*</td>
</tr>
</tbody>
</table>

$M₁$ (SD) represents the mean and standard deviation for the SAFE education group ($N=21$)

$M₂$ (SD) represents the mean and standard deviation for the control group ($N=24$)

Change scores were also analyzed to determine if they significantly differed from zero. For change scores on *Strategic Approaches* and *Total Safe Driving Behaviours*, t-tests were completed for each group. The change in *Strategic Approaches* was not
significantly different from zero for either the SAFE education group (t (20) = 1.15, p = .26) or the control group (t (23) = 2.04, p = .053), although the control group did approach significance at the .05 level. The change in Total Safe Driving Behaviours was significantly different from zero for the control group (t (23) = 2.60, p = .02), but was not significantly different from zero for the SAFE education group (t (20) = 1.15, p = .26).

For the other change scores, in which there were no group differences, t-scores were conducted using the entire sample. The mean increase in Knowledge of older driver safety issues was .60 (SD = 2.09), which approached significance, t (44) = 1.92, p = .061. The mean change in Awareness of Driving Performance did not differ significantly from zero, t (44) = -1.32, p = .19. The mean increase in Self-reported Driving Performance scores was -.14 (SD = 2.16) and did not differ significantly from zero, t (44) = .58, p = .56. The change score for Self-reported Difficulties (M = .59, SD = 1.05) did not differ significantly from zero, t (44) = -.22, p = .82. There was no change for Self-reported Problems (M = 0, SD = 1.02) or Intention to Change driving scores (M = 0, SD = 2.16).

When looking at the attitude and belief measures, the change scores for Instrumental Attitude (M = -.08, SD = .33; t (44) = -1.59, p = .12), Subjective Norm (M = -.02, SD = .32; t (44) = -.50, p = .61), and PBC (M = .05, SD = .24; t (44) = -1.42, p = .16) did not differ significantly from zero. Affective Attitude (M = .23, SD = .36) did differ significantly from zero, t (44) = 4.30, p < .001. Although the change score for Driving Restrictions (M = -.04, SD = 1.22) was non- significant (t (44) = -.24, p = .81), the change score for Tactical Strategies (M = .71, SD = 2.21) was significantly different from zero (t (44) = 2.16, p = .037).
Based on the t-tests, multiple regressions were only calculated for change scores that approached or were significantly different from zero. Change scores not approaching being significantly different from zero, indicated that there was no change and therefore predicting the variation in change would not be feasible. Therefore, hierarchical step-wise multiple regressions were conducted for the control group for Strategic Approaches and for Total Safe Driving Strategies. A second set of hierarchical step-wise multiple regressions using the entire sample were conducted for change in general Knowledge, Affective Attitude, and Tactical Driving Strategies. For each hierarchical multiple regression the baseline score for the dependent variable was entered into the model, with psychosocial and demographic variables entered next in a step-wise fashion create the most parsimonious model.

For the control group, both of the models to predict the change scores, Strategic Approaches and Total Safe Driving Behaviours, had only baseline scores as variables. For the multiple regressions using the entire sample, only Affective Attitude had a psychosocial variable (health status) contribute to the model. Health status increased the explained variance by 6%, with the entire model explaining 22.7% of the variance, F (1, 43) = 7.46, p = .002. The remaining models, for general Knowledge and Tactical Strategies, included only the baseline scores in the model, which explained 23.9% and 35.9% of the variance respectively. There models were not increased by the psychosocial and demographic factors.

**Objective #3: Theory of Planned Behaviour**

The purpose of this set of analyses was to determine which of the Theory of Planned Behaviour (TPB) attitudinal constructs, as measured by the Attitudes About
Driving questionnaire, are the best predictors of intention to change (as measured by the 
Attitudes About Driving questionnaire) and self-reported safe driving behaviours (as 
measured by the total safe driving behaviours from the Current Driving Habits 
questionnaire) at baseline and at follow-up.

The next purpose was to determine if self-reported safe driving behaviour change 
at 2-month post-intervention follow-up could be predicated by change in the following 
attributes: (a) awareness of older driver safety issues both at the general population and 
individual levels, (b) attitudes toward driving safety, and/or (c) self-perceptions of 
driving abilities, if the SAFE education program was effective. However, the analyses in 
Objective #1 indicated no significant differences in self-reported safe driving behaviour 
between baseline and follow-up (see Table 5 and follow-up paired t-tests). Therefore 
these analyses were not conducted. From a descriptive perspective, of the 20 older drivers 
from the SAFE education group who completed both the initial feedback and the follow-
up feedback questionnaires, 65% (N=13) indicated they had become more aware of 
changes in themselves that could impact their driving. Of these 13 older drivers, 77% of 
the (N=10) indicated they had made changes to their driving behaviours at the 2-month 
follow-up.

**TPB: Multiple Regressions to Predict Intention and Driving Behaviour**

A one-way ANOVA indicated no significant difference between the SAFE 
education group and the control group on *Intention to Change* at baseline, $F(1, 45) = .41$, 
$p = .52$ or follow-up, $F(1, 43) = .34, p = .56$. There was also no significant difference 
between *Group* on *Total Safe Driving Behaviours* at baseline, $F(1, 45) = 1.43, p = .24$ or 
follow-up, $F(1, 43) = .06, p = .80$. As the two groups did not differ significantly on
Intention to Change score and Total Safe Driving Behaviours, the groups were collapsed and the entire sample of scores was used in the following multiple regressions. For the entire sample, a paired t-test indicated that there was no significant difference between Intention to Change at baseline (M = 3.79, SD = .45) and at the 2-month follow-up (M = 3.79, SD = .52), t (44) = .000, p = 1.0. There was also no significant difference between Total Safe Driving Behaviours at baseline (M = 86.91, SD = .8.09) and at the 2-month follow-up (M = 88.20, SD = 8.52), t (44) = -1.49, p = .14. As there were no differences between baseline and follow-up, multiple regressions were only run to predict Intention to Change and Total Safe Driving Behaviours at baseline.

The hierarchical multiple regression model was used to determine the relative importance of each of the four TPB motivational antecedents on intent to change driving behaviours. As the TPB postulates that all motivational antecedents contribute to intention, all four variable (Affective Attitude, Instrumental Attitude, Subjective Norms, and Perceived Behavioural Control (PBC) were forced into the regression model. The analyses indicated that both PBC and Subjective Norm significantly contributed to the model, with the model accounting for 51.6% of the variance in Intention to Change (See Table 11).

The hierarchical multiple regression model was used to determine the relative importance of intent to change driving behaviours and each of the four TPB motivational antecedents on Total Safe Driving Behaviours. As the TPB postulates that intention is the precursor to actual behaviour, Intention to Change was entered into the regression model first. The four TPB motivational antecedents were entered next to determine if any of these continued to predict behaviour after intention was accounted for. The analyses
indicated that *Intention to Change* and *Affective Attitude* both significantly contributed to the model, with the model accounting for 15.4% of the variance in *Total Safe Driving Behaviours* (See Table 11).

### Table 11: Multiple regression model for intent to change driving behaviours

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Predictors</th>
<th>Beta</th>
<th>p</th>
<th>Adj. ( R^2 )</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to Change</td>
<td>Affective Attitude</td>
<td>.02</td>
<td>.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instrumental Attitude</td>
<td>.03</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subjective Norm</td>
<td>.26</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBC</td>
<td>.57</td>
<td>&lt;.001</td>
<td>.52</td>
<td>13.26</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Total Safe Driving Behaviours</td>
<td>Intent to Change</td>
<td>-.53</td>
<td>.01</td>
<td>.067</td>
<td>4.31</td>
<td>.043</td>
</tr>
<tr>
<td></td>
<td>Affective Attitude</td>
<td>-.40</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instrumental Attitude</td>
<td>.08</td>
<td>.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subjective Norm</td>
<td>.10</td>
<td>.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBC</td>
<td>.43</td>
<td>.055</td>
<td>.154</td>
<td>2.67</td>
<td>.035</td>
</tr>
</tbody>
</table>

**Secondary Objective #1: Transtheoretical Model of Change Analyses**

The purpose of these analyses was to determine changes in the TTM stages of change for both the intervention and control groups using a series of t-tests. The Readiness to Change questionnaires were used in this set of analyses. In accordance with the TTM, items related to intent to change/restrict driving behaviours were coded into continuous variable such that 1 indicated the driver was not thinking of changing their driving behaviour within the near future, 2 indicated the driver is thinking of changing their driving in the near future, but has not yet changed, 3 indicated the driver has started to make changes, but only practice these changes sometimes, 4 indicated the person has already made changes and always or usually practices these changes, and 5 indicated the person has stopped driving routinely. No participants reported stopped driving altogether. Higher scores indicated the driver was getting closer to action or maintenance phase, as
they had indicated making more changes to their driving. Table 12 indicates the frequency of responses.

Table 12: Responses to Readiness to Change

<table>
<thead>
<tr>
<th>Response</th>
<th>Group (SAFE education - N1 vs. Control- N2)</th>
<th>Baseline</th>
<th>2-Month Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁ = 22</td>
<td>N₂ = 25</td>
<td>N₁ = 21</td>
</tr>
<tr>
<td>Not thinking of changing driving</td>
<td>8</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Thinking of changing in the near future</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Started to make changes to driving, and sometimes practice these changes</td>
<td>5</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Already made changes to driving, and always/usually practice these changes</td>
<td>6</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Stopped driving routinely, occasionally drive</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

N₁ = number of responses for the SAFE education group.
N₂ = number of responses for the control group

Due to the small cell sizes, a one-way ANOVA was used to examine mean differences between the groups. The ANOVA indicated no differences between the SAFE education program group and the control group on the Stages of Change variable at baseline (F (1, 43) = .003, p = .95) or at the 2-month follow-up (F (1, 43) = .13, p = .72). Each group was also looked at individually to determine movement in readiness to change measure between baseline and 2-month follow-up using paired t-tests. There was no significant change in Stages of Change for the SAFE education group (t (20) = -.64, p = .53), or the control group (t (23) = -.60, p = .55).
Further descriptive examination of the baseline data indicted that although driver’s stated they were at a particular level of readiness to change, this was not necessarily consistent with what they reported regarding current driving restrictions on the Readiness to Change questionnaire. Although 19 of the older drivers indicated they were in the precontemplative stage (not thinking about changing their driving), only 7 of these individuals indicated no instances when they prefer not to drive on the Readiness to change questionnaire and all participants indicated at least 2 circumstances under which they would consider changing their driving. Similarly, all of the participants (N = 3) who were in the contemplative stage (thinking about changing their driving, but had not changed yet), indicated one area which they prefer not to drive on the Readiness to Change questionnaire. Additionally, two of the four participants who moved from within the action stage (already made changes and practice them always/usually) at baseline to the precontemplative stage at follow-up (not thinking about changing their driving), indicated 1 area they prefer not to drive at follow-up which was the same as at baseline. It should also be noted that not all participants who were in the preparation/action stages listed an area in which they preferred not to drive, although when asked to describe the changes they had either started to make or had made and were doing all participants listed at least one change indicating either a strategic or tactical strategy had been implemented (e.g., plan routes, drive slower, less noise/distractions, driving less at night).

**Secondary Objective #2: Individual Case Studies**

The purpose of this objective was to report on individual cases where participants scored below the 77 cutoff score on the 3MS or self-reported a diagnosis of a dementia or mild cognitive impairment (MCI) and participated in the intervention phase of the
study will be identified and reported as case studies. These case studies were intended to be primarily descriptive and exploratory in nature, as no previous studies (based on the available literature) had examined the ability of older driver’s with cognitive impairments to benefit from a driving education program. Each case was examined to determine the relative effectiveness of the SAFE education study on: (a) awareness of older driver safety issues both at the general population and individual levels, (b) self-perceptions of driving abilities, (c) attitudes toward driving safety, (d) intention to change driving behaviours, and (e) self-reported safe driving behaviours (e.g., restriction).

To aid in determining if the participants were similar to others in the SAFE education group, each participants score was compared to the 95% confidence interval (95% CI) of the SAFE education group (calculated with the cognitively impaired participants removed; See Table A-1 in Appendix K for 95% CI). Comparison with the SAFE education group was chosen to allow comparisons at all three times of measurement (baseline, immediately post intervention, 2-month follow-up) to be made with the same group. Scores above or below the 95% CI for any given score was thought to demonstrate more or less gain/loss relative to the others in the sample. Individual awareness of problems and difficulties, based on discrepancy scores, and the change in awareness on these measures were not examined. As previously noted in Objective #2, the passenger ratings contained numerous “don’t know” responses and therefore were not felt to be a reliable indicator of the older drivers’ capabilities.

Three participants met the case study criteria (Participant ID #3, #7, and #9). Participant #7 did not complete and return the 2-month follow-up questionnaires,
therefore only baseline and immediate post-intervention scores were available. Table 13 summarizes the demographic characteristics for each of these participants.

Table 13: Summary of Demographic Characteristics of Case Studies

<table>
<thead>
<tr>
<th>ID #</th>
<th>Age</th>
<th>Sex</th>
<th>3MS</th>
<th>Education</th>
<th>Home</th>
<th>Health Conditions</th>
<th># Meds</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3</td>
<td>83</td>
<td>Male</td>
<td>75</td>
<td>University</td>
<td>Retirement Home House</td>
<td>Epilepsy</td>
<td>1</td>
</tr>
<tr>
<td>#7</td>
<td>73</td>
<td>Female</td>
<td>76</td>
<td>University</td>
<td>House</td>
<td>Heart Disease Cancer</td>
<td>3</td>
</tr>
<tr>
<td>#9</td>
<td>75</td>
<td>Male</td>
<td>97</td>
<td>University</td>
<td>House</td>
<td>Arthritis Dementia/MCI Heart Disease Cancer</td>
<td>3</td>
</tr>
</tbody>
</table>

Case #3

Based on the self-report background questionnaire, Participant #3 rated his health as good and his vision as the same as others his age. Participant #3’s passenger was his spouse, was 80 years of age, female, had known him for 55 years, and road as a passenger while he drove on average 5 times a week. Participant #3 had been driving for 60 years, had never taken a driving course, and had not been asked by the provincial ministry of transportation to have a vision test, rules of the road test, on-road test, or a medical examination in the past five years. He reported he drives approximately the same amount as he did 10 years ago, although his passenger stated he drove a little less than he had 10 years ago. He reported having no vehicular incidents in the past year, although his passenger reported he has had at least one near miss in the past year. He reported having made changes to his driving in the past year, including keeping both hands on the wheel. He had talked to his family about his driving and reported that someone had suggested to him that he stop driving. His passenger reported that they had talked to a physician about
his driving. He indicated that it was very important to him that he continue to drive and it was moderately important to his passenger that he continue to drive.

To explore the effectiveness of the SAFE education program for Participant #3, his scores at baseline, post-intervention, and 2-month follow-up were examined (See Table 14).

**Table 14: Raw Scores for Participants #3**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline</th>
<th>Post-Intervention</th>
<th>2-month Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Awareness &amp; Self-Perception</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>10</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Self-Rated Driving Performance</td>
<td>59</td>
<td>60</td>
<td>57</td>
</tr>
<tr>
<td>Passenger-Rated Performance</td>
<td>53</td>
<td>--</td>
<td>53</td>
</tr>
<tr>
<td>Awareness of Driving Performance (discrepancy score)</td>
<td>-6</td>
<td>--</td>
<td>-4</td>
</tr>
<tr>
<td>Self-Rated Problems</td>
<td>6</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Self-Rated Difficulties</td>
<td>12</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td><strong>Attitudes and Intention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective Attitude</td>
<td>3</td>
<td>2.83</td>
<td>2.67</td>
</tr>
<tr>
<td>Instrumental Attitude</td>
<td>4</td>
<td>3.75</td>
<td>4</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>3.10</td>
<td>3.65</td>
<td>3.15</td>
</tr>
<tr>
<td>PBC</td>
<td>2.86</td>
<td>3.33</td>
<td>3</td>
</tr>
<tr>
<td>Intention to Change</td>
<td>3.33</td>
<td>2.67</td>
<td>3.33</td>
</tr>
<tr>
<td><strong>Safe Driving Behaviours</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Restrictions</td>
<td>2</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>Strategic Approaches</td>
<td>55</td>
<td>--</td>
<td>54</td>
</tr>
<tr>
<td>Tactical Strategies</td>
<td>22</td>
<td>--</td>
<td>24</td>
</tr>
<tr>
<td>Total Safe Driving Behaviours</td>
<td>79</td>
<td>--</td>
<td>80</td>
</tr>
<tr>
<td>Days Driven Past Week</td>
<td>3</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>Alternative Transportation (types)</td>
<td>1</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Alternative Transportation (often)</td>
<td>29</td>
<td>--</td>
<td>26</td>
</tr>
<tr>
<td>Vehicular Incidents (past month)</td>
<td>0</td>
<td>--</td>
<td>0</td>
</tr>
</tbody>
</table>

Regarding the effectiveness of the SAFE education program on awareness of older driver safety issues at the general knowledge level, Participant #3 had a baseline knowledge score (10) below the 95% CI for the SAFE education sample, but demonstrated an increase in knowledge immediately following the intervention (2 point
increase) that was within the change score 95% CI for the SAFE education group, suggesting he was able to learn the new information. His follow-up score demonstrated a continued increase in knowledge, with his change between baseline and follow-up (change score = 6) indicating an improvement, well beyond the 95% CI. His knowledge score at follow-up (16) was within the 95% CI of the SAFE education group. With regard to individual level awareness, based on the discrepancy scores, his awareness of his driving performance at baseline and follow-up was below the 95% CI. He did show improvement in his awareness level, with the change in awareness of driving performance being within 95% CI.

An examination of the self-perceptions of driving abilities measures indicated that Participant #3’s self-rated number of driving-related problems and resulting difficulties with driving were well above the 95% CI at baseline, post-intervention, and follow-up. His self-rating of his driving performance was well below the 95% CI at baseline, post-intervention, and follow-up. This may reflect that his driving performance was worse than the sample, as his self-ratings were higher than that of his passenger.

With respect to his attitudes and beliefs about driving, at all three points in time his affective attitude, instrumental attitude, subjective norm, and PBC were slightly below the 95%CI of the sample, indicating he had a less positive attitude towards driving, perceived driving as less important, felt less social pressure, and felt he had less behavioural control over his driving. His intention to change was also below the 95% CI indicating a greater intention to change his driving behaviour (higher scores indicate more intention to continue driving without change).
Regarding self-reported safe driving behaviours, his use of driving restrictions, was within the 95% CI. At baseline, he reported preferring not to drive at night and preferring to not maintain speed limits, and reported preferring not to drive in heavy traffic or bad weather at follow-up. His use of strategic strategies was within the 95% CI, while his use of tactical strategies was below the 95% at baseline and follow-up. He also drove less frequently relative to the SAFE education group, both at baseline and follow-up. He reported no vehicular incidents at baseline or follow-up, which was the mode for the group.

**Case #7**

Based on the self-report background questionnaire, Participant #7 rated her health as good and her vision as the same as others her age. Participant #7’s passenger was her spouse, was 76 years of age, male, had known her for 53 years, and on average road as a passenger while she drove 3 times a week. She had been driving for 48 years, had taken a classroom based driving course within the past year, and had not been asked by the provincial ministry of transportation to have a vision test, rules of the road test, on-road test, or a medical examination in the past five years. She reported that she drives about the same amount that she did 10 years ago, and her passenger stated that she drove more often than she had 10 years ago. She reported having no vehicular incidents in the past year, although her passenger noted she had become lost while driving at least once in the past year. She reported that she had made changes to her driving in the past year, including driving less often. She noted that no one had suggested to her that she stop driving and she had talked to her family about her driving. Her passenger reported that they had not talked to anyone regarding her driving. She indicated that it was very
important to her that she continue to drive, while it was extremely important to her passenger that she continued to drive.

Table 15: Raw Scores for Participants #7

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Awareness &amp; Self-Perception</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Self-Rated Performance</td>
<td>78</td>
<td>71</td>
</tr>
<tr>
<td>Passenger-Rated Performance</td>
<td>74</td>
<td>--</td>
</tr>
<tr>
<td>Awareness Performance</td>
<td>-4</td>
<td>--</td>
</tr>
<tr>
<td>(discrepancy score)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving-related Problems</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Driving-related Difficulties</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Attitudes and Intention</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective Attitude</td>
<td>3.33</td>
<td>3.33</td>
</tr>
<tr>
<td>Instrumental Attitude</td>
<td>4</td>
<td>3.75</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>4.20</td>
<td>3.90</td>
</tr>
<tr>
<td>PBC</td>
<td>3.56</td>
<td>3.44</td>
</tr>
<tr>
<td>Intent to Change</td>
<td>3.33</td>
<td>3.33</td>
</tr>
<tr>
<td><em>Safe Driving Behaviours</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Restrictions</td>
<td>3</td>
<td>--</td>
</tr>
<tr>
<td>Strategic Strategies</td>
<td>53</td>
<td>--</td>
</tr>
<tr>
<td>Tactical Strategies</td>
<td>28</td>
<td>--</td>
</tr>
<tr>
<td>Total Safe Drive Strategies</td>
<td>84</td>
<td>--</td>
</tr>
<tr>
<td>Days Driven Past Week</td>
<td>6</td>
<td>--</td>
</tr>
<tr>
<td>Alternative Transportation (types)</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Alternative Transportation (often)</td>
<td>32</td>
<td>--</td>
</tr>
<tr>
<td>Vehicular Incidents (past month)</td>
<td>0</td>
<td>--</td>
</tr>
</tbody>
</table>

Regarding the effectiveness of the SAFE education program, only the immediate impact of the program could be examined. Her baseline awareness of older driver safety issues at the general knowledge level was below the 95% CI for the SAFE education sample. Immediately following the intervention, her knowledge had improved, but was still below the post-intervention 95% CI. The amount her score increased was within the 95% CI. With regard to individual level awareness, based on the discrepancy scores, her awareness of her driving performance at baseline was below the 95% CI. As no
passenger ratings were available, any change in awareness using discrepancy scores could not be examined.

Her self-perception of her driving abilities was within the 95% CI at baseline and post-intervention. The 6-point decline within her self-ratings from baseline to post-intervention also fell within the 95% CI. Her self-ratings of her driving-related problems and subsequent driving difficulties both fell within the 95% CI at baseline. Her driving-related problems remained within the 95% CI at follow-up, while her difficulty level was equivalent to the group mode and fell slightly below the 95% CI.

With respect to her attitudes and beliefs about driving, at both points in time her affective attitude and subjective norm fell within the 95% CI of the sample. At baseline and post-intervention, her instrumental attitude and PBC both fell below the 95% CI, indicating she perceived driving as less important and felt she had less behavioural control over her driving. Her decline in instrumental attitude fell below the 95% CI for the change score, indicating a more significant change than the rest of the group regarding this attitude. Her intention to change remained stable across baseline and follow-up. On both occasions it was also below the 95% CI indicating a greater intention to change her driving behaviour (higher scores indicate more intention to continue driving without change).

Regarding baseline self-reported safe driving behaviours, her use of driving restrictions and tactical strategies were within the 95% CI. She reported preferring not to parallel park, and not to drive at night or in heavy traffic. Her use of strategic strategies was below the 95% CI. She drove more frequently relative to the SAFE education group and reported no vehicular incidents at baseline.
Case #9

Based on the self-report background questionnaire, Participant #9 rated his health as good and his vision as better than most others his age. Participant #9’s passenger was his spouse, was 76 years of age, female, had known him for 58 years, and on average road as a passenger while he drove 2 times a week. He had been driving for 58 years, had taken a classroom based driving course 38 years ago, and had not been asked by the provincial ministry of transportation to have a vision test, rules of the road test, on-road test, or a medical examination in the past five years. He reported he drives much less than he did 10 years ago, and his passenger stated he drove a little less than he had 10 years ago. He reported having no vehicular incidents in the past year, which was consistent with his passenger’s report. He reported he had not made changes to his driving in the past year. He noted that no one had suggested to him that he stop driving. He had talked to his physician and eye doctor about his driving. His passenger reported that they had not talked to anyone regarding his driving. He indicated that it was extremely important to him that he continue to drive and it was moderately important to his passenger that he continue to drive.

With regard to the effectiveness of the SAFE education program, based on the feedback questionnaire, Participant #9 indicated that as a result of taking the SAFE education program, he was more aware of changes that can affect his driving, found the program to be a useful reminder for driving issues he already knew about, discovered changes in himself of which he was not previously aware, and was now planning on making changes regarding his driving. After the course, he was less likely to have a physician check his hearing and vision, but was more likely to have a physician check his
physical abilities. He noted he found the SAFE education program very useful and would recommend it to others. At the 2-month follow-up he indicated that he had made changes to his driving, but did not endorse that the program had helped him with planning to make changes to his driving. He noted he had not seen a physician since the program. He had talked to family members about his driving as a result of the SAFE education program. He intended to do a driving self-assessment questionnaire, but did not intend to take a road-test, driving lesson, or any other driving education program.

Table 16: Raw Scores for Participant #9

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scores for Participant #9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
</tr>
<tr>
<td><strong>Awareness &amp; Self-Perception</strong></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>14</td>
</tr>
<tr>
<td>Self-Rated Performance</td>
<td>89</td>
</tr>
<tr>
<td>Passenger-Rated Performance</td>
<td>93</td>
</tr>
<tr>
<td>Awareness Performance (discrepancy score)</td>
<td>4</td>
</tr>
<tr>
<td>Driving-related Problems</td>
<td>1</td>
</tr>
<tr>
<td>Driving-related Difficulties</td>
<td>0</td>
</tr>
<tr>
<td><strong>Attitudes and Intention</strong></td>
<td></td>
</tr>
<tr>
<td>Affective Attitude</td>
<td>3.83</td>
</tr>
<tr>
<td>Instrumental Attitude</td>
<td>5</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>4.30</td>
</tr>
<tr>
<td>PBC</td>
<td>4</td>
</tr>
<tr>
<td>Intent to Change</td>
<td>4</td>
</tr>
<tr>
<td><strong>Safe Driving Behaviours</strong></td>
<td></td>
</tr>
<tr>
<td>Driving Restrictions</td>
<td>3</td>
</tr>
<tr>
<td>Strategic Strategies</td>
<td>58</td>
</tr>
<tr>
<td>Tactical Strategies</td>
<td>34</td>
</tr>
<tr>
<td>Total Safe Drive Strategies</td>
<td>95</td>
</tr>
<tr>
<td>Days Driven Past Week</td>
<td>5</td>
</tr>
<tr>
<td>Alternative Transportation (types)</td>
<td>1</td>
</tr>
<tr>
<td>Alternative Transportation (often)</td>
<td>28</td>
</tr>
<tr>
<td>Vehicular Incidents</td>
<td>0</td>
</tr>
</tbody>
</table>

Regarding the effectiveness of the SAFE education program on awareness of older driver safety issues at the general knowledge level, Participant #9’s knowledge of
older driver safety issues improved 4 points from baseline (below 95% CI) to post-intervention, suggesting that he was able to learn new information from the SAFE program. However, he showed a decline (change score below 95% CI) in knowledge between the intervention and follow-up, with his follow-up score being above his baseline score but below the 95% CI. With regard to individual level awareness, based on the discrepancy scores, his awareness of his driving performance at baseline was within the 95% CI, with his follow-up discrepancy score well above the 95% CI. An examination of the his follow-up scores, reveals that his rating of his driving performance declined from 89 to 80, while his passengers rating of his performance stayed stable at 93. Therefore, his decline in awareness, assuming his passenger provided an accurate rating, is in the direction of underestimating his abilities. Alternatively, his passenger may have overestimated his abilities, and his decline in his self-ratings may represent an increase in awareness of his actual driving abilities.

An examination of the self-perceptions of driving abilities measures indicated that Participant #9’s self-rating of his driving performance was above the 95% CI at baseline, but declined to within the 95% CI for post-intervention and follow-up. The 15 point decline between baseline and post intervention and the 9 point decline between baseline and follow-up were well above the 95% CI, with the 6 point increase between the intervention and follow-up being within the 95% CI. This may reflect that his driving performance was worse than the sample, as his self-ratings were higher than that of his passenger. His self-rated number of driving-related problems was within the 95% CI at baseline and post-intervention, although slightly above 95% CI at follow-up. Driving difficulties due to these problems were below the 95% CI at baseline, post-intervention,
and follow-up. However, it should be noted that the mode for driving difficulties at all three time periods was zero.

With respect to his attitudes and beliefs about driving, at baseline his affective attitude and instrumental attitude were above the 95% CI, suggesting that he perceived driving as more pleasurable and more important than the rest of the SAFE education program sample. His decline in affective and instrumental attitude was below the 95% CI. His affective attitude and instrumental attitude were both within the 95% CI at post-intervention and follow-up, suggesting that the SAFE education program was able to help change his attitudes in this regard. His score on subjective norm and PBC were within the 95% CI at baseline and follow-up. Compared to the sample, his intention to change was within the 95% CI at all three time points. However, his decline in intention between baseline and post-intervention was below the 95% CI, which indicated a significant change in intention to change his driving behaviour following the intervention.

Regarding self-reported safe driving behaviours, his use of driving restrictions, was within the 95% CI at baseline and below the 95% CI at follow-up. A review of his responses indicated he preferred not to turn left, back up, or drive in bad weather at baseline, and preferred not to drive in heavy traffic at follow-up. His use of strategic strategies was within the 95% CI, while his use of tactical strategies was above the 95% at baseline and within the 95% CI at follow-up. He also drove less frequently relative to the SAFE education group at follow-up, which was a decline from his baseline score. He reported no vehicular incidents at baseline, but reported having problems with getting lost (within the past month) at follow-up.
Chapter 5: Discussion

In this section, the results of the research study, with an emphasis on Study 2, are summarized, interpreted, and placed in context with regard to the study hypotheses and current literature. The section concludes with a critical review of the study limitations and implications.

Effectiveness of the SAFE Education Program

The main purposes of this study was to develop and examine the effectiveness of the SAFE education program in terms of a comparison to the treatment as usual control group at 2-month follow-up and with respect to the immediate effects of the SAFE education program. Overall, based on between group comparisons, the SAFE education group was no more effective than the treatment as usual group. However, an examination of the SAFE education program itself suggests some promising immediate impacts.

By comparing the SAFE education program to a treatment as usual control group, we were able to examine if the SAFE education program provided change in the areas examined beyond that provided by what is readily available through ICBC. It should be noted that although the “Roadsense for Drivers” handbook is available to those who want to review it, there is no information available on how many older drivers actually utilize this service.

The SAFE education program did not differ from the treatment as usual group at baseline or in the change between baseline and 2-month on any of the measures. Therefore the hypothesis regarding group differences between baseline and follow-up with the SAFE education group demonstrating: a) increased awareness of older driver safety issues both at the general population and individual levels, b) more positive
attitudes toward driving safety, c) more conservative ratings of their own driving abilities, d) greater intentions to change their driving behaviours, and e) report an increase in safe driving behaviours was not supported. Individual level awareness was further examined based on quartiles due to ceiling effect. Both groups demonstrated some improvement in awareness. It was also noted that at baseline 40% of older drivers in the SAFE education group were in the top 25th percentile with respect to awareness. Unfortunately it was not possible to examine the differences between the quartiles at the group level due the small sample size. Future studies should examine the impact of education program for older adults with various levels of initial individual awareness.

The SAFE education program did show some immediate effects regarding general awareness, self-perceptions of driving-related abilities, self-perceptions of driving abilities, and beliefs about driving. Older drivers demonstrated an increase in knowledge of general older driver safety issues, with 90.9% of participants scoring at or above 70% immediately following the intervention. This knowledge declined slightly at follow-up. Therefore the hypothesis regarding an increase in general awareness following the intervention was supported. Previous studies have reported an increase in knowledge following an education program. However, these studies have focused primarily on knowledge of rules of the road (Bédard, et al., 2008; Marottoli, Van Ness, et al., 2007; Nasvadi, 2007), or knowledge related to a specific targeted driving-related ability (i.e., vision; Stalvey & Owsley, 2003).

Additionally, 95% of older drivers reported that as a result of the SAFE education program they were more aware of changes that could impact their driving both immediately following the education program and at follow-up. This suggests an increase
in intellectual awareness at the general level. This is a higher endorsement than found immediately following other education based driving programs which measured knowledge and self-awareness using this type of question (Eby, et al., 2003).

Looking at self-perceptions, older drivers demonstrated a decrease in self-rated performance immediately following the SAFE education program. This supported the initial hypothesis. A decrease in self-rated performance was anticipated as older drivers have been reported to rate their own driving as above average, despite actual abilities (Brown, et al., 2005; Marottoli, et al., 1998), suggesting an inflated perceived sense of actual driving abilities. Although no passenger ratings were available, this decline suggests that older drivers may have become more aware of their own driving abilities immediately following the SAFE education program. Unfortunately, this gain was not maintained at follow-up.

The prediction that older drivers would demonstrate an increase in self-rated driving-related problems and driving difficulties immediately following the SAFE education program was also supported. However, this was also followed by a decline back to baseline at follow-up. While this decline may represent a reversion to their original beliefs about their driving-related problems, it may also be because older drivers attended to these driving-related problems between the intervention and follow-up. Two older drivers from the intervention group who reported vision difficulties following the intervention, had their vision checked by the 2-month follow-up and reported no vision difficulties at the follow-up period. While not every condition could be examined in this way and one also cannot be certain about the outcome of their vision test, it does suggest
that older drivers from the SAFE education program may have been proactively examining their driving-related problems.

Sixty-three percent of older drivers also reported that they had discovered changes in themselves that they had not previously been aware of as a result of the SAFE education program. This suggests that the SAFE education program may have resulted in an immediate increase in intellectual awareness at the individual level. Previous education studies have reported a 14% response rate in self-awareness; however, this was based on an individual workbook based intervention (Eby, et al., 2003).

Regarding attitudes and beliefs, immediately following the SAFE education program, older drivers reported a significant decline in Instrumental Attitude, indicating that they believed driving was less important and less central to their independence. Affective attitude, perceived social pressures, and perceived control over driving, did not change following the education program. Therefore, the hypotheses regarding shift in attitudes and beliefs was only partially supported. Interestingly, Affective Attitude did show a significant increase between baseline and 2-month follow-up, suggesting that at follow-up older drivers viewed driving as more pleasurable and felt less stress or apprehension regarding driving. As no significant group differences in Affective Attitude between baseline and follow-up were found, it is possible that this more positive attitude may be related to learning about driving in general or an effect of completing the questionnaires themselves. This speaks to the importance of including a control group in future driving intervention research.

As the majority of attitudes and beliefs toward driving did not shift, it was not surprising that ratings of intention to change driving did not change following the
education program. According to the TPB, the shift in attitudes and beliefs is directly related to a change in intention. Although on the Attitudes and Beliefs questionnaire older drivers generally reported a greater intention to continue driving without making changes, on the initial feedback questionnaire 86.4% of older drivers reported the SAFE program helped them with planning to make changes to their driving behaviour. Thus it would appear that older drivers did show some change in intention following the education program.

**Impact of Psychosocial Variables**

The second purpose of this study was to examine the predictive nature of demographic characteristics and psychosocial factors (age, cognitive status, health status, amount driven in a week, changes to driving in the past year, and the number of people they talk to about their driving), with regard to baseline levels of and change in, a) intellectual awareness, b) self-perceptions of driving, c) attitudes towards driving, d) intention towards driving, and e) safe driving behaviours as measured by the initial set of questionnaires. Age was not predictive of any of the baseline measures, while each of the remaining five psychosocial factors did impact on baseline scores.

Specifically, cognitive status was predictive of general knowledge of older driver safety issues, Subjective Norm, and PBC, suggesting older drivers with better cognitive status are associated with better knowledge of driving issues, higher perceived social pressure, beliefs, and higher perceived control over their driving. After controlling for age and cognitive status, health status was predictive of Instrumental attitude, PBC, and self-rated driving performance. These results suggest that older drivers who rate their health as better may view driving as more important to their independence, believe they
have less control over their driving behaviours, and rate their own driving abilities as higher. After controlling for age and cognitive status, amount driven was predictive of Affective Attitude, Instrumental Attitude, and intention to change driving behaviours. This suggests that older drivers who drive more often are associated with more positive attitudes toward driving, greater beliefs that driving is important for flexibility and independence, and have less intention to change their driving behaviours. Similarly, changes made to driving behaviours in the previous year were predictive of Affective Attitude and Intention to change driving behaviours, which suggests that older drivers who had not changed their driving in the past year and who drove more often had more positive attitudes towards driving (e.g., driving more pleasurable) and were associated with less intention to change their driving behaviours. This supported the hypothesis regarding intention to change driving behaviours.

The number of people the older driver spoke to about their driving in the past year was predictive of Subjective Norm, suggesting that older drivers who speak to more health care professionals and family/friends may feel less social pressure regarding their driving. Talking to others about driving was also associated with safe driving behaviours; however the model itself was not significant. None of the psychosocial variables examined were predictive of awareness of driving performance or overall use of safe driving behaviours. The various significant models accounted for between 9% (model for Knowledge) to 39% (model for Intent to Change) of the variance.

An examination of change scores indicated that most dependent variables did not differ significantly from zero. Older drivers in the control group did show significant increase in the use of strategic strategies and overall safe driving strategies. Older drivers
in the sample did change on measures of general knowledge about older driver safety issues, affective attitude, and use of tactical driving strategies. The change scores indicated that regardless of group, older drivers were able to improve in some areas.

Multiple regression models for each of these change scores indicated that after controlling for baseline levels, only affective attitude was further explained by the addition of psychosocial factors and demographic characteristics. Health status was predictive of change in affective attitude, suggesting that older drivers who rate their health status as better were associated with an increase in their beliefs regarding driving as pleasurable. This may be because in reviewing the driving materials, older drivers who are in better health come to believe that they have less to worry about regarding declines in their driving abilities and therefore come to view driving as a less stressful and more pleasurable behaviour.

By determining what characteristics of the general older driver population impact change in factors related to older driver safety, it can help tailor interventions to better facilitate the needs of older drivers.

**Theory of Planned Behaviour (TPB)**

The third objective of this research study was to determine which of the TPB attitudinal constructs were the best predictors of intention to change driving behaviours and actual driving behaviours. The multiple regression model included all four attitude constructs and accounted for 52% of the variance in intention. Both Subjective Norm and PBC significantly contributed to the model. This partially supported the initial hypothesis regarding the predictive nature of subjective norm. This supports our previous findings regarding social pressures and the role these pressures may play during early stages of
intending to change driving behaviours, although it does not support our previous findings regarding instrumental attitudes (Lindstrom-Forneri, et al., 2007). The strong relationship between subjective norms with intention appears to be unique to driving, in that the relationship has been found in regard to other driving behaviours (Parker, Manstead, Stradling, Reason, & Baxter, 1992) and it stands in contrast to a variety of other behaviours where normative beliefs and subjective norms have been found to have a weaker association with intention (Armitage & Conner, 2001). The finding regarding the importance of perceived control over driving regarding intent to change driving behaviours was not surprising as other research has demonstrated PBC to have a strong association with intention both with regard to driving (Forward, 2009; Parker, et al., 1992) and other behaviours (Armitage & Conner, 2001). Findings regarding openness to change indicate that older drivers report lifestyle demands or lack of alternative transportation as reasons why changing their driving is not possible (Tuokko, McGee, et al., 2007).

The multiple regression model to predict safe driving behaviours using the TPB framework accounted for 15.4% of the variance in total safe driving behaviours, with intention to change and affective attitude contributing significantly to the model. This is contrary to Ajzen’s hypothesized structure of the TPB model (Ajzen, 1991), suggesting that intention was not sufficient to mediate all of the effects of affective attitude. Other studies have shown similar findings (e.g., Rhodes, Blanchard, & Matheson, 2006). These findings indicate that older drivers with higher intentions to change their driving behaviour and who believe driving is less pleasurable are associated with using more safe driving strategies (i.e., restrictions, tactical strategies, strategic approaches). The
contribution of affective attitudes (pleasurable/stressful) above that of intention to change may help in explain why some older drivers acknowledge their intention to change (e.g., contemplation; Prochaska & Velicer, 1997), but do not take action or why older drivers who are aware of a deficits related to their driving choose to continue driving. Future research may benefit by examining this affective attitude in relation to older driver behaviours.

**Stages of Change**

One secondary objective of this study was to determine changes in the TTM stages of change for both the intervention and control groups. The results indicated no significant movement through the stages of change for either the SAFE education group or the control group. However, this result may have been due to inconsistencies in older driver reporting regarding their thoughts, considerations, and actions with respect to changing their behaviours. Although this was evident with other self-report measures (see Limitations section below), it was more apparent regarding stages of change as described in the TTM (Prochaska & Velicer, 1997). As part of the inclusion criteria, all older driver participants indicated that they were currently thinking about changing their driving behaviours; however on the baseline Readiness to Change questionnaire, 19 of the 47 participants indicated they were not thinking of changing their driving behaviours. While some of these participants indicated they had made changes to their driving on other questionnaires, suggesting they were in the preparation or action stage, others did not, suggesting they were in the precontemplative stage. The SAFE education program was developed and designed to help older drivers move from the contemplation or preparation stage into the higher stages. Although it was recognized a priori that not all older adults
participating in the study may need to change their driving, and therefore may not proceed from the contemplative stage following the intervention, the proportion of drivers self-identifying as being in the precontemplative stage may have further impacted the ability to detect group changes and thus the effectiveness of the SAFE education program.

Although movement with the stages of change are common within the TTM (Prochaska, et al., 1992), an examination of a subset of responses from the older drivers who indicated they moved from within the action stage (already made changes and practice them always/usually) at baseline to the precontemplative stage at follow-up (not thinking about changing their driving), revealed at least 1 area the older driver stated they prefer not to drive at follow-up which was the same as at baseline. Within the framework of the TTM this would indicate that older driver was still within the action phase with respect to driving restrictions. It is possible that once a change is made (e.g., restricting night driving), older drivers no longer think of themselves as one who has made changes (maintenance for that specific behaviour), but rather report that they are no longer thinking about making changes. Recent qualitative research on older drivers has suggested a subclass of older drivers, “consistent”, indicating that these older drivers have always restricted their driving in some way and thus while actions have been made, there is no thought about future changes to their driving (Kowalski, 2007).

Case Studies

The purpose of the case studies was a novel inquiry into the effectiveness of a driving education program for individuals with cognitive impairment. Two of the participants fell below the cut-off value on a cognitive screening test, while the third
participant self-reported a diagnosis of either dementia or mild cognitive impairment. Overall, the case studies suggested that these older drivers with cognitive impairments fell at or below the level of the healthy older drivers on most of the areas measured. General knowledge of older driver related issues fell below that of the rest of the SAFE education program sample. Although the improvements in knowledge for all three cases were greater than that found for the rest of the group, their scores still fell outside the 95% CI of the group. Individual level awareness, based on discrepancy scores, two of the older drivers had lower levels of awareness at baseline than the rest of the group. However, the amount of change in awareness was similar to the sample.

When looking at reports of vehicular incidents, two of the cases reported no vehicular incidents, while their passenger noted that they had experienced an incident in the past year. This suggests that older drivers with cognitive impairment may provide unreliable information regarding past driving behaviours. As one of the cases did not complete the follow-up questionnaires, it suggests that any follow-up measures may be best approached with another visit rather than mailing out a letter and questionnaires.

Overall, the case studies seem to suggest that older drivers with cognitive impairment were able to attend the SAFE education program and demonstrated changes in the same direction as the healthy older drivers in the sample. While the larger changes seen in some of the measures may represent a regression to the mean, due to lower initial ratings, it is also possible that these older drivers were able to benefit from the intervention. Although it has been suggested that older drivers with cognitive impairments would not benefit from a driving education program in terms of driving skills (Man-Son-Hing, et al., 2007), it appears based on these case studies that further
investigation is warranted as to the impact on driving knowledge, self-awareness, attitudes, intentions, and the use of safe driving strategies. Additional research using groups of older drivers with mild cognitive impairments would be useful in further establishing the utility of driving education programs for these individuals.

**Summary and Implications**

This research study developed a novel, theoretically based educational driving program for older drivers. The SAFE education program was well received by older adults. The SAFE education program demonstrated small immediate impacts, such as increases in knowledge of older driver safety issues (general level awareness), individual awareness, and some changes in attitude and intentions toward changing driving behaviours. However, the program did not appear to be more effective than the review of a drivers handbook available though ICBC in follow-up, with most follow-up measures being similar to baseline. This suggests that more work is needed to help with the long-term effects of the intervention.

Although the DEC model and the awareness models informed what factors and information were included in the SAFE education program, the TTM and TPB informed the development of the SAFE education model with respects to why people change (TPB) and how to present the information to foster change (TTM). While the TPB and TTM informed the development of the SAFE education model, the results from this study have implications for these theories. Regarding the TPB, the results from this study indicate that intention may not mediate all of the effects of the motivational antecedents for driving, which is a complex, multifaceted behaviour. While the TPB acknowledges that PBC can directly impact on behaviour, this study suggests that for driving, affective
attitude, may also directly impact behaviour. Future research on the TPB using an objective measure of driving may be beneficial.

When looking at the TTM, an examination of the responses from the older drivers suggests that the use of safe driving behaviours may not follow the stages of change as set out by the TTM. Responses indicated that some older drivers initially report making changes to their driving. However, based on the follow-up responses, it appeared that once having made a change for a specific and discrete compensatory driving behaviour (e.g., no longer driving at night), some older drivers no longer viewed themselves as in the action or even maintenance stage. Rather some older drivers appeared to continually “reset their baseline”, and thus report they were no longer thinking about changing their driving. This gives the illusion that the older driver has regressed to the precontemplative stage, when in actuality they have changed their driving for that one discrete behaviour and based on the TTM would be in the maintenance phase (for that behaviour). The TTM stages of change were originally developed to explain the process of change for a concrete and discrete behaviour. Driving is a complex behaviour and therefore within the TTM model safe driving behaviour may best be viewed as a series of discrete behaviours, which can change independently, and together constitute a specific level of safe driving. Future studies may benefit from incorporating the concept of “resetting their baseline” when trying to measure stages of change with older drivers.

Limitations

This study has several limitations. First, due to the difficulties with recruitment the sample size was smaller than desired, which limited power for some of the group analyses and the multiple regressions, thus increasing the risk of a Type II error. There
were numerous possible reasons for the difficulties with recruitment, based on
discussions with older drivers who called and did not participate and with health care
providers who were aiding in recruitment for the study. First, there may have been a
saturation of the participant pool, as numerous studies on older drivers have been
conducted in Victoria and the Greater Victoria Area over the last 3 years. Second, there
was competition from another group conducting older driver education session at local
senior community centers. Many older drivers who are in the contemplative stage, as
required for our study, had completed this course and did not wish to participant in
another course. And finally, there were older drivers who were interested in the SAFE
education program; however, they did not have a passenger on a regular basis and thus
did not meet the inclusion criteria.

The second largest limitation was the reliance of self-reported data. As was noted
in the section on Stages of Change, many of the older drivers were inconsistent in their
responses to related questions given at the same point in time, thus demonstrating
difficulties with reliability of the data. The self-rating questionnaires used did not
measure response bias and therefore it is uncertain if participants answered the questions
in a forthright manner. Additionally, passengers were used to provide their perspective on
the older driver’s driving abilities and driving-related abilities. Although passengers have
been used in previous awareness research (Wild & Cotrell, 2003), the passengers did
have a relationship with the older driver and while steps were taken to minimize bias
(e.g., reminding passengers that information would not be shared with the older driver),
there may still have been a social desirability bias or alternatively a bias to underestimate
the older drivers ability if they were concerned about their driving. Many passengers
were also not able to comment on all of the driving-related abilities, thus making it difficult to determine individual awareness with this measure.

Third, in addition to the self-ratings there was also the measurement issue related to the novelty of the questionnaires themselves. The awareness questionnaire was developed specifically for use in this study. While care was taken to ensure all of the questionnaires used were grounded in theory and, when possible, had been used in previous research, the questionnaires were still in development, which can impact on the internal validity of the study.

Fourth, as the efficiency of statistical tests often depends on a broad range of data points, the limited variability in many of the measured variables may have lead to difficulties in finding relationship among and between variables. Although recruitment was done through various clinics and locations throughout the community, most respondents had similar responses to many of the questionnaires.

Fifth, while the use of a treatment as usual control group was a strength of the study, the use of only one type of control group limited the conclusions that could be made by the study to the effectiveness of the SAFE education program over current practice. To the best of my knowledge, no previous driving intervention study has used a control group who received a driving based treatment. Previous intervention studies have used either no control group (Eby, et al., 2003; Nasvadi, 2007; Nasvadi & Vavrik, 2007), a wait-list control (Bédard, et al., 2004; Bédard, et al., 2008; McCoy, et al., 1993), or a non-driving based treatment that was relative to the participants (Marottoli, Allore, et al., 2007; Marottoli, Van Ness, et al., 2007; Owsley, et al., 2004; Owsley, et al., 2003).
Future Directions

Research into the impact of driving interventions on older drivers’ social cognition and driving behaviours is still a relatively new area of inquiry. This research provides evidence that older drivers may experience immediate benefits from a group-based educational driving program; however these effects were not retained at follow-up. Future research into education programs for older drivers may benefit from focusing on what aspects of the education program are producing the immediate effects. By using meaningful control groups and by partitioning out aspects of larger interventions (e.g., giving only some of the participants the Awareness stops), future research may be able to better explain the factors within the intervention that are most beneficial for older drivers. Qualitative research, using individual interviews and focus groups, may help to determine how older drivers benefit from educational interventions and assist in explaining why the immediate impacts of group interventions may not be maintained over time. Future research should also examine if some older adults do retain the benefits of the intervention over time and how they differ from older adults who return to baseline levels on measures of awareness, attitudes, and self-perceptions of driving. Future research should continue to focus on the area of individual awareness in older drivers and using interventions to increase this awareness.

As suggested by the older driver’s in the pilot study of the SAFE education program, the combination of an on-road educational component with the in-class component may be beneficial. Some researchers have started to examine the impact of this type of an intervention for older adults (Bédard, et al., 2008), however more work is still needed in this regard.
One aspect of this study was the creation of an older driver awareness questionnaire. Future research into the development of this questionnaire would be beneficial in order to provide the field with a reliable and valid measure of driving awareness. The addition of an objective measure of driving abilities may be useful in helping to better capture awareness of one’s driving performance. Qualitative research may be beneficial to discern why there is a discrepancy between the findings from the DAQ, indicating no change in awareness, and older drivers self-reported change in awareness on the feedback questionnaire.
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Appendices
Appendix A: Figure of DEC Model

Note: The SAFE education program focused at the Moderator level on beliefs, awareness, and self-monitoring, and at the Outcome level on strategic and tactical compensatory strategies.

GLOBAL FACTORS

SPECIFIC CONTEXTUAL FACTORS

MODERATORS

OUTCOME

Individual Factors:
Health
Cognition

Personal Factors:
Physical
Cognitive
Emotional
Sensory
Driving experience and training

Beliefs
Awareness
Self-monitoring
Self-efficacy

DRIVING PERFORMANCE

LEVEL OF COMPETENCE

Strategic level

Tactical level

Functional behaviours

Operational level

Societal Factors
Social Policy
Laws
Institutional Factors

Individual Factors
Social
Physical
Attitudinal

Environmental Factors

Figure A-5: Driving as an Everyday Competence (DEC) Model
Appendix B: Pilot Study for the Driving Awareness Questionnaire

Purpose
The purpose of piloting the Driving Awareness Questionnaire (DAQ) was to ensure readability and clarity of the questions. To ensure the participants were similar to those who would be participating in Study 2, all participants in the DAQ pilot study met the inclusion criteria for Study 2.

Method

Participants
Participants were recruited from an existing participant list generated through previous research activities where people voluntarily put their name on a contact list to be called for involvement in any future older driving based studies. Participants were contacted via telephone and interested participants were scheduled for an appointment time at the Centre on Aging at the University of Victoria. Informed consent was obtained from all participants prior to participation in the pilot of the Driving Awareness Questionnaire.

Participants included 5 older drivers (3 female; 2 male) who completed the DAQ – Driver Version and 5 passengers (3 female; 2 male) who completed the DAQ – Passenger Version to ensure the questions are clear and easily understood. The older drivers ranged from 72 – 80 years of age and were well educated with 60% having university or college level education. Eighty percent rated their health as good relative to their peers and all of the older drivers rated their vision as the same or better than their peers. Days driven ranged from 3 – 7 days/week (M = 5.4 times/week) with 80% of trips being less than 30 minutes each way. Two of the older drivers reported using alternative
transportation by means of rides from family or friends. No other alternative transportation use was reported. The passengers ranged from 72 – 82 years of age and were well educated with 60% having university of college level education. Eighty percent rated their health as good or excellent and 40% rated their vision as worse than their peers. One passenger required an enlarged version (16-point font) of the DAQ to accommodate for a visual impairment. Passengers had known the older driver for 7 – 56 years and rode as a passenger 2 – 6 times a week (M = 4.6 times/week). Three of the five passengers were still driving.

**Design**

In order to facilitate feedback regarding the questionnaires, cognitive interviewing techniques were utilized (Collins, 2003; Presser, et al., 2004; Willis, 1999, 2004). Cognitive interviewing has been shown to enhance the feedback received from participants. Verbal probing has come into favor with researchers as it allows for control over the interview to ensure relevant potential error sources are targeted, time is not wasted with potentially irrelevant discussion, it is easy to introduce, and most participants are receptive to this technique. However, probes have the potential for appearing artificial and it has been argued that they potentially bias responses. Using no probing initially and following-up with retrospective probes allows for three things: 1) helps determine if participants are able to complete the questionnaire on their own with the written instructions provided, 2) allows for facilitating unbiased feedback, and 3) it still allows for potential error sources to be queried. To ensure a wide range of response and to ensure all potential sources of response error were attained, half of the participants (3 drivers and 2 passengers) received verbal probes as they completed the questionnaire and
half of the participants (2 drivers and 3 passengers) were asked to note and comment on any aspects of the questionnaire and were asked probes retrospectively. See Appendix C for the original Driving Awareness Questionnaires with probes and Appendix I for the final versions.

**Results**

**Driving Awareness Questionnaire – Driver Version (DAQ-DV): Changes and Rational**

*Part A of the DAQ-DV had the following changes:*

1. On the Likert scale the term “neutral” was changed to “don’t know”, as participants found the term neutral confusing for these types of questions and the new term better reflected their lack of knowledge rather than not having an opinion.

2. All questions that had referred to something being “less likely” were removed and rephrased to read as “more likely”. The term “less likely” had originally been used based on the Falls Risk Awareness Questionnaire (FRAQ) to reduce response bias. However, the term “less likely” was noted by all participants to cause confusion when responding to the question. Participants noted they had to read these question numerous times and even then they were not always sure their choice indicated the answer they were trying to convey. Although wording questions with “more likely” may lead to a response bias for some people, it was felt that this was a lesser risk than having individuals being unable to understand the question and unable to ensure their response reflected their actual knowledge.
3. Question #1 was re-worded to better reflect that we were referring to population statistics.

4. For questions #2, 5, 6, 15, 17, and 18 the issue or problem of interest was added to the end of the question to ensure the participants were comparing older drivers with and without the particular issue/problem (e.g., If an older driver has a visual disorder (e.g., macular degeneration), they are more likely to have difficulties driving compared to other drivers without this condition was changed to: If an older driver has a visual disorder (e.g., macular degeneration), they are more likely to have difficulties driving compared to other drivers without a visual disorder).

5. Question #4 was re-worded as the term “hearing difficulties” was changed to “hearing problems” as participants commented on having to re-read this question as the word “difficulties” occurred too frequently.

6. In question #7, participants were unsure of the meaning of “tactical strategies” in a driving context and thus an example was provided to help clarify the meaning of the term.

7. Question #11 was re-worded as some participants found it confusing and to ensure that the comparison was being made between older drivers with and without age-related changes in speed of thinking.

8. For question #13, participants found the term “over learned” to be confusing. Some participants were not sure what was intended by “over learned”, thus it was replaced with “well-learned”, which participants felt would improve the readability and comprehension of the question.
9. For question #14, the phrase “when distance driven” was changed to “over the same distance driven” as the first phrase did not convey the message that distance was being equalized for both driver groups.

10. Four additional questions were added (questions #6, 10, 15, and 21 on the final DAQ-DV) after the final development of the SAFE driving intervention to ensure that all content areas included in the educational program were included in the questionnaire. This would allow us to better track any change in knowledge in Part 2 of the study.

**Part B of the DAQ-DV had the following changes:**

1. For all questions, the words “In general” were added to the beginning of all part a) questions as some participants noted they started to answer part a) specifically in relation to their driving rather than in relation to their general functioning.

2. For all questions, “If yes”, was bolded for part b) to emphasize that part b) was only to be completed if the response to part a) was yes. Most participants felt that bolding this would by sufficient to draw their attention to that aspect of the question.

3. Participants noted difficulties in understanding the phrase “a great deal of difficulty” and thought that “a lot of difficulty” would be easier to understand and convey the same meaning, so this change was made for the response scale on all questions in part b).

4. Question #4 was changed from “flexibility” to “physical flexibility” as some participants were unsure if this referred to cognitive flexibility, physical flexibility, or both.
Part C of the DAQ-DV had the following changes:

1. In the instructions, the statement “All of your answers are confidential and will not be shared with anyone” was added to remind participants of confidentiality. Although most participants did not feel the instructions would alter their answers, they did state that they would be more comfortable answering the questions if the statement was included.

2. Within the original instructions, some people were unsure of the meaning of “typical performance” and one participant perceived it to mean “proper performance”, thus the wording was changed to “usual” to clarify the instructions.

3. For all questions, the Likert scale term “neutral” was changed to “average”, as many participants stated they needed a term that reflected performances between good and poor, but felt that “neutral” did not adequately describe one’s performance.

4. Question #3 on proper lane change procedures was expanded to include the phrase “shoulder checks their blind spot”, as a few participants noted this was an important aspect of lane changes.

5. Question #6 on maintaining proper lane changes was expanded to include the qualifier “stays in the middle of the lane” as some participants interpreted this question to mean using the right hand lane when driving, unless passing or turning. While using the right hand lane is a good driving practice, it was not the intended meaning of the question.
Driving Awareness Questionnaire - Passenger Version (DAQ-PV): Changes and Rational

The primary concern with the DAQ-PV was the use of the term “significant other” when referring to the passenger and when referring to the driver from the passenger’s perspective. The term “significant other” was changed to “passenger” when referring to the person completing the questionnaire and “family member/friend” when referring to the driver. Using the term “driver” was considered; however, some participants stated they would consider all older drivers and not specifically the person who they were suppose to be rating.

Part A of the DAQ-PV had the following changes

1. The instructions were expanded to clarify how part a) and b) of each question differed. The previous instructions “The following questions refer to your significant others’ driving performance” was changed to “The following questions refer to your family member/friend’s driving performance. For each question, part a) refers to their health in general, and part b) refers to what they actually do while driving. The statement “Please answer all questions to the best of your ability.” was also added as participants believed it was important to acknowledge that their responses reflect their perceptions about the driver. Participants were asked about a confidentiality statement here, but the majority of participants noted that such a statement was not necessary.

2. For all questions, the choice “Don’t Know” was added to part a) as participants expressed that they were not always familiar with all aspects of the driver’s general health. As some passengers noted they started to answer part a) in relation
to their family member/friends driving, the term “In general” was added to the beginning of all part a) questions.

3. For all questions, “If yes”, was bolded for part b) to emphasize that it was only necessary to respond to part b) if part a) was answered yes. Most participants felt that bolding “If yes” would by sufficient to direct their attention to that aspect of the instructions.

4. Participants noted difficulties in understanding “a great deal of difficulty” and felt that “a lot of difficulty” would be easier to understand and convey the same meaning. Therefore, this change was made to the response scale for all of part b).

5. Question #4 was changed from “flexibility” to “physical flexibility” as some participants were unsure if the word flexibility referred to cognitive flexibility, physical flexibility, or both.

**Part B of the DAQ-PV had the following changes:**

1. In contrast to Part A, for Part B participants felt an acknowledgement that their answers represent their opinions and a confidentiality statement would be beneficial. In general, participants felt that the proposed statement was sufficient to alleviate any concerns regarding confidentiality and privacy. Therefore, the statement “Please answers all questions to the best of your knowledge. All of your answers are confidential and will not be shared with your family member/friend or anyone else” was added to the instructions for this section. Within the original instructions, some people were unsure about the meaning of the phrase “typical performance”. One participant perceived “typical performance” to mean “proper
performance”, thus the wording was changed to “typical/usual” to help clarify the intended meaning of phrase.

2. For the Likert scale, the middle term “neutral” was changed to “average”, as many participants stated that neutral did not adequately describe one’s performance, but they needed a term that represented driving performances that fell between good and poor.

3. Question #3 on proper lane change procedures was expanded to include “shoulder checks their blind spot”, as a few participants noted this was important in conducting proper lane changes.

4. Question #6 on maintaining proper lane position was expanded to include the qualifier “stays in the middle of the lane” as some participants interpreted this question to mean using the right hand lane when driving, unless passing or turning. While using the right hand lane is a good driving practice, it was not the intended meaning of the question.

Part C (“Addition Questions”) of the DAQ-PV had the following changes:

1. Participants noted that the forced choice format in question #3 did not allow them to accurately report the driver’s habits. Participants noted that some drivers did not *always* do the behaviour in question. Participant varied on whether or not they would check off an item if they felt the driver did the behaviour only sometimes. Also not all passengers lived with the driver, thus they were unsure whether or not the driver engaged in some of the strategies. Which strategies they were unsure about varied between participants. Thus, having a general do not know category at the end of the list of behaviours was not sufficient. With the forced choice
approach an unchecked box for any of the behaviours could have indicated a) the
driver only does it sometimes, b) the participant was unsure if the driver did the
behaviour, or c) the driver did not ever do the behaviour. Based on this feedback,
the question was changed to reflect “how often” the driver engages in these
behaviours and a 6-point Likert scale was added ranging from always to never,
with an additional “Don’t Know” option included. The same Likert scale in
question #3 was also added to question #4, to again allow participants to rate
“how often” the driver engaged in the driving behaviours.

2. Question #3 b) was changed from “regular eye examinations” to “yearly eye
examinations”, as participants varied on how often one would have to go to be
considered regular. The once a year was picked based on the recommendation of
the Canadian Association of Optometrists (2008) that older adults (aged 65 and
older) at minimum have an annual eye examination. For question #3 d) regular
physician visits were not quantified as this will vary dramatically depending on
the person’s health. For question #3 f) “regular” physical activity was quantified
as 2-3 times per week. Examples of “night, rush hour, etc.” were added to
question #3 g) to help people clarify what was meant by “certain times of day”.
The word “assessment” was changed to “check-in” for question #3 i) as some
participants thought of an assessment as a formal evaluation, rather than the
intended personal evaluation or thought about how one is feeling that day.
Question #3 j) was moved to the last position (#3 p) in the final version to clarify
if people had special equipment installed and if so, to what degree they utilized
this equipment. The word “not” was bolded in question #3 n (#3 m, on the final
version) because some participants missed this word and felt bold font would draw their attention to the word. Question #3 n) and o) on the final version were added as these issues are important for driving and had not been included in the pilot version of the DAQ-PV.

3. For question #4 c), the words “or eliminate” was added to the phrase “Minimizes or eliminates in car noise” as participants stated that some drivers did not minimize noise, but rather eliminated the noise all together by turning off equipment or not allowing others to talk to them while driving.
Appendix C: Study 1 – Questionnaires for DAQ Pilot Study

Background Questionnaires

BACKGROUND AND DEMOGRAPHICS: OLDER DRIVER

Part A. Please tell us about yourself.

1. Are you? ___ male   or  ___ female

2. Your age: ______

3. Did you complete high school? ___ Yes ___ No

4. Did you complete university/college ___Yes _____ No

5. Overall, would you say your health is:
   ___Excellent     ___Good    ___Fair    ____Poor

6. Compared to others your age, would you say that your eyesight is:
   ___Better than most    ___About the same    ___Worse than most

7. How many days have you driven in the past week? ___ (# days)

8. In the last month how long were most of your driving trips (each way)?
   ___ less than 30 minutes   ___ over 30 minutes   ___ over 60 minutes

9. In the past month have you taken or used: (Check all that apply)
   ___ rides from family or friends     ___ taxis    ___ buses
   ___ delivery services   ___ special transit services

BACKGROUND AND DEMOGRAPHICS: SIGNIFICANT OTHERS

Part A. Please tell us about yourself.

1. Are you? ___ male   or  ___ female

2. Your age: ______

3. Did you complete high school? ___ Yes ___ No

4. Did you complete university/college ___Yes _____ No
5. **Overall**, would you say your health is:
   ___Excellent   ___Good   ___Fair   ___Poor

6. Compared to others your age, **would you say that your eyesight is**:
   ___Better than most   ___About the same   ___Worse than most

7. How long have you known the **older driver**? _____year(s)
   *Please note older driver refers to your relative/friend who is participating in this study.

8. On average, how often are you a passenger while **your relative/friend drives**?
   ________________ (times a week)

9. Do you currently drive? ___ Yes   ___ No

**Piloted Driving Awareness Questionnaire with probes**

**Driving Awareness Questionnaire – Older Driver Form**

**PART A: GENERAL KNOWLEDGE**

Indicate your agreement/disagreement with the following statements about older drivers (70 years +):

1. Older drivers are more likely than middle aged drivers (aged 25 -55) to be in a crash.

   [ ] Strongly Agree   [ ] Agree   [ ] Neutral   [ ] Disagree   [ ] Strongly Disagree

   **Probes:** What does the term “more likely” mean to you?
   Who do you think of when you read “older drivers”

2. If an older driver has a visual disorder (e.g., macular degeneration), they are more likely to have difficulties driving compared to older drivers without this condition.

   [ ] Strongly Agree   [ ] Agree   [ ] Neutral   [ ] Disagree   [ ] Strongly Disagree

   **Probes:** Can you repeat the question in your own words?
   Was that an easy or hard question to answer?
   How did you arrive at your answer?

3. Older drivers are more likely than middle aged drivers (aged 25 – 55) to be fatally injured if they are involved in a crash.

   [ ] Strongly Agree   [ ] Agree   [ ] Neutral   [ ] Disagree   [ ] Strongly Disagree
Probes: What does “fatally injured” mean to you?

What do you think of when you read “crash”? All types of accidents or just accidents involving 2 or more vehicles?

4. If an older driver has difficulties with hearing, they are more likely to have difficulties driving compared to older drivers without this difficulty.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

5. Older drivers who are experiencing age-related changes in learning are more likely to have difficulties driving compared to older drivers without this difficulty.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

6. Older drivers who are experiencing age-related changes in vision are likely to have difficulties driving compared to older drivers without this difficulty.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

Probe: What does “age-related changes” mean to you?

Repeat question in your own words?

7. Older drivers who use tactical compensation strategies are less likely to be involved in crashes compared to older drivers who do not use tactical strategies.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

Probe: What does “tactical compensation strategies” mean to you?

8. Older drivers are more likely than younger drivers to experience road rage.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

9. If an older driver has memory problems, they are more likely to have difficulties driving compared to older drivers without memory problems.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

Probe: What types of memory problems were you thinking about when answering this question? Daily forgetting or disease based memory problems (e.g., dementia)?

10. If an older driver has poor flexibility in their neck, they are more likely to have difficulties driving compared to older drivers without poor neck flexibility.
11. Older drivers are more likely to have difficulties driving due to age-related changes in speed of thinking compared to older drivers who do not have these problems.

Probe: What does “older drivers” mean to you?

Are you thinking about any one person in order to answer this question?

12. Medications can have a negative impact on driving.

Probe: What does “younger drivers” mean to you?

13. Over learned driving tasks tend to decline more rapidly in older adults compared to younger drivers.

Probe: When you think about strength are you thinking about upper body? Lower body? Whole body?

14. When distance driven is taken into account, older drivers are more likely to be involved in crashes than middle aged drivers (age 25 – 55 years).

15. Older drivers who are experiencing age-related changes in strength are more likely to have difficulties with driving compared to older drivers without these changes.

Probe: When you think about strength are you thinking about upper body? Lower body? Whole body?

16. If an older driver has problems with balance, they are more likely to have difficulties driving compared to older drivers without balance problems.

Probe: What does “difficulties with driving” mean to you?

17. Older drivers who are experiencing age-related changes in lung capacity are more likely to experience difficulties with driving compared to older drivers without this condition.

18. Older drivers who are experiencing age-related changes in attention are more likely to experience difficulties with driving compared to older drivers without this condition.
Older drivers who use compensatory strategies, such as avoiding certain driving situations, are less likely to be involved in a crash compared to older drivers who do not use these strategies.

**Probe:** What does “avoiding certain driving situations” mean to you?
Are you thinking of a specific driving situation?
Who are you thinking of when you answer this question?

**PART B: DRIVING-RELATED ABILITIES: OLDER DRIVER FORM**

The following questions refer to YOUR driving performance. That is, these questions refer to what you actually do while driving.

1. a) Do you have problems with your vision (e.g., glare, cataracts)? [ ] Yes [ ] No
   b) If yes, how much difficulty do these problems with your vision cause when you are driving?
      [ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty
   **Probe:** Who are you thinking of when you answer this question?
   Does the question make sense to you?
   **Question b) Please rephrase this in your own words**
   Check to see if they answered part b) if a) is YES.
   **What does “problems with your vision” mean to you?**
   **How did you arrive at your answer? Talk me through your thoughts.**

2. a) Do you have problems with your memory? [ ] Yes [ ] No
   b) If yes, how much difficulty do these problems with your memory cause when you are driving?
      [ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

3. a) Do you have problems with your ability to physically react quickly? [ ] Yes [ ] No
   b) If yes, how much difficulty does your ability to physically react quickly cause when you are driving?
      [ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty
4. a) Do you have problems with your flexibility? [ ] Yes [ ] No

Probe: What does “flexibility” mean to you?

b) If yes, how much difficulty do these problems with your flexibility cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

5. a) Do you have problems with your hearing? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with your hearing cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

6. a) Do you have problems with strength (e.g., wrist strength, ankle strength)? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with your strength cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

7. a) Do you have problems with dividing your attention between two tasks? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with dividing your attention cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

8. a) Do you have problems with your depth perception? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with your depth perception cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

9. a) Do you have problems with your ability to think quickly? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with your ability to think quickly cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

10. a) Do you have problems with selective attention (begin able to pay attention to one thing and ignore something else that is also going on)? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with your selective attention cause when you are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty
PART C: DRIVING ABILITIES: OLDER DRIVER FORM

The following questions refer to YOUR driving performance. That is, these questions refer to what you actually do while driving.

Probe: Do you have any concerns about answering these questions?
Do you feel the following statement would be helpful in adding to the instructions?

"Please answer all questions to the best of your knowledge. All of your answers are confidential and will not be shared with anyone else."

Please evaluate your typical performance on each of the following driving tasks:

1. Maintain proper speed
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor
   Probe: What does “proper speed” mean to you?

2. Use mirrors appropriately
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor
   Probe: What does “appropriately” mean to you?
   What mirrors were you thinking of?

3. Change lanes by signalling and checking my mirror
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor

4. Respond to changing road conditions
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor
   Probe: How did you arrive at your answer? Talk me through your thoughts.

5. Manage intersections
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor

6. Maintain proper lane position
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor
   Probe: What does “proper lane position” mean to you?

7. Signal in time to alert other drivers of my intended action (e.g., turn, lane change)
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor

8. Respond appropriately to warning road signs
   [ ] Very Good   [ ] Good   [ ] Neutral   [ ] Poor   [ ] Very Poor

9. Leave a safe distance between my vehicle and the vehicle in front of me is
10. Handle in car distractions (e.g., talking, radio)
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

11. React quickly to unexpected road hazards (e.g., pedestrian, cyclist, debris on the road)
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

**Probe:** What does “safe distance” mean to you?

12. Drive in heavy traffic
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

13. Drive at night
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

14. Use proper procedures when making a left hand turn
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

**Probe:** What does “proper procedures” mean to you?

15. Drive in unfamiliar areas
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

16. Park my vehicle safely
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

17. Drive safely, in comparison to other drivers my age
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

18. Notice changes in my driving abilities and make appropriate changes
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

19. Notice driving errors when you make an error while driving (e.g., cutting off another driver, failing to signal, etc.)
   [ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

**Probe:** Did you find yourself “editing” your responses either to be more positive or more negative than your initial reaction?

Do you believe your responses are an accurate estimate of your driving abilities?
Driving Awareness Questionnaire – Significant Other’s Form

PART A: DRIVING-RELATED ABILITIES: OLDER DRIVER FORM

The following questions refer to your significant other’s driving performance.

Probe: Do you have any concerns about answering these questions?

Do you feel the following statement would be helpful in adding to the instructions?

“Please answer all questions to the best of your knowledge. All of your answers are confidential and will not be shared with your significant other or anyone else.”

1. a) Do they have problems with their vision (e.g., glare, cataracts)? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with their vision cause when they are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

2. a) Do you have problems with your memory? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with their memory cause when they are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

3. a) Do they have problems with their ability to physically react quickly? [ ] Yes [ ] No

b) If yes, how much difficulty does their ability to physically react quickly cause when they are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

4. a) Do they have problems with their flexibility? [ ] Yes [ ] No

Probe: What does “flexibility” mean to you?

b) If yes, how much difficulty do these problems with their flexibility cause when they are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

5. a) Do they have problems with their hearing? [ ] Yes [ ] No

b) If yes, how much difficulty do these problems with their hearing cause when they are driving?

[ ] No difficulty [ ] A little Difficulty [ ] Some Difficulty [ ] A great deal of difficulty

6. a) Do they have problems with strength (e.g., wrist strength, ankle strength)? [ ] Yes [ ] No
b) If yes, how much difficulty do these problems with their strength cause when they are driving?

[ ] No difficulty  [ ] A little Difficulty  [ ] Some Difficulty  [ ] A great deal of difficulty

7. a) Do they have problems with dividing their attention between two tasks?  [ ] Yes  [ ] No

b) If yes, how much difficulty do these problems with dividing their attention cause when they are driving?

[ ] No difficulty  [ ] A little Difficulty  [ ] Some Difficulty  [ ] A great deal of difficulty

8. a) Do they have problems with their depth perception?  [ ] Yes  [ ] No

b) If yes, how much difficulty do these problems with their depth perception cause when they are driving?

[ ] No difficulty  [ ] A little Difficulty  [ ] Some Difficulty  [ ] A great deal of difficulty

9. a) Do they have problems with their ability to think quickly?  [ ] Yes  [ ] No

b) If yes, how much difficulty do these problems with their ability to think quickly cause when they are driving?

[ ] No difficulty  [ ] A little Difficulty  [ ] Some Difficulty  [ ] A great deal of difficulty

10. a) Do they have problems with selective attention (begin able to pay attention to one thing and ignore something else that is also going on)?  [ ] Yes  [ ] No

b) If yes, how much difficulty do these problems with their selective attention cause when they are driving?

[ ] No difficulty  [ ] A little Difficulty  [ ] Some Difficulty  [ ] A great deal of difficulty

PART B: DRIVING ABILITIES: OTHER RATING

The following questions refer to your significant other’s driving performance. That is, these questions refer to what he/she actually does while driving.

Probe: Do you have any concerns about answering these questions?
Do you feel the following statement would be helpful in adding to the instructions?

“Please answer all questions to the best of your knowledge. All of your answers are confidential and will not be shared with your significant other or anyone else.”

Please evaluate your typical performance on each of the following driving tasks:

1. Maintain proper speed is

[ ] Very Good  [ ] Good  [ ] Neutral  [ ] Poor  [ ] Very Poor

Probe: What does “proper speed” mean to you?
2. Use mirror appropriately is
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

   **Probe:** What does “appropriately” mean to you?
   What mirrors were you thinking of?

3. Change lanes by signalling and checking their mirrors is
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

4. Respond to changing road conditions
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

   **Probe:** How did you arrive at your answer? Talk me through your thoughts.

5. Manage intersections
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

6. Maintain proper lane position
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

   **Probe:** What does “proper lane position” mean to you?

7. Signal in time to alert other drivers of their intended action (e.g., turn, lane change) is
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

8. Respond appropriately to warning road signs is
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

9. Leave a safe distance between their vehicle and the vehicle in front of them is
   [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

   **Probe:** What does “safe distance” mean to you?

10. Handle in car distractions (e.g., talking, radio)
    [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

11. React quickly to unexpected road hazards (e.g., pedestrian, cyclist, debris on the road)
    [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

   **Probe:** What did you think about when coming up with your answer?

12. Drive in heavy traffic is
    [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

13. Drive at night is
    [ ] Very Good     [ ] Good     [ ] Neutral     [ ] Poor     [ ] Very Poor

14. Use proper procedures when making a left hand turn is
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[ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very Poor

Probe: What does “proper procedures” mean to you?

15. Drive in unfamiliar areas is

[ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very Poor

16. Park their vehicle safely is

[ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very Poor

17. Drive safely, in comparison to other drivers their age

[ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very Poor

18. Notice changes in their driving abilities and make appropriate changes

[ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very Poor

19. Notice driving errors when they make an error while driving (e.g., cutting off another driver, failing to signal, etc.)

[ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very Poor

Probe: Did you find yourself “editing” your responses either to be more positive or more negative than your initial reaction?

Additional Question about YOUR SIGNIFICANT OTHER’S driving.

Driving ability refers to the person’s performance on various driving tasks (e.g., making turns, navigating traffic, handling bad road conditions).

Driving habits refers to the things a person does to ensure they are driving safely (e.g., not driving at night because they had difficulties seeing, minimizing distractions in the car, driving less frequently, etc.)

Probe: Are you able to understand the difference between ability and habits? Describe the difference in your own words.

1. a) Over the past 2 months, have you noticed any changes in their driving ability?

[ ] A lot of Decline [ ] Some Decline [ ] No Change [ ] Some improvement [ ] A lot of Improvement

Probe: What did you think about in order to arrive at your answer?

b) If you have noticed any changes, please describe these changes.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. a) Over the past 2 months, have you noticed any recent changes in their driving habits?
A lot of Decline [ ] Some Decline [ ] No Change [ ] Some improvement [ ] A lot of Improvement

Probe: What does “driving habits” mean to you?
Is this different from “driving ability” in the previous question?

b) If you have noticed any changes, please describe these changes.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

3. Which of the following strategies does your significant other use before he/she drives?
(Check all that apply to you)
[ ] Plan your route
[ ] Regular eye examinations
[ ] Talk to others about your driving
[ ] Regular visits to the doctor
[ ] Keep windshields clean
[ ] Regular physical exercise
[ ] Chooses not to drive during certain times of day
[ ] Chooses not to drive when he/she is not up to it
[ ] Do a self-assessment to ensure he/she is physically, emotionally and mentally able to drive that day
[ ] Have special equipment installed in his/her vehicle for his/her needs
[ ] Limit his/her driving to certain areas
[ ] Regular mental exercise (e.g., reading, logic puzzles)
[ ] Has asked a doctor/pharmacist about the effects of his/her medications on driving
[ ] Do not consume alcohol if he/she is going to be driving
[ ] None of the above
[ ] I do not know if they do any of the things on this list

4. Which of the following strategies does your significant other use while he/she is driving?
(Check all that apply to him/her)
[ ] Use the 3 second rule
[ ] Check mirrors regularly
[ ] Minimize in car noise (e.g., radio, people talking)
[  ] Looks well ahead of the vehicle (e.g., to the next traffic light, 4 or 5 cars ahead) to see what traffic is doing

[  ] Minimize distractions in the vehicle

[  ] Use a passenger to help navigate

[  ] Drive at the speed limit

[  ] None of the above

[  ] I do not know if they do any of the things on this list
Appendix D: Study 1 - Questionnaires for SAFE Intervention Pilot Study

Background Questionnaire

Part A. Please tell us about yourself.

1. Are you? ___ male   or  ___ female

2. Your age: ______

3. Did you complete high school? ___ Yes ___ No

4. Did you complete university/college ___Yes  ____ No

5. **Overall**, would you say your health is:
   ___Excellent     ___Good    ___Fair    ____Poor

6. Compared to others your age, **would you say that your eyesight is**:
   ___Better than most   ___About the same   ___Worse than most

7. **How many days** have you driven in the **past week**? ___ (# days)

8. **In the last month how long** were **most** of your driving trips (each way)?
   ___ less than 30 minutes   ___ over 30 minutes   ___ over 60 minutes

9. In the **past month** have you taken or used:  (Check all that apply)
   ___ rides from family or friends   ___ taxis   ___ buses
   ___ delivery services   ___ special transit services

Feedback Questionnaire

Please answer the following questions regarding the SAFE driving program. Your opinions are important to us and will help in improving this program. Your answers will be confidential.

1. What did you think about the length of the program?
   [   ] Too long     [   ] Just the right length     [   ] Too brief
If you thought the program was too long or too brief, what length would you recommend (e.g., only 1 session, a full day, etc.)?__________________________________________

2. Did you find yourself becoming fatigued by:
   a. The end of the 1st session? [  ] Yes [  ] No
   b. The end of the 2nd session? [  ] Yes [  ] No

3. In your opinion, were the slides easy to read? [  ] Yes [  ] No
   a. If No, what, if anything, do you think made the slides difficult to read (e.g., small font, too much information on a slide, etc.)?____________________________________________________

4. Did you find the slides clear and easy to understand? [  ] Yes [  ] No
   a. If No, what, if anything, do you think made the slides unclear and difficult to understand (e.g., use of words that are unfamiliar to you, content was too complex, etc.)?____________________________________________________

5. In your opinion, were the videos included in the presentation helpful? [  ] Yes [  ] No

6. What did you think about the pace at which the material was presented?
   [  ] Way too fast [  ] A bit too fast [  ] Just the right pace
   [  ] A bit too slow [  ] Way too slow

7. How satisfied were you with the topics covered in the SAFE driving program?
   [  ] Very satisfied [  ] Satisfied [  ] Neutral [  ] Unsatisfied [  ] Very unsatisfied
8. What topics, covered by the SAFE driving program, did you find the most useful?

(Check all that apply)

[ ] Information on crash risk

[ ] Review of high crash risk driving skills (e.g., left turns)

[ ] How vision and hearing impact driving

[ ] How physical abilities impact driving

[ ] How thinking abilities impact driving

[ ] Awareness Stops – you were asked to think about your own driving

[ ] Strategic strategies to use before you drive
   
   If checked: What strategies did you find particularly useful? ______

[ ] Tactical strategies to use when you are driving
   
   If checked: What strategies did you find particularly useful? ______

[ ] Warning Signs that you may need to evaluate your driving

[ ] Financial aspects of driving

[ ] Alternatives to driving (e.g., buses, taxies)

[ ] None of the above

[ ] Other ________________________________

9. What topics, covered by the SAFE driving program, did you find the least useful?

(Check all that apply)

[ ] Information on crash risk

[ ] Review of high crash risk driving skills (e.g., left turns)

[ ] How vision and hearing impact driving

[ ] How physical abilities impact driving

[ ] How thinking abilities impact driving

[ ] Awareness Stops – you were asked to think about your own driving

[ ] Strategic strategies to use before you drive
   
   If checked: What strategies did you find particularly useful? ______

[ ] Tactical strategies to use when you are driving
If checked: What strategies did you find particularly useful?

[    ] Warning Signs that you may need to evaluate your driving
[    ] Financial aspects of driving
[    ] Alternatives to driving (e.g., buses, taxies)
[    ] None of the above
[    ] Other __________________________________________________

10. What other topics or information would you like to see included in the SAFE driving program?
________________________________________________________________
________________________________________________________________
________________________________________________________________

11. How helpful did you find the SAFE driving program handbook?
[    ] Very helpful   [    ] Somewhat helpful   [    ] Neutral   [    ] Somewhat unhelpful
[    ] Very unhelpful

12. In your opinion, was the handbook easy to read?   [    ] Yes   [    ] No
   a. If No: What, if anything, do you think made the handbook difficult to read (e.g., small font, too much information on a slide, etc.)?
      __________________________________________________________
      __________________________________________________________
      __________________________________________________________

13. Did you find the handbook clear and easy to understand?   [    ] Yes   [    ] No
   a. If No: What, if anything, do you think made the handbook unclear and difficult to understand (e.g., use of words that are unfamiliar to you, content was too complex, etc.)?
      __________________________________________________________
      __________________________________________________________
      __________________________________________________________
14. What did you like best about the handbook? __________________________
________________________________________________________________
________________________________________________________________

15. What did you like least about the handbook? __________________________
________________________________________________________________
________________________________________________________________

16. Did attending the SAFE education program make you more aware of changes 
   that can affect your driving? 
   [ ] Yes 
   [ ] No

17. Would you recommend this session to an older adult friend or family member 
   who drives? 
   [ ] Yes 
   [ ] No 
   If No, what would need to be changed about the program for you to 
   recommend it to another older adult? ________________________________

18. Do you think that the information provided in this program could be useful for 
   helping older adults talk about driving concerns with their families? 
   [ ] Yes [ ] No

19. Overall, how would you rate the usefulness of the SAFE education program? 
   [ ] Very useful [ ] Somewhat useful [ ] A little useful [ ] Not at all useful

20. Overall, what did you find most useful about the SAFE education 
    program? ______________________________________________________
    ________________________________________________________________
    ________________________________________________________________
21. Overall, what would you suggest to improve the session? ________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

22. Any additional comments
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

Thank you for completing this questionnaire.
Appendix E: Study 1 Recruitment Materials

Telephone Script for DAQ Pilot Study

Hi (Name)

My name is (name of researcher/research assistant). I am a (researcher/ research assistant) that works with Dr. Holly Tuokko at the Centre on Aging at the University of Victoria. I am calling as your name was on our participant list for older driving research. (If participant are not home a message will be left asking them to call me back if they are interested in being involved in another research project: See Note 1 at the bottom of this page)

In order to participate, you must be 70 years of age or older, be currently driving, and have someone who drives with you at least once a week.

Are you 70 years of age?

Do you currently drive?

Do you have someone who drives with you at least once and week?

In this study, we are evaluating a new questionnaire called the Driving Awareness Questionnaire that we created at the University of Victoria. This questionnaire is designed to help measure older drivers awareness about driving and driving issues related to older adults. Through this study, we hope to gather your opinions about the questionnaire

This study involves a total time commitment of about 1 hour for both you and your significant other.

If you decide to participate you will be asked come in the Centre on Aging at the University of Victoria to fill out a consent form and complete questionnaire and a feedback form. This session will take 1 hour. Your significant other can also attend this meeting, or they can come in at another time that is convenient for them.

Would you be able to contact the person who drives with you to ensure they would like to participate in our study? If they would like to participate they can contact us so we can explain the study to them.

Do you have any questions? See Note 2 at the bottom of this page.

Your participation of course, is strictly voluntary, and you can decide to drop out of the study at any time.
Would you like to schedule a questionnaire session? When are you available to come into the Centre on Aging for this session? The session will take 1 hour.

Thank you for interest in the study and we look forward to meeting you.

NOTES:

1. First 2 sentences will vary depending on whether we are answering or returning their call.

2. The purpose of this telephone script is to inform the participant of the nature of the study and to schedule the first session. Many issues that individuals may have questions about are addressed in the consent form. The research assistants will keep a copy of the consent form beside them to refer to when answering these questions.

Consent Forms for DAQ Pilot Study

Participant Consent Form

Research Project Title: Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention

Researcher(s): Wendy Lindstrom-Forneri, MA, University of Victoria, British Columbia  Dr. Holly Tuokko, University of Victoria, British Columbia

Sponsor (if applicable): Alzheimer’s Society of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

You are invited to participate in a study of older drivers that is being conducted by Dr. Holly Tuokko and Wendy Lindstrom-Forneri at the Centre on Aging at the University of Victoria. Dr. Holly Tuokko is a faculty member in the Psychology Department at the University of Victoria and Wendy Lindstrom-Forneri is a PhD student in the Psychology
Department and you may contact either one of them if you have further questions by email or by phone at:

Email: htuokko@uvic.ca Ph: 721-6576
Email: wel@uvic.ca Ph: 721-8987

This research is being funded by the Alzheimer’s Society of Canada.

**Purpose and Objectives**
The purpose of this research project is to evaluate a questionnaire entitled Driving Awareness. This questionnaire was developed for older drivers. The questionnaire will take approximately 20 minutes to complete. We would like to find out your opinions about the Driving Awareness questionnaire to determine if questions are clear and easy to understand. Your feedback may be used to change the questionnaire to make it more user-friendly.

**Importance of this Research**
It is important to get your feedback regarding the Driving Awareness questionnaire to ensure the questionnaire is easily understood. The questionnaire will be used in future research on older driver safety.

**Participants Selection**
You are being asked to participate in this study because you are an older driver who is 70 years of age and older, has a significant other who drives with them at least once a week, and are fluent in English.

**What is involved?**
This study will involve you completing 2 questionnaires.

The questionnaires will ask questions about a) your awareness of older driver issues and rating your driving abilities, and b) your opinions about the clarity of the questions on the questionnaire. The session will take you 1 hour or less to complete.

**Inconvenience**
The inconveniences in this study are time and the transportation to and from the Centre on Aging.

**Risks**
There are no known or anticipated risks to you by participating in this study.

**Benefits**
You will have the opportunity to help evaluate the Driving Awareness questionnaire. This may help to advance our knowledge on older driver awareness. This knowledge may be helpful for educational interventions to help older drivers drive safely longer.
Voluntary Participation
Your participation in this study must be completely voluntary. If you do decide to participate, you may withdraw at any time without any explanation. IF YOU CHANGE YOUR MIND ABOUT PARTICIPATING IN THE STUDY AT ANY POINT WE WILL ASK FOR YOUR PERMISSION TO USE YOUR COMPLETED DATA IN OUR RESEARCH.

Anonymity and Confidentiality
In regard to your anonymity, as your significant other knows who you are we cannot guarantee anonymity. Your confidentiality and the confidentiality of the questionnaire data will be protected as much as possible. ALL experimental data associated with you will be identified with a subject number only. Your answers to the questions will not be shared with your significant other. To ensure confidentiality of the data the consent forms and questionnaires will be stored securely in a locked filing cabinet and the computer files will be password protected. In any written reports you will not be identified.

Dissemination of Results
The results will be used for a dissertation and will be shared with others through published articles and presentation at scholarly meetings. Your identity will remain confidential in all published journals, reports and presentations at scholarly meetings.

Disposal of Data
Data from this study will be kept securely for 7 years. At this time computer files will be erased, and paper files and consent forms will be shredded.

Contacts
Individuals that may be contacted regarding this study include Dr. Holly Tuokko or Wendy Lindstrom-Forneri. Please see contact information at the beginning of this consent form.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545) or ethics@uvic.ca.

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

Name of Participant ___________________________ Signature ___________________________ Date ______________

A copy of this consent will be left with you, and a copy will be taken by the researcher.
Significant Other Consent Form

Research Project Title: Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention

Researcher(s): Wendy Lindstrom-Forneri, MA, University of Victoria, British Columbia
Dr. Holly Tuokko, University of Victoria, British Columbia

Sponsor (if applicable): Alzheimer’s Society of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

You are invited to participate in a study of older drivers that is being conducted by Dr. Holly Tuokko and Wendy Lindstrom-Forneri at the Centre on Aging at the University of Victoria. Dr. Holly Tuokko is a faculty member in the Psychology Department at the University of Victoria and Wendy Lindstrom-Forneri is a PhD student in the Psychology Department and you may contact either one of them if you have further questions by email or by phone at:

Email: htuokko@uvic.ca
Ph: 721-6576
Email: wel@uvic.ca
Ph: 721-8987

This research is being funded by the Alzheimer’s Society of Canada.

Purpose and Objectives
The purpose of this research project is to evaluate a questionnaire entitled Driving Awareness. This questionnaire was developed for older drivers. The questionnaire will take approximately 20 minutes to complete. We would like to find out your opinions about the Driving Awareness questionnaire to determine if questions are clear and easy to understand. Your feedback may be used to change the questionnaire to make it more user-friendly.

Importance of this Research
It is important to get your feedback regarding the Driving Awareness questionnaire to ensure the questionnaire is easily understood. The questionnaire will be used in future research on older driver safety.
Participants Selection
You are being asked to participate in this study because you drive at least once a week with an older driver who is 70 years of age and older and are fluent in English.

What is involved?
This study will involve you completing 2 questionnaires.

The questionnaires will ask questions about a) your ranking of your significant other (whom you drive with at least once a week) driving abilities, and b) your opinions about the clarity of the questions on the questionnaire. The session will take you 1 hour or less to complete.

Inconvenience
The inconveniences in this study are time and the transportation to and from the Centre on Aging.

Risks
There are no known or anticipated risks to you by participating in this study.

Benefits
You will have the opportunity to help evaluate the Driving Awareness questionnaire. This may help to advance our knowledge on older driver awareness. This knowledge may be helpful for educational interventions to help older drivers drive safely longer.

Voluntary Participation
Your participation in this study must be completely voluntary. If you do decide to participate, you may withdraw at any time without any explanation. IF YOU CHANGE YOUR MIND ABOUT PARTICIPATING IN THE STUDY AT ANY POINT WE WILL ASK FOR YOUR PERMISSION TO USE YOUR COMPLETED DATA IN OUR RESEARCH.

Anonymity and Confidentiality
In regard to your anonymity, as your significant other knows who you are we cannot guarantee anonymity. Your confidentiality and the confidentiality of the questionnaire data will be protected as much as possible. ALL experimental data associated with you will be identified with a subject number only. Your answers to the questions will not be shared with your significant other. To ensure confidentiality of the data the consent forms and questionnaires will be stored securely in a locked filing cabinet and the computer files will be password protected. In any written reports you will not be identified.

Dissemination of Results
The results will be used for a dissertation and will be shared with others through published articles and presentation at scholarly meetings. Your identity will remain confidential in all published journals, reports and presentations at scholarly meetings.
Disposal of Data
Data from this study will be kept securely for 7 years. At this time computer files will be erased, and paper files and consent forms will be shredded.

Contacts
Individuals that may be contacted regarding this study include Dr. Holly Tuokko or Wendy Lindstrom-Forneri. Please see contact information at the beginning of this consent form.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office, at the University of Victoria (250-472-4545) or ethics@uvic.ca.

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

| Name of Participant | Signature | Date |

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Telephone Script for SAFE Pilot Study

Hi (Name)

My name is Wendy Lindstrom-Forneri. I am a researcher that works with Dr. Holly Tuokko at the Centre on Aging at the University of Victoria. I am calling as your name was on our participant list for older driving research. (If participant are not home a message will be left asking them to call me back if they are interested in being involved in another research project: See Note 1 at the bottom of this page)

In order to participate, you must be 70 years of age or older, be currently driving, and have someone who drives with you at least once a week, and are thinking about changing your driving behaviours?

Are you 70 years of age?

Do you currently drive?

Do you have someone who drives with you at least once and week?

Are you thinking about changing your driving behaviours?
In this study, we are evaluating a new educational driving course called the Safety Awareness for Elderly Drivers that we created at the University of Victoria. This educational program was developed for older drivers to help them learn more about age-related driving issues and to drive safely longer. The program consists of two half-day sessions of three hours each. We would like to find out your opinions about the SAFE educational program.

Through this study, we hope to gather your opinions about the educational program.

This study involves a total time commitment of about 6 hours.

If you decide to participate you will be asked come in the Centre on Aging at the University of Victoria to fill out a consent form and take part in the educational program and give us feedback about the program. There are 2 sessions that you would attend. Each session is 3 hours in length.

Do you have any questions? See Note 2 at the bottom of this page.

Your participation, of course, is strictly voluntary, and you can decide to drop out of the study at any time.

Would you like to participate in this educational driving course?

(If yes – information will be given on the 2 dates for the educational session and instructions will be given on where the Centre on Aging is located on campus).

Thank you for interest in the study and we look forward to meeting you.

NOTES:

1. First 2 sentences will vary depending on whether we are answering or returning their call.

2. The purpose of this telephone script is to inform the participant of the nature of the study and to schedule the first session. Many issues that individuals may have questions about are addressed in the consent form. The research assistants will keep a copy of the consent form beside them to refer to when answering these questions.
Consent Form for the SAFE Pilot Study

Research Project Title: Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention

Researcher(s): Wendy Lindstrom-Forneri, MA, University of Victoria, BC
Dr. Holly Tuokko, University of Victoria, BC

Sponsor (if applicable): Alzheimer’s Society of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

You are invited to participate in a study of older drivers that is being conducted by Dr. Holly Tuokko and Wendy Lindstrom-Forneri at the Centre on Aging at the University of Victoria. Dr. Holly Tuokko is a faculty member in the Psychology Department at the University of Victoria and Wendy Lindstrom-Forneri is a PhD student in the Psychology Department and you may contact either one of them if you have further questions by email or by phone at:

Email: htuokko@uvic.ca Ph: 721-6576
Email: wel@uvic.ca Ph: 721-8987

This research is being funded by the Alzheimer’s Society of Canada.

Purpose and Objectives
The purpose of this research project is to evaluate an educational program called Safety Awareness for Elderly Drivers (SAFE). This educational program was developed for older drivers to help them learn more about age-related driving issues and drive safely longer. The program consists of two half-day sessions of three hours each. Class size is a maximum of 5 people with course materials supplied at no cost. We would like to find out your opinions about the SAFE educational program.

Importance of this Research
It is important to get your feedback regarding the SAFE educational program because it has potential to promote older driver safety. The SAFE program, if found to be a useful educational tool, is an inexpensive way to help older adults drive safely longer.
Participants Selection
You are being asked to participate in this study because you currently drive, are 70 years of age and older, are thinking about changing your driving behaviours, have a significant other who is familiar with your driving and drives with you at least once a week, and are fluent in English.

What is involved?
Participants will attend the SAFE education program. This will consist of two 3 hour sessions over 2 days. The SAFE program will include an informational component, a driving strategies component, and an overcoming obstacles component. At the end of each session participants will complete a feedback questionnaire to evaluate the program.

Inconvenience
The potential inconvenience in this study is time. Another potential inconvenience that you may experience is transportation to and from the Centre on Aging or local community centre.

Risks
You may learn that you are at greater risk for unsafe driving behaviours or a motor vehicle accident than they were aware of previously. This may make you feel uncomfortable, however, these issues will be addressed as part of the education program. If you are still concerned following the intervention please talk to the instructor. If you have concerns about your driving abilities, we also encourage you to discuss this with your family and/or your doctor.

Benefits
You will have the opportunity to learn more about safe driving practices, the issues facing older drivers and what you can do to help yourself stay on the road safely longer. You will receive free the SAFE educational program materials. After all the data is analysed we will provide you with results from the study.

Voluntary Participation
Your participation in this study must be completely voluntary. If you do decide to participate, you may withdraw at any time without any explanation. IF YOU CHANGE YOUR MIND ABOUT PARTICIPATING IN THE STUDY AT ANY POINT WE WILL ASK FOR YOUR PERMISSION TO USE YOUR COMPLETED DATA IN OUR RESEARCH.

On-going Consent
To make sure that you continue to consent to participate in this research, I will provide a verbal reminder of the purpose of the study and your right to withdraw at any point at the beginning of each of the SAFE educational sessions.

Anonymity and Confidentiality
In regard to your anonymity, due to the group format of the educational program, we cannot guarantee anonymity or confidentiality of any comments you make during the
sessions. Your confidentiality and the confidentiality of the questionnaire data will be protected as much as possible. ALL experimental data associated with you will be identified with a subject number only. To ensure confidentiality of the data the consent forms and questionnaires will be stored securely in a locked filing cabinet and the computer files will be password protected. In any written reports you will not be identified.

**Dissemination of Results**
The results will be used for a dissertation and will be shared with others through published articles and presentation at scholarly meetings. Your identity will remain confidential in all published journals, reports and presentations at scholarly meetings. A short report will be made available to you on the Centre on Aging website. You can access this website at [http://www.coag.uvic.ca/](http://www.coag.uvic.ca/).

**Disposal of Data**
Data from this study will be kept securely for 7 years. At this time computer files will be erased, and paper files and consent forms will be shredded.

**Contacts**
Individuals that may be contacted regarding this study include Dr. Holly Tuokko or Wendy Lindstrom-Forneri. Please see contact information at the beginning of this consent form.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545) or ethics@uvic.ca.

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

________________________  ______________________  ____________
Name of Participant       Signature                          Date

*A copy of this consent will be left with you, and a copy will be taken by the researcher.*
Appendix F: Study 2 – Design

Contact Researchers

3MS and Pre-Intervention Questionnaires (*a-e)

Gender and Cognition Stratified Random Assignment to Intervention or Control Group

SAFE Intervention Group

Intervention and Immediate Post-Intervention Questionnaires (*b-d, f)

2 months Post-Intervention Questionnaire (*a-f)

Treatment as Usual Control Group

Road Sense Booklet

2 months Post-Intervention Questionnaire (*a-f)

Intervention

*Questionnaires: a) Background and Demographics questionnaire, b) Driver Safety Awareness questionnaire, c) Attitudes and Beliefs questionnaire, d) Readiness to Change questionnaire, e) Current Driving Habits questionnaire, f) Feedback questionnaire.
Appendix G: Study 2 – Recruitment Materials

Telephone Script

Hi (Name)

My name is (name of research assistant). I am a research assistant that works at the Centre on Aging at the University of Victoria. I am returning your call about the Safety Awareness for Elderly Drivers education program. You indicated in the message that you left with us that you would be interested in participating in our study. See Note 1 at the bottom of this page.

In order to participate, you must be 70 years of age or older, be thinking about your driving, be currently driving, and have someone who drives with you at least once a week.

Are you 70 years of age?

Do you currently drive?

Have you recently thought about your driving behaviours?

Do you have someone who drives with you at least once and week?

Are they willing to participate in the research study?

In this study, we are evaluating the SAFE education program that we created at the Centre on Aging (University of Victoria). This is an education program that takes 2, 2hour sessions and is designed to help older drivers increase their knowledge about driving issues and drive safely longer. Through this study, we hope to gather your opinions regarding the SAFE education program and evaluate the effectiveness of the program.

This study involves a total time commitment of about 6 – 8 hours over 4 sessions.

If you decide to participate you will be asked come in the Centre on Aging at the University of Victoria to fill out a consent form and complete questionnaires. This session will take 1-1.5 hrs. Your significant other also attends this meeting, or they can come in at another time to complete the consent form and questionnaire.

At the end of this session you would be randomly assigned to either the SAFE program group or to a treatment as usual group (See explanation for each group)

The control group is important for our research as part of that group you will get a copy of the Roadsense for Drivers handbook. You will be given an opportunity to take the 2 day Education course at the end of the study (once you have been mailed back the follow-up questionnaires).
For the SAFE education program you will be asked to come to the Yakamovich Wellness Centre on Hillside Avenue for 2, 2-hour sessions. There are sessions available both in the morning and the afternoons. The program will include educational information on driving issues, strategies to increase safe driving practices, and ways to overcome potential obstacles. At the end of the second day you will be asked to complete another set of questionnaires.

Two months later we will mail you another questionnaire package that will take approximately 1 hour for you to complete. You will be asked to mail back the completed questionnaires using the stamped envelope provided. Your passenger will also receive a questionnaire that will take 15-20 minutes to complete.

Do you have any questions? See Note 2 at the bottom of this page.

Your participation of course, is strictly voluntary, and you can decide to drop out of the study at any time.

Would you like to schedule the first questionnaire session? When are you available to come into the Centre on Aging for this session? The session will take 1-1.5 hours.

Thank you for interest in the study and we look forward to meeting you.

NOTES:

1. First 2 sentences will vary depending on whether we are answering or returning their call.

2. The purpose of this telephone script is to inform the participant of the nature of the study and to schedule the first session. Many issues that individuals may have questions about are addressed in the consent form. The research assistants will keep a copy of the consent form beside them to refer to when answering these questions.

Posters

Please note that the font size and layout of these posters have been altered slightly to accommodate the required margins for this manuscript. A copy of the original posters if available upon request.
THINKING ABOUT CHANGING YOUR DRIVING HABITS?

Research study on the
Safety Awareness for Elderly Drivers (SAFE)
A Mature Driver Educational Program

Participants Needed
We are inviting men and women, 70 years of age and over
 to participate in a study on driving. This project is being
conducted by researchers at the Centre on Aging at the
University of Victoria.

What is required of participants?
- Complete an initial background & driving questionnaire package
- Attend a new educational course (two ½ day sessions; 2.5
  hours each)
- Two months later, complete a second questionnaire package
- Must have a passenger who rides with you at least once a
  week: They would need to complete 2 brief questionnaires

How will participants benefit?
- Learn more about safe driving practices
- Learn strategies to drive safely
- Get a free driving handbook for older drivers (as part of the
  education program)
- No impact on your driver’s license

IF YOU WOULD LIKE TO VOLUNTEER TO PARTICIPATE
PLEASE CONTACT Wendy at 721-8987
THANK YOU FOR YOUR INTEREST!
THINKING ABOUT YOUR DRIVING HABITS?

Research Study on an Educational Program for Mature Drivers:
Drive SAFE: Safety Awareness for Elderly Drivers

Participants Needed!!

We are inviting men and women, 70 years of age and over to participate in a study on driving. This project is being conducted by researchers at the Centre on Aging at the University of Victoria.

What is required of participants?
- Complete an initial background & driving questionnaire package
- Attend a new educational course (two ½ day sessions; 2 hours each)
  - Sessions available in July, Aug., Sept., Oct., Nov. – Call Today!
- Two months later, complete a second questionnaire package
- Must have a passenger who rides with you at least once a week: They would need to complete 2 brief questionnaires

How will participants benefit?
- Learn more about safe driving practices
- Learn strategies to drive safely longer
- Get a free driving handbook for older drivers
- No impact on your driver’s license

IF YOU WOULD LIKE TO VOLUNTEER TO PARTICIPATE
PLEASE CONTACT Wendy, Nancy or Ginny at 250-721-8987
Take-away Handouts
These handouts were places near the posters and given to health care professionals to distribute within local clinics.

Research study on the Safety Awareness for Elderly Drivers: A Mature Driver Educational Program

Participants Needed
Must be 70 years of age or over

What is required?
• Complete a questionnaire package
• Attend a new educational driving course
• Two months later, complete a second questionnaire package
• Must have a passenger who rides with you at least once a week: They would need to complete 2 brief questionnaires

How will you benefit?
• Learn about safe driving strategies
• Get a free driving handbook

To Participate Contact Wendy: 721-8987

University of Victoria Centre on Aging
Letter and Centre on Aging Map

I look forward to seeing you and your passenger. Please come to the Centre on Aging in Sedgewick Building A for your scheduled appointment.

Here is a map of the campus. I have included both 1) a large overview map and 2) a map that focuses in on the Centre on Aging and the parking.

You can park in either lot 4 or lot 8 in the general parking. Parking pay stations are available in both parking lots. The pay stations take credit cards or coins. It does not matter where you buy your parking pass - it is good in any general lot. If you park in the metered parking, you must pay at that meter.

Thank you for volunteering to participate!

Wendy Lindstrom-Forneri, MA
Graduate Student
Centre on Aging
University of Victoria
250-721-8987
Directions

If you park in parking lot 4 you will walk between the Business and Economics Building and the new Social Sciences and Math Building— it has just currently just completed construction. At the end of the site is three green low-rise buildings called Sedgewick A, B, & C. The Centre on Aging is located in Sedgewick Building A (indicated by the pink arrow). If you have any problems please don’t hesitate to call my office at 721-8987. I will have signs posted to assist with directions so keeps your eyes out.
**Letter and Map for Community Centre**

Older drivers in the intervention group were given this once an education session was assigned.

Thank you for participating in this research project.

The Drive SAFE education program will be held at the Yakimovich Wellness Centre.

You are booked to come to the Drive SAFE program on _________________.
**Only you** come to this session, your passenger does not come to this session.

If you have any questions about your involvement in this research study please call Wendy at 250-721-8987.

The Yakimovich Wellness Centre is located in the **Hillside Seniors Health Centre** at 1454 Hillside Ave, Victoria, BC. Phone 250-370-5641.

There is **limited free two hour parking** available on Gosworth Street off Hillside Avenue. Paid parking is available at the back of the building. The cost is one dollar per one and three quater hours of parking. We are easily accessible by the #4 city bus (UVIC/Downtown).
Instruction Letter for Control Group

Older drivers who were in the control group were given this letter after the first session.

Safety Awareness For Elderly Drivers (S.A.F.E.): The development and evaluation of an educational intervention

As part of Group 2 you have been given a book entitled “RoadSense for Drivers: BC’s Safe Driving Guide.”

Please review this book over the next week from ______________ to ______________.

Please do not review the materials for longer than one week, for the importance of the research study.

In approximately 9 weeks we will mail you and your passenger the last set of questionnaires. When you received these, please complete them and mail them back in the self-addressed stamped envelope that will be provided.

Once you have mailed back the questionnaires you will be given an opportunity to participate in the 2 day (2 hours each day) S.A.F.E. Education Program.

Thank you for participating in our research project.
Appendix H: Study 2 – Consent Forms

Participant Consent Form

Research Project Title: Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention

Researcher(s): Wendy Lindstrom-Forneri, MA, University of Victoria, BC
              Dr. Holly Tuokko, University of Victoria, BC

Sponsor (if applicable): Alzheimer’s Society of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

You are invited to participate in a study of older drivers that is being conducted by Dr. Holly Tuokko and Wendy Lindstrom-Forneri at the Centre on Aging at the University of Victoria. Dr. Holly Tuokko is a faculty member in the Psychology Department at the University of Victoria and Wendy Lindstrom-Forneri is a PhD student in the Psychology Department and you may contact either one of them if you have further questions by email or by phone at:

Email: htuokko@uvic.ca                         Ph: 721-6576
Email: wel@uvic.ca                              Ph: 721-8987

This research is being funded by the Alzheimer’s Society of Canada.

Purpose and Objectives
The purpose of this research project is to evaluate an educational program called Safety Awareness for Elderly Drivers (SAFE). This educational program was developed for older drivers to help them learn more about age-related driving issues and drive safely longer. The program consists of two half-day sessions of two hours each. Class size is a maximum of 10 people with course materials supplied at no cost. We would like to find out your opinions about the SAFE educational program and the effectiveness of the program.
**Importance of this Research**
It is important to get your feedback regarding the SAFE educational program because it has potential to promote older driver safety. The SAFE program, if found to be a useful educational tool, is an inexpensive way to help older adults drive safely longer.

**Participants Selection**
You are being asked to participate in this study because you currently drive, are 70 years of age and older, are thinking about changing your driving behaviours, have a significant other who is familiar with your driving and drives with you at least once a week, and are fluent in English.

**What is involved?**
This study will involve three different stages: 1) baseline questionnaires, 2) two 1/2 day sessions for the SAFE educational program, and 3) follow-up questionnaires.

**Stage 1:**
All participants will complete the baseline questionnaires and a brief cognitive screen. The brief cognitive screen is a 10-minute task in which you will be asked to answer questions orally and do some paper-pencil based tasks. Your significant other will also attend this session and complete 2 questionnaires. The questionnaires will ask questions about a) your background and demographics, so we know more about who is participating in the study; b) your awareness of driving safety; c) your driving abilities; d) your attitudes and beliefs toward driving; e) your readiness to change your driving behaviours, and f) your current driving practices (e.g., how often you drive, how far). The first session will take 1 – 1.5 hours to complete.

**Stage 2:**
Individuals will be randomly assigned to two groups. One group will attend the SAFE education program. This will consist of two 2 hour sessions over 2 days. The SAFE program will include an informational component, a driving strategies component, and an overcoming obstacles component. At the end of the second session participants will fill out another set of questionnaires, including a feedback questionnaire. Questionnaires will take less then 1 hour to complete.

Another group will be given a copy of the Roadsense for Drivers handbook and asked to review the information within the booklet over a one week period. This group will be given the opportunity to take the SAFE education program at the end of the study.

**Stage 3:**
Two-months following the education session (either the SAFE program or Roadsense for Drivers handbook program) you will be asked to complete a set of follow-up questionnaires. These will be the same questionnaires as it stage 1, although you will not have to do the background questionnaire. These questionnaires will take 1 – 1.5 hours to complete. Your significant other will also receive one questionnaire to complete. All packages will contain a self-addressed stamped envelope so there will be no cost to you. You will be asked to mail back the completed questionnaires.
For those in the Roadsense for Drivers handbook group you will be phoned upon receipt of the final questionnaire package to be offered the opportunity to take the SAFE education program.

**Inconvenience**
The major inconvenience in this study is time. Another potential inconveniences that you may experience is transportation to and from the Centre on Aging or local community centre.

**Risks**
You may learn that you are at greater risk for unsafe driving behaviours or a motor vehicle accident than they were aware of previously. This may make you feel uncomfortable, however these issues will be addressed as part of the education program. **If you are still concerned following the intervention please talk to the instructor.** If you have concerns about your driving abilities, we also encourage you to discuss this with your family and/or your doctor.

**Benefits**
You will have the opportunity to learn more about safe driving practices, the issues facing older drivers and what you can do to help yourself stay on the road safely longer. You will receive free the SAFE educational program materials. After all the data is analysed we will provide you with results from the study.

**Voluntary Participation**
Your participation in this study must be completely voluntary. If you do decide to participate, you may withdraw at any time without any explanation. **IF YOU CHANGE YOUR MIND ABOUT PARTICIPATING IN THE STUDY AT ANY POINT WE WILL ASK FOR YOUR PERMISSION TO USE YOUR COMPLETED DATA IN OUR RESEARCH.**

**On-going Consent**
To make sure that you continue to consent to participate in this research, I will provide a verbal reminder of the purpose of the study and your right to withdraw at any point at the beginning of each of the SAFE educational sessions. The final questionnaire package will contain an information sheet.

**Anonymity and Confidentiality**
In regard to your anonymity, due to the group format of the educational program we cannot guarantee anonymity or confidentiality of any comments you make during the sessions. Your confidentiality and the confidentiality of the questionnaire data will be protected as much as possible. **ALL experimental data associated with you will be identified with a subject number only. To ensure confidentiality of the data the consent forms and questionnaires will be stored securely in a locked filing cabinet and the computer files will be password protected. In any written reports you will not be identified.**
**Dissemination of Results**
The results will be used for a dissertation and will be shared with others through published articles and presentation at scholarly meetings. Your identity will remain confidential in all published journals, reports and presentations at scholarly meetings. A short report will be made available to you on the Centre on Aging website. You can access this website at [http://www.coag.uvic.ca/](http://www.coag.uvic.ca/).

**Disposal of Data**
Data from this study will be kept securely for 7 years. At this time computer files will be erased, and paper files and consent forms will be shredded.

**Contacts**
Individuals that may be contacted regarding this study include Dr. Holly Tuokko or Wendy Lindstrom-Forneri. Please see contact information at the beginning of this consent form.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office:

- **University of Victoria**: 250-472-4545, [ethics@uvic.ca](mailto:ethics@uvic.ca)
- **VIHA**: 250-370-8620 [marilyn.fuller@viha.ca](mailto:marilyn.fuller@viha.ca)

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

____ Name of Participant __________________________ Signature __________________________ Date __________

*A copy of this consent will be left with you, and a copy will be taken by the researcher.*

**Passenger Consent Form**

Research Project Title: **Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention**

Researcher(s): Wendy Lindstrom-Forneri, MA, University of Victoria, British Columbia

Dr. Holly Tuokko, University of Victoria, British Columbia

Sponsor (if applicable): Alzheimer’s Society of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should...
You are invited to participate in a study of older drivers that is being conducted by Dr. Holly Tuokko and Wendy Lindstrom-Forneri at the Centre on Aging at the University of Victoria. Dr. Holly Tuokko is a faculty member in the Psychology Department at the University of Victoria and Wendy Lindstrom-Forneri is a PhD student in the Psychology Department and you may contact either one of them if you have further questions by email or by phone at:

Email: htuokko@uvic.ca Ph: 721-6576
Email: wel@uvic.ca Ph: 721-8987

This research is being funded by the Alzheimer’s Society of Canada.

**Purpose and Objectives**
The purpose of this research project is to evaluate an educational program called Safety Awareness for Elderly Drivers (SAFE). This educational program was developed for older drivers to help them learn more about age-related driving issues and drive safely longer. The program consists of two half-day sessions of two hours each. Class size is a maximum of 10 people with course materials supplied at no cost. We would like to find out your opinions about the SAFE educational program and the effectiveness of the program.

**Importance of this Research**
It is important to get your feedback regarding the SAFE educational program because it has potential to promote older driver safety. The SAFE program, if found to be a useful educational tool, is an inexpensive way to help older adults drive safely longer.

**Participants Selection**
You are being asked to participate in this study because you drive at least once a week with an older driver who is 70 years of age and older and are fluent in English.

**What is involved?**
This study will involve three different stages: 1) baseline questionnaires, 2) two ½ day sessions for the SAFE educational program, and 3) follow-up questionnaires.

**Your participation is ONLY required at stage 1) baseline questionnaires and stage 3) follow-up questionnaires.**

**Stage 1:**
You will attend this session and complete 2 questionnaires.
The questionnaires will ask questions about a) your demographics, so we know more about who is participating in the study; b) your rating of your significant other’s driving abilities. The first session will take you no more than 1 hour to complete.

Stage 2:
Education program for the older driver. You do not participate in this stage.

Stage 3:
Two-months following the older driver’s education session you will be asked to complete a set of follow-up questionnaires. These will be the same questionnaires as in stage 1, although you will not have to do the demographic questionnaire. These questionnaires will take approximately 30 minutes to complete. The packages will contain a self-addressed stamped envelope so there will be no cost to you. You will be asked to mail back the completed questionnaires.

Inconvenience
The inconveniences in this study is time and the transportation to and from the Centre on Aging or local community centre.

Risks
There are no known or anticipated risks to you by participating in this study.

Benefits
You will have the opportunity to help evaluate the effectiveness of an educational program that may benefit older drivers. After all the data is analysed we will provide you with results from the study.

Voluntary Participation
Your participation in this study must be completely voluntary. If you do decide to participate, you may withdraw at any time without any explanation. IF YOU CHANGE YOUR MIND ABOUT PARTICIPATING IN THE STUDY AT ANY POINT WE WILL ASK FOR YOUR PERMISSION TO USE YOUR COMPLETED DATA IN OUR RESEARCH.

On-going Consent
To make sure that you continue to consent to participate in this research the final questionnaire package will contain an information sheet.

Anonymity and Confidentiality
In regard to your anonymity, as your relative/friend driver knows who you are we cannot guarantee anonymity. Your confidentiality and the confidentiality of the questionnaire data will be protected as much as possible. ALL experimental data associated with you will be identified with a subject number only. Your answers to the questions will not be shared with your significant other. To ensure confidentiality of the data the consent forms and questionnaires will be stored securely in a locked filing cabinet and the computer files will be password protected. In any written reports you will not be identified.
Dissemination of Results
The results will be used for a dissertation and will be shared with others through published articles and presentation at scholarly meetings. Your identity will remain confidential in all published journals, reports and presentations at scholarly meetings. A short report will be made available to you on the Centre on Aging website. You can access this website at http://www.coag.uvic.ca/.

Disposal of Data
Data from this study will be kept securely for 7 years. At this time computer files will be erased, and paper files and consent forms will be shredded.

Contacts
Individuals that may be contacted regarding this study include Dr. Holly Tuokko or Wendy Lindstrom-Forneri. Please see contact information at the beginning of this consent form.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office:
   University of Victoria: 250-472-4545, ethics@uvic.ca
   VIHA: 250-370-8620 marilyn.fuller@viha.ca

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

Name of Participant       Signature       Date

A copy of this consent will be left with you, and a copy will be taken by the researcher.
Appendix I: Study 2 Questionnaires

Note: Some font sizes have been decreased to accommodate the margin requirements for this document.

Background Questionnaire: Older Driver

Part A. Please tell us about yourself.
1. Are you? ____ male or ____ female
2. Your age? _____
3. Did you complete high school? ____ Yes ____ No
   Did you complete university/college? ____ Yes ____ No
4. Do you live in? ____ a private home ____ apartment or condo
   ____ a retirement or seniors’ complex
5. Do you live? ____ alone ____ with spouse or partner
   ____ with family members or ____ with roommates (not related)

Part B. Now please answer a few questions about your health and activities.
1. **Overall**, would you say your health is:
   ____ Excellent ____ Good ____ Fair ____ Poor

2. How many days in an average week do you do at least 30 minutes of moderate physical activity (e.g., a brisk walk)? _____ (# of days)

3. Have you ever had cataract surgery? ____ Yes ____ No
   If yes, how long ago? ____ within the past year ____ over a year ago

4. Do you wear **prescription glasses or contacts for driving**?
   ____ All the time ____ Sometimes ____ Never

5. Compared to others your age, **would you say that your eyesight is:**
   ____ Better than most ____ About the same ____ Worse than most

6. Have you been **diagnosed** with any of the following? (Check all that apply)
   ____ arthritis, rheumatism or osteoporosis
   ____ Parkinson’s, Multiple Sclerosis or other neurological disorder
   ____ Alzheimer’s Disease, Mild Cognitive Impairment (MCI) or other dementia
   ____ high blood pressure, cholesterol or heart problems
   ____ diabetes
7. Do you experience any of the following symptoms?  
   (Check all that apply)  
   ____ back or neck problems  
   ____ foot problems  
   ____ hearing problems  
   ____ limited strength or movement in the body (torso)  
   ____ limited strength or movement in the legs  
   ____ limited strength or movement in the arms and/or shoulders  
   ____ stiffness in the neck  
   ____ stiffness in the spine  
   ____ difficulty with balance  
   ____ chronic pain  
   ____ fatigue  
   ____ involuntary movements (e.g., shaking)  
   ____ visual problems  
   ____ other (please specify______________________________)  
   ____ none

8. How is your hearing (with a hearing aid if you wear them)?  
   (Check one)  
   ___ Excellent  ___ Poor  
   ___ Good  ___ Unable to hear  
   ___ Fair  ___ Don’t know

9. In the past month did you take any of the following medications?  (Check all that apply and list specific name if known)  
   ____ Pain relievers (such as aspirin or tylenol)______________________  
   ____ Codeine, demerol, or morphine____________________________  
   ____ Tranquilizers (such as valium)_____________________________  
   ____ Diet pills______________________________________________  
   ____ Anti-depressants_______________________________________  
   ____ Cough or cold remedies________________________________  
   ____ Allergy medicine such as Sinutab___________________________  
   ____ Asthma medications____________________________________  
   ____ Medicine for the heart___________________________________  
   ____ Medicine for blood pressure________________________________  
   ____ Diuretics or water pills__________________________________  
   ____ Insulin________________________________________________
10. When did you last visit a physician?
___ Within past 6 months ___ Past year ___ More than a year ago

11. a) Have you taken any driving courses? ___ Yes ___ No
    b) If so, have you taken more than one course? ___ Yes ___ No
    c) About how long ago? (1) ___________; (2) ___________
    d) Was the course(s) ___ classroom ___ on-road ___ or both?
    e) If you remember, who offered the course(s)?
       (1) ___________________; (2) ___________________
    f) Did you have to pay for the course(s)? ___ Yes ___ No

Note: If you have taken more than one driving course, please try and provide as much information as you can about each one.

12. In the past year, have you done any of the following regarding your driving?
    a) Taken a driving self-assessment questionnaire? ___ Yes ___ No
    b) Completed an on-road self-assessment? ___ Yes ___ No

13. In the past five years, have you been asked by the provincial ministry of transportation to:
    take a vision test? ___ Yes ___ No
    a rules test? ___ Yes ___ No
    a road test? ___ Yes ___ No
    or a medical examination? ___ Yes ___ No

Part C: Please tell us about your driving history.
1. About how long have you been driving? _____ (# of years)

2. Overall, compared to 10 years ago, do you drive:
   ___ much less often ___ a little less ___ the same ___ more often

3. In the past year have you taken or used: (Check all that apply)
   ___ rides from family or friends ___ taxis ___ buses
   ___ delivery services ___ special transit services ___ bike
   ___ electric scooter ___ none

4. Do you feel that taxis are too expensive to take once a week?
   ___ Yes ___ No ___ Don’t know (never use)
5. To what extent do you worry about car related expenses? (gas, maintenance or repair costs, license and insurance costs)
   \[\text{Often} \quad \text{Sometimes} \quad \text{Rarely} \quad \text{Never}\]

6. If you did not feel like driving, are you close enough to walk to:
   a) do your weekly shopping & errands? \[\text{Yes} \quad \text{No}\]
   b) get to church, social or recreation clubs? \[\text{Yes} \quad \text{No}\]

7. How important is it for you, personally, to continue to drive? (Circle one)
   \[1 \quad 2 \quad 3 \quad 4 \quad 5\]
   \[\text{Extremely Important} \quad \text{Very Important} \quad \text{Moderately Important} \quad \text{Somewhat Important} \quad \text{Not that Important}\]

8. In the past year, have you talked about your driving with any of the following?
   Your physician \[\text{Yes} \quad \text{No}\]
   An eye care professional \[\text{Yes} \quad \text{No}\]
   Family members \[\text{Yes} \quad \text{No}\]
   Friends \[\text{Yes} \quad \text{No}\]
   Other (please specify) \[\text{Yes} \quad \text{No}\]

9. Over the past year, has anyone suggested that you limit or stop driving?
   \[\text{Yes} \quad \text{No}\]

10. In the past year, have you had any of these problems when driving?
    Accidents involving another vehicle? \[\text{Yes} \quad \text{No}\]
    Near misses (almost an accident)? \[\text{Yes} \quad \text{No}\]
    Backing into things besides other cars? \[\text{Yes} \quad \text{No}\]
    Getting lost? \[\text{Yes} \quad \text{No}\]

11. Have you made any changes to your driving habits or behaviours in the past year (e.g., stopped driving at night, check blind spots more regularly)?
    \[\text{Yes} \quad \text{No}\]
    If Yes, please explain how you have changed your driving
    \[\text{__________________________________________________________________________}\]
    \[\text{__________________________________________________________________________}\]
    \[\text{__________________________________________________________________________}\]
Driving Awareness Questionnaire – Older Driver

PART A: General Knowledge

Indicate your agreement/disagreement with the following statements about older drivers (70 years +):

1. In the population, the percentage of older adults involved in crashes is higher than the percentage of middle aged drivers (aged 25 -55) involved in crashes.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

2. If an older driver has a visual disorder (e.g., macular degeneration), they are more likely to have difficulties driving compared to older drivers without a visual disorder.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

3. Older drivers are more likely than middle aged drivers (aged 25 – 55) to be fatally injured if they are involved in a crash.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

4. If an older driver has problems with hearing, they are more likely to have difficulties driving compared to older drivers without hearing problems.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

5. Older drivers who are experiencing age-related changes in learning are more likely to have difficulties driving compared to older drivers without changes in learning.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

6. Older drivers who are regularly honked at by other drivers are more likely to be at risk on the road compared to older drivers who do not get honked at.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

7. Older drivers who are experiencing age-related changes in vision are more likely to have difficulties driving compared to older drivers without age-related changes in vision.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

8. Older drivers who use tactical compensation strategies, such as looking well ahead in traffic, are more likely to be involved in crashes compared to older drivers who do not use tactical strategies.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

9. Older drivers are more likely than younger drivers to experience road rage.
   [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree

10. Older drivers who have multiple unexplained dents on their vehicle more likely to be at risk on the road compared to older drivers who do not have unexplained dents.
    [ ] Strongly Agree   [ ] Agree   [ ] Don't Know   [ ] Disagree   [ ] Strongly Disagree
11. If an older driver has memory problems, they are more likely to have difficulties driving compared to older drivers without memory problems.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

12. If an older driver has poor flexibility in their neck, they are more likely to have difficulties driving compared to older drivers without poor neck flexibility.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

13. If an older driver is experiencing age-related changes in speed of thinking, they are more likely to have difficulties driving compared to older drivers without age-related changes in speed of thinking.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

14. Medications can have a negative impact on driving.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

15. Older drivers who often find things “come out of nowhere” are more likely to be at risk on the road compared to older drivers who do not find things “come out of nowhere.”

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

16. Well-learned and frequently practiced driving tasks tend to decline more rapidly in older adults.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

17. Over the same distance driven, older drivers are more likely to be involved in crashes than middle aged drivers (age 25 – 55 years).

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

18. Older drivers who are experiencing age-related changes in strength are more likely to have difficulties driving compared to older drivers without changes in strength.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

19. If an older driver has problems with balance, they are more likely to have difficulties driving compared to older drivers without balance problems.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

20. Older drivers who are experiencing age-related changes in lung capacity are more likely to experience difficulties with driving compared to older drivers without changes in lung capacity

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

21. Older drivers who get lost in familiar places are more likely to be at risk on the road compared to older drivers who do not get lost in familiar places

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree

22. Older drivers who are experiencing age-related changes in attention are more likely to experience difficulties with driving compared to older drivers without changes in attention.

[   ] Strongly Agree  [   ] Agree  [   ] Don't Know  [   ] Disagree  [   ] Strongly Disagree
23. Older drivers who use compensatory strategies, such as avoiding certain driving situations, are more likely to be involved in a crash compared to older drivers who do not use these strategies.

[ ] Strongly Agree [ ] Agree [ ] Don’t Know [ ] Disagree [ ] Strongly Disagree

PART B: Driving-related Abilities: Older Driver Form

The following questions refer to YOUR general health and driving performance. For each question, part a) refers to your health in general; part b) refers to what you actually experience while driving.

1. a) In general, do you experience any problems with your vision (e.g., glare, cataracts)?
   [ ] Yes [ ] No
   b) If yes, how much difficulty do these problems with your vision cause when you are driving?
      [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

2. a) In general, do you have problems with your memory?
    [ ] Yes [ ] No
    b) If yes, how much difficulty do these problems with your memory cause when you are driving?
       [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

3. a) In general, do you have problems with your ability to physically react quickly?
    [ ] Yes [ ] No
    b) If yes, how much difficulty does your ability to physically react quickly cause when you are driving?
       [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

4. a) In general, do you have problems with your physical flexibility?
    [ ] Yes [ ] No
    b) If yes, how much difficulty do these problems with your physical flexibility cause when you are driving?
       [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

5. a) In general, do you have problems with your hearing?
    [ ] Yes [ ] No
    b) If yes, how much difficulty do these problems with your hearing cause when you are driving?
       [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

6. a) In general, do you have problems with strength (e.g., wrist strength, ankle strength)?
    [ ] Yes [ ] No
    b) If yes, how much difficulty do these problems with your strength cause when you are driving?
       [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

7. a) In general, do you have problems with dividing your attention between two tasks?
b) If yes, how much difficulty do these problems with dividing your attention cause when you are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

8. a) In general, do you have problems with your depth perception?
   [ ] Yes [ ] No
   b) If yes, how much difficulty do these problems with your depth perception cause when you are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

9. a) In general, do you have problems with your ability to think quickly?
   [ ] Yes [ ] No
   b) If yes, how much difficulty do these problems with your ability to think quickly cause when you are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

10. a) In general, do you have problems with selective attention (begin able to pay attention to one thing and ignore something else that is also going on)?
     [ ] Yes [ ] No
     b) If yes, how much difficulty do these problems with your selective attention cause when you are driving?
        [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

PART C: Driving Abilities: Older Driver Form

The following questions refer to YOUR driving performance. That is, these questions refer to what you actually do while driving.

Please answer all of the questions to the best of your knowledge. All of your answers are confidential and will not be shared with anyone.

Please evaluate your usual performance on each of the following driving tasks:

1. Maintain proper speed
   [ ] Very Good [ ] Good [ ] Average [ ] Poor [ ] Very Poor

2. Use mirrors appropriately
   [ ] Very Good [ ] Good [ ] Average [ ] Poor [ ] Very Poor

3. Change lanes by signalling, checking my mirror, and shoulder checking my blind spots
   [ ] Very Good [ ] Good [ ] Average [ ] Poor [ ] Very Poor

4. Respond to changing road conditions
   [ ] Very Good [ ] Good [ ] Average [ ] Poor [ ] Very Poor

5. Manage intersections
   [ ] Very Good [ ] Good [ ] Average [ ] Poor [ ] Very Poor

6. Maintain proper lane position (stays in the middle of the lane)
7. Signal in time to alert other drivers of my intended action (e.g., turn, lane change)

8. Respond appropriately to warning road signs

9. Leave a safe distance between my vehicle and the vehicle in front of me is

10. Handle in car distractions (e.g., talking, radio)

11. React quickly to unexpected road hazards (e.g., pedestrian, cyclist, debris on the road)

12. Drive in heavy traffic

13. Drive at night

14. Use proper procedures when making a left hand turn

15. Drive in unfamiliar areas

16. Park my vehicle safely

17. Drive safely, in comparison to other drivers my age

18. Notice changes in my driving abilities and make appropriate changes

19. Notice driving errors when you make an error while driving (e.g., cutting off another driver, failing to signal, etc.)
**Attitudes and Beliefs About Driving**

**Instructions:** The following statements represent different opinions about driving. Please rate your level of agreement or disagreement with each statement.

1. Driving a vehicle is pleasurable.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
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<td>1</td>
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2. My driving does not put others at risk.

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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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3. The financial cost of driving and maintaining a vehicle is an increasing concern of mine.

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<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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4. People who are important to me count on me being able to drive.

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<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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5. People who are important to me think I should stop driving.

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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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6. Being able to drive is important to me.

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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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7. I am experiencing increasing apprehension about driving.

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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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8. People who are important to me disapprove of my driving.

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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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9. Driving is central to my independence.

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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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10. Parking is becoming more difficult for me.
11. By driving, I can visit with others.

12. I am becoming more concerned about the unsafe and aggressive behaviour of other drivers.

13. The physical demands of driving a vehicle (e.g., getting in and out of the car, turning my head to shoulder check) are becoming a challenge.

14. By driving, others don’t need to be concerned about me getting to places.

15. Driving is increasingly more stressful.

16. Changing my driving habits/behaviours is possible.

17. I am starting to question whether maintaining a vehicle (e.g., repairs, renewing licenses, renewing insurance) is worth all the effort.

18. Driving is necessary in my life to give me the flexibility I desire.

19. My friends drive their vehicles regularly.

20. Most of my friends do not drive.
21. I am confident in my ability to drive.

22. I am becoming more concerned about my safety when driving.

23. Changing my driving habits/behaviours is beneficial.

24. People who are important to me think I should change my driving habits/behaviours.

25. The visual demands of driving (e.g., seeing street signs, seeing with oncoming headlights) are becoming increasingly difficult for me.

26. I plan to continue driving in the foreseeable future.

27. I plan on stopping driving in the foreseeable future

28. I intend to continue to drive without making any changes to my driving habits/behaviours in the foreseeable future.

29. The cognitive (thinking) demands of driving a vehicle (e.g., attending to all information in the environment, remembering my route, interpreting traffic situations) are becoming increasingly difficult for me.
Current Driving Habits

Please tell us about your **current** driving habits.

1. **How many days** have you driven in the **past week**? _____ (# days)

2. **In the last month how long** were **most** of your driving trips (each way)?
   - ___ less than 30 minutes
   - ___ over 30 minutes
   - ___ over 60 minutes

3. In the **past month** have you taken or used: (Check **all** that apply)
   - ____ rides from family or friends
   - ____ taxis
   - ____ buses
   - ____ delivery services
   - ____ special transit services
   - ____ bike
   - ____ electric scooter
   - ____ none

4. **In the past month**, have you had any of these problems when driving?
   - Accidents involving another vehicle?   ___ Yes   ___ No
   - Near misses (almost an accident)?     ___ Yes   ___ No
   - Backing into things besides other cars? ___ Yes   ___ No
   - Getting lost?                         ___ Yes   ___ No

5. In the **last month**, how many **days a week** did you drive to do the following activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th># of days</th>
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<tbody>
<tr>
<td>a) shopping, banking, other errands</td>
<td></td>
</tr>
<tr>
<td>b) volunteer work or paid employment</td>
<td></td>
</tr>
<tr>
<td>c) visiting or assisting family or friends</td>
<td></td>
</tr>
<tr>
<td>d) attending religious services</td>
<td></td>
</tr>
<tr>
<td>e) going to a movie, concert, play or sports event</td>
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<tr>
<td>f) going to a restaurant</td>
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<tr>
<td>g) to play cards, bingo or other games (at other people’s homes)</td>
<td></td>
</tr>
<tr>
<td>h) senior or community centers</td>
<td></td>
</tr>
<tr>
<td>i) fitness centers, pools, curling, bowling</td>
<td></td>
</tr>
<tr>
<td>g) golf or other physical activity centers</td>
<td></td>
</tr>
<tr>
<td>j) taking day trips</td>
<td></td>
</tr>
<tr>
<td>l) any <strong>other activities</strong> you do regularly outside the home not listed above?</td>
<td></td>
</tr>
</tbody>
</table>

   If **yes**, describe below, estimate frequency:

<table>
<thead>
<tr>
<th>Activity</th>
<th># of days</th>
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<tbody>
<tr>
<td>Activity</td>
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<tr>
<td>Activity</td>
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</table>

6. Which driving situation(s) do you **prefer not to drive** in when possible? (Check **all** that apply to you)
[ ] Turning left at intersections  [ ] Navigating parking lots
[ ] Driving at night  [ ] Changing lanes
[ ] Backing up  [ ] Maintaining the speed limit
[ ] Parallel parking  [ ] Driving in bad weather
[ ] Driving in unfamiliar areas  [ ] Other________________
[ ] Driving with passenger(s)  [ ] None of the above
[ ] Driving in heavy traffic

7. Based on your current driving habits, how often do you use each of the following strategies before you drive?

a. Plan your route
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

b. Go for yearly eye examinations
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

c. Talk to others about your driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

d. Go for regular visits to the doctor
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

e. Keep the windshields clean
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

f. Participate in regular physical exercise (2 – 3 times a week)
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

g. Choose not to drive during certain times of day (e.g., night, rush hour, etc.)
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

h. Choose not to drive when you are not feeling up to driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

i. Do a self-check in to ensure you are physically, emotionally, and mentally able to drive that day
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

j. Limit your driving to certain areas
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

k. Participate in regular mental exercise (e.g., reading, logic puzzles)
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

l. Check with a doctor/pharmacist about the effects of your medications on driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

m. Do not drink alcohol if you are going to be driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

n. Check the position of your mirrors before driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

o. Adjust the seat for you (e.g., so can see over dash, are at least 10" for steering wheel)
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never

p. Have special equipment installed in your vehicle for your needs (e.g., extra mirrors, handbars)
   [ ] Yes  [ ] No
If Yes: How often do you use this special equipment
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
q. Other (please specify) ______________________________________
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never

8. Based on your current driving habits, how often do you use each of the following strategies while driving?

a. Use the 3 second rule
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
b. Check your mirrors regularly (side mirrors and rear view mirror every 5 - 8 seconds)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
c. Minimize or eliminate in car noise (e.g., turn down/off the radio, people talking)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
d. Look well ahead of you (e.g., to the next traffic light, a few cars ahead) to see what traffic is doing
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
e. Minimize or eliminate distractions, other than noise (e.g., eating, pets in the drivers lap), in the vehicle
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
f. Use a passenger to help navigate
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
g. Drive at the speed limit
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never
h. Other (please specify) ______________________________________
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never

9. a) Which form(s) of transportation are available in your community? (Check all that apply)
[ ] buses
[ ] volunteer drivers
[ ] taxis
[ ] buses for people with disabilities (e.g., handyDART)
[ ] other (please specify) _________________________________
b) Which form(s) of transportation do you use? (Check all that apply to you)
[ ] car as driver
[ ] car as passenger
[ ] volunteer driver
[ ] taxi
[ ] city bus
[ ] buses for people with disabilities (e.g., handyDART)
[ ] motorized scooter
[ ] other, please specify, _________________________________
Readiness to Change Questionnaire

1. a) Are you seriously thinking of changing/adjusting your driving behaviours (e.g., not drive in bad weather, drive at slower speeds)? (Check one)
   - No, I am not thinking of changing my driving behaviour within the near future (answer 1c and 1d)
   - Yes, within the near future, but I have not yet changed my driving (answer 1c)
   - I have already made changes to my driving behaviours (e.g., not driving at night), and always or usually practice these changes (e.g., never drive at night, or only if I absolutely had to) (answer 1b and 1c)
   - I have started to change my driving behaviours (e.g., not driving at night), but only practice these changes sometimes (e.g., still sometimes drive at night) (answer 1b and 1c)

b) In what ways have you changed your driving behaviours? (e.g., plan my route) Please describe.
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

b) In what ways have you changed your driving behaviours? (e.g., plan my route) Please describe.
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

   c) Which situations do you choose/prefer not to drive? (Check all that apply):
      [ ] Night             [ ] Unfamiliar routes
      [ ] Alone             [ ] Bad weather
      [ ] Other ________________  [ ] None of the above

d) Under what conditions might you consider changing/adjusting your driving? (Check all that apply)
   _____ If my vision deteriorated
   _____ If my general health deteriorated
   _____ If I began feeling unsafe or nervous when driving
   _____ If my doctor or other health professional advised me to
   _____ If someone else advised me to (e.g., family or friend)
   _____ If ICBC or the police imposed a driving restriction on me
   _____ If there was a deterioration of my thinking abilities
   _____ If there was a deterioration of my memory
   _____ If the cost of gas and upkeep of my car gets too expensive
   _____ If medications were interfering with my ability to drive
   _____ When I reach a certain age
   _____ If I have an accident
   _____ If I had a stroke or other serious illness
   _____ There is no reason I would consider changing my driving
   _____ Other (Please specify) _________________________________
2. a) Are you seriously thinking of stopping driving? (Check one)
   ☐ No, not thinking of quitting within the near future (answer 2c)
   ☐ Yes, within the near future (answer 2b)

b) What led to you think of stopping driving? (e.g., an event, other people, information)?
   Please describe_______________________________________________________
   ___________________________________________________________________

c) Under what conditions might you consider stopping your driving? (Check all that apply)
   ____ If my vision deteriorated
   ____ If my general health deteriorated
   ____ If I began feeling unsafe or nervous when driving
   ____ If my doctor advised me to
   ____ If someone else advised me to (e.g., family or friend)
   ____ If ICBC or the police imposed a driving restriction on me
   ____ If there was a deterioration of my thinking abilities
   ____ If there was a deterioration of my memory
   ____ If the cost of gas and upkeep of my car gets too expensive
   ____ If medications were interfering with my ability to drive
   ____ When I reach a certain age
   ____ If I have an accident
   ____ If I had a stroke or other serious illness
   ____ There is no reason I would consider restricting my driving
   ____ Other (Please specify) ______________________________
Readiness to Change Questionnaire: 2-Month Follow-up

1. a) Are you seriously thinking of changing/adjusting your driving behaviours (e.g., not drive in bad weather, drive at slower speeds)? (Check one)

☐ No, I am not thinking of changing my driving behaviour within the near future (answer 1c and 1d)

☐ Yes, within the near future, but I have not yet changed my driving (answer 1c)

☐ I have already made changes to my driving behaviours (e.g., not driving at night), and always or usually practice these changes (e.g., never drive at night, or only if I absolutely had to) (answer 1b and 1c)

☐ I have started to change my driving behaviours (e.g., not driving at night), but only practice these changes sometimes (e.g., still sometimes drive at night) (answer 1b and 1c)

b) In what ways have you changed your driving behaviours? (e.g., plan my route) Please describe.

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

b) Which situations do you choose/prefer not to drive? (Check all that apply):

[ ] Night
[ ] Unfamiliar routes
[ ] Alone
[ ] Bad weather
[ ] Other ____________________________
[ ] None of the above

d) Under what conditions might you consider changing/adjusting your driving? (Check all that apply)

_____ If my vision deteriorated
_____ If my general health deteriorated
_____ If I began feeling unsafe or nervous when driving
_____ If my doctor or other health professional advised me to
_____ If someone else advised me to (e.g., family or friend)
_____ If ICBC or the police imposed a driving restriction on me
_____ If there was a deterioration of my thinking abilities
_____ If there was a deterioration of my memory
_____ If the cost of gas and upkeep of my car gets too expensive
_____ If medications were interfering with my ability to drive
_____ When I reach a certain age
_____ If I have an accident
_____ If I had a stroke or other serious illness
_____ There is no reason I would consider changing my driving
_____ Other (Please specify) _______________________________
2. a) Have you stopped driving? (Check one)
   ☐ Yes, I have quit driving routinely, but occasionally drive
   ☐ Yes, I have quit driving altogether
   ☐ No, I am still driving

3. a) Are you seriously thinking of stopping driving? (Check one)
   ☐ No, not thinking of quitting within the near future (answer 3c)
   ☐ Yes, within the near future (answer 3b)

   b) What led to you think of stopping driving? (e.g., an event, other people, information)?
   Please describe._____________________________________________________
   _________________________________________________________________

   c) Under what conditions might you consider stopping your driving? (Check all that apply)
   _____ If my vision deteriorated
   _____ If my general health deteriorated
   _____ If I began feeling unsafe or nervous when driving
   _____ If my doctor advised me to
   _____ If someone else advised me to (e.g., family or friend)
   _____ If ICBC or the police imposed a driving restriction on me
   _____ If there was a deterioration of my thinking abilities
   _____ If there was a deterioration of my memory
   _____ If the cost of gas and upkeep of my car gets too expensive
   _____ If medications were interfering with my ability to drive
   _____ When I reach a certain age
   _____ If I have an accident
   _____ If I had a stroke or other serious illness
   _____ There is no reason I would consider restricting my driving
   _____ Other (Please specify) ______________________________
Drive SAFE Feedback Questionnaire: Post Intervention

1. Did the Drive SAFE education program make you more aware of changes that can affect your driving?
   [ ] Yes  [ ] No

2. By attending the Drive SAFE education program, did you discover any changes in yourself that you had not been aware of before?
   [ ] Yes  [ ] No

3. Did the Drive SAFE education program serve as a useful reminder of things that you already knew?
   [ ] Yes  [ ] No

4. Did attending the Drive SAFE education program help you with planning to make changes regarding your driving (i.e., using new strategies)?
   [ ] Yes  [ ] No

5. As a result of attending this program, do you think you will be more or less likely to have a doctor check your:
   a. Hearing?  [ ] more likely  [ ] no change  [ ] less likely
   b. Seeing?  [ ] more likely  [ ] no change  [ ] less likely
   c. Thinking?  [ ] more likely  [ ] no change  [ ] less likely
   d. Physical abilities?  [ ] more likely  [ ] no change  [ ] less likely

6. Would you recommend this program to an older adult friends or family members who drive?
   [ ] Yes  [ ] No

7. Do you think that the information provided in this program could be useful for helping older adults talk about driving concerns with their families?
   [ ] Yes  [ ] No

8. Overall, how would you rate the usefulness of the Drive SAFE education program?
   [ ] Very useful
   [ ] Somewhat useful
   [ ] A little useful
   [ ] Not at all useful

9. What topics, covered by the Drive SAFE driving program, did you find the most useful? (Check all that apply)
   [ ] Information on crash risk
   [ ] Review of high crash risk driving skills (e.g., left turns)
   [ ] How vision and hearing impact driving
[ ] How physical abilities impact driving
[ ] How thinking abilities impact driving
[ ] Awareness Stops – where you reflected on your own driving
[ ] Strategic strategies to use before you drive
   **If checked:** What strategies did you find particularly useful? ______
[ ] Tactical strategies to use when you are driving
   **If checked:** What strategies did you find particularly useful? ______
[ ] Warning Signs that you may need to evaluate your driving
[ ] Financial aspects of driving
[ ] Alternatives to driving (e.g., buses, taxies)
[ ] None of the above
[ ] Other ____________________________________________

10. What topics, covered by the SAFE driving program, did you find the **least useful?** (Check all that apply)
[ ] Information on crash risk
[ ] Review of high crash risk driving skills (e.g., left turns)
[ ] How vision and hearing impact driving
[ ] How physical abilities impact driving
[ ] How thinking abilities impact driving
[ ] Awareness Stops – where you reflected on your own driving
[ ] Strategic strategies to use before you drive
   **If checked:** What strategies did you find particularly useful? ______
[ ] Tactical strategies to use when you are driving
   **If checked:** What strategies did you find particularly useful? ______
[ ] Warning Signs that you may need to evaluate your driving
[ ] Financial aspects of driving
[ ] Alternatives to driving (e.g., buses, taxies)
[ ] None of the above
[ ] Other ____________________________________________

11. Would you be willing to pay for this type of program?
[ ] Yes
[ ] No
If Yes, how much would you be willing to pay? __________

12. Any additional comments
Drive SAFE Feedback Questionnaire: 2 month follow-up Education Group

1. As a result of attending the Drive SAFE education program are you more aware of changes that can affect your driving?
   [ ] Yes   [ ] No

2. As a result of attending the Drive SAFE education program did you **make any changes to your driving habits or behaviours** (i.e., you are now using new strategies)?
   [ ] Yes   [ ] No

3. Did attending the Drive SAFE education program help you with **planning to make** changes regarding your driving (i.e., using new strategies)?
   [ ] Yes   [ ] No

4. **As a result of attending** the Drive SAFE program, did you make an appointment to have (or have you had) your:
   a. Hearing checked?     [ ] Yes     [ ] No
   b. Seeing (vision) checked?  [ ] Yes     [ ] No
   c. Thinking checked?       [ ] Yes     [ ] No
   d. Physical abilities checked? [ ] Yes     [ ] No

5. **As a result of attending** the Drive SAFE program, have you talked about your driving with any of the following people?
   Your physician     ___ Yes      ___ No
   An eye care professional ___ Yes      ___ No
   Family members     ___ Yes      ___ No
   Friends           ___ Yes      ___ No
   Other (please specify)___________ ___ Yes      ___ No

6. **As a result of attending** the Drive SAFE program, have you done any of the following:
   a. Taken a driving self-assessment questionnaire?
      [ ] Yes     [ ] No, but I intend to     [ ] No, and I do not intend to
      **If Yes**, please describe __________________________________
   b. Completed an on-road self-assessment?
      [ ] Yes     [ ] No, but I intend to     [ ] No, and I do not intend to
      **If Yes**, please describe __________________________________
   c. Taken any driving lessons or driving education courses/programs?
      [ ] Yes     [ ] No, but I intend to     [ ] No, and I do not intend to
      **If Yes**, please describe __________________________________
   d. Completed or taken any other education or self-assessment related to driving?
      [ ] Yes     [ ] No, but I intend to     [ ] No, and I do not intend to
      **If Yes**, please describe __________________________________
7. Any additional comments

Feedback Questionnaire: 2 month Follow-up Control Group

1. Did you review the “RoadSense for Drivers” book?
   [    ] Yes – Over what amount of time (e.g., one week)? ___________
   [    ] No – Please describe why _______________________________

2. As a result of reviewing “RoadSense for Drivers” did you make any changes to your driving habits or behaviours (i.e., you are now using new strategies)?
   [    ] Yes [    ] No
   If Yes, please describe________________________________________

3. Did reviewing “RoadSense for Drivers” help you with planning to make changes regarding your driving (i.e., using new strategies)?
   [    ] Yes [    ] No

4. As a result of reviewing “RoadSense for Drivers”, did you make an appointment to have (or have you had) your:
   a. Hearing checked? [    ] Yes [    ] No
   b. Seeing (vision) checked? [    ] Yes [    ] No
   c. Thinking checked? [    ] Yes [    ] No
   d. Physical abilities checked? [    ] Yes [    ] No

5. As a result of reviewing “RoadSense for Drivers”, have you talked about your driving with any of the following people?
   Your physician ___Yes ___No
   An eye care professional ___Yes ___No
   Family members ___Yes ___No
   Friends ___Yes ___No
   Other (please specify)___________ ___Yes ___No

6. As a result of reviewing “RoadSense for Drivers”, have you done any of the following:
   a. Taken a driving self-assessment questionnaire?
      [    ] Yes [    ] No, but I intend to [    ] No, and I do not intend to _______________________________
      If Yes, please describe _______________________________
   b. Completed an on-road self-assessment?
      [    ] Yes [    ] No, but I intend to [    ] No, and I do not intend to _______________________________
      If Yes, please describe _______________________________
   c. Taken any driving lessons or driving education courses/programs?
      [    ] Yes [    ] No, but I intend to [    ] No, and I do not intend to _______________________________
      If Yes, please describe _______________________________
d. Completed or taken any other education or self-assessment related to driving?
   [ ] Yes          [ ] No, but I intend to       [ ] No, and I do not intend to
   **If Yes**, please describe _________________________________

7. Any additional comments
Background Questionnaire: Passenger Form

*Please note older driver refers to your relative/friend who is participating in this study.

**Part A. Please tell us about yourself.**

1. Are you? ____ male or ____ female
2. Your age? ______
3. Did you complete high school? ___ Yes ___ No
   Did you complete university/college? ___Yes ___ No
4. Do you live in? ____ a private home ____ apartment or condo____ a retirement or seniors’ complex
5. Do you live? ___ alone ___ with spouse or partner ____ with family members or ___ with roommates (not related)
6. How long have you known the **older driver**? ______ year(s)

**Part B. Now please answer a few questions about your health and activities.**

1. Overall, would you say your **health** is:
   ___Excellent     ___Good    ___Fair    ____ Poor

2. Compared to others your age, would you say that your **eyesight** is:
   ____ Better than most    ___ About the same ___ Worse than most

3. Overall, would you say your **hearing** is (with a hearing aid if you wear them):
   ___Excellent     ___Good    ___Fair    ____ Poor

4. Have you been **diagnosed** with any of the following? (Check all that apply)
   ___ Neurological disorder (e.g., Parkinson’s, Multiple Sclerosis, ect.)
   ___ Dementia Related Disorder (e.g., Alzheimer’s disease, Mild Cognitive Impairment, Vascular dementia, ect.)
   ___ Visual impairments (e.g., cataracts, macular degeneration, glaucoma, etc.)
   ___ Psychological diagnosis (e.g., depression, anxiety, etc.)
   ___ Other (please specify ________________________________)

5. a) Have you taken any **driving courses**? ____ Yes ____ No
   b) If so, have you taken **more than one** course? ____ Yes ____ No
   c) About **how long ago**? (1)__________ ; (2)__________
   d) Was the course(s) ____ classroom ____ on-road ___ or both?
e) If you remember, who offered the course(s)?
   (1) _______________________ ; (2) ___________________

f) Did you have to pay for the course(s)? ___Yes ___ No

Note: If you have taken more than one driving course, please try and provide as much information as you can about each one.

6. In the past five years, have you been asked by the provincial ministry of transportation to:
   take a vision test? ___ Yes ___ No
   a rules test? ___ Yes ___ No
   a road test? ___ Yes ___ No
   or a medical examination? ___ Yes ___ No

Part C: Please tell us about your driving history.

1. On average, how often are you a passenger while your relative/friend drives? _______________ (times a week)

2. Do you currently drive? ___ Yes ___ No
   If YES –
   2a) About how long have you been driving? _____ (# of years)
   2b) How important is it for you, personally, to continue to drive? (circle one)
      1              2              3              4              5
      Extremely Important        Very Important        Moderately Important        Somewhat Important        Not that Important

3. How important is it for you, personally, that your relative/friend continues to drive? (circle one)
   1              2              3              4              5
   Extremely Important        Very Important        Moderately Important        Somewhat Important        Not that Important

4. In the past month have you taken or used: (Check all that apply)
   ___ rides from family or friends   ___ taxis   ___ buses
   ___ delivery services   ___ special transit services   ___ bike
   ___ electric scooter   ___ none

5. In the past year, have you talked about your relative’s/friend’s driving with any of the following people?
   Your relative/friend ___ Yes ___ No
   A physician ___ Yes ___ No
   An eye care professional ___ Yes ___ No
   Other Family members ___ Yes ___ No
   Other Friends ___ Yes ___ No
   Other (please specify) _____________ ___ Yes ___ No
6. In the past year, has your relative/friend had **any of these problems when driving**?
   - Accidents involving another vehicle?  ___ Yes  ___ No
   - Near misses (almost an accident)?  ___ Yes  ___ No
   - Backing into things besides other cars?  ___ Yes  ___ No
   - Getting lost?  ___ Yes  ___ No

7. Overall, **compared to 10 years ago**, does your relative/friend drive:
   ___ much less often  ___ a little less  ___ the same  ___ more often

8. Has your **relative/friend** made any changes to their driving habits or behaviours in the past year (e.g., stop driving at night, drive more cautiously, etc.)?  ___ Yes  ___ No
   If Yes, please explain what changes they have made.____________________
   _____________________________
   _____________________________
Driving Awareness Questionnaire – Passenger Form

PART A: Driving-related Abilities: Passenger Form

The following questions refer to your family member/friend’s driving performance. For each question, part a) refers to their health in general, part b) refers to what they actually do while driving.

Please answer all questions to the best of your knowledge.

1. a) In general, do they experience any problems with their vision (e.g., glare, cataracts)?
   [ ] Yes [ ] No [ ] Don’t Know
   b) If yes, how much difficulty do these problems with their vision cause when they are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

2. a) In general, do they have problems with their memory?
   [ ] Yes [ ] No [ ] Don’t Know
   b) If yes, how much difficulty do these problems with their memory cause when they are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

3. a) In general, do they have problems with their ability to physically react quickly?
   [ ] Yes [ ] No [ ] Don’t Know
   b) If yes, how much difficulty does their ability to physically react quickly cause when they are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

4. a) In general, do they have problems with their physical flexibility?
   [ ] Yes [ ] No [ ] Don’t Know
   b) If yes, how much difficulty do these problems with their physical flexibility cause when they are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

5. a) In general, do they have problems with their hearing?
   [ ] Yes [ ] No [ ] Don’t Know
   b) If yes, how much difficulty do these problems with their hearing cause when they are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

6. a) In general, do they have problems with strength (e.g., wrist strength, ankle strength)?
   [ ] Yes [ ] No [ ] Don’t Know
   b) If yes, how much difficulty do these problems with their strength cause when they are driving?
   [ ] No difficulty [ ] A little difficulty [ ] Some difficulty [ ] A lot of difficulty

7. a) In general, do they have problems with dividing their attention between two tasks?
b) If yes, how much difficulty do these problems with dividing their attention cause when they are driving?
   [ ] No difficulty  [ ] A little difficulty  [ ] Some difficulty  [ ] A lot of difficulty

8. a) In general, do they have problems with their depth perception?
   [ ] Yes  [ ] No  [ ] Don’t Know
b) If yes, how much difficulty do these problems with their depth perception cause when they are driving?
   [ ] No difficulty  [ ] A little difficulty  [ ] Some difficulty  [ ] A lot of difficulty

9. a) In general, do they have problems with their ability to think quickly?
   [ ] Yes  [ ] No  [ ] Don’t Know
b) If yes, how much difficulty do these problems with their ability to think quickly cause when they are driving?
   [ ] No difficulty  [ ] A little difficulty  [ ] Some difficulty  [ ] A lot of difficulty

10. a) In general, do they have problems with selective attention (begin able to pay attention to one thing and ignore something else that is also going on)?
    [ ] Yes  [ ] No  [ ] Don’t Know
b) If yes, how much difficulty do these problems with their selective attention cause when they are driving?
    [ ] No difficulty  [ ] A little difficulty  [ ] Some difficulty  [ ] A lot of difficulty

PART B: DRIVING ABILITIES: PASSENGER RATING

The following questions refer to your family member/friend’s driving performance. That is, these questions refer to what he/she actually does while driving.

Please answer all questions to the best of your knowledge. All of your answers are confidential and will not be shared with your family member/friend or anyone else.

Please evaluate his/her typical/usual performance on each of the following driving tasks:

1. Maintain proper speed
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

2. Use mirrors appropriately
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

3. Changes lanes by signalling, checking mirrors, and shoulder checking their blind spots
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

4. Respond to changing road conditions
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

5. Manage intersections
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor
6. Maintain proper lane position (stays in the middle of the lane)
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

7. Signal in time to alert other drivers of their intended action (e.g., turn, lane change)
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

8. Respond appropriately to warning road signs
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

9. Leave a safe distance between their vehicle and the vehicle in front of them is
   [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

10. Handle in car distractions (e.g., talking, radio)
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

11. React quickly to unexpected road hazards (e.g., pedestrian, cyclist, debris on the road)
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

12. Drive in heavy traffic
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

13. Drive at night
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

14. Use proper procedures when making a left hand turn
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

15. Drive in unfamiliar areas
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

16. Park their vehicle safely
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

17. Drive safely, in comparison to other drivers their age
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

18. Notice changes in their driving abilities and make appropriate changes
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

19. Notice driving errors when they make an error while driving (e.g., cutting off another driver, failing to signal, etc.)
    [ ] Very Good  [ ] Good  [ ] Average  [ ] Poor  [ ] Very Poor

Additional Questions about your family member/friend’s driving

For Question #1 and #2:

Driving ability refers to the person’s performance on various driving tasks (e.g., making turns, navigating traffic, handling bad road conditions).
Driving habits refers to the things a person does to ensure they are driving safely (e.g., not driving at night because they had difficulties seeing, minimizing distractions in the car, driving less frequently, etc.)

1. a) Over the past 2 months, have you noticed any changes in his/her driving ability?
   [ ] A lot of improvement  [ ] Some decline
   [ ] Some improvement  [ ] A lot of decline
   [ ] No change
b) If you have noticed any changes, please describe these changes.
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

2. a) Over the past 2 months, have you noticed any changes in his/her driving habits?
   [ ] A lot of improvement  [ ] Some decline
   [ ] Some improvement  [ ] A lot of decline
   [ ] No change
b) If you have noticed any changes, please describe these changes.
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

3. How often does your family member/friend use each of the following strategies before he/she drives?
   a. Plans his/her route
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   b. Goes for yearly eye examinations
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   c. Talk to others about his/her driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   d. Goes for regular visits to the doctor
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   e. Keeps the windshields clean
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   f. Participates in regular physical exercise (2 – 3 times a week)
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   g. Chooses not to drive during certain times of day (e.g., night, rush hour, etc.)
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   h. Chooses not to drive when he/she is not feeling up to driving
   [ ] Always  [ ] Usually  [ ] Sometimes  [ ] Rarely  [ ] Never  [ ] Don’t Know
   i. Does a self-check in to ensure he/she is physically, emotionally, and mentally able to drive that day
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
j. Limits his/her driving to certain areas
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
k. Participates in regular mental exercise (e.g., reading, logic puzzles)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
l. Checks with a doctor/pharmacist about the effects of his/her medications on driving
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
m. Does **not** drink alcohol if he/she is going to be driving
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
n. Checks positions of their mirrors before driving
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
o. Adjusts the seat for them (e.g., so can see over dash, are at least 10” for steering wheel)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
p. Has special equipment installed in his/her vehicle for his/her needs (e.g., extra mirrors, handbars)
[ ] Yes [ ] No [ ] Don’t Know

**If Yes:** Uses this special equipment
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
q. Other (please specify) __________________________________________
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know

4. How often does your family member/friend use each of the following strategies **while he/she is driving**?
a. Uses the 3 second rule (leaves 3 seconds of space between them and the vehicle in front of them)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
b. Checks mirrors regularly (side mirrors and rear view mirror every 5 - 8 seconds)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
c. Minimizes or eliminates in car noise (e.g., turn down/off the radio, people talking)
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
d. Looks well ahead of him/her (e.g., to the next traffic light, a few cars ahead) to see what traffic is doing
[ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don’t Know
e. Minimizes or eliminates distractions, other than noise (e.g., eating, pets in the drivers lap), in the vehicle
f. Uses a passenger to help navigate
   [ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don't Know

g. Drives at the speed limit
   [ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don't Know

h. Other _____________________________________________________
   [ ] Always [ ] Usually [ ] Sometimes [ ] Rarely [ ] Never [ ] Don't Know
Appendix J: Cover Letters - 2 - Month Mail Back

Instructions for Older Driver: 2 Month Follow-up

Dear Participant:

Thank you so much for your continued participation in our study entitled “Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention”. By participating in our study up to this point, you have already completed the consent form, an initial package of questionnaires, and participated in an educational program (either the “RoadSense for Drivers” handbook or the Drive SAFE educational program).

We are now asking that you complete the final package of questionnaires. Please complete and mail back the following enclosed questionnaires within one week.

1. Feedback
2. Driving Awareness
3. Attitudes and Beliefs
4. Readiness to Change
5. Current Driving Behaviours

Please use the self-addressed, stamped envelope provided to mail back all of the completed questionnaires.

We would like to remind you that your participation in this study is voluntary. As previously mentioned, you may withdraw from this study at any time without any explanation. If you decide to withdraw from the study, we will ask for your permission to use your completed data in our research. We would also like to remind you that by returning your completed questionnaires you are agreeing to continue to participate in our study.

If you were in the group that received the “RoadSense for Drivers” handbook, Nancy or Ginny will call you once we have received the enclosed questionnaires from you and your passenger to see if you would still like to attend the Drive SAFE education program.

If you have any questions about completing this final section of our study, feel free to contact Wendy, Nancy, or Ginny at 250-721-8987.

Thanks again for your involvement in our study,

Wendy Lindstrom-Forneri, MA
Dr. Holly Tuokko
Instructions for Passenger: 2 Month follow-up

Dear Participant:

Thank you for your continued participation in our study entitled “Safety Awareness For Elderly Drivers (SAFE): The development and evaluation of an educational intervention”. By participating in our study up to this point, you have already completed the consent form and initial questionnaires at the Centre on Aging.

We are now asking that you complete this final questionnaire. Please complete and mail back the following enclosed questionnaire within one week.

1. Driving Awareness – Passenger Form
   a. Remember, this questionnaire is all about your family member or friend’s driving

Please mail back the completed questionnaire using the self-addressed, stamped envelope provided.

We would like to remind you that your participation in this study is strictly voluntary. As previously mentioned, you may withdraw from this study at any time without any explanation. If you decide to withdraw from the study, we will ask for your permission to use your completed data in our research. We would also like to remind you that by returning your completed questionnaires you are agreeing to continue to participate in our study.

If you have any questions about completing this final section of our study, feel free to contact Wendy, Nancy or Ginny at 250-721-8987.

Thanks again for your involvement in our study,

Wendy Lindstrom-Forneri, MA

Dr. Holly Tuokko
## Appendix K: Study 2 – 95% CI for Case Studies

### Table A-17: 95% Confidence Intervals for SAFE Education Group

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<th>2M (Upper, Lower)</th>
<th>2MTI (Upper, Lower)</th>
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<th>2MPI (Upper, Lower)</th>
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Appendix L: SAFE Education Program Materials

SAFE Education Program Protocol

**Day 1**

Present Day 1 Drive SAFE PowerPoint slideshow, which corresponds to the following protocol:

1) Welcome
   a. Introduction of speaker
   b. Review of research study

2) Introduction and Overview of the Sessions
   a. Format for the 2 days
   b. Anonymity Issues
   c. Voluntary participation

3) Handbook Introduction
   a. Handout SAFE Education Handbook and pencils
   b. Review 4 parts that will be covered for each topic within the handbook
      (Knowledge, Awareness Stops, Strategies, Overcoming Obstacles)

4) Crash Risk
   a. Review of information
   b. Videos and review of procedures for high risk manoeuvres

5) Aging-related Health Changes and Driving
   a. Hearing
   b. Vision

6) BREAK
   a. Provide refreshments

7) Aging-related Health Changes and Driving continued
   a. Physical Abilities
   b. Thinking Abilities

8) Closing
   a. Collect handbooks
   b. Brief overview of Day 2 topics

**Day 2**

Present Day 2 Drive SAFE PowerPoint slideshow, which corresponds to the following protocol:

1) Welcome and Overview of the Session
   a. Reminder of research study participation
   b. Voluntary participation
   c. Distribute Handbooks
   d. Overview of Day 2 session

2) Review of Day 1
   a. Questions regarding Day 1 topics

3) Warning Signs
a. CRASH FREE topics covered
4) Cost of Driving
   a. Complete driving cost worksheets

5) Alternative Transportation
   a. Cost of alternative transportation
6) BREAK and REFRESHMENTS
7) Alternative Transportation continued
   a. Forms available
   b. Cost comparison analysis
8) Worksheets
   a. Review purpose of worksheets provided
9) Thank participants for coming
   a. Handout “Passport to Drive”
10) Questionnaires
   a. Those in SAFE education group for the study complete the post-intervention package
   b. Check questionnaires for completeness
This handbook was developed as part of the Safety Awareness For Elderly Drivers (S.A.F.E.) education program.

© Wendy Lindstrom-Forneri, 2008
Driving is the main way that people get from one place to another. Being able to drive has been equated with independence, as it gives us the ability to go where we want, when we want. It is thus understandable that most of us want to be able to drive for as long as possible.

So, it is important to make sure that we are equipped with the knowledge we need to make good decisions about our driving. Driving safely is important both for us and for other road users.

With age comes numerous physical and cognitive (thinking) changes that may increase our risk on the road. Everyone is different. So, it is up to you to examine yourself and your ability to adapt to these changes. The good news is there are things we can do to help decrease our risk and improve our driving.

Purpose of this education session is to provide:

1. **Knowledge**
   Learning about the changes that occur as we age is important, as these changes can impact our ability to drive safely. This book will also help you brush up on driving rules and procedures that have been found to be difficult for older drivers.

2. **Awareness**
   Awareness of how these changes can impact our own driving is the key factor in allowing us to make changes to increase our safety.

3. **Strategies**
   Tips and tools will be provided that you can use to help make choices to increase your driving safety and for making decisions about your driving habits. We will focus on two types of approaches: 1) Strategic – things that you do before you begin driving, and 2) Tactical – behaviours you do while driving.

4. **Overcoming Barriers**
   Suggestions and tips will be provided on how to overcome some of the things that get in the way of being people being able to make changes to their driving habits and behaviours.
* Each topic covered in this book will look at these four areas – Knowledge, Awareness, Strategies, Overcoming Barriers.

** Throughout this book and during the education session you will be provided with worksheets. Please use these tools to help you better understand your own driving skills, habits, and safety strategies.

## Older Drivers – What the Research Says

Most of us have heard the stereotypes about older drivers, but what does the research say?

### Knowledge

#### Crash Risk for Older Drivers

Research shows that **per kilometre driven older drivers** are:

- More likely than other drivers (except for very young drivers) to be involved in a car crash!
  - Older drivers with cognitive (thinking) impairment (e.g., Alzheimer’s disease) may be 2.5 times more likely to be in a crash compared to older drivers without cognitive impairments
- More likely to be at fault for car crashes which they are involved in (compared to middle aged drivers)
- More likely to be seriously injured or die in a car crash. This risk increases with age and with the number of physical/medical conditions.
- More likely to require a longer recovery time for their injuries following a crash

These findings are for older drivers, in general. Older adults with various medical/physical/psychological conditions may be at an even higher risk of being in a car crash.

Research shows that older drivers are more likely to be in a crash that involves:

1. Intersections – often when turning left
2. Failure to yield the right of way – often
3. Violation of the traffic signal or sign
4. Improper lane changes
**Good News!** Research shows that by using strategic (before driving) and tactical (while driving) strategies we can **decrease our crash risk!**

### Awareness

Everyone needs to be aware of the risks of driving. Being aware of your own risks and taking appropriate steps regarding your driving behaviour may help to decrease your crash risk!

**Awareness Stop**

**Ask yourself** – Are you comfortable with each of these skills (turning left, right of way rules, changing lanes)?

**Ask other people** if you make some of these common errors and learn the correct procedures.

The numerous strategies found throughout this book may help to increase your driving safety. If you are very concerned about your driving safety and crash risk, you can always take a driving course or assessment through a private company.

### Strategies

Strategies for the types of crashes: **Think of the 3 R’s**

**Route Planning** – ensure there are few left hand turns and when possible these occur at traffic lights. Making 3 right hand turns will equal one left hand turn!

**Review Skills** - When not driving, try to talk yourself through the correct way to do each of these higher risk driving skills. Can you do it? If not, you may need to brush up the rules of the road regarding these skills.

**Rehearse** - Practice your ability to perform these skills in a safe environment, such as part of a driving course or as a self-assessment on a quiet street with little traffic and/or distractions.

---

### Health Changes and Driving

**How do aging and medical symptoms affect driving??**

There are many changes that are part of the natural aging process that can impact driving. These include natural changes in seeing (vision), hearing, physical abilities, and thinking (cognitive abilities).
Knowledge

Hearing and Seeing

Hearing – It is important to be able to hear warning signs when driving. As we age our hearing becomes less acute, making it more difficult to hear horns, sirens, and other warning sounds.

Changes are usually gradual. It becomes hardest to hear high pitched sounds. 40 – 50% for people age 75 and older experience significant age-related hearing loss.

Seeing – Good vision is essential to safe driving. Most of the information we have to take in and process while driving is visual (e.g., signs, other road users, lights, etc).

So what happens to our eyes as we age??

Changes include:

- Retina becomes less sensitive to light. This means that older drivers require significantly more light to drive.
- Our ability to focus starts to slow down around 40 yrs old. So it takes us longer to refocus when we look from close to far away (e.g., dashboard to the road ahead).
- More sensitive to glare because lenses of the eye thicken and pupils become smaller. Older adults need at least 5x longer to recover from glare than a teenager.
- Depth perception declines. As a driver you need to be able to judge the distance between you and another car. We use depth perception to judge how fast an oncoming car is approaching when preparing to turn left.
- Peripheral vision and ability to detect motion declines. When driving we are slower to see things that “jump” onto the road from the side.
- Colours become more difficult to see – especially red, which is an important colour when driving (e.g., brake lights, traffic lights).

Yes, I know vision changes with age, but MY vision is ok…or is it??

Awareness
Research shows that people 60 years of age and over often over-estimate their vision. Changes are often very gradual, as such people may not be aware of how much their vision has changed (decreased) and therefore do not make the necessary changes to their driving.

Having problems seeing and not being aware that you have problems can increase your risk while driving!

**Awareness Stop**

**Your Seeing and Hearing**

Do you have a disease that affects your ability to see? [ ] Yes [ ] No [ ] Not Sure

When was the last time you saw an eye doctor? _______________

When was the last time you had your hearing tested? _______________

Do you have to squint to see street signs? [ ] Yes [ ] No [ ] Not Sure

Do things seem to “come out of no where”? [ ] Yes [ ] No [ ] Not Sure

Do you have trouble judging space needed for turning? [ ] Yes [ ] No [ ] Not Sure

**Strategies**

**Strategies for Seeing and Hearing**

**Strategic Strategies: Before you drive**

- Regular check-ups! British Columbia Association of Optometrists recommends people over 64 years of age get their eyes checked once **every 12 months**!
- Wear your eye wear and/or hearing device (with charged the batteries)
- Avoid driving during twilight hours or a night. These are the times when low light and glare are more of a problem.
- Test yourself – park your car in your driveway; guess how close you are to the house/curb etc. and check – How accurate were you?
- Keep your windshields clean
• Plan ahead – choose routes with well lit streets to decrease glare from oncoming headlights
• Adjust your mirrors and seat to minimize blind spots
• Look around your vehicle so you know what is behind and beside you
• Get special side mirrors that will help you see to the side of your car: ask your car dealership about mirrors for your car or see an occupational therapist
• Backup warning devices – these will beep when you are close to another object (e.g., another car when backing up)

Tactical Strategies: When driving
• Be sure you are checking your mirrors every 5 – 8 seconds when driving (side and rear view) so things do not “jump” out at you
• Leave enough space between you and the other vehicle. Remember if you have depth perception problems this can be difficult.
  o Use the 3 second rule! Leave 3 seconds between you and the car in front of you. Practice estimating this on a quiet street so you get a better sense of how far 3 seconds is.
• Keep background noises to a minimum by turning off the radio, minimize talking with passengers, and turn off cell phones while driving.

Overcoming Barriers

Obstacles – What gets in our way of using these strategies??

Problem: Sometimes I have to go somewhere at night, but I do not like to drive at night!
Solutions: Ask someone else to drive – perhaps you can drive to the next daytime event; Take a taxi or bus; other ______________________

Problem: ______________________________________________________
Solutions: ______________________________________________________

Physical Abilities – What we do and how we do it!

Physical Abilities – When driving we have to be able to react quickly. Research has shown that older drivers have more difficulties with performing motor activities.
What happens to our physical abilities as we age?

Changes include:

- Slower reaction times
- Reduced strength
- Reduced flexibility and range of motion

What about specific health problems? Let’s talk about different symptoms that can impact driving.

Research has shown that it is the symptoms of health problems that are related to more driving difficulties. Many different health conditions (e.g., arthritis, heart disease, high blood pressure, MS, Parkinson’s, Alzheimer’s disease, sleep disorders, etc.) can lead to these types of symptoms.

Common symptoms include:

- Limited strength or movement in the torso
- Stiffness in the neck
- Stiffness in the spine
- Limited strength or movement in the legs
- Difficulty with balance
- Chronic pain
- Fatigue
- Involuntary movements (e.g., twitching, shaking)
- Decreased height

How do these age-related changes and symptoms effect our driving?

Make it more difficult to:

- Turn our heads (e.g., to check blind spots)
- Grip and turn the wheel
- Press the pedals (accelerator or the brake)
- Reach controls or handles (e.g., door, window, emergency brake)
• React quickly to sudden changes in the driving environment

**Awareness**

We do not often think of driving as a physical activity, but to drive safely we need to be able to do certain tasks (e.g., check mirrors, press pedals). It is important to “listen” to our bodies. Even if you do not have a disease, such as arthritis or high blood pressure, that can cause physical symptoms, how you feel physically can change day to day.

**Strategies for Physical Abilities**

**Strategic – Before You Drive**

- Exercise – This can help keep your neck and truck flexible to allow you to check your mirrors and blind spots effectively
- Get enough sleep to minimize fatigue
- Talk to your doctor about any difficulties with strength, flexibility, joint stiffness, pain to see if an exercise program or medication can help
- See an occupational therapist for an assessment as there may be devices you can use in your car (e.g., hand bars, mirrors, etc.) – You can self refer to community rehabilitation
- Adjust your seat so your chest is at least 10” from the steering wheel
• Adjust the height of your see so you are at least 3” higher than the dash
• Adjust the headrest so it hits the middle of your head if you lean back
• Choose not to drive if you are not physically feeling up to it

**Tactical – When Driving**

• Leave extra space between vehicles
• Look ahead – *occasionally* look 15 seconds ahead to see what traffic is doing (e.g., braking) to give yourself more time to react. Remember you need to come back to what the car in front of you is doing!

**Overcoming Barriers**

**Obstacles – What gets in our way of using these strategies??**

Problem: I cannot change the fact that I have arthritis, which makes it difficult to look behind me when I am backing up.

Solution: Talk to your doctor about an assessment to see if changes to your vehicle would help. These may include special mirrors to help you see what is behind you. These mirrors are often available from your car dealership. Look into different types of transportation (e.g., bus, taxi, delivery services).

Problem: __________________________________________________________

Solutions: _______________________________________________________

**Knowledge**

**Thinking – What and how we think!**

There is a lot of information coming at us when we drive. It is important to be able to take in the information quickly and decide what action to take in order to avoid hazards or a collision. As we age we process information more slowly. Older drivers have more experience to help with judgment. Good thinking is important as we make **up to 15 decisions for every km** we drive!

**What happens to our thinking abilities as we age?**
Changes include:

- Reduced divided attention – It is harder to pay attention to more than one thing at the same time. When driving we need to pay attention to lots of information all at once.
- Reduced selective attention – It is harder to ignore one thing and pay attention to another important thing. When driving we often talk to a passenger, but we still need to pay attention to what is going on around us.
- Decreased memory
- Decreased planning abilities
- Decreased speed of thinking

Remember that other things also impact our thinking.

Things such as:

- Neurological conditions – Such as dementia (e.g., Alzheimer's disease), epilepsy, Multiple Sclerosis, etc.
- Mental health conditions – Such as depression, anxiety, sleep disorders, etc.
- Medical conditions (e.g., high blood pressure, infections, cold, flu)
- Medications – Be sure to talk to your doctor about any condition or medication you are taking and how it can impact your driving
- Emotions – Being upset, angry, sad, etc., can all impact our ability to think

How can these changes in thinking impact our ability to drive?

Effects on driving can include:

- Being less aware of our driving environment – because we cannot take in the information quickly and cannot attend to as much of the information as before
- More difficult to plan and remember our route – this may lead to getting lost or turned around
- More difficult to plan or judge our driving maneuvers (e.g., turning left)
- Less time to react to sudden situations – because we take longer to process the information and take action
- Being less aware of our own driving habits and abilities
Strategies for Thinking Abilities

Strategic – Before You Drive

- Talk to your doctor/pharmacist about the effects of your medication on your ability to think quickly, react, and drive. If necessary stop driving while on these medications.
- Avoid fast moving (rush hour) traffic
- Plan route ahead and take a map
- Limit driving to familiar places
- Keep yourself mentally fit – Doing things like logic games (e.g., Sudoku, crosswords), reading, and puzzles are great ways to keep mentally active. Think of it as Brain Exercise!!!
- Be aware of your abilities on that day - Lack of sleep, stress, being angry or upset, pain, etc., can all decrease our ability to think quickly and pay attention. If you are not feeling well, take alternative transportation or wait for another day/time to drive.
• Have a neuropsychological assessment – ask your doctor for a referral

Tactical – While Driving

• Pay attention while driving – eliminate distractions in the vehicle, such as radio and conversations with passengers

• Use a passenger to navigate – Research shows that this can both help and hinder our ability to drive safe. So be sure that you do not depend on this as a way to drive.

• Use defensive driving techniques to increase the time you will have to react and make a decision – These include the 3 second rule (see vision section), and checking your mirrors so you know what is happening around you.

• If you are unsure about making a turn or passing another vehicle, then wait until you are sure.

Overcoming Barriers

Obstacles – What gets in our way of using these strategies??

Problem: I just had an argument with a loved one/friend and am very upset, but I need leave and drive home!

Solution: Sit in your car, take a few deep breaths, and do not start the car until you are focused on the task of driving. Count down from 100 to help calm yourself. Go for a brief walk before getting behind the wheel. Call for someone else to come pick you up; you can go back to get your car later.

Problem: _______________________________________________________

Solutions: _______________________________________________________

Knowledge

I am a Good Driver – Or am I??

A Look at Beliefs and Warning Signs

The research shows that age alone is not a good predictor of driving ability. However, age-related changes, medical conditions, and other factors (as discussed in the first part of this course) all impact our driving. The more risk
factors we have, the more likely we are to be at risk of unsafe driving practices. But, how do we know if this applies to us??

I have never had an accident, so I must be a good driver!
Are we really good at judging our own driving ability???

Research shows that almost all older drivers, when asked, will rate themselves as average or above average drivers, in comparison to other drivers their age. But, we cannot all be average or above average!

Research shows:
100% of older drivers rated themselves as average or above average (even if they had been in an accident or a near-miss) – BUT 27% of these drivers performed below average on an on-road driving test.

So, while many older drivers performed well on the driving test, there were still some that did not. We cannot just assume we are a good driver.

Strategies

How do we know how well we are really doing? Think SOAP!

S = Self-assessment - There are many places to test your knowledge and self-assessments are available that you can do with a family member or friend
  o  www.icbc.com has rules of the road practice tests online
  o  www.tsf-bcaa.com has self-assessments that you can print off

O = On-road assessment or test – Ask at local driving schools

A = Ask family and friends for their opinions

P = Practice, Practice, Practice!

If we become more aware of our own situation (e.g., what we do well, where can we make improvements) we can make better decisions regarding our safe driving behaviours! This is important so that we can stay driving safely for as long as possible!
Warning Signs
Part of being safe on the road is looking for signs that you may be having some difficulties on the road. Remember, if you experience any of these things then you may need to consider what you can do to increase your safety.

What are some warning signs? Think – CRASH FREE !!

C – Challenging to do manoeuvres that were once taken for granted: This includes having difficulties judging gaps in traffic, turning, using correct pedals, backing-up, parking, etc.

R – Road signs are difficult to read: You should be able to read signs from a distance

A – A series of near-misses, unexplained dents or scratches on your vehicle, minor collisions

S – Sometimes your thoughts wander while driving: It is important to be alert and focused on your driving.

H – Honking by other drivers: If other drivers honk at you it may be an indication that you are making an error that you were not aware of

F – Family, friends, or doctors have expressed concern about your driving

R – Remark while driving “Where did that come from”, “It came out of nowhere”

E – Even in familiar places you sometimes get lost

E – Emotions: increased anger or irritation or anxiety, and/or decreased confidence or comfort while driving

Is Driving Worth the Cost?
A Look at the Cost of Driving and Alternative Methods of Transportation

Knowledge
Cost of Driving
The cost of driving is increasing. So thinking about what it costs to use and maintain your car is important to consider.
**How much does it cost??**

The cost to use and maintain a vehicle for 1 year includes – insurance, gas, maintenance (e.g., oil change, brakes, tires), depreciation of the car.

* **Estimate the cost of your vehicle for 1 year**  $__________

According to the Canadian Automobile Association (CAA, 2007) the annual cost of having a car is $_______. For a larger vehicle, like a van, the cost is $_______.

*Remember these costs do not include the cost of parking or other extras such as using premium gasoline, toll highways, or fines.

---

**Awareness**

---

**Awareness Stop – Cost of your vehicle**

Use the worksheet below to see how much your vehicle costs for 1 year. You may be surprised!

<table>
<thead>
<tr>
<th>Costs of Driving</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly vehicle payments _____ x12 =</td>
<td></td>
</tr>
<tr>
<td>Monthly gas and oil costs _____ x12 =</td>
<td></td>
</tr>
<tr>
<td>Monthly parking costs ________ x12 =</td>
<td></td>
</tr>
<tr>
<td>Auto Insurance (for the year)</td>
<td></td>
</tr>
<tr>
<td>Registration and license fees (for the year)</td>
<td></td>
</tr>
<tr>
<td>Yearly Car Maintenance (oil changes, brakes, wheels, etc.)</td>
<td></td>
</tr>
<tr>
<td>Tickets and car accident costs (for the year)</td>
<td></td>
</tr>
<tr>
<td>Value of vehicle if you sold it</td>
<td></td>
</tr>
<tr>
<td>(or calculate the depreciation of your vehicle over 1 year: depreciation = price paid – value if sold / # of years you have owned the car)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td></td>
</tr>
</tbody>
</table>
Alternative Transportation – What you need to know

Knowledge

When we think of alternative transportation, many people think of a big hassle. But, alternative transportation can be easy, cost effective, and even social!

While it may seem that you will always drive; you may choose not to drive at certain times. For these times you may need another way to get to your destination. There may also be a time when you choose or have to stop driving. There are many alternative modes of transportation available and the best time to learn about these is now. Why? So that when the time comes, you will feel comfortable using these methods.

Using these methods can help by:

- Saving you money
- Allowing you more choices for times when you don’t want to drive (e.g., going out for dinner and drinks) or for when you choose not to drive (e.g., night, heavy rain, when you are not feeling up to driving)
- Being environmentally friendly
- Saving you from having to find parking

Alternative Transportation – So many options to choose from!

Strategies

1. Buses
   - BC Transit offers discount fares for passengers 65 years of age and older
     - At the time this book was made (May 2008) rates were as follows:
       - Cash - $1.40
       - 10 tickets - $12.60
       - Day Pass - $5.00 (unlimited rides all day)
       - Monthly pass - $42.00 (unlimited rides for the month)
   - Lots of kneeling buses and special seating for seniors
   - Community Travel Training – by BC Transit and provides free one-on-one teaching sessions to assist seniors or anyone with a special need to use the bus service. Call 250-384-7723 for more information.
     - Research shows that this program helps seniors learn to use, and feel more comfortable taking, the bus
• **HandyDART** – eligible for any person who is unable to use public transit without assistance and for most people over 85 years.

2. **Taxi**
   • If you are signed up with HandyDART you may qualify for Taxi Saver Coupons
     o By purchasing a sheet of Taxi Saver Coupons save you 50% off your taxi fare
   • Average cost (as of May 2008): $2.75 for the first 60 meters then a $1.50/km
   • Remember you can share a taxi to reduce costs – The fare is the same no matter how many people are in the taxi

3. **Volunteer Drivers**
   • Programs for driving people to medical appointments, social activities, grocery shopping, etc.
   • See Seniors Services Book
     o available from Seniors Serving Seniors at Suite 109, 1022 Pandora Avenue or online at [www.seniorservingseniors.bc.ca](http://www.seniorservingseniors.bc.ca)

4. **Family and Friends**
   • Offer to pay for gas sometimes

5. **Walking, Biking**

6. **Electric Scooters**

7. **Deliveries and catalogue shopping**
   • Delivery services are available to deliver items at a reasonable cost
   • See Seniors Services Book for more information and services
     o available from Seniors Serving Seniors at Suite 109, 1022 Pandora Avenue or online at [www.seniorservingseniors.bc.ca](http://www.seniorservingseniors.bc.ca)

**Remember, all of these are great ways to supplement your driving!** Also, many older adults tell us that driving is important to their independence and are fearful of isolation is they do stop driving. By supplementing your driving now, if you do ever stop driving, it will be easier to get places and be independent.

**Awareness**
1 Year Cost Comparison – Wow what a Savings!!!

<table>
<thead>
<tr>
<th>Cost of Car</th>
<th>Alternative Transportation</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7 000</td>
<td>Bus = $504</td>
<td>$6 496</td>
</tr>
<tr>
<td></td>
<td>Taxi at regular fare:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 000km = $4 500 - $5 000</td>
<td>$2 000 – 2 500</td>
</tr>
<tr>
<td></td>
<td>(300 trips that are 10km each)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bus + 1000 km Taxi = $2 250</td>
<td>$4 750</td>
</tr>
</tbody>
</table>

Awareness Stop – Alternative Transportation

Stop and think about what types of alternative transportation would work for you!!

What types of alternative transportation do you already use? ______________

What types would be helpful to use? ___________________

Would it save you money to use other methods of transportation instead of driving??

How far do you drive each month? ______________

How much does your car cost for a month? __________

What would it cost to take a taxi the same distance for one month? _________

Could you also use less expensive transportation (e.g., bus, walk, others)?
[ ] Yes
[ ] No

How much would you save by using alternative transportation? __________

Overcoming Barriers
Obstacles – What gets in our way of using these strategies??

Problem: I would like to use other methods of transportation, but it’s just too inconvenient.

Solution: There are many ways to make using alternative transportation easier. For example: 1) buy a bus pass in advance, so you don’t have to always have the correct change, 2) leave the phone number of the taxi or handyDART close to the phone, 3) let family and friends know if you prefer not to drive during certain times, so they do not expect you to drive at these times, and 4) use the Transit Training Program to familiarize yourself with the city bus.

Problem: The bus routes are too confusing.

Solution: Yes, the bus routes can seem confusing at first. If you are unsure how to use the bus, call the Transit Training Program. You can also have someone you trust teach you how to travel by bus. You can get a bus schedule (online or from BC transit) to help you learn the routes. Start by learning how to get to one or two places that you go to often. Remember, the bus drivers are very knowledgeable and friendly. If you are unsure if you are getting on the correct bus just ask the driver.

Problem: ________________________________________________________

Solutions: _______________________________________________________

___________________________________________________________________

Remember – Be Self Aware and Drive SAFE!!
My Look at Alternative Transportation: Plans and Actions

We may not always drive. This may be because we prefer/choose not to drive at certain times, we choose not to drive at all, or someone else (e.g., family doctor) tells us that we should no longer be driving. By adding alternative means of transportation to your usual routine, it may help you in the future and may benefit you now (e.g., save money, decrease stress).

<table>
<thead>
<tr>
<th>Alternative Transportation</th>
<th>Benefits (Pros)</th>
<th>Negative Aspects (Cons)</th>
<th>My Plan</th>
</tr>
</thead>
</table>
| E.g., City Bus             | 1) Save money  
2) Do not have to drive in downtown traffic  
3) Can use in bad weather  
4) Environmentally Friendly  
5) Social | 1) Not sure what bus goes downtown  
2) Have to wait for the bus | 1) Call about Transit Training Program  
2) Take the bus with my friend who uses it regularly at first  
3) Try using the bus 2 times this week |
Looking at my chart, this week I plan on: (e.g., taking the bus with my friend to get familiar with it) _______________________________________

My reward for meeting my goal: (e.g., treat myself while downtown)
My Driving Safety Plan

There has been a lot of information presented in this book. It is up to you, as a driver, to make sure that you are as safe as possible when on the road. This worksheet was designed to help you put some of this information together, so you can create your own safe driving plan! These are the first steps to remaining safe on the road.

Things about my seeing and hearing that may affect my driving are:

________________________________________________________________________

Things about my physical abilities that may affect my driving are:

________________________________________________________________________

Things about my thinking that may affect my driving are:

________________________________________________________________________

Things I am already doing to increase my safety:

________________________________________________________________________

Things I am going to do to increase my safety:

a) Before I drive I plan on using these strategies: (e.g., get an eye exam, not drive at night)

________________________________________________________________________

b) When I drive I plan on using these strategies: (e.g., leave at least 3 seconds between my vehicle and the vehicle in front of me)

________________________________________________________________________

My reward for taking these steps (Think of a way to reward yourself for trying a new strategy – e.g. treat yourself to a fancy coffee):

________________________________________________________________________
Passport to Drive

This pocket-size handout was provided to participants at the end of the SAFE education program.

Before You Get in Your Car

- Self - Check In
  - I am physically ready to drive.
  - I am mentally ready to drive.
  - I am emotionally ready to drive.
  - I have my glasses or a hearing aid? (if needed)
  - I am not taking any medications that will affect my driving.
  - I have not had any alcohol to drink.
  - If you cannot check off each of these things, consider using alternative transportation.

Before You Drive

- Check Your Vehicle
  - Nothing behind the vehicle.
  - Lights are all working properly.
  - Windshield is clean.

- Self - Check In
  - I have a plan and know my route.
  - Seatbelt is fastened.
  - Mirrors are adjusted for me (both side mirrors and rear-view mirror).
  - Head rest is adjusted for me (so it will catch the middle of

Tips for Driving

When Driving:
- 3 second Rule: Leave at least 3 seconds between you and the vehicle in front of you.
- Look Ahead: Be aware of what is happening ahead of you.
- Minimize Distractions: Turn off the radio, minimize conversation, do not use a cell phone, do not eat, etc.
- Check Your Mirrors: Be sure you know what is going on around you.
- Use a Passenger to Navigate
Day 1 Slides

Drive S.A.F.E.
Safety Awareness For Elderly Drivers

Wendy Lindstrom-Forneri, MA
University of Victoria Centre on Aging

Slide 2

About the Research Study

- Thank you for participating!!
- Why are we here??
  - Looking at effectiveness of this driver awareness program to enhance older driver safety

Reminder that participation is voluntary and participants may withdraw at any time. Confidentiality of the course – do not have to share anything you are not comfortable with, anything you do share will not be confidential as this is a group setting. This program will not impact your driver’s license. Main emphasis for this course in to increase awareness and for people to have an open mind and be willing to change.
Slide 3

About the Research Study

- 2 day education program
  - Day 1 = 2 hours with 15 minute break
  - Day 2 = 2 hours:
    - 1.5 hours with 15 minute break
    - 30 minutes to fill out questionnaires

Slide 4

Topics for Today

- Day 1
  - Crash risk
  - Rules for high-risk driving tasks
  - Age-related things that can impact our driving
    - Vision and Hearing
    - Physical Factors
    - Thinking Factors

Each person should have a handbook. We will use this book today and tomorrow. This is yours to keep at the end of the program.

Slide 5

Handbook

- Each section we talk about today will cover:
  1. **Knowledge** – this is the information
  2. **Awareness** – this section helps you reflect on how the information provided applies to you and your driving
  3. **Strategies** – this are tips and things you can do to increase your driving safety
  4. **Obstacles** – we will talk about some of the things that may get in our way of using the safety strategies

Slide 6

Driving is the main way that people get from one place to another. Being able to drive has been equated with independence, as it gives us the ability to go where we
Driving SAFE – It’s up to you!

- Driving is important to all of us, no matter what our age.
- Being a safe driver means:
  - Knowledge of the rules of the road, how to drive, and how our physical and mental well-being impacts our driving
  - Examining and being honest with ourselves about our driving and safety
  - Taking steps to decrease our risk and improve our driving

These are some quotes from older adults about driving and the importance of knowing yourself and your abilities.

Read Quotes

Quote #2 – this is referring to our need to be aware of our abilities and to check things out if we have questions.

Crash Risk

- When the number of km driven are equal, older drivers are more likely than other drivers to be in a crash!
- When in a crash older drivers are more likely to:
  - Be fatally injured
  - Have longer recovery rates if hospitalized
  - Be at fault

Crash Risk is important because we are here to talk about driving safety and how to maintain our safety on the road, so we need to know the risks of not maintaining our safety. If we just look at the population as a whole, older drivers have one of the lowest crash risks, BUT this is because older drivers drive less. So we must look at #km driven. When we look at # of km driven, older drivers are more likely to be involved in a crash compared to middle aged drives and EQUALLY as likely as teenagers! (let this sink in as this is likely be new information) Older drivers may have different reasons for crashes (which we will talk about), but still have a high crash rate. We are also more likely to be at fault. Even more importantly is the risk to ourselves, as older drivers, if we are involved in a crash (go over points on want, when we want. It is understandable that most of us want to be able to drive for as long as possible. So, it is important to make sure that we have the knowledge we need in order to make good decisions about our driving. Driving safely is important both for us and for other road users. With age come numerous physical and mental changes that may increase our risk on the road. Everyone is different. So, it is up to you to examine yourself and your ability to adapt to these changes. It is important to be honest with ourselves so we can adjust our driving behaviours as necessary to increase our safety. Good News - there are things we can do to help decrease our risk and improve our driving.

"I've always said, driving is a full-time job that requires all of your faculties, physical and mental."

“. . .if you can you do, and if you have doubts you find out...for my own sake as much for everyone else’s”

“You have to realize if you are not 100% and work around that”
Age alone does not increase crash risk – but with aging does come physical changes, changes in our thinking that can impact driving. Also there is an increase in medical conditions – people often have more than one medical condition – and more than the conditions people often experience numerous symptoms (e.g., stiffness) that can impact driving. As we age we tend to have multiple conditions, changes, or symptoms and it is this that increases our risk of crashes. That is why it is important to be aware of our own health and changes that we are experiencing.

For an example of how these things can impact driving – older drivers with early Alzheimer’s Disease, which impact our memory, attention, and planning abilities, have more than double the risk of being in a crash than other older drivers.

Click mouse --- GOOD NEWS! We can make changes and research shows that by using some of the strategies we will talk about in this course you can decrease your risk and increase your safety!!
Failure to yield the right of way – often when turning left or merging into traffic

We will talk about each of these and the proper procedures in a few minutes.

This is our first Awareness Stop. We will have many of these throughout the sessions. The purpose of these is to take a moment and reflect on what we just talked about relates to you and your driving. It is important to be honest with yourself here. This is only for your eyes and to help you assess yourself. Reflecting on yourself at each awareness stop will help you know which of the strategies will work best for you.

For this one there is no writing, so you just have to think about each of these questions (bottom of Page 2 in the handbook)

Go over left hand turn procedures.

We are the red car – so we have approached, signaled, and are taking control of the intersection

Who has the right of way? The grey car approaching us does.

Remember that it may be difficult to see that grey car approaching, because of the other vehicle in the intersection. If in doubt – wait!!! Do not worry about the drivers behind you. It’s better to be safe!

When you do turn be sure to turn into the lane closest to you – in this case the left hand lane.

As a note – the grey car behind us (red car) should actually be stopped before the white line, as they are partially in the crosswalk.

If you are waiting – even in a big intersection, where you could also fit in the intersection – you must wait behind the cross walk until the intersection is clear. If

### Slide 10

**Crash Risk**

- **Types of crashes** older drivers are more likely to be involved in:
  1. Intersections – often when turning left
  2. Failure to yield the right of way
  3. Violation of the traffic signal or sign
  4. Improper lane changes

### Slide 11

**Crash Risk Awareness Stop**

- Being aware of your own risks and taking appropriate steps regarding your driving behaviour may help to decrease your crash risk!
- **Ask yourself**
  - Are you comfortable with each of these skills (turning left, right of way, merging, changing lanes)?
  - **Have you had a crash or near miss?** If yes, you may need to have a driving assessment
- **Ask other people** if you make some of these common errors and learn the correct procedures.

### Slide 12

**Left Hand Turns**

**Left Hand Turn Picture**
the light turns yellow, stay there and wait for the next light. Any questions?

Slide 13

Yielding the Right of Way

This video was made in Winnipeg and is a 60 second clip that explains how to merge into traffic. Watch what happens at the end, if you are not paying attention.

After the video: Points to make
1) the need to check for what is coming
2) the need to merge into the lane closest to you
3) be sure to do a quick check so that you can still know what is happening in front of you!! Or end up like the people on the video!
Any questions?

Slide 14

Traffic Signals and Signs

Pictures of signs

Important to know what the signs mean and to obey them. If you are unsure of what a sign means contact ICBC. Does anyone have any signs they are unfamiliar with and would like to ask about?? (if I don’t know… find out for tomorrow’s session)
This is another short video about proper procedures for a lane change.

**After the video emphasize:**
1) Need to check mirrors first!
2) That a blind spot check needs to be quick
3) To know where your blind spots are – remember there are blind spots in the back and the front of a vehicle.

---

You will learn many strategies and tips on how to reduce your crash risk and increase your safety during this course. So do not limit yourself to the 3 R’s. Think of this as just the starting point.

**Route Planning** – plan your route before you leave the house. If you are not comfortable with left hand turns (especially if there are no traffic lights) then make 3 right hand turns

**Review Skills and Knowledge** – if you cannot talk yourself through a set of rules (e.g., for 4 way stop) when not in the car, then you should consider reviewing the rules of the road – you can get this information from ICBC or on their website

**Rehearse** – practicing is important to retain your skills. Just like any skill or ability you need to practice in order to stay sharp!

---

Health Changes and Driving

- Many changes occur as we age that can impact our driving:
  - **Vision and Hearing** – what we see and hear
  - **Physical** – what we do and how we do it
  - **Thinking/Cognitive** – what we think and how we think
Hearing

How does our hearing change as we age?
- Hearing becomes less acute
- 40 – 50% of people age 75 and older experience significant age-related hearing loss (presbycusis)
- Gradual loss
- Hardest to hear high pitch sounds (e.g., sirens!)

Impact on Driving
- Difficult to hear warning signals (e.g., horns, sirens)

Vision

What happens to our eyes as we age?
- Retina less sensitive to light = require more light to drive, harder to see at night
- Ability to focus slows down - takes longer to refocus when look from close to far away (e.g., dashboard to the road ahead)
- More sensitive to glare = 5x longer to recover from glare than a teenager

Good vision is essential to driving
Expand a bit on each point – to ensure they understand what the change is

These are the same picture of someone driving into the sunset. The one on the left is what a 20 year old sees and the one on the right is what an 80 year old sees. What do you notice about the two different pictures?
Point out how although a 20 year old has trouble with glare, it gets worse as we age. The oncoming vehicle disappears in the glare. Imagine how much more dangerous this would be if this car was turning left. The difference is a clear example of how glare can impact our driving. It can happen at sunset, but also at night with headlights. Avoiding driving at these times can help.
When driving at night driving on well lit streets and not looking directly into the headlights can help minimize glare.
Slide 21

**Vision**

- What else happens to our eyes as we age?
  - **Depth perception declines** = difficulty judging how fast an oncoming car is approaching
  - **Peripheral vision declines** = things “jump” onto the road from the side
  - **Colours become more difficult to see** – especially red (e.g., brake lights, traffic lights).
  - **Ability to see details declines** = difficult to take in the driving environment quickly

Slide 22

**Vision**

- Diseases that impact vision
  - Macular degeneration
  - Glaucoma
  - Diabetes
  - Retinal detachment
  - Cataracts

Depth Perception: Also difficult to judge point of no return (point you decide on during your approach to a stale green light where if you hit that you will go through the light even if it turns yellow)

Ability to see details decline: When we piloted this program with older drivers like yourself, many of the talked about how hard it is to see all of the details that come at us quickly when we drive.
Tell story of man who didn't know he had cataracts – was driving and did a self-assessment of his driving as part of one of our research studies. This suggested that he get his vision checked. He went to the eye doctors and was shocked to find out he had cataracts.

Notice in this picture how you lose the car at the bottom of the picture. So if you were driving, you can see how much detail you lose by having cataracts. Often people have vision problems without knowing because it happens so gradually.


Vision changes are often gradual, so you may not be aware of the changes.

Handbook on page 4 – (Show by holding up your book) Read out the first couple of questions. Remind people this is only for their own eyes and the importance of being honest with yourself. Give people a few minutes to answer the questions. Once done let them know: If answered Yes or Not Sure, your vision may be affecting your driving.
We will talk today about 2 types of strategies. **Strategic strategies** are things to do before you drive. We will also talk about **tactical strategies** which are things to do while you are driving.

Optometrists recommend people 70 and over have annual eye exams. If you have not had a hearing test recently it may be worthwhile, as hearing loss is so gradual. Remember to have your sunglasses handy for glare.

Avoid night driving, if you need to get places at night consider alternative transportation (we will talk more about various forms of transportation tomorrow). Test yourself – practice this until you get better at judging your distance. Tomorrow we will talk more about other ways to self-assess.

Clean windshields will help more light get to your eye. If you have not cleaned the inside and your windshield for a while you may be surprised at how much dirt builds up.

Plan your route ahead of time – if you have problems with glare, choose well lit streets at night.

Adjust your mirrors and seats for you – this will help to minimize the blind spots. Be sure you know where your blind spots are for your vehicle.

Special Mirrors – you can get these mirrors from your local dealership. These mirrors help you to see farther around your vehicle and minimize blind spots at the rear of your vehicle. If you want to get an assessment to see if devices like special mirrors will help you, you can self-refer to the Rehabilitation Program to see an occupational therapist.

**Warning Devices**: These will beep when you are within 6 inches of an object.
Vision and Hearing

**Tactical Strategies: When driving**
- Look in your mirrors regularly (side and rearview) so things do not “jump” out at you
- Keep background noises to a minimum
  - Turn off the radio, minimize talking with passengers, turn off cell phones
- Leave enough space between you and the other vehicle.
  - Use the 3 second rule!

Look in mirrors – it is recommended that you look in your mirrors every 5 – 8 seconds. This is because traffic moves quickly and it is important to see what is going on around you. Remember not to look too long in your mirror – just glance, as your attention needs to be focused on what is in front of you.

Minimizing background noise can be helpful as it allows you to better hear any warning signals on the road (e.g., horns, sirens)

It is important to leave enough distance between you and the vehicle in front of you – however you may have trouble judging this, especially if you have difficulties with your depth perception. So be sure to follow the 3 second rule. (go to next slide)

The 3 second rule refers to the distance between you and the car in front of you. To measure this, when the back bumper of the car in front of you passes a stationary object (like a tree) you start counting….one thousand 1, one thousand 2, one thousand 3. The front of your car should then be at the tree.

Click mouse – Remember that if you have a heavy vehicle, or if it is raining or slippery you need to leave more space.

I don’t like to drive at night because of the glare, but every Tuesday I play cards until 9:30pm.

**Solutions:**
- Ask a friend in the card group for a ride
- Offer to pay for gas or to drive to a daytime event
- Take a taxi or HandyDART – set up a weekly appointment
- Take the bus
- Walk
- Family member or friend
- Offer to have the card game at your house

Sometimes we want to use a strategy, but are not sure how.
Break Time!!

15 minute break for coffee & tea
Day 1 Slides (Continued)

Physical Abilities
- Driving requires being able to react quickly.
- **Age-related Physical Changes include:**
  - Slower reaction times
  - Reduced Strength
  - Reduced Flexibility and range of motion

Slide 33

Physical Abilities
- **Health conditions**
  - Many health conditions can impact driving (e.g., MS, Parkinson’s, arthritis, heart disease, high blood pressure, sleep disorder)
  - Regardless of what disorder you have or do not have, it is the symptoms that impact driving

Speaker Notes/Reminders
When driving things can happen very quickly, so it is important for us to be able to react quickly. Luckily we have experience on our side to help us react appropriately, however there are physical changes that can reduce our ability to react. Some of the changes that people may experience with age include 1) slower reaction time – takes longer to move our foot from the gas to the brake, 2) Reduced strength – it requires a certain amount of strength to grip the steering wheel, turn the wheel, or to slam on the brakes in an emergency, and 3) reduced flexibility – this is a common thing experienced by older adults and often impacts our ability to check our blind spots effectively. So it is important to know where your blind spots are and whether or not the range of motion you have in your neck will allow you to check these blind spots.

As we age there is an increase risk of us getting these conditions, or having many different conditions. However, research has shown that it is not the disorder or condition itself that impacts driving, rather it is the symptoms!! So, even if you do not have a diagnosed condition, you may still experience some of the symptoms that can affect your driving.
Go through each of these. Reminding people that the more of these you are experiencing the harder driving may be for you. Remember that you may not experience each of these things everyday. How we feel physically can change from day to day and moment to moment, so it is important to be aware of our body and how what we are feeling can impact our driving.

Talk about the importance of being able to do each of these tasks in order to drive safe.

Handbook Page 7: It is important to be honest with yourself about your physical abilities. Be sure to listen to your body, as things can change. Ask people if anyone wishes to share any of there experiences with physical abilities impacting their driving.
Physical Abilities

- **Strategic – Before You Drive**
  - Exercise – Flexibility is important for checking mirrors and blind spots
  - Talk to your doctor about any difficulties with strength, flexibility, joint stiffness, pain to see if an exercise program can help
  - Community Rehabilitation for assessment with an occupational therapist (e.g., mirrors, hand bars)

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Exercise – getting regular physical exercise (e.g., 2-3 times a week) can help you maintain and increase your flexibility and strength

Be sure to talk to your doctor before starting any exercise program. Your doctor may have specific exercises they recommend for your particular physical difficulties. You can also refer yourself for a physiotherapist assessment from Community Rehabilitation if you are concerned about your physical abilities. Getting special equipment such as hand bars can make it easier to get in and out of your vehicle. If you have limited flexibility, using special mirrors may help you to maintain your safety on the road by minimizing blind spots so that you can still see all the way around your vehicle.

Adjusting your seating will help you be able to see what is happening in the environment, if you see it better you will be better able to react to what is happening around you.

These adjustments are important 1) so you can handle your car effectively and 2) for your safety if you were in a crash

It is very important to be honest about how you are feeling before you drive. If you do not feel physically up to it, then do not drive. If you have to go some where use alternative transportation like family, the bus, taxi. I know a senior driver who’s rule is – if she wouldn’t feel comfortable having her children or grandchildren in the car with her, then she doesn’t drive that day. So if she has a head cold, she has someone else drive or takes a bus or taxi.

- Adjust your seat so your chest is at least 10” from the steering wheel
- Adjust the height of your seat so your eyes are at least 3” above the dash
- Adjust your headrest
- Choose not to drive if you are not physically feeling up to it
Slide 39

Physical Abilities

- **Tactical – When Driving**
  - Leave extra space between vehicles
  - Even more than 3 seconds at high speeds
  - Look ahead
    - Look a couple vehicles ahead to see what traffic is doing (e.g., braking) to give yourself more time to react

Leave extra space – this will help give you the time needed to stop, if someone in front of you slams on their brakes.

Look ahead – it is important to look ahead of you so you know what traffic is doing. For example, if no one is in front of me and I’m approaching a stale green light, I often look at the countdown on the crosswalk, as it gives me a good idea as to if the light is going to change to yellow. BUT…. you have to be careful that you are not looking too far ahead or focusing there for too long, as you need to be aware of the vehicle directly in front of you.

Slide 40

Physical Abilities

- **Obstacle:**
  - I have arthritis, which makes it difficult to look behind me when I am backing up.

  - **Solutions:**
    - An assessment may help determine if changes to your vehicle would help
    - Can self-refer to community rehabilitation for an occupational therapy assessment
    - Car dealerships may have mirrors available for your car
    - Look into different types of transportation (e.g., bus, taxi, delivery services)

Tell a story about an obstacle….does not have to be what is on this slide

Any questions about physical abilities before we move on to thinking.

Any questions about physical abilities before we move on to the next section?

Slide 41

Thinking Abilities

- Lots of information comes at us when we are driving
  - We make up to 15 decisions/km
- Need to be able to take in and process this information quickly to make safe decisions
- Experience driving helps with decision making

Driving, as we know, is a complex task that requires us to make many decisions and actions. In fact, we make up to 15 decisions every km we drive!! In order to make safe decisions we need to be able to take in the information, process it, and then make a decision based on that information. As seniors our years of driving experience help us with this decision making and increases our safety on the road.
Thinking Abilities

- Age-related Changes in Thinking Abilities
  - **Reduced divided attention** – When driving we need to pay attention to lots of information all at once.
  - **Reduced selective attention** – When driving we often talk to a passenger, but we still need to pay attention to what is going on around us.
  - **Decreased memory**
  - **Decreased planning abilities**
  - **Decreased speed of thinking**

Divided Attention: It is harder to pay attention to more than one thing at the same time. This is something we have to do all the time when driving. For example, we need to pay attention to what the car in front of us is doing and how close we are to the street we want to turn down.

Selective Attention: It is harder to ignore one thing and pay attention to another important thing. When driving we often have to ignore one important thing, such as what our passenger is saying, to attend to a more important thing, like making our left hand turn safely.

Decrease memory – We may find ourselves forgetting where we were going, or what street to turn onto next. This can lead to confusion on the road.

Decreased planning abilities – We start to find it takes more effort to plan our route ahead of time, but also to plan our driving maneuvers. So it becomes harder to take in all of the information at an intersection, interpret what traffic is doing, spot the hazards (such as children playing on the sidewalk) and to plan our left hand turns.

Decreased speed of thinking – the rate at which we are able to take in information slows down AND the speed at which we can process that information and interpret it also slows down. So you can imagine if you have decreased speed of thinking and decrease reaction time and/or problems with your vision.....it is going to take you much longer to react to what is happening in the environment.

These are things that **can happen** with age and you **may not** experience all of these, but you may be experiencing some of these things. The important thing is to know yourself.
Thinking Abilities

Other Things that Impact Our Thinking
- **Neurological conditions** – e.g., Alzheimer’s Disease, other dementias, epilepsy, Multiple Sclerosis, etc.
- **Mental health conditions** – e.g., depression, anxiety, sleep disorders, etc.
- **Medical conditions** - e.g., high blood pressure, infections, cold, flu, etc.
- **Medications** – Ask your pharmacist about how your medications can impact your driving
- **Emotions** – being upset, angry, sad, etc.

Conditions such as early Alzheimer’s disease, can impact our thinking abilities and make it more difficult to drive safely. Mental health conditions can decrease our thinking speed and our ability to pay attention to our driving. Medical conditions – these can make it difficult to concentrate and pay attention, they can also slow our speed of thinking. Medications – many medications can impact our ability to think clearly and quickly. It is important to know how your medications may impact your driving. Emotions – being upset, anxious, confused, sad can all slow down our thinking speed, take our attention away from driving.

All of these things listed here have the potential to impact our judgment and awareness. So we may not be accurately judge distances or speed. We also may not have the awareness or insight that we need to be able to adjust our driving. As we have said, being aware of ourselves is important when examining our driving abilities and habits.

Being less aware of our driving environment: So we may not be aware of the ball bouncing out into the street. Or when there are many signs in a short distance, we may not be able to process and pay attention to all of them, so we may miss important information like construction and detour signs. More difficult to plan our route – this can lead to becoming confused and unsure on the road. This leads to increased anxiety and takes our attention away from the driving task and onto trying to determine where we are.

Thinking Abilities

- How can these changes in thinking impact our ability to drive?
  - **Being less aware of our driving environment**
    - we cannot take in the information quickly and cannot attend to as much of the information as before
  - **More difficult to plan and remember our route**
    - this may lead to getting lost or turned around
Thinking Abilities

- How can these changes in thinking impact our ability to drive?
  - More difficult to plan and judge driving maneuvers
    - e.g., difficult to plan and make turns at intersections
  - Less time to react to sudden situations
    - because we take longer to process the information and take action
  - Being less aware of our driving habits and abilities

Difficult to plan/judge driving maneuvers – as our speed of thinking slows down it is more difficult to take in all the information necessary to plan and judge difficult driving maneuvers, such as parallel parking or turning at a busy intersection. Less time to react – this can be because of slower speed of thinking or due to changes in our planning, judgment or concentration. Remember all of these thinking abilities may change with age, but also will change depending on how we are feeling physically. For example, thinking speeds, concentration, and attention are all decreased if we are fatigued, emotionally upset, or in pain.

Being less aware of our driving habits and abilities – while this is not necessarily part of aging, decreases in awareness can happen as part of a condition, like Alzheimer’s disease, or this may happen because of our own attitudes and beliefs about our driving. Sometimes we can ignore signs or brush them off, because it is hard to look at our own driving. Driving is important to us, so it is important that we are honest with ourselves so we can maintain our safety on the road.

Page 9 in the handbook.
Give people a couple minutes to fill out the questions.
Ask in anyone has any experiences or questions about this awareness stop.
Thinking Abilities

**Strategic – Before You Drive**
- Find out how your medication effects your ability to think quickly, react, and drive.
  - If necessary stop driving while on these medications.
- Avoid fast moving (rush hour) traffic
- Plan route ahead and take a map
- Limit driving to familiar places

If you take a map be sure that you do not read it while you are driving. Have someone navigate or pull off to the side of the road and stop completely before you read it. Sometimes when people become lost, they drive really slowly down the side of the road. This is a hazard and can cause accidents as other drivers do not know what you are doing or why. It is best to signal, pull over, and stop on a safe section of the road. Determine where you are and plan where you need to go next before getting back into traffic.

Thinking Abilities

“I try to stay on certain roads...when I went on a new road, I had a great deal of trouble...I can drive much easier on a road that I know. I’ve adjusted to that.”

Thinking Abilities

**Strategic – Before You Drive**
- Keep yourself mentally fit
  - Doing things like logic games (e.g., Sudoku, crosswords), reading, and puzzles are great ways to keep mentally active. Think of it as Brain Exercise!!
- Be aware of your abilities on that day
  - Lack of sleep, stress, pain, etc., can decrease our ability to think quickly and pay attention
  - Do not drive if you are not feeling well
- Ask your doctor about a neuropsychological assessment

Be aware of your abilities – just like physical abilities, our thinking abilities will change from day to day. Be honest with yourself and if you are not feeling up to it, do not drive.

If you are experiencing changes in your thinking and are really concerned about it, ask your doctor if having a neuropsychological assessment would be helpful. This is an assessment of one’s thinking abilities, however they are expensive and there are often long waiting lists.
Thinking Abilities

Tactical Strategies – When Driving
- Pay attention while driving
- Eliminate distractions in the vehicle
- Use a passenger to navigate
  - This can both help and hinder our ability to drive safe.
- Use defensive driving techniques
  - 3 second rule, checking your mirrors frequently
- If you are unsure if you should pass or turn, then wait

Eliminate or minimize distractions – these can be noises such as the radio or chatter, but can also be things like eating or drinking, as these take your attention momentarily away from driving. Passengers can be a great help, but be sure that you are not relying on them all of the time. If you cannot go to familiar places without a passenger to navigate, you may need to look at your driving and how safe you are.

Thinking Abilities

Obstacle:
- I just had an argument with a friend and am very upset, but I need to leave and drive home!

Solutions:
- Sit in your car, take deep breaths, do not start the car until you can focus on driving
- Go for a brief walk before getting behind the wheel.
- Call someone to pick you up; you can get your car later.

Any questions or this section?

End of Day 1

- Please leave your handbooks here
- What we will cover on Day 2
  - More tips for safe driving
  - Warning signs – some of these may surprise you!
  - Costs of driving – this may shock you!
  - Alternative transportation
  - Check list for Driving – a handout for you
  - Questionnaires

Any questions or comments about anything we covered today?
Thank everyone for coming. Ask them to leave their handbooks with you. They can put their first name or initials on the inside cover, so we will know whose book is whose. It is important for people to have there books here for tomorrow.
Day 2

Slide 1

Drive S.A.F.E.
Safety Awareness For Elderly Drivers

Wendy Lindstrom-Forneri, MA
University of Victoria  Centre on Aging

Slide 2

Welcome Back!

- Agenda for Day 2
  - Review of Day 1
  - Warning Signs
  - Cost of Driving
  - Alternative Transportation
  - Worksheets
  - Questionnaires

Speaker Notes/Reminders

Quickly list the topics covered from Day 1
Check to see if any questions have come up based on yesterday's information

Quote from an older driver about how they viewed their driving before they were in an accident…(Click mouse) Quote from a passenger about a friend’s driving – their friend believes they are an excellent driver. So, even though we may think we are good drivers we still need to look at ourselves honestly to make sure we are as safe as we can be on the road
When asked older drivers, and most drivers regardless of age, will rate themselves as average or above average. However, by definition we cannot all be average. Older drivers rate themselves as average or above average even if they have a history of accidents, near-misses, or traffic violations. Research has shown that although all the older drives in the study rated themselves as average or higher, almost 30% failed the in-car driving test. This shows us that we really need to be aware of our driving and be honest about our driving. We cannot assume we are good drivers…the risk is too high!

Quote from an older driver about how they viewed their driving before they were in an accident…(Click mouse) Quote from a passenger about a friend’s driving – their friend believes they are an excellent driver. So, even though we may think we are good drivers we still need to look at ourselves honestly to make sure we are as safe as we can be on the road.
How do we know how well we are doing?

- Think SOAP
  - S – Self-assessment
  - O – On-road assessment or test
  - A – Ask family and friends
  - P – Practice, Practice, Practice!

If we become more aware of our own situation (e.g., where can we improve, what do we do well) we can make better decisions regarding our safe driving behaviours! This is important so that we can stay driving safely for as long as possible!

The first thing we can do is Self-Assessments: These can be done either by completing on-line questionnaires and surveys that will test your knowledge of the rules of the road. These types of tests are available on-line from ICBC or BCAA. The other type of self-assessment is to go on the road with a trusted relative or friend and have them rate your driving. BCAA has a self-assessment available on-line or you can pick one up from us before you leave today. The important thing to remember is 1) be prepared for honest feedback, 2) talk with your relative or friend before you have them rate you so they know exactly what you want regarding feedback, 3) be sure to use the feedback and change your driving habits or behaviours to help increase your safety.

On-road assessments – while these can be done through ICBC, remember that this could then affect your driver’s license. You can also get lessons and assessments done through local driving schools – be sure to ask the school before you take a lesson or assessment to see if this will impact your license at all.

Ask family and friends – again be open and honest about the kind of feedback you want and be open and willing to listen to what they have to say. Often it is easier to see problem areas when you are observing someone, then when you are actually doing the task. So, they may have good feedback which will help you to know if you should be using some of the strategies we talked about yesterday.

Practice – driving is a skill and like any skill you need to practice to maintain your abilities. They is no set rule on how often you should be driving, in order to maintain your skills, but I would think that once a week or every 2 weeks.
Part of being safe of the road is looking for signs that you may be having some difficulties on the road. Remember, if you experience any of these things then you may need to consider what you can do to increase your safety.

A series of near misses, dents etc. – what we mean by a series will really depend on how often you drive. But if you drive once a week and you have this happen once a month (that’s 25% of the time) it may indicate you are having problems on the road. Try to look for patterns of near-miss experiences – are they always when changing lanes, or at intersections without lights, or when backing up. If you can determine this, you may be able to figure out what you are doing that leads to these near misses.

Honking by others – again if it happens semi-regularly then you need to consider that it is not always the other driver! Honking is a way of telling another driver they have done something or are doing something unsafe.

Take concerns of others seriously. Often it is hard for people to express their concerns, so if they are, you may want to take time by yourself to reflect on these concerns. If you think they are just plain wrong, maybe doing a self-assessment will help to see if they are just being picky or if you do have some areas where you are having difficulty. Again, if you know where your difficulties are you may be able to use strategies to increase your safety!!
Slide 9

Is Driving Worth the Cost?

- How much does it cost??
- Estimate what you think it costs to drive and maintain your vehicle for 1 year

In your handbook on page 13 there is a spot for you to estimate the cost of your vehicle for one year. Get people to write down their estimate in their book. Ask some people to volunteer to say their estimate aloud.

Slide 10

Cost of Driving

- Canadian Automobile Association, 2007
  - Annual cost of driving a car = $8 581
  - Annual cost of driving a van = $10 836

This is based on averages in Canada and includes maintenance, insurance, and depreciation of the vehicle.

So, the point of the exercise was for us to see that what we think or believe does not always reflect the reality of the situation. So even though we all have owned and maintained a vehicle for a number of years, we are not necessarily aware of what our vehicle costs us. So remember this when you are thinking about your driving……you may not be the best estimator of your abilities, unless you really take the time to think about it and be honest with yourself.

In your workbook there is also a cost worksheet (go to next slide)

Slide 11

Awareness Stop Cost of Driving

<table>
<thead>
<tr>
<th>Costs of Driving</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly vehicle payments 0 x 12 =</td>
<td>0</td>
</tr>
<tr>
<td>Monthly gas and oil costs 110 x 12 =</td>
<td>1320</td>
</tr>
<tr>
<td>Monthly parking costs 25 x 12 =</td>
<td>300</td>
</tr>
<tr>
<td>Auto Insurance (yearly)</td>
<td>1140</td>
</tr>
<tr>
<td>Registration and license fees (yearly)</td>
<td>40</td>
</tr>
<tr>
<td>Yearly Car Maintenance</td>
<td>1000-2000</td>
</tr>
<tr>
<td>Tickets and car crash costs (yearly)</td>
<td>30</td>
</tr>
<tr>
<td>Value of Vehicle if sold or Depreciation per year</td>
<td>1600</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td>5430+</td>
</tr>
</tbody>
</table>

So, we are going to go through this chart using the cost of my vehicle. Hopefully after this course, you will go home and fill out the chart based on your own car, so you can see how much costs.

Now some of the costs of a vehicle never change, like registration fees, insurance, yearly oil changes. Other costs are variable, such as gas, maintenance, tickets.

So, let’s go through the chart -(when you get to depreciation) Remember that you have already paid money for your vehicle that you will not get back, so you need to account for the depreciation of your car each year.

So my car costs 5430 or more a year (depending on maintenance).
Slide 12

Alternative Transportation

- Why do I need to think about other forms of transportation?
  - To supplement your driving
  - You choose not to drive sometimes (e.g., night, rain, heavy traffic)
  - May come a time when you stop driving
    - You choose to stop driving
    - Doctor’s advice
    - Medical condition
    - Medications

Slide 13

Alternative Transportation

- Benefits
  - Save money
  - More choices for when you do not want to drive (e.g., going out for dinner and drinks)
  - Supplements driving for when you choose not to drive (e.g., during rush hour)
  - Do not have to worry about parking
  - Social
  - Environmentally friendly

It is important to think about and start supplementing your driving, while you are still driving. That way if ever there was a time when you did not want to drive or when you choose to stop driving or have to stop driving for a time - you will already know how to use alternative transportation

Slide 14

Break Time!!

15 minute break for coffee & tea
Slide 15

Alternative Transportation

- **Bus – BC Transit**
  - Discount fares for seniors
    - $1.40 per ride
    - $5.00 unlimited rides for a day
    - $42.00 a month
  - Community Travel Training
    - Free one-on-one teaching session
    - 384-7723 for more information
    - Research shows it works!
- **HandyDART**
  - Door to Door service
  - Great for regular appointments
  - Need to register

Slide 16

Alternative Transportation

- **Taxi**
  - Taxi Saver Coupons
    - Need to be registered with HandyDART
    - 50% off your taxi fare
    - Order coupons in advance
  - Average regular fare = $2.75 to start, then $1.50/km
  - Door to Door Service
  - Can order in advance

Slide 17

Alternative Transportation

- **Volunteer Drivers**
  - Saanich Volunteer Services, Beacon Community Services, James Bay Community Project, etc.
  - See Seniors Services Book for more
- Walking, Biking
- Electric Scooters

BC Transit – you can also buy packs of 10 tickets, to use whenever you need them so you do not have to find the correct change.

Community Travel Training is free and available to any senior who would like to learn how to use the bus. Older adults often tell us that the bus is too inconvenient and confusing. Travel Training has been shown to help older drivers master using the bus and they then feel more confident about using it. You may be surprise how easy it can be to get to various places by the bus!

HandyDART – I am going to hand out information on the HandyDART application. You do need to register for HandyDART, however once you are registered you can book appointments well in advance. This can make it great for medical appointments or weekly social events.

*If time go over the application process*

Taxis are a great way to get around. Now, I had an older adult tell me that they “were not of a generation that used taxis”. So, if you are unsure of how to use a taxi, ask a relative or friend to show you how. The taxi drivers are also very good at letting you know what the process is. Remember you do not need cash, as you can now pay by credit card in the taxi.

Some taxi companies also have on-line ordering, so you can order a cab online days or weeks in advance.

Volunteer Drivers are available to take people to medical appointment, social events, etc. It depends on what service you are using, exactly what they will take you to, so be sure to call your local service and ask. The website for the seniors services book is in your handbook. You can also get a hard copy of the book from the Seniors Serving Seniors office.

The only caution with electric scooters is to be aware of what is happening around you. These can be a great way to go shopping and do errands if places are close to you, but too far to walk to and from.
Family and friends are often more than happy to give you a ride. If you feel like you are burdening them, you can always offer to give them some gas money. Offering to pay for gas is not necessary, but may be nice once and a while. Also, talk to family and friends about your driving so they know if you are not comfortable driving at night, that way they won’t expect you to drive during those times.

There are many delivery services available in Victoria and these are just a sample for the Seniors Services Directory.

Page 15 – When you fill this out, and you may need to do it at home, be sure to remember that the less you drive the more cost effective it is to use alternative transportation. This is because of the fixed costs of a car like insurance and depreciation. If you drive a lot and often go long distances, only using alternative transportation may not be cost effective, however using it sometimes will still save you money in gas and maintenance.

Let’s look at how alternative transportation can save us money!

As a note it is about 10km from Tillicum Mall in Saanich to the University of Victoria in Gordon Head area. So you could go across town 300 times in a taxi for less then it would cost to run a car for a year!
I know of an older driver who sold his car and now only uses alternative transportation. He was on a limited income, and with the money he saves each year he goes on a trip!

On page 18 in your book is the Alternative transportation worksheet. This will allow you to weigh the pros and cons of using different types of alternative transportation. Try to make a plan on how you can learn to use or start using this type of transportation. (next slide)
Then decide on just one new type of transportation that you are going to try. And most importantly, give yourself a reward for trying something new! We often find trying a new behaviour easier if we give ourselves a little incentive or reward for doing it!

The other worksheet is on Page 17. This is where you can record the things that you are already doing…… (next slide)

And then write down the things that may help you increase your safety. Again make a plan for what you are going to try and do when you drive. So maybe you are going to plan your route, or do a self-assessment. Again, think of a way to reward yourself for taking this step toward safer driving. Research finds that rewarding ourselves can help to give us the push we need to help implement our plan!
Questions and Discussion

What’s Next?
- In a moment I will hand out questionnaires to complete today!
- 2 months from now you and your passenger will each receive a questionnaire package in the mail
  - Please fill out these questionnaires and return them in the stamped, addressed envelope that will be provided.

Please remember, it is very important that you make sure I review your questionnaires before you leave to ensure we have the correct ID number and all the forms are complete. This is necessary for the research. Thank you.
Thank you!! Drive SAFE!