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**OXFORD REGIONAL TRAINING COURSE IN  
CLINICAL PSYCHOLOGY**

**FACTORS INFLUENCING DRIVING IN OLDER AGE:  
AN APPLICATION OF THE THEORY OF PLANNED  
BEHAVIOUR**

**REBECCA MITCHELL**

**A thesis submitted in partial fulfilment of the requirements  
of the Open University for the degree of  
Doctor of Clinical Psychology**

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## ABSTRACT

This study investigates factors that may be related to dependency on driving and decisions to continue or cease driving in older age. Some older drivers may be unsafe to drive (Drachman & Swearer, 1993), but are unwilling to cease, this can result in referrals to mental health services. The potential influence of attitudes towards driving on driving behaviour has been highlighted (O'Neill, 1996) but as yet has not been fully investigated.

A questionnaire was developed, based on the Theory of Planned Behaviour, to elicit factors which might predict older drivers' intentions to drive more or less often. Reliability was demonstrated for the questionnaire, which was completed by 99 older drivers. The results indicated that the majority of older drivers used their car frequently. Two components of the Theory of Planned Behaviour were demonstrated to predict 73% of the variance in driving behaviour, namely, perceived behavioural control and attitude towards driving. Those drivers who perceived more positive outcomes for driving and less negative outcomes were likely to intend driving more often. Also those drivers with higher levels of perceived behavioural control were likely to intend to drive more often. A self-report measure of actual driving behaviour two to three months later, suggested that behavioural intention was highly related to subsequent driving behaviour. Methodological issues, future research and clinical implications of the findings are discussed. In particular, interventions based on attitude change and problem solving to decrease perceived dependency on the car, may facilitate the process of giving up driving.

# CONTENTS

	Page
<b><u>1.0 INTRODUCTION</u></b>	1
1.1 DRIVING IN OLDER AGE	2
1.1.1 Relevance of driving behaviour to mental health services for older adults	2
1.1.2 Social context	3
1.1.3 Age related changes in driving capability	4
1.1.4 Legal and ethical issues in the re-licensing process	6
1.1.5 The psychological and social significance of driving	7
1.1.6 Decisions to cease driving in older adulthood	9
1.2 DECISION MAKING	13
1.2.1 Decision making in general health	13
1.2.2 A model applicable to decision making about driving	14
1.2.3 Detailed analysis of the Theory of Planned Behaviour	14
1.2.4 Applications of the Theory of Planned Behaviour to driving	17
1.3 RATIONALE FOR THE CURRENT STUDY	19
1.3.1 Problems with existing research	19
1.3.2 The role of clinical psychology	20
1.3.3 Aims and research questions	22
1.3.4 Hypotheses	23
<b><u>2.0 METHOD</u></b>	24
2.1 EXPERIMENTAL DESIGN	24
2.2 PARTICIPANTS	24
2.3 MEASURE	25
2.3.1 Initial development	25
2.3.2 Description of components included in the first draft	27
2.3.3 Measurement of attitudes	29
2.4 PROCEDURE	30
2.4.1 Draft questionnaire and information sheet	30
2.4.2 First pilot phase	31
2.4.3 Second pilot phase	32
2.4.4 Main study	33
2.4.5 Test re-test procedure and validation of behavioural intention	34
2.4.6 Ethical approval	34
2.5 TREATMENT AND DISSEMINATION OF RESULTS	35
2.5.1 Statistical analysis	35
2.5.2 Dissemination of results	35

<b><u>3.0 RESULTS</u></b>	37
3.1 RESPONSE RATES	37
3.1.1 First and second pilot phase	37
3.1.2 Main study	37
3.1.3 Test re-test	38
3.2 DEMOGRAPHIC DETAILS	38
3.2.1 Pilot sample	38
3.2.2 Main study	39
3.3 STATISTICAL PROPERTIES OF THE QUESTIONNAIRE	40
3.3.1 Internal reliability	40
3.3.2 Test re-test reliability	41
3.4 DESCRIPTIVE DATA	42
3.5 TESTS OF THE HYPOTHESES	47
3.5.1 Hypotheses 1-3	47
3.5.2 Hypothesis 4	50
3.5.3 Hypothesis 5	52
3.5.4 Additional analyses	53
3.6 QUALITATIVE DATA	54
<b><u>4.0 DISCUSSION</u></b>	56
4.1 SUMMARY OF FINDINGS	56
4.1.1 Psychometric properties of the questionnaire	56
4.1.2 Findings related to the hypotheses	57
4.2 METHODOLOGICAL CONSIDERATIONS	58
4.2.1 The measure	58
4.2.2 The sample	60
4.2.3 Design	61
4.2.4 Treatment of the data	61
4.2.5 Theoretical framework	62
4.2.6 Strengths of the study	62
4.3 INTERPRETATION OF THE RESULTS	63
4.3.1 Use of the car	63
4.3.2 Factors affecting intended frequency of driving	64
4.3.3 Dependence on the car - the link between attitudes and driving	65
4.3.4 The influence of others	65
4.3.5 The importance of perceived control	66
4.4 CLINICAL AND SERVICE IMPLICATIONS	67
4.4.1 Intervening with health care professionals	68
4.4.2 Intervening with older drivers	68
4.4.3 Intervening in the licensing process	70
4.5 FUTURE RESEARCH	71
4.6 CONCLUSIONS	73
<b><u>REFERENCES</u></b>	74
<b><u>APPENDICES</u></b>	82

## **1.0 INTRODUCTION**

This study investigates the importance of driving to older drivers. In particular, the study will examine the role beliefs about driving play in the decision to continue or cease driving. Factors which contribute to dependence on the car will be examined as will factors which lead to lower dependence.

The introduction is divided into three parts. The first part outlines driving in older age and is divided into the following subsections:

- the relevance of driving behaviour to mental health services for older adults,
- the social context,
- age related changes in driving capability,
- the re-licensing process,
- the psychological and social significance of driving,
- decisions to cease driving in older adulthood.

The second section outlines decision making and is divided into the following subsections:

- decision making in general health,
- a model applicable to decision making about driving,
- a detailed analysis of the theory of planned behaviour,
- applications of the theory of planned behaviour to driving.

The third section outlines the rationale for the study and is subdivided as follows:

- problems with existing research,
- the role of clinical psychologists,

- the aims of the study and research questions,
- hypotheses to be tested.

## **1.1 Driving in older age**

### **1.1.1 Relevance of driving behaviour to mental health services for older adults**

A recent survey of a regional clinical psychology service for older adults showed that all respondents had received referrals where driving was a central issue (Allen & Mitchell, 1997). In addition, one community mental health team for older adults received a number of referrals requesting assessment for fitness to drive, or other involvement to aid an older driver cease driving. This represented between 20-25% of the total cases for one year (Allen & Mitchell, 1997). Other clinics in this country and abroad have also reported cases where driving has been addressed (e.g. Carr, Jackson & Alquire, 1990; Coni, 1996; Dubinsky, Williamson, Gray & Glatt, 1992; Rees, Bayer & Phillips, 1995; Wiseman & Souder, 1996). This can be an assessment of fitness to drive (e.g. Mitchell, Castleden & Fanthome, 1995) or to aid the process of ceasing driving (e.g. Bahro, Silber, Box & Sunderland, 1995).

Anecdotal reports from health professionals, older drivers and their families commonly refer to the disabling consequences of ceasing driving. The perception of negative consequences point to a clear role for mental health services in supporting older drivers faced with cessation of driving. The types of comments heard in clinical settings include comparing ceasing driving to loss of limbs, or even death.



**Section summary**

*The issue of driving in older age is of relevance to mental and physical health services. Mental health services can receive requests to assess fitness to drive or to provide input to assist adaptation to giving up driving. This is particularly important as many older drivers perceive only negative consequences of giving up driving. Consequences of giving up driving will be discussed later in section 1.1.5 but depression may be one consequence. The issue of driving in older age also has ramifications for wider society which will now be discussed.*

**1.1.2 Social context**

Recent reports suggest that the population in the western world is ageing. The average age expectancy in the European Community has increased from 67 years for males and 73 years for females in 1960, to 73 years for males and 76 years for females in 1990 (Eurostat, 1993). Therefore, by the year 2020 there could be twice as many people over 60 years of age as in 1960 (Eurostat, 1993). This pattern is also occurring in the United States (Barr & Eberhard, 1994). In addition, the number of people owning and driving cars has also increased as has general dependence on the car as a means of transportation (Schlackman & Winstone, 1988; Simms, 1993). Thus, it can be assumed that the number of older drivers (aged 65 or over) is larger than it has ever been and will continue to grow (Retchin & Anapolle, 1993).

Recent media attention has focused on the problems associated with driving in old age. In particular older drivers are rapidly becoming stereotyped as unsafe and incompetent (e.g. Express, 1997; Independent, 1997; Independent, 1998). There is, in addition, a growing body of research suggesting that older drivers, as a group, may represent a significant risk to

road safety. Older drivers are more at risk of having road accidents than middle aged drivers (Broughton, 1988; Cooper, Tallman, Tuokko & Beattie, 1993), particularly after the age of 65 (O'Neill, 1992), and are also more physically vulnerable to the effects of accidents (Bull & Raffle, 1992; OECD & WHO, 1986 cited in Holland & Rabbitt, 1994, p17; O'Neill, 1992). In the United States it has been shown that drivers aged over 70 have an increased crash rate, per number of miles driven, than any other age group (see Drachman & Swearer, 1993 for a review).

### **Section summary**

*The increasing number of older drivers and recent publicity about accidents has led to concern about the safety of older drivers and the risk they present to other road users. The car is becoming increasingly important in our society which means that people may be reluctant to give up driving. The social and psychological significance of driving will be discussed more fully in section 1.1.5. Factors which may account for the increased risk in this age group will be explored in the following section.*

### **1.1.3 Age related changes in driving capability**

There are many changes which occur, as a result of the normal ageing process, which may influence ability to drive. There is a substantial body of literature outlining age related physical changes which may adversely affect driving (e.g. Bull & Raffle, 1992; Carr et al, 1990; Morgan & King, 1995; Retchin & Anapolle, 1993). Patients are often not informed of risks relating to medication and driving (Persson, 1993) or the possible adverse effects of their illness on driving ability (O'Neill, Crosby, Shaw, Haigh & Hendra, 1994). Visual changes that occur with age have been discussed by Ball, Owsley and Sloane (1991);

Hutcherson (1989) and Retchin and Anapolle (1993). Some have been shown to directly relate to increased crash risk (Morgan and King, 1995).

Cognitive changes may arise as a result of normal ageing processes or dementing processes. In particular Alzheimer's Disease has been studied with regard to its effect on driving ability (e.g. Donnelly & Karlinsky, 1990; Dubinsky et al, 1992; Hunt, Morris, Edwards & Wilson, 1993; Kapust & Weintraub, 1992; Mitchell et al, 1995) as has vascular dementia (Fitten, Perryman, Wilkinson, Little, Burns, Pachana, Merris, Malmgren, Siembieda & Ganzells, 1995). Some feel that a diagnosis of dementia should preclude someone from driving (Gilley, Wilson, Bennett, Stebbins, Bernard, Whalen & Fox, 1991) whereas others feel that this is not necessary in the earlier stages of the process (Drachman & Swearer, 1993). This issue is made more complex by the difficulty of diagnosing dementia in the early stages.

Opinion is divided over whether there is an increased crash risk in drivers with dementia, but it is likely that the type of cognitive impairments occurring in the dementias adversely affect driving ability (Parasuraman & Nestor, 1991). Johansson, Bogdanovic, Kalimo, Winblad and Vitanen (1997) conducted post-mortems on the brains of 98 older drivers killed in road accidents and found evidence that 47-53% of them could be diagnosed with Alzheimer's Disease. This was significantly higher than their control group. The authors concluded that this was evidence for an increased crash risk in drivers with Alzheimer's Disease. Their research went some way to addressing the difficulty of diagnosing dementia with certainty.

The effects of normal ageing processes on driving ability are even less well understood. Mitchell et al (1995) found that almost half their control group of older drivers without known dementia failed a neuropsychological test battery thought to relate to driving ability.

Other authors have pointed to slowed reaction times, poor insight, fatigue, poor judgement and inattention particularly affecting the driving ability of older adults without known dementia (Holland & Rabbitt, 1994).

### **Section summary**

*It is likely that ageing processes may bring about some changes in driving capability for some older drivers. Whilst increased knowledge and experience may improve driving, there are various physical, visual and cognitive changes which may adversely affect driving and eventually render someone unfit to drive. The evidence that dementia adversely affects driving is particularly strong. Some guidelines are available for older drivers and health professionals and these will be presented in the following section.*

#### **1.1.4 Legal and ethical issues in the re-licensing process**

Current legislation places responsibility on the individual driver to report any problems which may affect driving. After the age of 70 a driver must apply for an extension to their driving licence which must be renewed every three years. However, this assumes that the driver is in a position to objectively judge their ability to continue driving. Holland and Rabbitt (1994) found that a group of healthy older drivers were likely to overestimate their driving skill, compared to the judgement of a driving assessor. When an individual may have a diagnosis of dementia the issue of impaired judgement becomes even more significant (Mitchell et al, 1995). In such cases the doctor has a duty to inform the Driver and Vehicle Licensing Agency (DVLA), although the guidelines at present do not preclude someone with dementia from driving (Medical Advisory Branch, DVLA, 1996).

The Department of Transport has issued a leaflet "Advice to Older Drivers" (DoT, 1993) which contains information about improving safety, assessment of driving and renewal of a drivers licence over the age of 70. The issue has been discussed in terms of rights and responsibilities. The right of older people to maintain independence and control for as long as possible must be balanced with the need for maintaining the highest possible safety standards for road users (Oppenheimer, 1996). The area is made more complicated as driving is viewed as a right not a privilege by the majority of older drivers (O'Neill, 1992). Currently many GPs are unwilling to discuss driving with their older patients or are concerned about breaching patient confidentiality and thus it is often left to family members and friends to influence the older driver. This is unsatisfactory as advice from family is often seen as unpersuasive by older drivers (Burns & Harris, 1996; Persson, 1993). The difficulties that may be faced in giving up driving often make it difficult for professionals, or families to discuss the possibility of ceasing driving.

#### ***Section summary***

*The current situation is inadequate because guidelines are vague and different parties have their own interests to consider as well as the interests of others. Part of the complexity stems from the fact that driving is so important to many older drivers and their families who may depend on them driving. Some of the psychological and social factors that make driving so important will be discussed next.*

#### **1.1.5 The psychological and social significance of driving**

It has been suggested that driving is important for practical and psychological reasons (Simms, 1993). For example, driving enables rapid, door-to-door, flexible transport which is

under one's own control. Therefore, driving could be said to decrease isolation, increase social contact, feelings of control and autonomy (Bahro et al, 1995). This could be particularly true for people living in rural communities (Retchin & Anapolle, 1993). Rabbitt, Carmichael, Jones & Holland (1996) found that driving was particularly important for assisting with daily activities and social interests. In one sample 77% of respondents rated a car as essential to their way of life (Schlackman & Winstone, 1988). In today's society it is seen as a skill indicating adulthood and competence (Gillins, 1990; Persson, 1993). Some authors have suggested that driving is therefore important for an individual's self esteem and status (Gillins, 1990; Hutcherson, 1989; Persson, 1993).

Certainly, many authors have hypothesised negative consequences for those who cease driving. Coni (1996) proposes that withdrawal of driving rights is a blow to self esteem and promotes perception of invalidity and marginalisation. Gillins (1990) suggests that mastery of new knowledge may represent a problem to ex-drivers seeking new means of transportation, in addition to feelings of grief and embarrassment. In a sample of Swedish older adults, isolation and loneliness were correlated with lack of a car for transportation (Berg, Mellstrom & Persson, 1981, see also Johnson, 1995). In a large scale survey of older drivers, Rabbitt et al (1996) found that many feared loss of independence and mobility if they ceased driving and also worried about letting those down who depended on them driving. A cohort study of over 1000 older drivers found that cessation of driving led to increased depressive symptoms which could not be accounted for by sociodemographic and health-related factors (Marottoli, Mendes de Leon, Glass, Williams, Cooney, Berkman & Tinetti, 1997). The use of a cohort, longitudinal design for the study, and the large number of participants add strength to the findings. However, the sample consisted entirely of

drivers in the United States and therefore caution should be applied when generalising the findings to a British population.

Despite these findings, it is possible that giving up driving is not necessarily an entirely negative experience. Some drivers may stop to reduce the anxiety associated with driving (Yoshimoto, 1994) or to decrease unwanted responsibility (Rabbitt et al, 1996). Others may make financial gains after their car is sold (Simms, 1993). Certainly, there is some evidence to suggest that the anticipation of giving up driving is more negative than reports from ex-drivers who have successfully adapted to life without a car (Carp, 1971; Rabbitt et al, 1996). Whether this is due to psychological defence mechanisms operating (Carp, 1971) or successful adaptation to other means of transportation (Rabbitt et al, 1996) is unclear.

#### ***Section summary***

*Giving up driving may be a negative experience for some older drivers and has social and psychological ramifications for themselves and others who may depend on them driving.*

*For this reason it is important to explore the reasons why some people have been able to successfully give up driving and what influences others to consider giving up driving.*

*Decisions to cease driving will be discussed in the next section.*

#### **1.1.6. Decisions to cease driving in older adulthood**

Researchers have identified groups of older drivers who consider giving up driving of their own accord. A report commissioned by the Transport Research Laboratory found that 87% of their sample (n=45) had considered giving up driving. This is in contrast to only 11% of a sample of over 2,000 drivers surveyed on behalf of the Automobile Association (Rabbitt et

al, 1996). This difference may be accounted for by the different age ranges of the two samples. The former study surveyed drivers aged 70 and over, whereas the latter study included drivers aged 55 and over. Indeed, it has been found that drivers are more likely to consider giving up driving the older they are (Marottoli, Ostfield, Merrill, Perlman, Foley & Cooney, 1993; Rabbitt et al, 1996).

Groups of ex-drivers have also been identified (Marottoli et al, 1993; Rabbitt et al, 1996). Reasons given for ceasing driving have been divided into the following categories presented in order of decreasing significance. These reasons were medical/ability, accident/safety, financial/economical and rated of least importance were personal/social reasons. Many drivers described the financial burden of keeping a car as excessive in comparison to their pension. Others described fear for their own or others' safety due to declining health or eyesight, or possibly having had an accident or near miss. There were also a small number of drivers who gave up because they had no use for a car (Rabbitt et al, 1996).

Jette, Branch and Laurence (1992) found the most significant predictors of dependence on the car were being male, having a higher income and good health. Marottoli et al (1993) found primary factors associated with decreased dependence on the car were poor health, visual impairment, age and social factors (economics and retirement). Interestingly cognitive impairment was not related to decreased dependence on the car and the authors hypothesise that this is due to lowered levels of insight (Marottoli et al, 1993).

Rabbitt et al (1996) identified a pervasive pattern of decreased driving as drivers grew older. In particular, drivers commonly reduced mileage and reduced their exposure to adverse driving conditions. This appears to apply equally to drivers with Alzheimer's Disease



(Drachman & Swearer, 1993; Dubinsky et al, 1992). Persson (1993) similarly observed this pattern in a sample of older American drivers but also found a substantial minority who suddenly decided to cease driving following a single event (for example, a stroke or an accident). Therefore, it appears that for many older drivers giving up driving is a gradual process which is under the control of the individual. Many older drivers, when questioned, agree that the decision should be made by the older driver (Johnson, 1995; Persson, 1993; Schlackman & Winstone, 1988). Such self-regulation may be successful for some drivers (Johnson, 1995).

However, there are clearly substantial numbers of older drivers who do not decide to give up driving, but may be unsafe to continue (Lucas-Blaustein, Filipp, Dungan & Tune, 1988). This may certainly be true of drivers with Alzheimer's Disease (Freedman & Freedman, 1996; Trobe, Waller, Cook-Flannagan, Teshima & Bieliauskas, 1996). There may be a role for medical practitioners (Trobe et al, 1996; Wiseman & Souder, 1996), on-road driving assessments (Coni, 1996; Odenheimer, Beaudet, Jette, Albert, Grande & Minaker, 1994) and cognitive assessment (Hunt et al, 1993; Mitchell et al, 1995; Rees et al, 1995) to help aid decision making in such cases. This group may encounter even more problems in ceasing driving than other drivers.

Whether or not the decision to cease driving is gradual or sudden, the outcome appears to be more successful in cases where the individual is actively involved in the decision making process (Bahro et al, 1995; Gillins, 1990) Where the older driver is not actively involved in the decision making process compliance is low (Rees et al, 1995). Cases have been described where relatives have had to disable cars (Bahro et al, 1995; Gillins, 1990) or remove access to vehicles (Odenheimer et al, 1994). Clearly such measures are extreme and

can cause additional tension in families along with loss of self-esteem and trust in older drivers (Gillins, 1990). If an individual is involved in the decision self esteem and personal autonomy may be preserved (Gillins, 1990).

Bahro et al (1995) described a case in which individual psychotherapy was used to assist an older driver give up driving. They allowed the individual to express anger, grief and other emotions, they built up a positive therapeutic alliance and brought about gradual attitude change. In this way the individual was more in control of the situation, had opportunity to grieve and then to move on. The authors felt that this approach was preferable to behavioural management alone, but acknowledge that such strategies can be useful in cases of cognitive impairment and memory loss. Grief counselling has also been used to help individuals and families adjust to loss of driving ability (Gillins, 1990).

### **Section summary**

*It appears that there is a difference between drivers who make a decision to cease driving of their own accord, and those who cease driving involuntarily. It also can be assumed that the negative consequences of ceasing are less for those who reached the decision by themselves and gave up driving voluntarily. It is possible that the crucial element is the attitude of older drivers to driving. Thus it would appear that interventions aimed at changing older drivers attitudes to driving and their perceived dependence on the car might help. There is a shortage of research in this area. The next section will outline some research on decision making in the related area of general health.*

## **1.2 Decision making**

### **1.2.1 Decision making in general health**

Patient involvement in decision making has been advocated by many authors in the field of general medicine (e.g. Coulton, 1990; Kasper, Mulley & Wennberg, 1992). For example, patients undergoing orthopaedic surgery reported more satisfaction with the outcome when they had been involved in decision making (Larsson, Svardsudd, Wedel & Saljo, 1992). Advice about contraception was also more likely to be adhered to successfully if patients were actively involved in decision making (Delbanco & Daley, 1996). A review of the literature in psychiatric care revealed that patients who were involved in decision making were far more likely to adhere to community care plans and medication than those who were not involved (Buchanan & David, 1994). In addition, patients not involved in decision making were far more likely to receive inappropriate care (Hoge & Feucht-Haviar, 1995). In order to participate in decision making an individual may need education (Street, Voigt, Geyer, Manning & Swanson, 1995). Other strategies such as diaries, contracts and open communication also help (Delbanco & Daley, 1996).

#### ***Section summary***

*Support has been found for improved outcomes for patients involved in decision making in general health. It is important therefore to examine factors that influence decision making. Theories of decision making which examine the link between attitudes, beliefs and behaviour will now be discussed.*

### **1.2.2 A model applicable to decision making about driving**

Within health psychology, various models have been employed to examine health behaviours. For example, Health Locus of Control (Wallston & Wallston, 1982), the Transtheoretical Model of Behaviour Change (Prochaska & DiClemente, 1982) and the Health Belief Model (Rosenstock, 1966). All have attempted to explore the link between attitudes and behaviour but none have provided an account of the social context of decision making.

Due to the potential significance of social factors in driving, possibly the most useful model to apply to driving behaviour is one which has been developed by social psychologists. The Theory of Planned Behaviour (Ajzen, 1985, 1988, 1991; Ajzen & Madden, 1986) is applicable as it takes account of the social context of decision making, potential aids and obstacles to performing behaviour and attitudes which may influence whether or not a behaviour is intended and carried out. It offers a parsimonious theoretical account of the links between beliefs and behaviour and a clear format for how these should be operationalized. It can identify the relative importance of different factors which may lead to suggestions for interventions to change attitudes and behaviour. Furthermore, it has already been used to investigate various aspects of driving behaviour which will be discussed later. A more detailed analysis of the theory will now be presented.

### **1.2.3 Detailed analysis of the theory of planned behaviour**

The Theory of Planned Behaviour was derived from the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen 1975). The Theory of Reasoned Action takes account of the social context of decision making and attitudes towards the behaviour. It has been

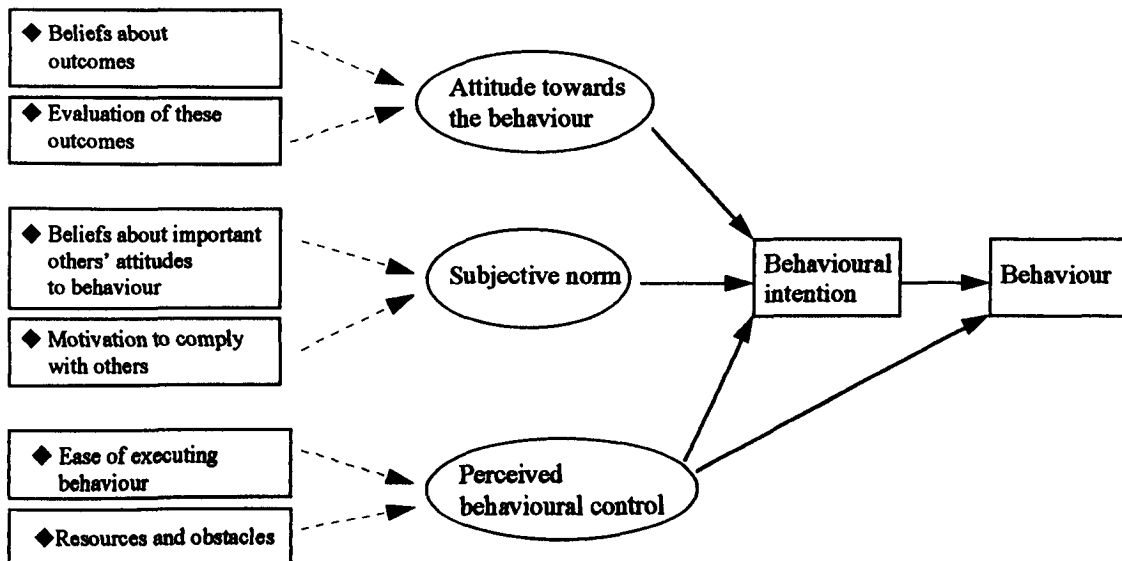
used extensively to examine factors which may predict behaviours (Ogden, 1996). However, this model applied mainly to behaviours which are under volitional control (Gross, 1996). For this reason, a component assessing perceived behavioural control was added to the model thus forming the Theory of Planned Behaviour. The addition of this component can significantly improve the prediction of behavioural intention and actual behaviour (Jonas, Eagly & Stroebe, 1995).

The Theory of Planned Behaviour suggests that intentions are ‘plans of action in pursuit of behavioural goals’ (Ajzen & Madden, 1986, p.456). Intentions may not turn into actual behaviour, but the assumption is that they often do, unless some obstacle interferes directly with the performance of the behaviour. Behavioural intentions are assumed to result from attitudes towards the behaviour, the social norm for the behaviour and the degree of control the individual perceives they have over the behaviour. These components are presented in more detail below and in diagrammatic form in Figure 1.1.

*Attitude towards the behaviour:* This is a set of beliefs about the outcomes of the behaviour and an evaluation of whether these outcomes are positive or negative. For example, “eating fruit is pleasant and is good for me”.

*Subjective norm:* This is a set of beliefs about what others think about the behaviour and an evaluation of how motivated an individual is to comply with such social pressures. For example, “my family want me to go to university and I want to please them”.

**Perceived behavioural control:** This is a set of beliefs about the ease with which an individual can perform the behaviour. It assesses the resources an individual has to perform the behaviour and any obstacles. These may be internal (e.g. ability, skill) or external (e.g. finances, accessibility). For example, “I am not fit enough to run a marathon and I do not have a good coach”.



**Figure 1.1 Diagrammatic representation of the Theory of Planned Behaviour**

According to the model the three components can predict behavioural intention which then translates into actual behaviour. It is also possible for perceived behavioural control to affect behaviour directly, so bypassing behavioural intention.

The theory has received empirical support (e.g. Ajzen, 1987; Ajzen & Madden, 1986; Conner, Martin, Silverdale & Grogan, 1996). Although problems with the model have also been highlighted. These include difficulties with the definition and differentiation of the different variables in the model (Sallis, Hovell, Hofstetter, Faucher, Elder, Blanchard, Casperson, Powell & Christenson, 1989). This means that the different components may

actually measure the same thing. Furthermore, research applying the theory has been subject to criticism. Reasons include, lacking operational definitions (e.g. Godin, Volois, Lepage & Desharnais, 1992), failure to specify action, context and time elements (e.g. Mullen, Hersey & Iverson, 1987). Some studies have not included measures of internal consistency (Conner et al, 1996; Traeen & Nordlund, 1993) or test re-test reliability (Conner et al, 1996; Terry & O'Leary, 1995; Traeen & Nordlund, 1993). Generally, the validity of studies using the Theory of Planned Behaviour has been high, as components of the model are found to predict the behaviour under question (e.g. Giles & Cairns, 1995; Terry & O'Leary, 1995; Wittenbraker, Gibbs & Kahle 1983).

#### **1.2.4 Applications of the Theory of Planned Behaviour to driving**

The Theory of Planned Behaviour has already been used to examine various different aspects of driving behaviour. Parker, Manstead, Stradling, Reason and Baxter (1992) have studied intention to commit different driving violations. They found that perceived behavioural control was the strongest predictor of intention, although all constructs were significantly related to intention (Parker, Manstead & Stradling, 1995). When components measuring anticipated regret and moral norm were added, the predictive power of the model substantially increased. They concluded that personal normative influence is an important factor in shaping intentions to perform anti-social behaviours such as cutting across traffic, overtaking on the inside and drink-driving.

Parker, Stradling and Manstead (1996) have designed an intervention based upon their application of the Theory of Planned Behaviour to driving behaviour, to modify those beliefs which are linked to intention to exceed the speed limit. They found that their intervention

brought about statistically significant changes in beliefs and general attitudes towards speeding. The authors have not yet attempted to evaluate the impact on actual behaviour of the attitude change programme. Such research is needed before fully advocating attitude change programmes based on the theory.

Other authors have used the Theory of Reasoned Action to investigate seat belt attitudes, habits and behaviours (Wittenbraker, Gibbs & Kahle 1983). They found support for the model as all components were predictive of behavioural intention which was also related to actual behaviour. In addition, Bamberg and Schmidt (1993) applied the Theory of Planned Behaviour to choices of transportation amongst students. They found that the components of the model were able to account for a large part of the variance in behavioural intention and their results have been used to inform transport policy in German universities. In both of these studies, past behaviour and habit were also measured and significantly improved the predictive power of the model. Until now the theory has not been used to examine decisions to continue or cease driving in older adulthood.

Many studies applying the Theory of Planned Behaviour to driving have used vignettes to measure behavioural intention. Whilst this permits analysis of behavioural intention over a variety of controlled situations, the vignettes may not relate well to actual behaviour. Studies measuring actual behaviour in real-life situations have a clear advantage in terms of validity and reliability.



### ***Section summary***

*The Theory of Planned Behaviour offers a useful model within which to examine the process of decision making about driving and the relative influence of different factors on driving behaviour. As it has already been applied to other aspects of driving behaviour, it appears appropriate to attempt an application of this theory with respect to the behaviour of older drivers.*

## **1.3 Rationale for the current study**

### **1.3.1 Problems with existing research**

Research which has examined decisions about driving has commonly used a survey methodology (e.g. Marottoli et al, 1993; Persson, 1993, Rabbitt et al, 1996; Schlackman & Winstone, 1988) or interview (e.g. Johnson, 1995). Whilst these methods have elicited much useful information there have been no attempts to date to address the area within the theoretical framework of decision making. Such theories allow a more structured analysis of the process and meaningful comparisons of factors which may influence decisions. Theories also allow the development of predictions and provide pointers towards areas for intervention.

Further problems with studies investigating driving behaviour in older adults include relying on recall of past events by participants (Persson, 1993) and insufficient consideration of attitudes. Indeed, Assum (1997) found support for a relationship between attitudes towards driving and driving behaviour, particularly with regard to accident risk.

The Theory of Planned Behaviour has been chosen as the model of decision making which may most usefully be applied to the area of driving. This model includes measurement of attitudes and beliefs thought to relate to behaviour. Indeed this model has already been used successfully as a basis for identifying and modifying problematic beliefs about driving in younger drivers (Parker et al, 1996). This model has not yet been applied to older drivers decisions about driving. Some studies applying the Theory of Planned Behaviour have failed to measure internal consistency and test re-test reliability (Conner et al, 1996) or have not included a measure of actual behaviour (Bamberg & Schmidt, 1993). These shortcomings mean that caution should be employed when interpreting results. The current research will address these methodological shortcomings.

#### ***Section summary***

*Many studies which have attempted to apply the Theory of Planned Behaviour have been criticised for their methodological problems. This means that findings should be interpreted with caution. Ways of improving on this research have been suggested and will be incorporated into the current study.*

#### **1.3.2 The role of clinical psychology**

Recent research suggests that there are growing numbers of older drivers and that changes which occur as part of the ageing process may adversely affect driving performance. Many drivers anticipate, or experience, psychological and practical difficulties when considering giving up driving. The negative consequences of ceasing driving may be less for those who have made their own decision to stop. If this is the case, interventions designed to assist older drivers make a positive decision to cease driving may be of use (O'Neill, 1996). The

first stage involves developing a clearer understanding of the decision making process and those factors that most influence dependency on the car.

Clinical psychologists are well placed to investigate decision making processes and the relative importance of different attitudes and beliefs. They are also well placed to design and implement interventions to address attitude and behaviour change. There have been no attempts so far to conceptualise decisions about giving up driving within a coherent theoretical framework. The current research on ageing and driving has also been heavily biased towards assessment of fitness to drive with little consideration of what is required to assist people cease driving. This study will aim to address the methodological shortcomings of previous research into driving and previous research using the Theory of Planned Behaviour framework. It will aim to provide a coherent framework to investigate the issue of ceasing driving in older adulthood. In doing so, the study also constitutes a test of the Theory of Planned Behaviour and its applicability to this clinical area. Thus it is the intention of this study to evaluate attitudes, beliefs and other factors which may be related to decisions to cease or continue driving. Understanding the process represents a first step in designing interventions to assist older drivers give up driving.

### ***Section summary***

*Clinical psychologists need to address the area of driving cessation in older adults. This is important both in terms of the number of drivers presenting to health services for older adults and in terms of the potential level of psychological distress anticipated by those ceasing driving. Clinical psychologists have specialised knowledge about attitudes and behaviour from which interventions may be usefully developed and implemented.*

### **1.3.3 Aims and research questions**

- The current study aims to examine factors which may be related to dependency on driving. In particular it aims to differentiate those attitudes and beliefs related to decisions to continue or cease driving. The study will survey older drivers to examine current driving behaviour and salient beliefs related to decision making.
- This study draws on the Theory of Planned Behaviour as a model of human decision making drawn from social psychology and used commonly in health psychology. As such this study also aims to evaluate the utility of the theory for addressing decision making in this clinical area.
- The study aims to design a tool to assess beliefs salient to decisions about driving behaviour. This tool will be a survey based on a template provided by the Theory of Planned Behaviour.

Thus there are three main research questions:

1. What factors influence decisions to continue or cease driving in older drivers. In particular, what is the influence of components of the Theory of Planned Behaviour?
2. Does the Theory of Planned Behaviour provide a useful framework for investigating these decision making processes?
3. Do older drivers in this sample decrease their frequency of driving in different situations?

### 1.3.4 Hypotheses

- H1:** There will be an association between behavioural intention regarding driving and attitude to driving. In particular, those drivers who have a more positive attitude to driving will be more likely to intend to continue to drive more often.
- H2:** There will be an association between behavioural intention regarding driving and subjective norm. In particular, those drivers who feel that their driving is regarded positively by others will be more likely to intend to continue to drive more often
- H3:** There will be an association between behavioural intention regarding driving and perceived behavioural control. In particular, those drivers who feel they have more control over driving will be more likely to intend to continue to drive more often
- H4:** There will be an association between behavioural intention regarding driving and past behaviour. In particular those drivers showing most marked patterns of decreased driving will be more likely to intend to cease driving or continue driving infrequently.
- H5:** There will be an association between behavioural intention regarding driving and actual driving behaviour two to three months later. In particular those drivers intending to continue driving most frequently will report frequent driving behaviour two to three months later.

## **2.0 METHOD**

This section outlines the planning and implementation of the current study and is subdivided as follows:

- experimental design,
- participants,
- measure,
- procedure,
- treatment and dissemination of results.

### **2.1 Experimental design**

A survey design was employed to address the research questions and test the hypotheses. A two-stage pilot survey preceded the main survey in which a questionnaire was developed specifically for use in the main study. The questionnaire was based on a template provided by the Theory of Planned Behaviour. The pilot phases permitted modification of the questionnaire prior to use in the main study. The dependent variable was intended frequency of driving in the next two months, this constitutes the behavioural intention component of the Theory of Planned Behaviour. The independent variables were other components of the Theory of Planned Behaviour as outlined below in section 2.3.2.

### **2.2 Participants**

Participants were men and women aged 65 and over. All were holders of valid driving licences. The mean age was 73 years and the range was from 65 to 85. The majority of

participants were male which reflects the larger numbers of male drivers in this cohort. Participants were excluded if they were younger than 65 or not currently in possession of a driving licence permitting the holder to drive a car. Participants were recruited from a wide range of sources including the University of the Third Age, carer support groups, community mental health teams for older adults, through health advisors to the elderly and advertisements placed in the local media, surgeries and hospital waiting areas (see Appendix 1). Few exclusion criteria were applied so as to maximise the sample size and representative nature of the sample. Further demographic details of the survey respondents appear in the results (section 3.2).

## **2.3 Measure**

### **2.3.1 Initial development**

A questionnaire was designed in accordance with guidelines based on the Theory of Planned Behaviour (Conner and Sparks, 1996). The Theory of Planned Behaviour has been described in section 1.2 and Figure 1.1. A draft version of the questionnaire was developed based on information taken from published surveys of older drivers and ex-drivers (Rabbitt et al, 1996; Schlackman & Winstone, 1988; Simms, 1993). Beliefs about driving were elicited from these survey findings and checked for local relevance with five local drivers aged over 65 (two female and three male). This was done via structured interviews.

In the structured interview participants were asked about the advantages and disadvantages of driving, the attitudes of others to their driving, whose opinion was most important to them regarding their driving, and lastly about things which made driving easier or more difficult. These interviews were conducted at their home and lasted no more than 20

minutes. The interviews followed recommendations made by Ajzen and Fishbein (1980) to elicit salient beliefs for the questionnaire. Participants gave written consent prior to the interview (see Appendix 2). The match between salient beliefs extracted in the published surveys and those gathered locally in the interviews was good. Beliefs mentioned most often by the interviewees were the same as the beliefs mentioned most often in the survey samples. The most salient beliefs were extracted from the survey results and interviews to form the indirect measures of the constructs of *attitude*, *subjective norm* and *perceived behavioural control*. Direct measures for each component were taken directly from the Theory of Planned Behaviour template. The salient beliefs can be seen below in Table 2.3.



<b>Component and question(s) asked</b>	<b>Most salient beliefs</b>	
<b>Attitude to the behaviour</b> ( <i>what do you see as the advantages/disadvantages of continued driving?</i> )	<b>Advantages of continued driving</b> Helps me maintain the best lifestyle Helps me remain independent Helps me maintain my status Helps those who depend on me Helps completion of everyday tasks Helps maintain social life/interests	<b>Disadvantages of continued driving</b> Brings unwanted responsibility Causes anxiety Causes danger to self/others Causes financial strain Makes life too complicated
<b>Subjective norm</b> ( <i>whose opinion is important to you with regard to your continued driving?</i> )	Optician General Practitioner Family Friends Other road users	
<b>Perceived behavioural control</b> ( <i>what do you think makes continued driving easier/harder?</i> )	<b>Factors making driving easier</b> A well designed reliable car Good vision Good physical health Care and consideration from other drivers Extensive driving experience	<b>Factors making driving harder</b> Declining skills Limited finances Available alternative transport A bad driving experience Losing confidence

**Table 2.3 Salient beliefs elicited from large scale survey and interviews.**

### 2.3.2 Description of components included in the first draft

#### Component One: Behavioural intention

This component was designed to measure participants' current intention to continue to drive. It was measured by a categorical item asking about the intended frequency of driving in the foreseeable future. A further six scaled items were included to measure global intention to continue to drive in the foreseeable future.

### Component Two: Attitude to the behaviour

This component was designed to measure participants' attitudes towards driving. A direct global measure of *attitude* which relates directly to the original theory (Ajzen, 1985,1988; Ajzen and Madden, 1986) was measured using six items. An indirect measure of *attitude* consisted of 22 items assessing beliefs about outcomes and the desirability of these outcomes (see Table 2.3 for salient beliefs).

### Component Three: Subjective norm

This component was designed to assess which people are important in influencing an individual's behaviour. A direct global measure of *subjective norm*, which relates directly to the original theory, was measured using two items. An indirect measure consisted of eight items assessing the opinions of important others and the motivation to comply with these opinions (see Table 2.3 for salient beliefs).

### Component Four: Perceived behavioural control

This component was designed to evaluate the degree of control the individual feels they have over the behaviour as well as what makes the behaviour easier or harder to perform. A direct global measure of *perceived behavioural control* which relates directly to the original theory was measured using four items. An indirect measure consisted of 20 items assessing the contribution of different factors to driving and the likelihood of these factors occurring (see Table 2.3 for salient beliefs).

### Additional Component: Past behaviour

This component was included to evaluate some aspects of past driving behaviour. The 13 items were developed by Rabbitt et al (1996) and were used with the permission of the

authors. Questions consisted of descriptions of different driving situations and a five point rating scale indicating changes of frequency in driving in that situation. This component was included as it has been suggested that the addition of a measure of past behaviour significantly improves the predictive power of the model (Bamberg & Schmidt, 1993; Wittenbraker, Gibbs & Kahle, 1983).

### Demographic details

Demographic details were collected on the basis of relevance to driving behaviour as demonstrated in the literature. Measures were kept to a minimum as much demographic information already exists for older drivers (e.g. Rabbitt et al, 1996) and it was important to keep the questionnaire as concise as possible.

The template for the Theory of Planned Behaviour questionnaire specifies that the questionnaire should include a clearly defined action, context and time for the performance of the behaviour in question. In this case the action was driving a car, the context was on public roads and the time was the foreseeable future. Section 2.4 will outline the subsequent development of the questionnaire.

### **2.3.3 Measurement of attitudes**

Attitudes are commonly measured using a series of statements and scales (Gross, 1996). This carries two assumptions, firstly, that the same statement has the same meaning for different people, and secondly, that subjective attitudes can be expressed quantitatively. Two of the most frequently used scales are the Likert scale (Likert, 1932) and the semantic differential (Osgood, Suci & Tannenbaum, 1957). A combination of these two scales was

used to measure attitudes. To control for acquiescent response set the direction of positive responses were alternated. In addition, the tendency for respondents to answer in a 'socially desirable' way may be lessened if responses are anonymous. Anonymity was provided by means of identity numbers assigned to each questionnaire.

## **2.4 Procedure**

### **2.4.1 Draft questionnaire and information sheet**

A draft questionnaire was developed as described in section 2.3. Advice on the first draft was provided by a research psychologist with expertise in the Theory of Planned Behaviour, a clinical psychologist with expertise in applications of the Theory of Planned Behaviour and the project supervisor. All components of the theory were included in the questionnaire (Ajzen, 1985; 1988; 1991; Ajzen & Madden, 1986). The literature on questionnaire design was consulted to inform the layout of the questionnaire and use of scales (e.g. Oppenheim, 1992). In addition a draft information sheet was designed to provide relevant details about the project, a brief rationale for the study and why participants had been approached. It also included assurances of confidentiality, anonymity and the participant's right to refuse to participate. An address and telephone number was provided for participants who wished to ask questions, request further information or request help with completion of the questionnaire. The information sheet was printed on headed letter paper.

The questionnaire and information sheet were screened by five colleagues for readability and face validity. Small changes were made at this stage before piloting. In addition a set of nine questions were developed for pilot study participants to complete to structure their feedback on the questionnaire (see Appendix 3).

### **2.4.2 First pilot phase**

The initial pilot questionnaire and information sheet was distributed to 10 older drivers of whom nine responded. A stamped addressed envelope was included with each questionnaire. The reason for the pilot was to ascertain the readability and face validity of the questionnaire for the target population. It also provided specific information about ease of completion, time taken, clarity of the instructions and information about the experience of completing the questionnaire. The feedback was used to modify the questionnaire for the second pilot phase.

Changes made to the questionnaire after the first pilot phase included alterations to some of the attitude statements, in order to improve readability. In addition, the instructions were modified to emphasise the repetitive nature of questions and the importance of answering all questions. Further questions about demographic details were included according to the feedback received. These included, a question about number of years driving experience, the type of area lived in and whether or not glasses were worn for driving. The approximate completion time for the questionnaire was added, based on the responses of participants in the first pilot phase (mean time = 20 minutes, range = 10-30 minutes). Space was included for participants to make comments about driving or about the questionnaire. A section was added at the end of the questionnaire explaining the test re-test procedure and giving participants the opportunity to volunteer to be re-contacted (see Appendix 4 for an outline of changes made to the questionnaire and information sheet).

The time element was changed from 'foreseeable future' to 'two months'. The rationale for this was that two months was a time most participants felt fairly certain about when asked to make predictions about their behaviour. In contrast 'foreseeable future' was a term which

was difficult to make predictions about for most participants. Some particularly voiced concerns about health worries which made the future uncertain. It also permitted the measurement of actual behaviour within the time limit of the project. The revised questionnaire and information sheet can be found in Appendix 5.

None of the participants reported experiencing any psychological distress as a result of completing the questionnaire, it was therefore judged appropriate to proceed with the next stage.

#### **2.4.3 Second pilot phase**

The revised questionnaire and information sheet were distributed to 40 older drivers to check the changes made and to assess the statistical properties of the questionnaire. The internal reliability was assessed for the first 20 responses using Cronbach alpha coefficient tests and was found to be acceptable (see results section 3.3). This meant that the internal consistency was sufficiently high to proceed with the main study. This was in line with other studies applying the Theory of Planned Behaviour to a range of behaviours (e.g. Ajzen and Madden, 1986; Terry and O'Leary, 1995). No further changes were indicated thus the main study could proceed.

Test re-test procedures and a measure of correspondence between behavioural intention and actual behaviour were incorporated into the design in order to address reliability and validity of the questionnaire. Many previous studies using the Theory of Planned Behaviour have not measured these.

#### **2.4.4 Main study**

The revised questionnaire and information sheet were distributed, along with stamped addressed envelopes, to 250 potential participants. Participants were recruited with the assistance of members of the community mental health team, health advisors to the elderly and carer support groups. Presentations were made by the researcher at the University of the Third Age and at carer support groups throughout the area. The profile of the study was raised through appeals in the local newspaper and on local radio. Many steps were taken to maximise the response including advertisements in surgeries and hospital waiting areas, oral and written presentations to professionals and potential participants. Networking and word of mouth also provided additional contacts.

Potential participants were reached through presentations by the researcher, or by appeals from professionals or volunteers (e.g. nurses and carer support group co-ordinators). Other participants contacted the researcher directly to offer to participate after hearing about the study. Potential participants were told about the study and, if they were willing to consider participation, they took the information sheet, questionnaire and a stamped addressed envelope. Potential participants were advised to read through the information sheet and questionnaire in their own time. They were also invited to contact the researcher if they had any questions about the study. A consent form was not required as consent was assumed if participants chose to complete and return the questionnaire.

All participants were offered an opportunity to receive assistance with completing the questionnaire, a small number requested assistance. In these cases telephone contact was made with the enquirer and a home visit was offered. A mutually convenient time was then arranged for the investigator to visit the participant's house. On all occasions the

investigator reminded the participant that they could choose to withdraw at any stage and the guarantee of anonymity. A standardised method of completing the questionnaire was undertaken for those requesting help. On all occasions the instructions were repeated and the investigator assisted completion of the first few questions. Assistance was only needed with those questions that involved circling a number on a scale from one to seven. Once a number of these questions had been completed the participants were able to complete the remaining questions with only minimal verbal prompts to expand on the meaning of questions. The home visits took a maximum of 40 minutes, with the majority taking less than 20 minutes.

#### **2.4.5 Test re-test procedure and validation of behavioural intention**

A second questionnaire was distributed by post to all those participants who consented to be approached a second time (n=34). This questionnaire was exactly the same, apart from the removal of the instructions about the test re-test procedure. The information sheet was also modified accordingly (see Appendix 6). A stamped addressed envelope was provided for participants to return completed questionnaires. The number of questionnaires returned was 23 giving a response rate of 68%. The time interval between the first and second completion ranged from two to three months.

#### **2.4.6 Ethical approval**

Ethical approval was sought from the local research ethics committee prior to the start of the study. Approval was granted for the study and the amendments to the questionnaire (see appendix 7). The manager of the service in which the research was based also gave backing



to the project. In all cases of contact with other agencies or bodies the verbal consent of the person in charge was obtained before steps were taken to recruit participants.

## **2.5 Treatment and dissemination of results**

### **2.5.1 Statistical analysis**

Cronbach's alpha was used to assess the internal consistency of the questionnaire. The main analysis was a within group multiple regression. The direct and indirect measures corresponding to the main components of the theory were correlated with the behavioural intention measure. Past behaviour was also correlated, alongside the main components, with the behavioural intention measure. Mann-Whitney, Wilcoxon and t-tests were used to investigate other factors and differences between groups. In addition, the main components and behavioural intention were correlated with data from the re-test sample to assess test re-test reliability. Parametric and non-parametric tests were employed as appropriate. Assumptions for the use of tests were analysed using the Kolmogorov Smirnov test for normality, Levine's test for equivalence of variance and scatter plots to examine linear relationships. Advice was obtained from a statistician on all aspects of the analyses carried out.

### **2.5.2 Dissemination of results**

A summary of the findings of the study is planned and will be circulated to the ethics committee and those participants who have requested this information. It will also be circulated to individuals and organisations who have assisted with the project in any way, particularly in recruiting participants. Professionals and volunteers will be encouraged to

photocopy and share this summary with people who may have assisted with the project but were not known by name to the researcher. It is also expected that several presentations will be made summarising the project and its findings to groups in the community and within the health service. Publication of the study may eventually be pursued in peer-reviewed journals.

## **3.0 RESULTS**

This section will outline the results obtained from the questionnaire. Data were analysed using the Statistical Package for the Social Sciences (SPSS, 1992). The section will be subdivided into the following areas.

- response rates,
- demographic details,
- statistical properties of the questionnaire,
- descriptive data,
- tests of the hypotheses and additional analyses,
- qualitative data.

### **3.1 Response rates**

#### **3.1.1 First and second pilot phase**

A total of nine older drivers completed the initial pilot questionnaire (response rate 90%). These participants were not included in the main study. The second pilot questionnaire was completed by 20 older drivers. The response rate for this stage was 50%. This sample was also included in the main study as no changes needed to be made to the questionnaire.

#### **3.1.2 Main study**

The revised questionnaire was distributed to 250 potential participants and returned, by post, by a total of 99 older drivers (this figure includes the 20 participants from the second pilot phase, as the questionnaire was unchanged). This represents a response rate of nearly

40%. This is once again higher than the 30% response rate usually expected for postal surveys (Goyder, 1985). This may be because participants were able to opt out of participation before being given a questionnaire and information sheet for consideration. Therefore it was not a true postal survey as most participants took or requested surveys following a presentation of the research. Other participants were given a questionnaire in person by the researcher or other distributor.

### **3.1.3 Test re-test**

All participants were informed of the nature of the test re-test procedure. A total of 54 participants volunteered to complete the revised questionnaire a second time. However, only 34 participants volunteered before the deadline. A second questionnaire was therefore distributed to all 34 participants and was returned by 23. This represents a response rate of 68%. Once again the high response rate may be due to allowing participants the opportunity to volunteer participation.

## **3.2 Demographic details**

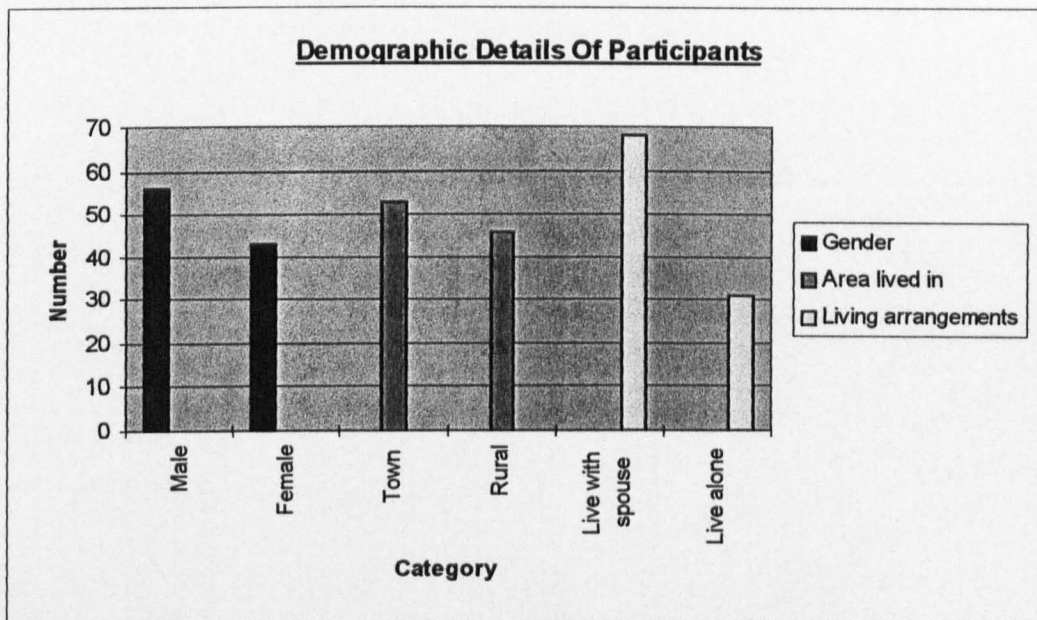
### **3.2.1 Pilot sample**

The initial pilot questionnaire was completed by nine older drivers aged between 66 and 82 years (mean age 73 years). All were holders of valid driving licences. All lived with a spouse apart from one who lived alone. The sample consisted of seven males and two females. Seven were driving on a daily basis at the time of completion, the remainder were driving a few times a week. There was no information for this sample on number of years driving

experience or type of area lived in as these questions were added after the first pilot phase in response to feedback from these participants.

### 3.2.2 Main study

The revised questionnaire was completed by 99 participants (including those in the second pilot phase). The mean age of the group was 73 years (range=65-85, s.d.=5). The sample had been driving for an average of 43 years (range=13-65, s.d.=12). Further demographic details for this group can be seen below in Figure 3.2.



**Figure 3.2 Demographic details of participants in the main study (n=99)**

### **3.3 Statistical properties of the questionnaire**

#### **3.3.1 Internal reliability**

Internal reliability of the questionnaire's subscales was assessed using Cronbach's alpha coefficient. This was initially tested for a sub-sample of 20 responses in the second pilot phase and subsequently for the total sample in the main study. This gives an indication of the degree of consistency in the responses of each individual on each subscale. Other studies applying the Theory of Planned Behaviour have obtained alpha values of between 0.77 to 0.87. The values obtained indicate acceptable internal reliability. The alpha values for the individual subscales of the questionnaire can be seen below in Table 3.3.1.

<b>Component</b>	<b>Number of items</b>	<b>Alpha value (pilot)</b>	<b>Alpha value (main study)</b>
Direct attitude	6	.91	.91
Indirect attitude	11	.83	.80
Subjective norm	4	.82	.93
Direct perceived behavioural control	4	.71	.80
Indirect perceived behavioural control	10	.81	.67
Past behaviour	13	.91	.91

**Table 3.3.1 Cronbach alpha values for subscales of the questionnaire tested in the second pilot phase (n=20) and main study (n=99)**

### 3.3.2 Test re-test reliability

The questionnaire was completed on a second occasion by 23 participants, two to three months after the first completion. Wilcoxon tests for differences between median ratings over time were conducted. None of the median ratings differed significantly between the first and second completion. In addition, Pearson and Spearman correlations were conducted to examine similarity of the scores. Pearson product moment correlations were conducted for interval data and Spearman's rho correlations were conducted for ordinal data. The results of the correlation analyses can be seen below in Table 3.3.2. The assumptions were met for all tests.

Subscale	<i>r</i>
Behavioural intention	.84***
Direct attitude	.15
Indirect attitude	.81***
Direct subjective norm	.40*
Indirect subjective norm	.85***
Direct perceived behavioural control	.64**
Indirect perceived behavioural control	.66**
Past behaviour	.65**

*Significance levels* \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 3.3.2 Correlation coefficients for a test re-test analysis of the subscales in the questionnaire (n=23)**

The results indicate that the scores on the measure of direct attitude were not significantly correlated on the first and second occasions on which the questionnaire was completed. However, as the Wilcoxon test did not demonstrate any significant difference in median scores for this subscale it may be concluded that the measure has some reliability although this is not as high as it is for the other subscales of the questionnaire. The remaining subscales performed well and it may be concluded that they demonstrate good test re-test reliability.

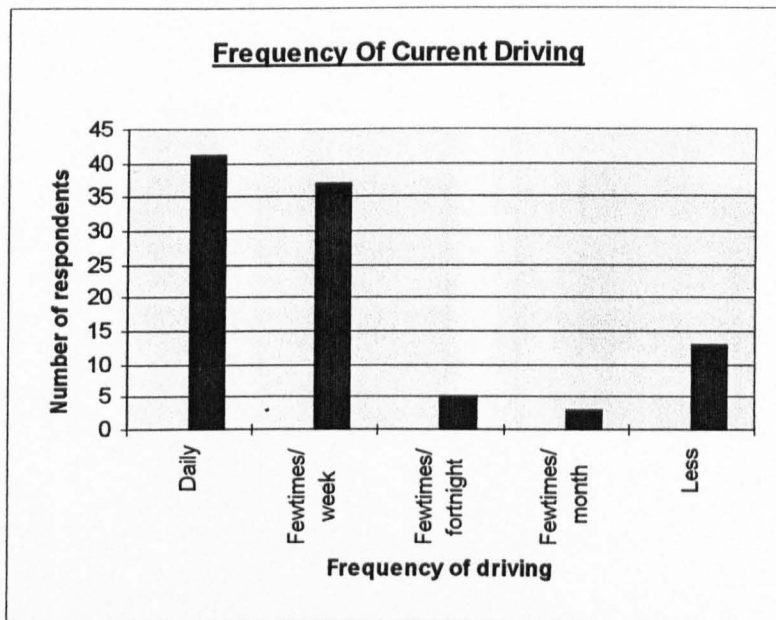
#### ***Section summary***

*The questionnaire was completed by 99 participants in the main study, representing a response rate of nearly 40%. All participants were drivers aged 65 or over. The questionnaire generally demonstrated good internal consistency and test re-test reliability.*

### **3.4 Descriptive data**

A large amount of descriptive data was obtained from the 99 questionnaires returned in the main study. Those findings of most interests will be reported in this section. The total number of respondents for each item presented in this section varies from 90 to 99. The specific numbers will not be presented separately for each category, instead percentages will mostly be used. The majority of older drivers in the sample were driving on a daily basis or a few times a week. A total of 21 drivers in the sample were driving a few times a fortnight or less. The distribution can be seen below in Figure 3.3.





**Figure 3.3 Frequency of driving**

The majority of respondents intended to continue driving in the same way for the following two month period ( $n=81$ ). Four older drivers were intending to increase the amount of driving and one planned to reduce the amount. A total of 13 respondents were intending not to drive at all in the following two month period. Most of these respondents had the lowest current frequency of driving, but two were currently driving a few times a month.

When reasons for the intention not to drive were offered, they included recovering from surgery, postponing renewal of car insurance to save money and not having any need to drive.

In the total sample there was a noticeable trend towards decreased driving since reaching retirement age. The patterns of change in driving can be seen in Table 3.4. Most drivers reported a decrease in driving only a small number reported an increase. Increases in driving behaviour in specific situations were often attributable to factors related to retirement or older age. For example, two of the drivers who reported an increase in driving alone added

comments explaining that this was due to the death of their spouse. The participant who reported driving much more on country lanes since retiring stated that this was because he had more time to take routes on back roads rather than on main roads.

Measure of past behaviour Driving condition	Number of participants responding in each category				
	Much more	More	Same	Less	Much less
Driving when dark	0	1	20	41	37
Driving in rush hour	0	1	17	44	37
Driving on motorways	1	6	36	22	34
Driving in bad weather	0	0	45	33	21
Driving when tired	0	0	19	38	42
Driving when not in best of health	0	1	25	33	40
Driving unfamiliar vehicles	0	0	28	20	51
Town centre driving	2	6	47	23	21
Driving in an unfamiliar area	1	5	37	29	27
Driving in country lanes	1	10	57	13	18
Driving long distances (100+ miles)	0	6	22	29	42
Driving when rather be doing something else	1	2	42	24	30
Driving alone	7	7	45	16	24
Total	13	45	440	365	424

**Table 3.4 Driving changes since reaching retirement age**

The majority of drivers viewed driving positively with only 13% yielding a global attitude score corresponding to a negative attitude. A breakdown of some of the attitude components can be seen in Figure 3.4.

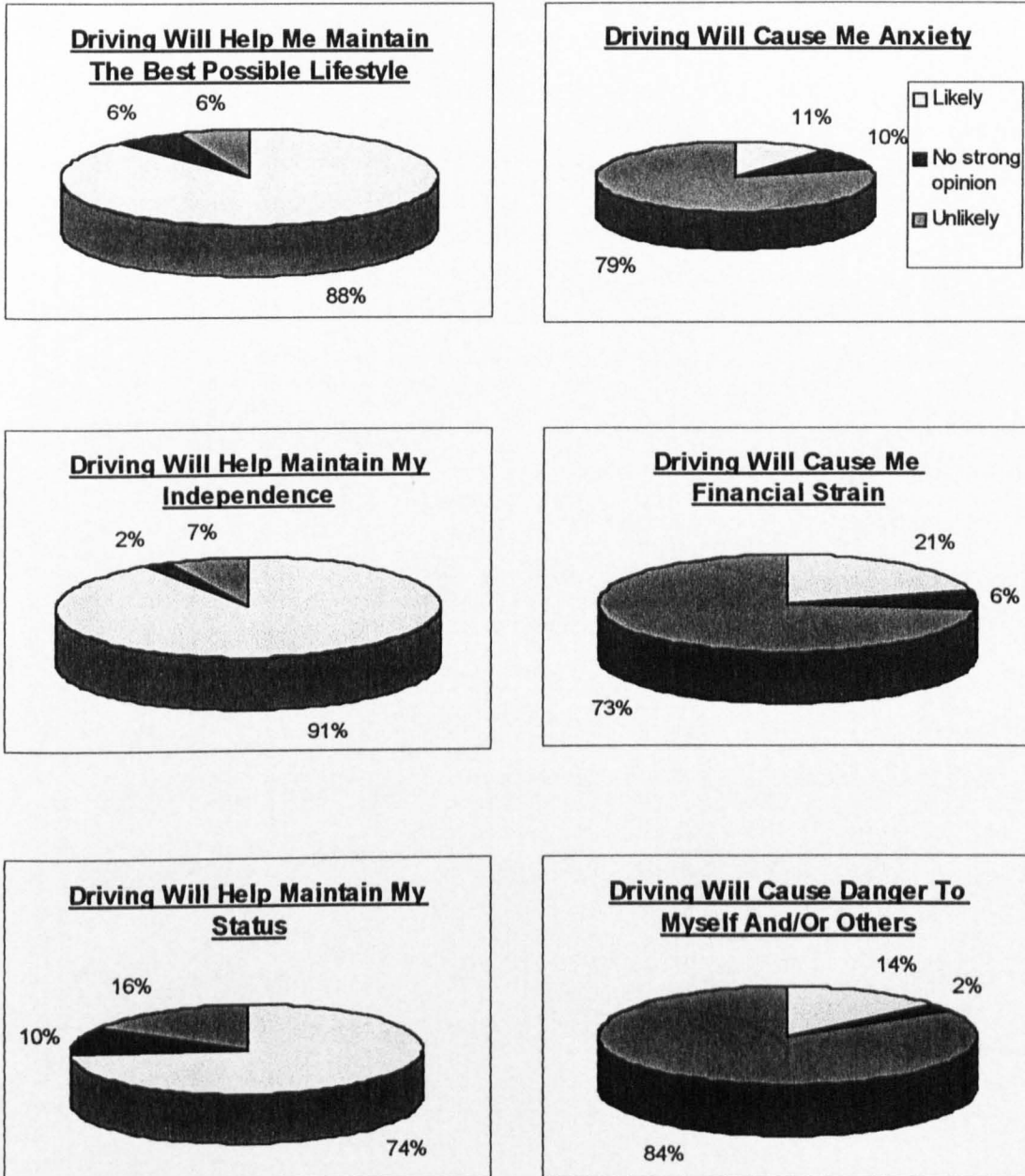


Figure 3.4 Pie charts showing responses to six attitude items

With regard to the opinion of others, 90% felt that most people important to them would approve of their continued driving. Interestingly, only 54% felt that other road users

approved of older drivers continuing to drive. Participants were more motivated to follow guidance from their GP (96%) and optician (94%), than family (88%) and friends (68%). The majority (94%) felt that they had control over whether or not they were driving. Only 26% felt that they had viable alternative transport if they were to cease driving. Most felt that their visual and physical health were unlikely to adversely affect their driving ability in the next two months (96% and 92% respectively). However, almost a quarter of respondents (23%) felt that a decline in skills over the next two months was likely. A similar number (22%) were concerned about losing confidence and 83% of respondents felt that this would make driving harder. Just over 50% of older drivers reported having someone dependent on them driving. Most often this was their spouse or a neighbour (often described as elderly). Indeed, 76% of respondents felt that driving was likely to help people dependent on them, and 82% of respondents felt that this was a desirable objective.

#### ***Section summary***

*The results reveal a pattern of reduced driving amongst the majority of participants in different situations. Despite this, most intended to continue driving on a daily basis. The majority viewed driving positively and felt that those important to them viewed their continued driving positively. Similarly, most felt that they had a high degree of control over continuing driving.*

## **3.5 Tests of the hypotheses**

### **3.5.1 Hypotheses 1-3**

The analysis of hypotheses one to three will be presented together. A stepwise multiple regression was used to assess the relative predictive abilities of the components of the Theory of Planned Behaviour.

- H1: There will be an association between behavioural intention regarding driving and attitude to driving. In particular, those drivers who have a more positive attitude to driving will be more likely to intend to continue to drive more often.**
- H2: There will be an association between behavioural intention regarding driving and subjective norm. In particular, those drivers who feel that their driving is regarded positively by others will be more likely to intend to continue to drive more often.**
- H3: There will be an association between behavioural intention regarding driving and perceived behavioural control. In particular, those drivers who feel they have more control over driving will be more likely to intend to continue to drive more often.**

The following variables were entered into the stepwise multiple regression analysis.

**Dependent variable:** *Intended frequency of driving in the next two months*

**Independent variables:** *Direct attitude, Indirect attitude, Direct subjective norm, Indirect subjective norm, Direct perceived behavioural control, Indirect perceived behavioural control.*

The dependent variable was selected out of two possible outcome measures. Intended frequency of driving in the next two months was selected as it demonstrated more variability than the other measure of intention to drive in the next two months. The other measure involved a choice between whether or not the individual was intending to continue or cease driving. Only a small number of respondents felt that they were likely to cease in the next two months. The remainder felt that they would drive, but with different frequencies. Thus the frequency measure was thought to be more appropriate as it provided greater variance in behavioural intention. The results of the regression analysis can be seen in Table 3.5.1 below, only significant predictors are included in the table (level for entry,  $p < .05$ ).

Dependent variable	Independent variables entered stepwise	$\beta$	t	R Square (total)	d.f. (total)	F (total)
Intended frequency of driving	Direct perceived behavioural control	-.41	-5.30***	0.73	3,74	67.91***
	Indirect attitude	-.33	-3.61**			
	Direct attitude	-.25	-2.82**			

Significance levels \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 3.5.1 Results of the multiple regression analysis for the components of the Theory of Planned Behaviour**

The multiple regression analysis demonstrated that the direct measure of perceived behavioural control was the largest single predictor of variance in the dependent variable. However, both measures of attitude also significantly contributed and, in total the three

factors accounted for 73% of the variance in the dependent variable. The indirect measure of subjective norm was initially entered into the multiple regression analysis as the most significant single explanatory variable, accounting for 62% of the variance. However, this was excluded from subsequent steps in the model, probably because its inter-correlation with other variables lowered its significance as a predictor.

The assumptions for a multiple regression analysis were satisfied in post-test analyses. The residual deviations were normally distributed and showed constant variance. There was no evidence of a correlation between the residual deviations and any of the explanatory variables whilst there was evidence of linear relationships between the dependent variable and all the independent variables. Furthermore, the data may be assumed to be interval as the original ordinal scales are multiplied and summed to produce interval data.

Therefore, it may be concluded that there is strong support for hypotheses one and three, but relatively little support for hypothesis two. That is, a positive attitude to driving and high levels of perceived behavioural control lead to more frequent driving. Hypothesis one is particularly strongly supported as both measures of attitude were significant predictors of variance in the dependent variable. Hypothesis three is strongly supported, for one measure of perceived behavioural control, but the indirect measure was not a significant predictor of variance. Hypothesis two was not supported in the final regression model, although the indirect measure of subjective norm had been included first as the best predictor of variance in initial steps of the regression. This suggests that there is partial support for hypothesis two, namely the positive opinion of others about an individual's driving may lead to more frequent driving. However, the relationship between the indirect measure of subjective norm

and behavioural intention is complicated by the inter-correlation between this component and other independent variables.

The Theory of Planned Behaviour performs well in this analysis. The majority of other studies using this model have produced figures accounting for between 20-68% of the variance. The figure of 73% obtained in this analysis is therefore relatively high.

### **3.5.2 Hypothesis 4**

A second stepwise multiple regression was conducted to assess the predictive value of the added component, past behaviour. The predictive value of this component was compared with the predictive values of original components of the Theory of Planned Behaviour.

**H4: There will be an association between behavioural intention regarding driving and past behaviour. In particular those drivers showing most marked patterns of decreased driving will be more likely to intend to cease driving or continue driving infrequently.**

The following variables were entered into the stepwise multiple regression analysis.

Dependent variable: *Intended frequency of driving in the next two months*

Independent variables: *Direct attitude, Indirect attitude, Direct subjective norm, Indirect subjective norm, Direct perceived behavioural control, Indirect perceived behavioural control, Past behaviour.*



The results of the stepwise multiple regression analysis can be seen in Table 3.5.2. Once again, only significant predictors are included in the table (entry level for inclusion,  $p < .05$ ).

Dependent variable	Independent variables entered stepwise	$\beta$	t	R Square (total)	d.f. (total)	F (total)
Intended frequency of driving	Indirect subjective norm	-.210	-3.59**	0.77	3,74	84.78***
	Past behaviour	.379	6.05**			
	Indirect attitude	-.230	-2.27*			

*Significance levels* \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 3.5.2 Results of the multiple regression analysis for the components of the Theory of Planned Behaviour and the additional component of past behaviour**

This analysis provides support for hypothesis four, in that the addition of past behaviour adds to the proportion of variance explained. The total variance now explained is 77%, which is very high. However, this figure is achieved at the expense of other components of the theory. Indirect subjective norm has now been entered in the model as the most significant predictor of variance in the independent variable, whereas it had been excluded in the previous analysis. Furthermore, the measures of direct attitude and perceived behavioural control, which were included in the previous analysis, have also now been excluded.

As with the first multiple regression analysis, assumptions were satisfied in post test analyses.

It may be concluded, therefore, that there is support for hypothesis four and additional support for hypotheses one and two. In other words, past behaviour, attitude and subjective norm influence the intended frequency of driving. However, hypothesis three is not supported by this analysis when an extra component, past behaviour, is added. Thus, perceived behavioural control is not a significant predictor of behavioural intention in this regression model. This suggests that the relationships between the independent variables and the dependent variable are complex and that the independent variables are related in some way to each other. Relationships were subsequently explored using Pearson product moment correlation coefficients for parametric data and Spearman's rho for non-parametric data. Not only were all the independent variables significantly correlated with the dependent variable, but they were also all significantly correlated with each other. The use of a stepwise method of entry in the multiple regression analysis goes some way to control for such multicollinearity.

### **3.5.3 Hypothesis 5**

A Spearman's rho correlation coefficient was calculated using the measure of intended frequency of driving in the next two months, and the measure of current driving frequency obtained in the test re-test analysis. This test was selected as the data was ordinal and could therefore not satisfy the assumptions for a parametric test.

**H5: There will be an association between behavioural intention regarding driving and actual driving behaviour two to three months later. In particular those drivers intending to continue driving most frequently will report frequent driving behaviour two to three months later.**

The correlation coefficient was calculated as  $r = .84$  ( $n=23$ ,  $p<.001$ ). In addition, a Wilcoxon analysis for related samples was conducted and found to be non significant. This suggests that the measure of intended driving behaviour, used here, is related to actual behaviour, as assessed two to three months later. This provides further support for the Theory of Planned Behaviour and its validity in the area of driving. In particular it provides support for the validity of the behavioural intention measure.

#### **3.5.4 Additional analyses**

The gender, age of participants and the number of years driving experience were investigated to ascertain the contribution of these factors to the prediction of the dependent variable. All were added separately, as independent variables, in the stepwise multiple regression model described in section 3.5.2. The variables were added separately, in three separate analyses, as there were not enough participants to justify inclusion of 10 separate independent variables in the equation. However, no variable added to the amount of variance explained and all were excluded from the multiple regression model.

A t-test for unrelated samples demonstrated that men had, on average, significantly more years of driving experience than women ( $t=6.39$ ,  $df=97$ ,  $p<.001$ ) and they drive more often (Mann-Whitney  $U=943$ ,  $p<.05$ ). The male drivers in the sample generally showed trends

towards a more positive attitude to driving and higher levels of perceived behavioural control. However, none of these trends reached statistical significance. Age was significantly correlated with past behaviour (Pearson product moment,  $r=21$ ,  $p<.05$ ) in that the older the driver, the more they had cut down on frequency of driving in different situations. Whether participants lived in a town or rural area did not make any difference to their intended frequency of driving, however, if drivers had someone dependent on them driving they were likely to drive significantly more often (Mann Whitney  $U=713.00$ ,  $n=98$ ,  $p<.001$ ).

### **Section summary**

*All hypotheses have received some support although the findings are complicated by multicollinearity. The Theory of Planned Behaviour performed well with components accounting for between 73-77% of the variance in behavioural intention. In particular, those drivers with a positive attitude towards driving were likely to intend driving more frequently as were those with higher levels of perceived behavioural control. The good opinion of others appeared important in influencing drivers' intention to drive more often. Also those who had reduced driving most were most likely to intend to drive less or not at all. Age, gender and years of driving experience were not predictive of intended frequency of driving.*

### **3.6 Qualitative data**

Approximately three quarters of participants added comments at the end of the questionnaire. Many centred around the lack of courtesy shown on the road today and criticism of younger drivers' attitudes. Others commented on the poor public transport network and how this means that they have to continue driving, whether or not they want

to. Two participants commented on the necessity of having a car to transport spouses who were ill and highly dependent on them (one had Alzheimer's Disease). Some felt the prospect of life without a car was 'quite frightening - a closing in of life', whilst others would be happy not to drive. One participant (a retired optician) commented on the need for regular eye checks, whilst others offered suggestions of driving tests every few years for all drivers. The financial burden of running a car was mentioned by some and one thought it was likely that he would have to give up the car next year as he could not afford to maintain it on his pension. Some drivers clearly felt that they were the best judge of their own driving ability and would give up when they felt they could no longer drive safely. As one participant put it "I've had no accidents in 50 years of motoring - experience is the key".

## **4.0 DISCUSSION**

This section will provide a detailed analysis of this research and its contribution to the body of knowledge outlined in section one of this report. It will be subdivided as follows:

- summary of findings,
- methodological considerations,
- interpretation of the results in relation to the aims, research questions and hypotheses,
- clinical and service implications,
- future research,
- conclusions of the study.

### **4.1 Summary of findings**

#### **4.1.1 Psychometric properties of the questionnaire**

The questionnaire was found to have good internal reliability. One component, indirect perceived behavioural control, had a relatively low alpha value. This may mean that there is a problem with the internal reliability of this component although it was not much below the acceptable level. The questionnaire performed well in a test re-test analysis. Again, one component, direct attitude, did not correlate significantly from the first completion to the second. However, as there was not a significant difference in this component, measured by the Wilcoxon test for two related samples, this component does have some reliability. In terms of validity, the measure of behavioural intent was highly correlated to the self report measure of actual driving behaviour two to three months later.

#### **4.1.2 Findings related to the hypotheses**

Data gathered from a sample of 99 older drivers (aged 65 years and over) suggested that the majority were driving on a daily or weekly basis and intended to continue doing so over the next two months. Other drivers were intending to drive less often and 15 were intending to drive infrequently or not at all in that time. Comparisons of current driving patterns and pre-retirement age driving patterns indicated that most had reduced the amount they were driving. The most reductions had been made by the oldest drivers in the sample. These drivers were choosing to drive less in adverse driving conditions. Measures of attitude towards driving suggested that most had a positive attitude to driving with some negative consequences being perceived. Most felt that others approved of their driving and that they had control over it.

A multiple regression analysis revealed that several components of the Theory of Planned Behaviour contributed to 73% of the variance in older drivers' behavioural intention regarding driving in the next two months. These components were direct perceived behavioural control, indirect attitude and direct attitude. In a second analysis, the measure of past behaviour was also found to increase the amount of variance explained to 77%. The relationships between these components and behavioural intention were not simple as many of the components were related to each other as well as to behavioural intention. The measure of behavioural intention appeared to be related to participants' actual behaviour. This, in addition to the high level of variance accounted for suggests that the model is applicable to this clinical area. Age, gender and years of driving experience were not found to predict variance in behavioural intention.

## **4.2 Methodological considerations**

### **4.2.1 The measure**

A criticism often levied at studies applying the Theory of Planned Behaviour is that there is no measure of actual behaviour included in the study. Whilst an attempt was made within this study to incorporate such a measure, a major shortcoming of the measure was that it was a crude self report scale. Participants had to indicate whether they were currently driving on a daily, weekly, fortnightly, monthly basis or less. It may have been better to ask participants an open ended question about how many times they had driven in the last month. The measure of actual behaviour was not validated by observing behaviour or requesting more information about current driving behaviour from the participant or another informant (e.g. spouse). The rationale for including few open ended questions was that it may have made the questionnaire easier to complete, as participants could select from a limited number of responses rather than generating their own response. Maximising ease of completion may improve response rates but may lead to loss of detail in the data set.

The indirect measures of components of the Theory of Planned Behaviour were compiled using data from large scale published surveys. Whilst this had the advantage of drawing on larger numbers of participants than would have been possible within this study, it may have produced beliefs with limited applicability to the sample used in this study. Whilst this was checked with a group of local older drivers, this sample was small and therefore may have not been representative of the larger sample of local older drivers.

The measurement of attitudes is not easy and carries potential problems of reliability and validity. The current questionnaire was not tested for either concept on a large population prior to the main study, thus reliability and validity of the measurements for each component



of the theory may be questionable. Attempts to address this were made through employing an internal reliability measure and test re-test analysis. However, one component achieved an internal reliability score lower than that which may be considered acceptable, when tested for the main study sample. Also, another component did not achieve a statistically significant correlation in the test re-test analysis, although a further test yielded no statistically significant difference for this component between the first and second completion of the questionnaire. Therefore this component may have questionable test re-test reliability.

A potential problem in asking older drivers to consider their driving behaviour may have involved them confronting an issue they did not wish to. Indeed, Rabbitt et al (1996) found that a proportion of his sample of older drivers had not considered giving up driving until they completed the questionnaire. It may also have been misinterpreted by some as a questioning of their own fitness to drive. Although the pilot sample did not report any psychological distress from completing the questionnaire it is possible that some in the main sample did. It certainly seemed to provoke a strong response in some respondents who gave detailed histories of impeccable driving records.

The measure of past behaviour was included in the questionnaire as some researchers have found this can add to the amount of variance accounted for. This measure was not inclusive of all types of driving behaviour and was only a measure of a certain aspect of past behaviour, namely changes in driving patterns in selected situations. This is a relative measure and did not take account of participants' actual amount of driving in these situations.

The measure developed for this study was rather long and repetitive for those completing it. This was due to the specifications laid down by the Theory of Planned Behaviour framework. For each question asked there should be a measure of desirability and likelihood so that each question is actually asked twice in a slightly different way. Whilst every effort was made to keep the questionnaire concise and to explain the reason for the repetition, this may have deterred some from responding. On the positive side, the questionnaire mainly focused on the present and near future which all but eradicated biases which may have occurred in previous research requiring participants to recall events in the past.

#### **4.2.2 The sample**

Potential biases in samples are hard to eliminate. In this case the sample comprised older drivers living within one county. Most lived in rural communities or small to medium sized towns. It is possible that issues for city-dwelling drivers are different, particularly with respect to accessible alternative transport and driving on busy roads. In addition, those who did not respond must also be considered. It is possible that those not responding represent certain groups of older drivers and therefore, these may be underrepresented in the sample of completed questionnaires received. For example, many caring for a spouse with dementia or other illness may not have had the time to complete the questionnaire. Yet the small number of responses received from carers demonstrate the importance of a car in this situation.

### **4.2.3 Design**

It is necessary to consider the possibility that participants were biased towards providing socially desirable answers. This has already been outlined above with the example of drivers who wished to establish their fitness to drive. Although anonymity was provided through identity numbers, participants who volunteered to participate in the re-test procedure provided their name and address on the back of the questionnaire. Thus, these participants were aware that their answers could be identified by the researcher. It is difficult to overcome this problem unless the test re-test responses were dealt with by a third party not connected with the research.

### **4.2.4 Treatment of the data**

The analyses conducted on the data were appropriate and in line with previous research in this area. However, there is an assumption that the product and sum of ordinal scales produces an interval scale for each component. This is a procedure often used; for example mood scales, such as the Beck Depression Inventory, comprise a set of ordinal scales summed to produce figures which are commonly treated as interval data. Statistical advice was sought on this matter and it was judged appropriate to treat the figures as interval data. A further problem with the treatment of results was that the sample size was reduced in the multiple regression analyses as some had not completed the questionnaires fully. This meant that no more than seven or eight independent variables could be entered into the multiple regression model at one time. Thus, variables such as gender and age were added separately to the model incorporating the main components of the theory of planned behaviour. It is therefore difficult to ascertain the relative effects of such variables on the dependent variable.

#### 4.2.5 Theoretical framework

The Theory of Planned Behaviour was selected as the most appropriate model to provide a theoretical framework to this study. It appears to be useful and components of the model were shown to explain a large amount of the variance in the dependent variable. However, there are some problems with the model. In particular many components are hard to separate and were shown to correlate with each other. Indeed, this problem was highlighted in section 1.2.3. Thus it is difficult to separate out the relevant importance of each variable in explaining driving behaviour.

##### *Section summary*

*Various methodological problems have been encountered. The measure of actual behaviour may be improved by asking participants to estimate the number of times driven over the past month. It may also help to have a driving diary and informant reports on the frequency of driving. Reliability and validity of the questionnaire have not been established on a large scale. One subscale of the questionnaire may have questionable internal consistency and another may have questionable test re-test reliability. Participation in the study may have influenced the attitudes and beliefs of older drivers, also responses may have been biased towards providing socially desirable answers. Potential problems with the statistical analysis exist, particularly with respect to the multicollinearity of variables which makes it hard to ascertain the predictive value of each component of the theory.*

#### 4.2.6 Strengths of the study

This study has attempted to investigate an area of clinical importance which has so far received little attention. In addition, it has improved upon previous research in this area by

investigating the relationship between attitudes, beliefs and driving behaviour within a theoretical framework. Previous methodological problems with studies applying the Theory of Planned Behaviour have also been addressed in this study. In particular, a measure of actual behaviour was attempted, also internal reliability and test re-test reliability were measured. Attempts were made at recruiting a wide range of participants through media appeals and presentations given to organisations involving older adults. Moreover, the aims, research questions and hypotheses outlined in section 1.3 have all been addressed.

### **4.3 Interpretation of the results**

#### **4.3.1 Use of the car**

The findings of this study indicate that most older drivers who completed the questionnaire used their car frequently and were intending to continue doing so. If it can be assumed that intended frequency of use corresponds with dependency then many older drivers are heavily dependent on the car as a means of transportation. In correspondence with findings from previous surveys of older drivers (Rabbitt et al, 1996, Schlackman & Winstone, 1988; Simms, 1993), the car is used for a variety of purposes encompassing daily tasks (e.g. shopping), social and pleasure activities. The majority of older drivers had made reductions in their driving since reaching retirement age which appears to be related to increasing age. This is again consistent with previous findings which appear to suggest that, for most, the process of giving up driving is a gradual one.

### **4.3.2 Factors affecting intended frequency of driving**

To differing degrees, all components specified in the Theory of Planned Behaviour were related to the intended frequency of driving. Past behaviour and whether the driver had someone dependent on them driving also had a bearing on intended frequency of driving.

In the first multiple regression analysis, which included all the original components of the Theory of Planned Behaviour and no additional variables, perceived behavioural control and attitude to the behaviour were the most significant predictors of intended frequency of driving. In particular, both the direct and indirect measure of attitude were highlighted as significant predictors. This makes attitude to the behaviour particularly important. Those drivers holding a more positive view of driving and holding fewer negative attitudes were likely to intend driving more frequently. The direct measure of perceived behavioural control, which emerged as the most significant predictor, indicates that those drivers with a perception of greater control over driving were likely to intend driving more frequently over the next two months.

The second multiple regression analysis indicated that when past behaviour was added as an independent variable, this contributed significantly to prediction of intended frequency of driving. The indirect measure of attitude was again a significant predictor, but indirect subjective norm emerged as the most significant predictor. In this analysis participants who felt that others approved of their driving were likely to intend to drive more frequently in the next two months. Drivers who had made more reductions in driving were likely to intend driving less frequently, this is in line with findings from surveys of older drivers (Rabbitt et al, 1996).

### **4.3.3 Dependence on the car - the link between attitudes and driving**

The findings of this study provide strong support for the view that attitudes to driving influence driving behaviour. Both the direct and indirect measure of attitude were found to be predictive of intended frequency of driving. Whilst attitudes towards driving have been elicited for samples of older drivers (Rabbitt et al, 1996, Schlackman & Winstone, 1988; Simms, 1993) this is the first time that the link between attitudes and behaviour has been demonstrated in this way. Those drivers who perceive more positive than negative outcomes for driving will intend to drive more often and will actually drive more often.

It is possible that older drivers over-rate the positive aspects of driving and catastrophise about not driving. This is certainly true of the clinical material cited at the beginning of the introduction section which included comparing loss of driving to loss of limbs. This may be symptomatic of a culture in which the car is seen as a necessity rather than a luxury or a right not a privilege (O'Neill, 1992). Certainly attempts are being made by environmental groups and government agencies to redress this situation and to highlight the merits of not using the car. This would lend support to the idea that attitudinal change may bring about change in actual driving behaviour.

### **4.3.4 The influence of others**

The subjective norm component of the Theory of Planned Behaviour had a questionable relationship with intended driving behaviour. Whilst it emerged as significant in one multiple regression model it was excluded in an analysis which included only the original components of the Theory of Planned Behaviour (i.e. not the measure of past behaviour). Despite this, it was significantly correlated with behavioural intention. What was clearer was the relative

importance of health professionals' opinions compared to friends and relatives. This is consistent with reports in the literature stating that older drivers find such advice unpersuasive (Burns & Harris, 1996; Persson, 1993). However, this points to a problem as health professionals are often unwilling to get involved.

Previous findings point to the importance of involving the driver in decisions (Bahro et al, 1995; Johnson, 1995). The qualitative data gathered in this study would support this view. The involvement of older drivers in decisions does lead to the potential problem of lack of insight. The findings of Holland and Rabbitt (1994) indicated that healthy older drivers are likely to overestimate their driving ability. Thus, it is likely that older drivers' judgements of their ability to drive may be heavily biased and influenced by their positive attitudes to driving and practical needs. This would highlight the need for health professionals to provide objective advice.

#### **4.3.5 The importance of perceived control**

Perceived behavioural control emerged as the most predictive component of intention to drive. It seems that certain abilities and resources are required in order to intend continuation of driving. The most obvious of these are a reliable car, sufficient finances and abilities. Ability to drive can be in relation to visual, physical and cognitive skills. As previously mentioned, the assessment of ability is not an easy task and there is a role for health professionals in providing advice (Hunt et al, 1993; Trobe et al, 1996).

The opposite situation may occur when an individual may wish to cease driving but is unable to. Perhaps because of having someone dependent on them driving or living too far away



from amenities. In the case of this sample, those with the highest levels of perceived behavioural control were likely to intend driving more frequently than those with low levels. Participants with low perceived behavioural control were frequently feeling forced to give up driving for financial or health reasons.

#### ***Section summary***

*The findings of this study correspond with previous surveys of older drivers in that many continue to depend on the car for a variety of activities. Also patterns of decreased driving over a number of years were also reported. The frequency of driving was affected by having a positive attitude and a higher level of perceived behavioural control. It is also likely to be influenced by subjective norm and past behaviour.*

#### **4.4 Clinical and service implications**

Many older drivers are confronted at some stage with the possibility of having to cease driving. Some are forced to due to health problems or insufficient finances, others are confronted with suggestions that they are not fit to drive. Still others choose to cease driving as they no longer perceive a need to drive. For a majority of these the decision to cease will not be easy and various negative consequences will be anticipated. In some cases the negative consequences may not occur as anticipated but for others giving up driving will cause problems. This study, building on previous research, points to different opportunities for intervention to facilitate the process of giving up driving. The findings of this study point to three main areas of intervention, namely, with health care professionals, with older drivers and with those responsible for licensing drivers.

#### **4.4.1 Intervening with health care professionals**

This study suggests that health care professionals should be involved in aiding older drivers make decisions about giving up driving. Primarily this is due to the fact that most older drivers in this sample felt that these opinions would be valuable. However, previous research has shown that GPs and other medical professionals are often unwilling to get involved or lack knowledge about driving in older age (Persson, 1993; O'Neill et al, 1994). For this reason it would be useful to educate health professionals about aspects of fitness to drive and the difficulties encountered in ceasing driving for many older drivers. Frequently, it may help preserve the important relationship between patient and GP if a third party is involved to provide objective assessment and intervention. Often it may be most appropriate for a clinical psychologist to become involved. Different ways of intervening with the older driver will now be presented.

#### **4.4.2 Intervening with older drivers**

The findings of this study suggest two ways in which a psychologist may become involved in the process of ceasing driving. The first may be to provide more information in the form of a cognitive assessment relevant to fitness to drive. This would be useful given the evidence of lack of insight and judgement on the part of some older drivers and the difficulties faced by GPs without knowledge in this area. Assessment of fitness to drive has been discussed extensively in the literature (e.g. Rees et al, 1995).

The second form of involvement could be to facilitate the process of giving up driving. The results of this study emphasise the role of attitudes and the role of perceived control in influencing driving behaviour. Furthermore, these results and previous research detailed in

the introduction of this report suggest the need for the older driver to retain a degree of control throughout the process and be personally involved.

O'Neill (1996) highlights the importance of research into the attitudes of older drivers to inform work in this area. This study supports the view that an intervention focusing on attitudinal change may facilitate successful adaptation to life without driving. Parker et al (1996) have shown that attitudes to committing driving violations can be changed, although they have not yet shown whether this has an effect on actual behaviour. Assessing the meaning of driving to individuals and the attitudes they hold about driving will guide a programme of attitude change. For example, some respondents in this study felt that driving was important for maintaining their status. This could be directly addressed through examining self esteem and other ways of maintaining a positive view of self.

Due to the influence of resources and ability on behavioural intention, as outlined in the theory and supported by this research, it is also necessary to consider obstacles to giving up driving. Some obstacles may be perceived but may be very unrealistic. These may be addressed through a process similar to that of challenging negative automatic thoughts and cognitive restructuring (e.g. Fennell, 1995), others may be discussed within a problem solving framework (e.g. Hawton & Kirk, 1995). In this way alternative forms of transport may be generated, for example. For drivers with dementia it may be important to devise memory aids to assist the older driver recall that they no longer drive. This is a particularly difficult area as the individual may re-experience shock and grief each time they are reminded of the loss. It could be useful to involve families in the process of ceasing driving. This may be crucial if the issue of driving has already caused tension. Bahro et al (1995) offer a good description of a case of ceasing driving in a patient with dementia.

Whilst working with older drivers and their families to change attitudes and problem solve other difficulties, it is nevertheless important to acknowledge the potential loss faced in giving up driving. Many authors have highlighted the sense of grief and anger that may be felt, in addition to loss of self esteem and depression (e.g. Bahro et al, 1995, Gillins, 1990). It may therefore be necessary to directly address problems such as low self esteem and depression.

An ultimate goal of psychological intervention in giving up driving would be to establish a collaborative working relationship. In this way the individual may feel empowered in the process which could protect their self esteem in the face of negative change. The aim would be that a decision to cease driving would eventually be reached by the older driver, or at least, the decision to cease driving could be seen to have some benefits and fewer negative consequences.

#### **4.4.3 Intervening in the licensing process**

A primary change indicated by previous research in this area would be to change reliance on self report of driving ability. Currently, older drivers simply sign a declaration and are usually given a renewed licence. Given the research indicating poor self assessment of driving ability by older drivers (Holland & Rabbitt, 1994) and the findings of this study suggesting that many older drivers are heavily dependent on continuing driving, driver reports may be inaccurate or not objective. It is not easy to generate a solution to this problem, apart from testing older drivers. This may be in the form of on-road tests, physical or visual checks and cognitive assessment. Several older drivers in this study felt that all drivers should go through regular checks to ensure adequate fitness to drive.

**Section summary**

*The findings of the study suggest interventions at three levels, firstly, with health care professionals, secondly, with older drivers and lastly, modifications to the licensing process. Health care professionals may need education about the impact of different ageing and illness processes on driving ability, and about the difficulties for some in ceasing driving. Older drivers, who may need to discontinue driving, may benefit from interventions aimed at attitude change and problem solving, to decrease their perceived dependence on the car. In this way they may be more proactive in the decision making process and benefit from advice given by people whose opinions are important to them. The licensing process should be adapted so that the responsibility for reporting fitness to drive should not be left primarily with the driver. This particularly applies in cases of reduced insight and dementia.*

**4.5 Future research**

Future studies in this area could involve more rigorous applications of the methodology applied here, with some modifications. For example, a similar study may improve the measure of actual behaviour through the use of driving records or informant reports. A larger sample would elicit more variation in behaviour and an improved measure of intended behaviour. For example, an open ended question asking about the number of times the driver intends to drive in the next month. This measure could also include more details about the type of driving currently undertaken and for what purpose. Similarly the measure of past behaviour could be modified to include actual quantities of driving done in different situations, rather than relative frequencies. Repeating this research with a group of drivers in a different region, particularly those living in a city, might well yield different findings.

A most interesting direction for this research to take would be to implement an intervention programme similar to that outlined in section 4.4.2 with a group of older drivers who have been advised to cease driving but are unwilling to do so. In this way attitude change could be evaluated as could the impact of attitude change on actual driving behaviour. The Theory of Planned Behaviour again provides a useful framework within which to investigate this. It may be possible eventually to devise a standardised measure of dependency on driving and attitudes to driving. This could give useful information on areas to target in an individually tailored intervention. Again the Theory of Planned Behaviour would provide a good basis for ascertaining the most salient factors to assess.

As well as research applying the Theory of Planned Behaviour, this area could also benefit from qualitative research. It would be particularly useful to analyse the process of giving up driving in different scenarios. For example, a driver ceasing through choice could be compared to a driver having to cease following advice from health professionals. Longitudinal data assessing the impact of ceasing driving would be particularly valuable to consolidate the findings of Marottoli et al (1997) who identified depression as a result of giving up driving. Findings by Carp (1971) suggested that the anticipation of giving up driving may be worse than the actual experience of giving up. Other studies in this area may be able to address the question of whether fears about giving up driving are actually realistic.

## 4.6 Conclusions

The major conclusions drawn from this study can be seen below.

- Most participants in the study indicated that they intended to continue driving on a daily or weekly basis. Only about a quarter of the sample intended driving infrequently or not at all.
- The factors which most influenced an older driver's intention regarding driving appeared to be perceived behavioural control and attitude to driving. When an additional component of past behaviour was added this was also found to predict future intention along with subjective norm and attitude.
- The Theory of Planned Behaviour provides a useful framework within which to examine the relationship between attitudes, beliefs, resources and driving behaviour.
- Descriptive data and anecdotal accounts reveal that older drivers are largely dependent on the car and anticipate negative consequences if they were to cease driving.
- The results of the study suggest that interventions aimed at challenging attitudes towards driving, and problem solving around alternatives, may help older drivers who need to stop driving.
- The findings also suggest that changes in societal attitudes to dependency on driving and improved public transport would also help older drivers cease.

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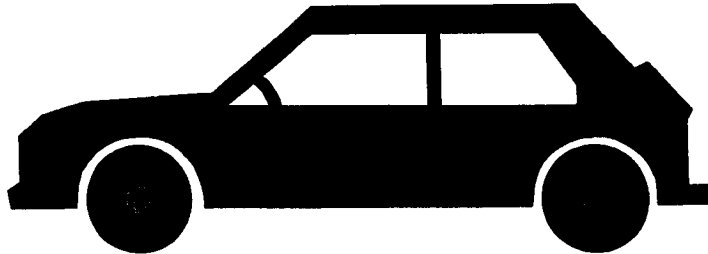
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## **APPENDICES**



**APPENDIX 1: Advertisement for participants**

The Community Team for Older Adults  
John Hampden Unit, Stoke Mandeville Hospital, Aylesbury



**•Are you a driver aged 65 or over?**

**If so we would like to hear from you**

We need older drivers to help with a survey which takes approximately 30 minutes to complete. If you may be able to assist and would like further information please contact:

Chris Allen,  
Consultant Clinical Psychologist,  
John Hampden Unit,  
Stoke Mandeville Hospital,  
Mandeville Road,  
Aylesbury, BUCKS HP21 8AL      Tel: 01296 395593

Participation in this survey is strictly confidential and will not affect your driving status.

**APPENDIX 2: Consent form for interview participants**

**Attitudes about driving in older drivers**

**Consent form for participants**

The research has been fully explained to me. All my questions at this stage have been answered to my satisfaction and I have been given an information sheet which I may keep for future reference.

I understand that I can withdraw from the study at any time and that this will not affect my contact with my GP or with the Community Mental Health Team.

I agree to a short interview to be conducted at my home by the researcher.

Signed \_\_\_\_\_

Name \_\_\_\_\_ (block capitals)

Date \_\_\_\_\_

Signature of researcher \_\_\_\_\_

**APPENDIX 3: Questions completed in the initial pilot phase**

**Questions about the driving survey:**

1. How long did it take to complete the survey?
2. Did you feel the instructions were clear? If not, in what way were they unclear?
3. Did you understand the rating scales from 1-7 which were used throughout?
4. List below any question numbers which you found particularly difficult, if any.
5. If you did find some questions difficult, what was difficult about them?
6. Did you have any difficulties with the term 'foreseeable future'?
7. Would you have preferred the use of a more definite term, if so what?
8. Did any part of the survey cause you distress, anxiety or discomfort, if so which parts?
9. Please feel free to add any further comments about the survey?

Thank you for your co-operation. Please return this form with the driving survey in the envelope provided.

**APPENDIX 4: Changes to questionnaire and information sheet**

### **Changes made to the information sheet are detailed below:**

- The first paragraph was expanded to include more detail about the rationale of the project.
- The second paragraph was expanded to include an approximate time for completion of the questionnaire.
- The third paragraph was expanded to make the instructions clearer. In particular the importance of answering all questions was explained and the theory was mentioned as a rationale for the repetitive nature of the questions.
- The third paragraph was also expanded to include the test re-test procedure and rationale.
- Participants were asked to keep the information sheet for future reference.

### **Changes made to the questionnaire are detailed below:**

- The instructions were expanded to include the rationale for the repetition of questions and the importance of answering all questions according to how the participant felt at the time of completion.
- The time component of the questionnaire was changed from 'the foreseeable future' to 'the next two months'. This was repeated throughout the questionnaire.
- Two categories were added to the question about frequency of driving to produce a wider spread of answers.
- A question was added on the first page asking participants how many years they had been driving.
- Participants were asked for their comments on driving and the questionnaire.
- The section 'about you' was expanded to include a question about the type of area lived in, whether glasses were worn for driving and whether there was anyone dependent on the older driver continuing driving.
- The test re-test section was added.

### **The wording of four attitude statements was changed. These changes can be seen below:**

*Pilot:* Continuing driving will bring me excess responsibility  
*Revised:* Continuing driving will bring me responsibility

*Pilot:* Continuing driving will cause me excess anxiety  
*Revised:* Continuing driving will cause me anxiety

*Pilot:* Continuing driving will cause danger to myself and others  
*Revised:* Continuing driving will cause danger to myself and/or others

*Pilot:* Continuing driving will make my life too complicated  
*Revised:* Continuing driving will make my life complicated



**The wording of eight perceived behavioural control statements was changed. These changes can be seen below:**

*Pilot:* Poor vision would make continued driving for me  
*Revised:* Good vision makes driving

*Pilot:* Poor health would make continued driving for me  
*Revised:* Good physical health makes driving

*Pilot:* Declining skill would make continued driving for me  
*Revised:* Declining skills make driving

*Pilot:* More care and consideration from other drivers would make continued driving for me  
*Revised:* Care and consideration from other drivers makes driving

*Pilot:* Limited finances would make continued driving for me  
*Revised:* Limited finances make driving

*Pilot:* Extensive driving experience would make continued driving for me  
*Revised:* Extensive driving experience and knowledge make driving

*Pilot:* Alternative viable forms of transport would make continued driving for me  
*Revised:* Availability of alternative transport makes driving

*Pilot:* Losing confidence would make continued driving for me  
*Revised:* Losing confidence makes driving

**APPENDIX 5: Revised questionnaire and information sheet**

# Driving Survey

## Instructions for completing the questionnaire:

We are interested in your initial responses to the questions listed. Please do not spend a lot of time thinking about your responses. It is important that you respond as accurately and honestly as possible, according to your situation **at the moment** and considering your driving over the **next two months**. Some questions require you to tick a box. Others require you to circle a response from a choice of words or numbers. You should select the response that is most applicable to you. This questionnaire has been designed using a specified format related to a theory of decision making. For this reason some of the questions are repetitive or the answers seem obvious. We have to ask the questions in this way and it is important that you **answer all the questions**. Here is an example to help you complete the questionnaire:

*Example*      *Regular exercise is beneficial to health*  
*strongly agree* 1 2 3 4 5 6 7 *strongly disagree*

The person in the example above very strongly agrees that regular exercise is beneficial to health. Below is a response from a person who slightly disagrees with the statement:

*Example*      *Regular exercise is beneficial to health*  
*strongly agree* 1 2 3 4 5 6 7 *strongly disagree*

Below is a response from a person who has no strong opinion either way, they neither agree nor disagree with the statement:

*Example*      *Regular exercise is beneficial to health*  
*strongly agree* 1 2 3 4 5 6 7 *strongly disagree*

If you have any difficulties filling in the questionnaire, please telephone the number on the last page of the questionnaire. We will be glad to assist you. When you have answered all the questions please return the questionnaire in the pre-paid envelope provided.

***Thank you for your co-operation***      ***Rebecca Mitchell-Farmer & Chris Allen***

Please write today's date:      date \_\_\_\_\_ month \_\_\_\_\_ year \_\_\_\_\_

Questions 1-6 concern your current driving status. *You should indicate your response by circling the most appropriate word or phrase, or by entering a number.*

1. Do you currently drive a car?      **Yes**      **No**

2. How often do you drive at the moment?

**Daily**      **A few times**      **A few times**      **A few times**      **Less than**  
                  **a week**                   **a fortnight**                   **a month**                   **this**

3. Approximately how many years have you been driving? \_\_\_\_\_ years

4. Listed below are a number of common driving situations. Please indicate how much you drive in each situation now compared to before you reached retirement age (*please circle the most appropriate response*).

Driving when dark

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving in rush hour

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving on motorways

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving in bad weather

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving when tired

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving when not in best of health

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving unfamiliar vehicles

**Much More**      **More**      **Same**      **Less**      **Much Less**

Town centre driving

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving in an unfamiliar area

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving in country lanes

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving long distances (100+ miles)

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving when you would rather be doing something else

**Much More**      **More**      **Same**      **Less**      **Much Less**

Driving alone

**Much More**      **More**      **Same**      **Less**      **Much Less**

5. Which of the following do you intend to do in the next two months? *(please tick one)*

Continue driving as I am at the moment

Increase the amount I drive

Reduce the amount I drive

Stop driving altogether

Other \_\_\_\_\_ *(please specify)*

*In question 6 below, please indicate your responses by circling one number from 1-7.*

6. I intend to continue driving for the next two months  
strongly agree 1    2    3    4    5    6    7 strongly disagree

I plan to continue driving for the next two months  
strongly agree 1    2    3    4    5    6    7 strongly disagree

I would like to continue driving for the next two months  
strongly agree 1    2    3    4    5    6    7 strongly disagree

I want to continue driving for the next two months  
strongly agree 1    2    3    4    5    6    7 strongly disagree

I expect to continue driving for the next two months  
strongly agree 1    2    3    4    5    6    7 strongly disagree

I will continue driving for the next two months  
strongly agree 1    2    3    4    5    6    7 strongly disagree

Questions 7 to 9 are concerned with your current attitude to continuing driving for the next two months. Please indicate your response by circling one number from 1-7.

7. For me to continue driving over the next two months is:

extremely good 1    2    3    4    5    6    7 extremely bad

extremely foolish 1    2    3    4    5    6    7 extremely wise

extremely beneficial 1    2    3    4    5    6    7 extremely harmful

extremely useful 1    2    3    4    5    6    7 extremely useless

extremely undesirable 1    2    3    4    5    6    7 extremely desirable

extremely enjoyable 1    2    3    4    5    6    7 extremely unenjoyable

8. Continuing driving will help me maintain the best possible lifestyle  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will bring me responsibility  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will enable me to remain independent  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will cause me anxiety  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will enable me to maintain my status  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will help those who depend on me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will cause danger to myself and/or others  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will enable me to complete everyday tasks  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will cause financial strain  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will make my life complicated  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Continuing driving will enable me to maintain my social life and interests  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

9. To me maintenance of the best possible lifestyle is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me responsibility is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me independence is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me anxiety is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me maintaining my status is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me helping those dependent on me is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me danger is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me completing everyday tasks is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me financial strain is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me a complicated life is  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

To me a social life and interests are  
**extremely desirable 1 2 3 4 5 6 7 extremely undesirable**

Questions 10 and 11 concern your perception of others' attitudes to you continuing driving for the next two months. You may or may not know their attitudes for sure, but try and guess. If you really do not know then go onto the next statement. *Please indicate your response by circling one number from 1-7.*

10. In general most road users think that drivers may continue driving into old age  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

Most people who are important to me think I may continue driving  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

My optician thinks I may continue driving  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

My GP thinks I may continue driving  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

My family think I may continue driving  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

My friends think I may continue driving  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

11. With regard to driving I want to do what most road users think  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

With regard to driving I want to do what people who are important to me think  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

With regard to driving I want to do what my optician thinks  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

With regard to driving I want to do what my GP thinks  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

With regard to driving I want to do what my family think  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

With regard to driving I want to do what my friends think  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

Questions 12 to 14 concern your beliefs about continuing driving and what may make it easier or harder. *Please indicate your response by circling one number from 1-7.*

12. I am confident that I have the ability to continue driving for the next two months  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

If I wanted to I could continue driving for the next two months  
**strongly agree 1 2 3 4 5 6 7 strongly disagree**

How easy or difficult will it be to continue driving for the next two months  
**extremely easy 1 2 3 4 5 6 7 extremely difficult**

How much control do you have over continuing driving for the next two months  
**complete control 1 2 3 4 5 6 7 no control**

13. A well designed reliable car makes driving  
**much easier 1 2 3 4 5 6 7 much harder**

Good vision makes driving  
**much easier 1 2 3 4 5 6 7 much harder**

Good physical health makes driving  
**much easier 1 2 3 4 5 6 7 much harder**

Declining skills make driving  
**much easier 1 2 3 4 5 6 7 much harder**

Care and consideration from other drivers makes driving  
**much easier 1 2 3 4 5 6 7 much harder**

Limited finances make driving  
**much easier 1 2 3 4 5 6 7 much harder**

Extensive driving experience and knowledge make driving  
**much easier 1 2 3 4 5 6 7 much harder**

Availability of alternative transport makes driving  
**much easier 1 2 3 4 5 6 7 much harder**

A bad driving experience makes driving  
**much easier 1 2 3 4 5 6 7 much harder**

Losing confidence makes driving  
**much easier 1 2 3 4 5 6 7 much harder**



14. Driving a well designed reliable car in the next two months is for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Good vision is for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Good physical health is for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Declining skills are for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Care and consideration from other drivers is  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Limited finances are for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Extensive driving experience and knowledge are for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Availability of alternative transport is for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

A bad driving experience is for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

Losing confidence is for me  
**extremely likely 1 2 3 4 5 6 7 extremely unlikely**

15. Is there anything else you would like to say about driving, or about this questionnaire?

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**About you:**

How old are you? \_\_\_\_\_ Years

Are you:            **Male**      **Female**            (*please circle*)Do you live:            **Alone**      **With spouse**      **With children**      **Other** \_\_\_\_\_What type of area do you live in?    **Rural**                      **Town**                      **City**Do you wear glasses or contact lenses for driving?    **Yes**                      **No**Is there anyone dependent on you continuing to drive (e.g. neighbour, spouse)?    **Yes**                      **No**

If so, who? \_\_\_\_\_

As part of this research it will be necessary to re-contact randomly selected participants. These participants will be asked to complete the same questionnaire one final time. This will help us to see if people's responses remain constant over time and is a usual procedure in research of this type. If you would be willing to be re-contacted within the next few months please provide your name and address below. The information given will remain confidential and will not be used for other purposes. Your name and address will not be passed on to anyone else and the records will be destroyed on completion of this research. All questionnaire responses will be identifiable by number only.

Name: \_\_\_\_\_

*(optional)*

Address: \_\_\_\_\_

*(optional)*

\_\_\_\_\_

Postcode: \_\_\_\_\_

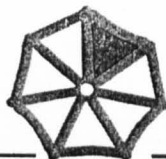
*(optional)*

***Thank you very much for your assistance with this survey. Please return the questionnaire in the envelope provided.***

**If you require assistance or have any questions about this research please contact:**

**Rebecca Mitchell-Farmer,  
Clinical Psychologist in Training,  
CMHT  
John Hampden Unit,  
Stoke Mandeville Hospital,  
Mandeville Road  
Aylesbury  
Tel: (01296) 395593**

**or      Chris Allen  
Consultant Clinical Psychologist  
CMHT  
John Hampden Unit  
Stoke Mandeville Hospital  
Mandeville Road  
Aylesbury  
Tel: (01296) 395593**



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# The John Hampden Unit

Aylesbury Vale Healthcare

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*Health Services for Older People, Stoke Mandeville Hospital, Mandeville Road,  
Aylesbury, Bucks. HP21 8AL.*

**Telephone: 01296 398404 Fax: 01296 399791**

## Information sheet for survey participants

### Research project: Attitudes and driving behaviour in drivers aged 65 and over

We are contacting you with regard to a survey we are conducting. You have been approached because you are aged 65 or over and drive a car. The survey examines different attitudes towards driving and also asks about current driving behaviour. This information is very important as there is growing evidence that some drivers change their driving behaviour as they get older. Some may limit or cease driving because of concerns about road safety, others choose to drive more as they find themselves with increased leisure time. The survey should help us understand which factors are most important in determining driving behaviour. It is useful to know about the attitudes and behaviour of older drivers in the Aylesbury area so that services can be planned and offered appropriately. This survey forms part of a larger research project. If you would like further information about the project please feel free to write or telephone.

If you choose to participate in this survey your answers will remain confidential as you will be identified by a number only. The information provided will only be used for the purposes of this research and will not in any way affect your driving status. The questionnaire should take about 30 minutes to complete and can be returned in the stamped addressed envelope provided. You are free to choose not to participate in this survey and this will not influence any future contact you may have with our service. If you choose not to participate you should simply discard this letter and the questionnaire, you will not be contacted again.

If you choose to complete the questionnaire you should answer all the questions as accurately and honestly as you can. There are no right or wrong answers. Most of the questions involve circling the response which applies to you. Due to the theory on which the questionnaire is based, some of the questions are repetitive and relate only to your driving behaviour over the next two months. A small group of respondents will be randomly selected and approached to complete the questionnaire again in a few months time. This is simply so that we can check the statistical properties of the questionnaire. The procedure will be exactly the same. At this time we do not know who will be asked to complete the questionnaire again.

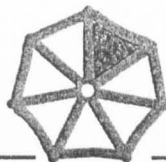
If you have any questions about how to complete the survey you can telephone either of the researchers on the number at the top of this sheet and we will be happy to assist. Once you have completed the questionnaire please return it in the envelope provided. Our names and addresses appear again on the last page of the questionnaire.

Please keep this information sheet for future reference.

Rebecca Mitchell-Farmer  
Clinical Psychologist in Training

Chris Allen  
Consultant Clinical Psychologist

**APPENDIX 6: Information sheet for test re-test participants**



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# The John Hampden Unit

Aylesbury Vale Healthcare

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*Health Services for Older People, Stoke Mandeville Hospital, Mandeville Road,  
Aylesbury, Bucks. HP21 8AL.*

**Telephone: 01296 398404 Fax: 01296 399791**

## Information sheet for survey participants

### **Research project: Attitudes and driving behaviour in drivers aged 65 and over**

Thank you very much for recently completing our survey examining attitudes towards driving and current driving behaviour. At the end of the questionnaire you indicated your willingness to be contacted again to complete the survey a second time. You have been selected to complete the survey again. You are free to choose not to complete the survey in which case you should discard it, if however you choose to complete it again we would be very grateful. As before, your answers will remain confidential and you will be identified by a number only. This will be the last time we contact you with regard to this research. The procedure is exactly the same and you can return the completed survey in the stamped addressed envelope. The purpose of completing the survey twice is so that we can test the statistical reliability of the questionnaire, that is, whether answers remain constant over a short period of time. You should answer the questions according to your attitudes and behaviour at the moment.

We are very grateful for your assistance with this research, please contact either of the researchers if you have any questions or would like to discuss the project further.

Thank you once again.

Rebecca Mitchell-Farmer  
Clinical Psychologist in Training

Chris Allen  
Consultant Clinical Psychologist

**APPENDIX 7: Ethics committee correspondence**

**Aylesbury Vale Local Research Ethics Committee**

**Mandeville Road, Aylesbury  
Buckinghamshire HP21 8AL  
Telephone (01296) 315000  
Direct Line: (01296) 316784  
Fax: (01296) 316789**

11 August 1997

Mr C Allen  
Consultant Clinical Psychologist  
The John Hampden Unit  
Stoke Mandeville Hospital

Dear Mr Allen

Re: Project NC772 - Decisions about driving ability in older adults

I refer to your application to the Local Research Ethics Committee for consideration of the above project. I am pleased to inform you that the Committee approves the project on ethical grounds on the understanding that:

- i Any ethical problem, arising in the course of the project, will be reported to the Committee.
- ii Any change in the protocol will be reported to the Committee.
- iii A brief report will be submitted after completion.

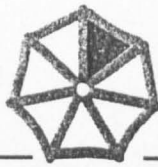
Ethical approval by the Committee is not an authority to proceed. You are advised to discuss your proposal with all heads of departments and others who might be affected, particularly if there are financial and/or staffing implications.

Please note that your research may be subject to review annually by the Committee.

Yours sincerely

  
R M HILL  
Secretary to Local Research Ethics Committee

c.c. Mrs B. Davies - AVCH NHS Trust



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## The John Hampden Unit

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Aylesbury Vale Healthcare

*Mental Health Services for Older People, Stoke Mandeville Hospital, Mandeville Road,  
Aylesbury, Bucks. HP21 8AL.*

*Telephone: 01296 398404 Fax: 01296 399791*

15th January 1998

Dr M. Webley  
Chair - Ethics of Research Committee  
Oxford Regional Rheumatic Diseases Research Centre  
Stoke Mandeville Hospital NHS Trust

Dear Dr Webley,

**re: Ethics Committee Submission - Decisions about driving ability in older adults**

We would be grateful if you could consider the enclosed questionnaire which has been modified since you originally approved the above mentioned project in July/August 1997. In the application it was specified that the questionnaire may be revised after piloting and in this case would be re-submitted for consideration by the Chair of the committee. The questionnaire has subsequently been modified as a result of the feedback received in the piloting phase and thus we require your approval before continuing with the survey.

If you would like any further information or have any queries, please do not hesitate to contact us.

Yours sincerely,

Chris Allen  
Consultant Clinical Psychologist

Rebecca Mitchell-Farmer  
Clinical Psychologist in Training



# Stoke Mandeville

HOSPITAL NHS TRUST

Mandeville Road  
Aylesbury  
Buckinghamshire  
HP21 8AL  
Tel: 01296 315000

## OXFORD REGIONAL RHEUMATIC DISEASES RESEARCH CENTRE

<b>Direct Lines:</b>	<b>Dr. M. Webley</b>	-	<b>01296 316666</b>
	<b>Dr. S. Edmonds</b>	-	<b>01296 316664</b>
	<b>Appointments</b>	-	<b>01296 316660</b>
	<b>Fax.</b>	-	<b>01296 315968</b>

MW/KJR

16th January, 1998

Mr. C. Allen,  
Consultant Clinical Psychologist,  
The John Hampden Unit,  
Stoke Mandeville Hospital NHS Trust.

Dear Dr. Allen,

Thank you for your letter with regard to the questionnaire, which I have read through.

I am happy to give approval to this modification.

Yours sincerely,



Michael Webley, M.B., F.R.C.P.,  
Consultant Rheumatologist.

c.c. Mr. P. Mansfield