Psychological and Cognitive Aspects of Ageing: The Importance of Driving on Senior Living

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Abstract: This research aims to understand the psychological, the social and cognitive aspects of ageing and assess the relevance of driving a personal automobile to seniors. We know that biological ageing is an inescapable fact, but is there also a psychological and a cognitive ageing? If so, is it related to getting older or to other factors? How relevant is continuing to drive to seniors, and how can the activity influence psychological and cognitive types of their ageing and self well-being? To answer these questions, we study several authors and concepts about mental health, development of ageing and their relationship to driving. We also explore psychological and cognitive changes associated with ageing, the principal behavioural changes of healthy senior people (with normal cognitive function) and MCI (mild cognitive impairment), as well as how driving inhibition can induce and affect psychological and cognitive characteristics. We conclude that low mental functioning is caused by a set of biological, psychological and social factors, connected in turn to environmental factors. The slowdown of cognitive activities and performances in seniors is not inevitably accompanied by a decrease in intellectual capacity, low sensory acuity, or slowing psychomotor skills. Other factors should be considered—such as health status, limitations, anxiety, lack of interest, motivation and attitudes. The loss of cognitive abilities and the prevalence of mild cognitive impairment increase with age and are a growing concern, especially among seniors who drive cars. However, we still lack specific evidence based on tests and criteria—in particular, on psychological and cognitive domains—to assess senior drivers actually at risk. It is important to establish a base of evidence to allow objective risk determination. The safest senior drivers should continue driving for as long as possible, thereby contributing to their mental health, independence and quality of life.

Key words: Psychological, cognitive, ageing, mental health, senior drivers, active ageing.

1. Introduction

The senior population is increasing worldwide. The average age of the world population is increasing rapidly, with 25% of the total population expected to be over 65 by 2060 [1]. Seniors can expect to live longer and healthier lives than earlier generations, with more activity, mobility and valid driver’s licenses [2, 3]. Also, the number and duration of trips is increasing among senior drivers [4]. In the near future, by increasing the number of women with driving licenses, a growing number of total senior drivers are still expected. In addition, in these age groups, there is an evident preference for the personal automobile as mode of transportation [5, 6]. Driving a personal automobile still remains an important primary mode of mobility, in so far as the ability to leave the home is essential aspects of the quality of life of senior persons and often connected to psychological well-being, independence, and the sense of being empowered in old age [5, 7-13].

Therefore, aspects of experience have a strong influence on the personal automobile choice as the preferred means of mobility, especially if seniors have reduced physical mobility or are socially isolated due...
to the limited or sporadic connections and networks of public transports [14, 15]. The car is a means of social connection and of access to the daily basic needs found in different places. It is an enabler of independence and well-being and a “property object,” with associated benefits such as comfort, choice and freedom of schedules and itineraries. For these reasons, over time, the experience of a driver and his or her car has a strong influence on many emotional, psychological and cognitive domains of different individuals [16].

Over the years, progresses made in living conditions and health have increased the number of aged individuals who continue to drive cars, making it important to consider factors that ensure the improvement of traffic safety for all [17]. In normal ageing, beyond obvious physical changes, there are general cognitive declines [18]. Some of the cognitive progressive impairments in ageing have clear relevance for car driving, such as a reduction of visual attention, slower decision-making and a general deterioration of the ability to deal with complex situations [19-21]. It is also noted that driving errors may increase with age, particularly related with task switching, visual distinction and selective attention [22]. However, other studies have shown that aged drivers usually are aware of their limitations, adopting behaviours of self-regulation in driving that tend to minimise the potential risk of accidents to safer behaviours, making this group of drivers not so potentially dangerous [17, 18]. The behavioral adaptation in driving is function of driver confidence in complex situations, such as the risk, fatigue and mental workload that are motivated by individual characteristics, including experience, age, gender, personality traits, attitudes and motivations, which induce greater subjectivity on drivers’ evaluation of their capabilities [24-27].

To many senior drivers, the personal automobile use represents an overcoming of needs in experience and wellness and contributes to active ageing and independent living, where better access to alternative transport modes cannot sufficiently compensate for mobility problems due to the lack of the option to drive [7]. Currently, senior drivers represent an attractive target audience for the automotive industry, and design research is fundamental to the development of friendly solutions and adjusted to the characteristics, needs and interests of these drivers [28-32].

2. Psychological Ageing Aspects: Life and Car Driving

There are no correlations between chronological age, physical age and psychological age in seniors [33]. Since childhood, the human being learns to keep his mental balance through appropriate mental attitudes and continues to develop this ability throughout life. The psychoanalytic model of Freud and Erickson relates to mental health and the proper development of psychosexual and psychosocial stages. According to these conceptions, individuals are able to adapt to the environment and to situations in order to perform social roles and preserve the balance between physical and psychological maturation. Individuals can confront their problems and solve them satisfactorily as a result.

Individuals are able to “love”, “work” and to “have fun”. Love is expressed in all forms of altruism, work is expressed as a life purpose, and leisure time is a main aim of relaxation and social interaction. Maintaining mental health corresponds then to a trilogy: love, work and leisure [34]. (Fig. 1)

“Mental health is a balance of psychic life which is characterized by a realistic self-assessment and a good ability to control the normal stresses that an individual has to cope” [35]. It is a state that allows individuals an optimal development at the physical, intellectual and emotional levels. In general, mental health settings are developed around two concepts: (1) mental health is a way of being, and (2) mental health is a sum of virtues. This second conception is more positive and tries to describe the attributes that allow individuals proper psychological functioning, justifying the adaptation resulting therefrom [36]. Mental health is often equated with “successful adaptation” and for the senior person
with “happy ageing” [37]. Mental health is related to emotional maturity [38]. This emotional maturity is a continuum evolution, and its manifestations are observed throughout life, unlike the physical manifestations of ageing. People between 65 and 95 years of age express different emotional reactions. So, we can define maturity as “an attitude” or an accumulation of attitudes or useful activities and variables—such as wisdom, stable social behaviour—or as a maturing and preparation for the next stage of life [39].

Although mental health is one of the most important aspects of human life, it is a vague concept that is difficult to define, and there is no real consensus around it. There are a variety of reasons for this: (1) the boundaries of mental health are not clearly circumscribed, and the terms used are often abstract; (2) most of the population’s health goals have focused on physical aspects of health and on the cure of diseases; (3) the concept of mental health varies with cultures; (4) “normalcy” of a psychological level gives rise to different interpretations, and the term “mental health” necessarily involves value judgments [40].

For a long time, it was believed that ageing would inevitably imply a reduction of mental and cognitive processes. For a long time, many theories and research studies expressed this idea and fuelled prejudices [37, 41]. Nowadays, it is known that it is possible to preserve mental health until the end of life and that most people can achieve this: “not all seniors end their days swinging and lost on their thoughts and out of reality” [41]. Most conserve what they have acquired and develop personal life trajectories adapted to their new conditions [34, 42]. Human beings evolve psychologically until the end of life: “psychically we get old and psychically we live” [40]. This evolution allows humans to retain autonomy, that is, the power to decide, act and change their guidance and conduct.

People who, at a certain stage of their lives, have less capacity for work cease activities, so retirement is a turning mark in senior life that can induce depressive states when not regarded with useful alternative activities and social interactions [7, 43, 44]. The resulting depression makes individuals more susceptible to disease and may aggravate pre-existing diseases [45]. There is evidence of the occurrence of deleterious processes in the human body that accelerate the ageing process in depressive states [46].
Increasingly, car driving is an integral part of human life, especially in developed countries, providing autonomy and other psychosocial benefits [16]. With more leisure time, seniors can start new activities, travel more often and visit friends and family. As drivers of any age, seniors use their cars to go shopping, run errands and get medical advice, among other activities. Driving is an important part of becoming independent [42, 47-50].

3. Cognitive Ageing Aspects: Experience and Car Driving

Cognitive or thinking skills are critical to safe driving. These are skills that allow drivers to get important information about the driving environment and take operational decisions and necessary strategic tactics [51].

Although there is variability among seniors, some cognitive skills are more likely to decline with age than others, and those that decrease more are: the ability to focus on two or more sources of information or on the execution of two or more tasks simultaneously [52-54]. It has been shown that with ageing, the information analysis capabilities needed while driving declines, resulting in greater difficulty with responding appropriately to sudden changes of contexts and traffic information, as well as with spatial cognition, or the ability to think about your position in relation to other objects in space. The low spatial cognition can be reflected in greater difficulties, such as navigation, the loss of position and steering. Advancing age also negatively affects executive function. This function refers to the metacognitive ability of individuals to effectively plan, organize, strategize, evaluate and self-regulate, which results in the most unsafe driving and increases the risk of accidents [51, 55-56].

With advancing age, some of the elderly population may suffer some variety of dementing disorder. Causes include Alzheimer’s disease, multi-infarct dementia and a variety of other disease states. Effects can vary from very subtle to severe. The prevalence of moderate dementia states or MCI (mild cognitive impairment) is more prominent at ages higher than 75 years [57]. MCI is a condition that presents as a mild impairment in cognitive functioning, normally at the memory level that is less than expected for age and education level, but that does not meet the criteria to be considered dementia [58, 59]. Drivers with MCI may face deficits in one or more areas of cognition. There are several pathologies of MCI with different clinical origins and presentations (MCI multiple domains, MCI amnestic, MCI single non-memory), which may result in specific deficits in higher level executive skills, memory or lower cognition levels [60, 61].

Although a large number of studies suggest that individuals with moderate to severe dementia are unable to drive, there is no clear definition regarding the onset of dementia [62-64], relatively little is known about the driving performance of senior drivers with MCI [51, 65], few studies demonstrate the relationship between MCI and driving performance [65-73], and there is no full consensus on the measurement of impairment in driving in seniors with MCI or whether they consequently have a higher risk of accidents compared to healthy people of the same age [51, 64]. The available research from driving simulators and road studies suggests that drivers with MCI have prominent difficulties with navigation and decisions. There is evidence of difficulty in responding to situations involving higher cognitive demands: at road crossings and intersections with complex traffic and in scenarios that require assimilating information related to distance perception, speed, other users on the road (for example, pedestrians) and environmental stimuli (such as traffic signs). Other difficulties were also noted, such as proper positioning on the road and lanes, maintenance of appropriate direction and speed, and reacting to other road users [51, 56, 74-75]. Given that drivers with MCI are more prone to develop dementia, they represent a group of drivers that is important to monitor to assure safe driving conditions [76]. Other studies indicate that senior drivers, compared to young
adults, have hesitations in their foot movements and require more time to move the foot from the accelerator to the brake and to react to visual stimuli such as color changes at the traffic lights [77, 78].

Currently, despite studies showing potential cognitive difficulties in driving, the lack of specific evidence-based tests and criteria prevents us from judging drivers who are potential at risk. It is important to establish an evidence base that clearly determines the risk so that senior drivers can continue driving for as long as possible, thereby enhancing their independence and quality of life and minimizing the risk to the drivers themselves and other road users [47, 51, 56].

4. Psychological and Cognitive Effects in Seniors Due to Car Driving Inhibition

Currently, the cognitive verification tests of driving skills are performed by doctors and are based on drawings and written questions. A usual question is if elderly citizens who have driven for many years without incident should have their licences suspended for failing a cognitive test based on paper questions. Even doctors do not reach consensus in this regard [80-82].

Some studies emphasise the importance of transport in promoting health throughout life. Driving cessation is associated with worsening health status, social and physical functioning limitations, and increased mortality risk [83-85]. However, less is known about the relationship between the driving cessation and the change on cognitive function in senior drivers [86]. For many seniors, driving cessation is a major life event and represents a significant loss of independence [87-88], causing negative social consequences that affect their psychological well-being [47, 89-94]. Individuals with social, mobility and spatial restrictions are more likely to develop cognitive degenerations such as MCI and Alzheimer’s disease [95-96]. For many seniors, stopping driving means fewer activities, excursions from home [97] and friends [98], resulting in an overall decrease in social and physical activities that would mitigate psychological and cognitive decline.

5. Discussion and Conclusions

Human beings, as they grow older, can take advantage of their past experiences, acquired knowledge and skills to enrich their present experience, continue certain activities and make better use of their intellectual and mental functions even if the latter have become slower.

The ageing process produces different effects in older adults.

Different theories about the psychological and cognitive changes arising from ageing were examined in this paper, and we conclude that decline in mental functioning is caused by a complex set of biological, psychological and social factors, which are in turn linked to environmental factors. Thus, ageing is an intrinsic process (e.g. genes, bodily composition, gender), but it is influenced by factors extrinsic to humans, such as the types foods they consume, the environment they live in, their lifestyle and psychosocial causes, among others, which have a crucial effect on the disparity, so people will age at different rates. Within the category of “normal ageing”, a distinction has been made between “common ageing” (in which ageing’s effects are enhanced by extrinsic factors) and “successful ageing” (with no or few of these effects). These extrinsic factors are prevalent in ageing and result in the individual’s type of experience. Also, the use of medicines, therapies and medical services has allowed seniors to delay the ageing effects, leading to healthier seniors.

On “successful ageing”, gains in years of life are best if these years are without unhappiness and suffering, instead of comprising a period of losses, disabilities and dependencies.

The slowdown of cognitive activities and performance among seniors does not lead, necessarily, to reduced intellectual capacity, low sensory acuity or psychomotor decline. Hence, psychological problems
that are associated with ageing are rarely caused by decreases in cognitive function, are mainly related to losses in social independence, stress, anxiety, disease and fatigue, among others, which generate a loss of concentration and reflection. Although these factors are not only associated with ageing, they influence the adaptation capacity of seniors.

On the one hand, several studies have shown that ageing leads to fewer cognitive abilities that are considered risks to safe car driving. On the other hand, driving cessation is itself also an enhancing factor in accelerating this process of cognitive decline. This means effectively that only drivers with obvious psychological and cognitive limitations should be inhibited from car driving. Taking away the freedom of car driving from seniors, without a thorough understanding of their effective limitations, means putting a group of individuals at an accelerated risk of psychological, cognitive and functional decline.

There is a wide variation in the cognitive ability to drive among elderly drivers with and without MCI. It is important to establish an evidence base to enable the objective determination of risk, so that individuals who are safe can continue to drive for the maximum possible time, thus enhancing independence and quality of life while minimising the risks to the driver or other road users [51].

Successful ageing is one in which the individual is in a state of constant experimentation and continues to make choices and to take a place in society. Therefore, it is necessary that we allow seniors to be successful in ageing and support the reconstruction of their social lives.

To achieve this, the intergenerational relationship, proper environmental integration, social programs and the right to mobility, particularly through car driving, are all necessary and allow them to live more productive and satisfying years and to slow down the ageing process.

References


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