Despite more conservative driving habits, older drivers have a high crash rate per distance travelled (Ball *et al.*, 1997; Owsley *et al.*, 1998) and they are believed to represent a high risk to road safety (Gray and Sullivan, 2002). Because driving is a highly visual task there has been a substantial amount of research about the effects of the aging visual system on driving performance. When trying to predict accident frequency, however, performance on various visual tests normally accounts for no more than 20% of the variance (Owsley *et al.*, 1991). This simply highlights the complex nature of the driving task and the need to examine other contributing causes. In this study, we would focus on one specific aspect of the driving task, that of the right-foot movements responsible for controlling accelerator and brake pedals. These movements are at the heart of the pedal-error phenomenon. Over the past few decades, more than 10,000 crashes have occurred in the US in which the driver claims the vehicle accelerated unexpectedly and the brakes were uneffective (Pollard and Sussman, 1989). Perhaps, the deadliest known case of such a mistake is that of Santa Monica in 2001. Is it necessary to recall that, before stopping the car, the driver (86 years old) had killed 10 and injured more than 50 people. The driver was not intoxicated and did not suffer a seizure before the accident. Similar cases with almost as tragic outcomes are reported throughout the world on a nearly daily basis (Gray and Sullivan, 2002). Clearly, the Santa Monica case cannot and should not be considered as an anecdotical incident.

While foot movements for controlling the pedals are largely programmed and performed without vision of the moving limb and targets (pedals), low-level kinesthetic feedback processes contribute to their accuracy. This raises an important concern since one of the most common manifestation of aging is a decreased lower limb sensory information or sensory neuropathy (Boucher et al., 1994; Richardson and Hurvitz, 1995; Simoneau et al., 1996; Thomson et al., 1993). Sensory neuropathy is a defect of the nerve conducting the sensory information from the limb to the central nervous system. Increased movement variability is also reported (Cantin *et al.*, 2004; Darling *et al.*, 1989) and the variable and inconsistent processes generating muscle force could be a primary factor for serious pedal actuation errors (Schmidt, 1989).

Pedal control is a key aspect of the driving task. Surprisingly, there are few studies on pedal errors, and much of this literature concerns human errors as a function of pedal placement and characteristics (Rogers and Wierwille, 1988; Vernoy and Tomerlin, 1989). These actions require contributions from low-level kinesthetic feedback. Yet, there is a scarcity of information on the effect of decreased lower limb kinesthetic information often observed with aging and age-related diseases on the movements necessary to activate the pedals. Reduced peripheral sensitivity may be at the heart of a critical driving problem, that of unintended acceleration. A better knowledge of the right foot movements required to control the accelerator and brake pedal is an essential step towards not only diagnosing those drivers that are at high risk of crashes but also towards the development of innovative approaches for securing older drivers that are still able to drive and developing innovative approaches to reduce the frequency of these incidents.

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